

## 第6章 専門家の生活環境等

メイン・サイトと目されるCSR&TIのあるマイソールは、人口30万人程度の市街地を持った標高約700mの古都風の都市である。サブ・サイトとCSB本部のあるバンガロールは、インドで第4の都市になりつつある大都会で都市部の人口は200万人とも言われる。標高は900m程度である。

両市とも高地のため一時期(4~5月)を除き涼しく過ごし易い。北部インドに較べると、カルナタカ州の人々は穏やかとの評が一般的である。

首都ニューデリーからバンガロールまで約2,300kmあり、ジェット機で2時間半、更にメイン・サイトまでは約150kmを車で約3時間かけて辿りつくので、かなり不便な感じはあるが、専門家の生活環境は総じて良く、マイソール、バンガロールともに大きな問題は見受けられない。但し、子供の教育及び余暇の過ごし方で若干適応するための工夫が必要となるであろう。

### (1) 住宅事情

メイン・サイトとなるであろうマイソール市には、市中心街を取りまくように中・高級住宅地域があり、いずれもメイン・サイトのCSR&TIからは車で10~15分の距離である。住み易そうな中・大型の1戸建て住宅がJICAの住居手当の範囲内の家賃で充分借り上げることができる。庭が広く静かな地域のもは、少々治安上の不安が残るので防犯対策が必要と思うが、予算の範囲内で各種防犯設備をつけて貰うことは可能の様である。子供を随伴しない家族なら、庭は小さくても近隣家屋が近い地域のもが、内部は日本の都市型一戸建住宅に較べゆとりのある広さの物が多いので、そちらを借り上げることが得策かも知れない。

家具は備えてないのが通常なので、家主に交渉するか、数多くあると言われる家具屋やレンタル業者からの借り上げになる。家具のレンタルはこの地域では一般的とのことである。また、単身であれば、下宿も可能と思われる。

バンガロール市内は雑然としているので、郊外の住宅を借り上げの方が良いと思われる。郊外の住宅地からは、CSB本部までは車で30分程度、サブ・サイトのCSSTLまでも同様の通勤となる。住宅の状態などはマイソールと同様で、大都市なので家賃は高めになるが、JICAの住居手当の範囲内で充分借り上げが可能である。市街地でも良いのなら、我国のマンションに匹敵するフラット(アパート)が多くある。

短期専門家用には、両市ともに中・高級ホテルが多くあり、長期滞在も可能である。どちらかという宿泊費は、バンガロールの方が高いが、快適さはやはりバンガロールのホテルの方が良い。いずれもJICAの支給する宿泊費内で滞在可能である。また、国・州営のゲスト・ハウスや各種研究所のゲスト・ハウス、寮などは安価で、友人をつくるなどの点からは推められる。これら施設での滞在にはCSBが便宜を計らうとのことであった。

## (2) 教育事情

日本人学校は無いので、小・中学生を随伴しどうしても日本人学校に入れたい場合は、ニューデリーやボンベイに家族を住まわせることになる。二重生活となり、双方の都市ともに飛行機で往復するしかないので、専門家にとって相当の負担となるので推められない。

英語で教育を行う学校が小・中・高を通して公立・私立ともに数多くあり、入学は容易とのことであった。インターナショナル・スクールやアメリカン・スクールの類は両市ともにないが、キリスト系ミッション・スクールなどは各種あり、それぞれ独自の教育方針で運営しているとのことであるからこれらの学校を幾つか比較してから選考するのが良いであろう。いずれにしても、インドの学校は我国の現在の学校に較べ規律が厳しいように思われた。

## (3) 治安

北部インドでの政情不安に較べるとカルナタカ州は安定しており、現在テロなどの騒ぎは起きていない。

貧困は慢性的で長期間同様の状況が続いているが、状況は良い方向に向かっており、急激な変化ではないので、経済的理由による暴動等は現在起きていない。新聞や聞き取りによる情報では強盗事件は少ない。夜の一人歩きにも特に不安を覚えることもなく、荷物を放置しても問題はなかった。勿論、短い調査時の経験から判断すべきではなく、専門家各自で充分気をつける必要がある。派手な生活をする日本人の存在が目立つようになれば狙われ易くなるのは他の諸国での例を待たない。CSB職員の話によればコソ泥・空巣狙いは多いので要注意とのことであった。

## (4) 食糧・日用品・物価事情

マイソールには、我国のスーパーに匹敵するものは地方村落部の農協マートのものが1つしかないが、雑貨屋が多く、日用品はこれらで豊富に入手可能。食糧は、市内に幾つかある市場（常時開設）で豊富に入手できる。日本食品は正油などの調味料がニューデリーで入手可能であるが、他のものはない。中華料理店が両市ともに幾つかづつあり、和食と類似の調味料の入手は可能の様である。野菜・果物は新鮮な物が豊富に出まわっており、我国の代表的なものはほとんど種類があるのに加えて熱帯性の珍しい物も多い。

日用品は、品質の良いものは少ないが、一とおり揃えられるし、品切れするようなことはないようである。家庭用品は電気製品以外は現地の物で充分用が足りる。日本のビデオを見たい場合は、システムが違うのでマルチ方式のTVとVTRを日本から持参する必要がある。その他の電気製品はバンガロール、またはニューデリーで入手できるものでも用は足りるが、特殊な物は日本から携行する必要がある。

バンガロールの方はスーパーが数軒あり、また電気製品、日用雑貨品を売る店が多い。また食糧品、日用品を扱う市場も多い。

物価は一般的に安い。食糧品・日用品・衣類は安い、電気製品・車等の工業製品はほとん

どが国産品だが高く質は劣る。輸入統制をしているので先進国の製品はほとんどなく、あっても高い。

#### (5) 医療事情

両市ともに公立・私立の総合病院が幾つかつつある。専門医のクリニックも多い。市の規模から言って、バンガロールの方が医療事情は良いと思われるが、どの程度の診断・治療が可能なのかは調査できなかった。

カルナタカ州は、マラリヤ・コレラなどの伝染病は現在発生していない。但し、デング熱はときおり流行すること。狂犬病、破傷風、肝炎などの予防接種は受けて行った方が良いと思われる。

#### (6) 余暇の過ごし方

両市ともに、ゴルフ、テニス、乗馬、水泳・卓球などのスポーツクラブがあり安価で入会可能である。

インド特有の文化、ヨガや手工芸、料理などを習うことも余暇の過ごし方としては興味深いものがある。特にマイソールは研究所が多く、知識階級が多く住んでいるので、こうした人達との交流・社交も意義深いものがある。マイソールは古都の雰囲気を持ち史跡も多いのでこれらを訪ねるのも良いであろう。

カルナタカ州内、近隣州には野性動物保護区や公園が多く、また、マイソールの西南部は更に高地で避暑地として有名な所となっている。ボンベイやマドラスまではバンガロールから飛行機で2時間足らずで行け、ケララ州やタミール・ナドゥ州の海岸への旅行も楽しみの一つとなろう。

ホテルのものを含め、西洋・中華及び各地のインド料理を食べさせるレストランが両市ともに多くあるので、外食も気分転換には良いと思う。

#### (7) 関連図書

- ・「私たちのインド」 辛島貴子 著 北洋社刊

1970年代に、メイン・プロジェクトサイトであるマイソールでの2年間の生活を中心に、それ以前のマドラスでの1年近くの滞在などと比較して、主婦の目で描いている。おそらくは、マイソールの生活体験について書かれた我国唯一の著書。この地が他のインド各地に較べて住み易いことや人々との触れ合いのことについては、時間が経ってはいても大方現在でも変わらないことと思われる。赴任に際しては是非一読したい本である。JICA国際協力総合研修所図書館蔵書。

- ・「裏がえしのインド」 西丸震哉 著 角川文庫刊

インドの文化・食生活などの調査のため広くインド各地を旅行した記録で、バンガロールの記述はほんの僅かだが、南インドについては幾らかの頁を割いている。30年近く前に書かれたものだが、インドとインド人を理解するには良い入門書と思われる。特に、日本人がイ

ンドやインド人に対して抱き易い偏見の原因と、そういう偏見を持たないためのコツをさりげなく説いている。

・「日本民族のふるさとを求めて」 森本哲郎 著 新潮文庫刊

標題のテーマを持って、知的な遊びを楽しみながら南アジアの各地を旅した記録。南インドに関しては4分の1ほどを割いており、カルナタカ州近辺州の歴史と風俗や人々のことが分かり易く描写されている。マイソール王朝についての記述もある。インダスやシッキムなど関連の地での体験・考察と併わせ読むと、インド文明の姿が見えてくる。

日本民族のふるさとが南インドとどう関連あるのかは分からないが、文化そして民族というものがどういう経緯で形成され変貌するのかを考えさせる著で、読後にはインドに対してどういうアプローチをすると良いのかが分かってくる。著者が何度か述べていることだが、インド亜大陸の北と南では風土、従って、文化そして人間にはきわ立った違いがある。これは何度もインドを訪れた著者でなくとも、今回の調査のように短い期間に南北を旅しただけでも感ずることができる。一般に我々日本人はデリーやカルカッタなど北部インドの印象からインドを語ることが多いが、プロジェクト・サイトのカルナタカ州を知るためには、南北の歴史・文化・風土の違いを知る必要があると思われる。

・JICA国際協力総合研修所図書館にあるインド生活情報に関連する蔵書を以下に列記する。

「各国事情のしおり、インド編」	1971年刊
「インドとイギリス」	1975年刊
「インド入門」	1977年刊
「インド大地の歌声」	1984年刊
「インド、世界各国便覧業書」	1982年刊
「南アジアの国土と経済」	1986年刊
「インドグラフィティ」	1987年刊
「インド・同時代」	1985年刊
「インドを歩く」	1987年刊
「ガンジスの流れに」	1985年刊
「インド人の世界」	1980年刊
「インド情勢及び日印関係」	1989年刊
「もっと知りたいインド」	1989年刊
「インドの社会経済発展とカースト」	1990年刊

・その他、市販されているもので興味深い図書を以下に列記する。

「インド民衆の文化誌」	小西正捷著	法政大学出版局	1986年刊
「脳みそカレー味」	山際素男著	三一書房	1985年刊

「ファンタスティックインド」	松本裕美著 芙蓉書房	1986年刊
「もっと知りたいインドⅡ」	臼田雅之ほか著 弘文堂	1989年刊

## 第7章 提言および留意事項等

- (1) インドにおける養蚕開発へのニーズは大きい。同国においては生糸の国内需要の増大、高級生糸の輸入への代替に応えることが重要な課題となってきた。同時に、養蚕及びその関連産業は、雇用吸収力が高く、農村部を中心に、雇用機会とくに女性への就業機会の提供に果す役割は大きい。加えて、同国における養蚕の収益力も相対的に高く、貧困からの解放に役立つ面もまた大きい。
- (2) このような状況をふまえ、同国では、国家政策上も養蚕開発に重要な位置けを与え、技術開発、普及のシステム化、繭、生糸等各種流通の改善、養蚕農家、製糸業者等各段階での金融その他の助成措置の強化、さらにはリスク負担のための保険制度の導入等総合的な接近を試みつつある。
- (3) 関連して、本分野における同国の海外からの協力に対するニーズには大きいものがある。そのうち、技術的分野に関しては、我国を最先進国とみなし、同国の我国への期待には極めて大きいものがある。
- (4) 養蚕分野におけるインドの技術開発・研究の水準は、他の途上国に比べかなり高い。試験・研究に携わる優れた人材も多く、施設もかなり整いつつある。協力受入れの組織・体制にも概してかなりしっかりしたものがみられる。
- (5) 一方、いくつかの点で補強を要する面がある。すなわち、①基礎的研究と農家へ普及すべき技術との接点、いわば実用技術の開発分野、②各種試験・研究分野相互間における進展度のギャップ、そして、とくに③二化性養蚕に関する技術開発のおくれと経験の不足、などである。なお、一連の養蚕振興策の中で……技術開発・普及分野を含め……国と州との役割分担がわかりにくいところがある。
- (6) 上記の状況をふまえ、我国が技術協力を行う場合には、我国の協力可能性にも留意しつつ、二化性養蚕の実用技術の開発・研究に焦点をあてて実施することが効果的であると思われる。  
具体的協力内容については、上記諸状況をふまえつつ、今後の調査でさらに詳細に協議する必要がある。協力期間は限定されているので、二化性養蚕の問題解決に必要で重要な緊急課題から段階的に、技術的に十分な可能性をも予測しつつ、具体的計画を立ててプロジェクトを進める必要がある。この場合、先にもふれたように、同国における養蚕を発展させるためには各種施策の総合的接近が求められているだけに、全体施策の中での我国協力の位置付け、具体的な協力の分野、目標、方法、協力対象機関、C/Pの配置等につき、当初の計画において、可能な限り明確にしておくことが重要である。もちろん、プロジェクトの進行過程において、進捗状況に応じた柔軟な対応が必要とされることはいうまでもない。
- (8) なお、以上のほか、若干の気付きの点をあげておこう。

- ① インド側関係機関の協力受入れ姿勢は誠実、かつ、柔軟であるが、長期間我国からのプロジェクト方式技術協力が無かった点もあり、実際の行政・事務手続上は相当の調整が必要となることも予想される。
  - ② 本件協力に対する関係者の意欲には強いものが見受けられたが、職階による身分感覚にはなお厳しいものがあり、トップ・ダウンの傾向が強い。こうした状況を考慮すると、日本側専門家はできるだけ高い地位の方をカウンターパートとしなければ発言力が弱くなり協力効果も減じられるおそれもあり得る。他方、職階が低いとされる多数の方々に指示し業務を遂行して行くための方策についても、工夫が必要とされる場面もあるかもしれない。いずれにしても、立派な方々が多く、信頼関係の確立が基本であることはいうまでもない。
  - ③ 事実、カウンターパートになるであろうと想定されるインド側研究者の方々は、日本側専門家への期待と尊敬の念が大きいと見受けられた。これに応えるべく意欲ある専門家の派遣が期待される。予測されるプロジェクトサイトの方々は柔和で日本人が馴染み易い。しかし、インドの文化と習慣等は我国のものとは相当の隔たりもあるので、赴任される専門家の方々は、事前に、極力同国の文化・社会への理解を深められて行かれるよう期待したい。
- (9) なお、養蚕分野の特殊性をも考慮し、協力期間中、若干名でも日本語の理解可能なカウンターパートの養成が行われ得れば、インド二化性養蚕の持続的発展に大きく貢献することになるものと思われる。
- (10) いずれにしても、インド側の大きな期待及び柔軟、かつ、積極的な対応振りに鑑み、従来の経緯からみても、我が方としては協力開始に向けて早急な対応を取る必要があるものと思われる。





別添資料①

議 事 錄 原 文



MINUTES OF MEETINGS  
BETWEEN  
JICA PROJECT APPRAISAL MISSION  
AND  
REPRESENTATIVES OF THE CENTRAL SILK BOARD  
ON  
THE PROJECT PROPOSAL  
FOR  
JAPANESE TECHNICAL COOPERATION  
FOR  
THE BIVOLTINE SERICULTURE DEVELOPMENT PROJECT  
OF  
THE GOVERNMENT OF INDIA

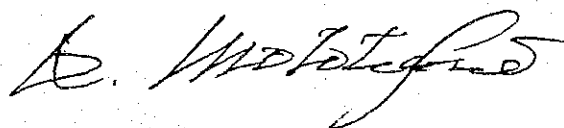
In response to a proposal from the Government of India for technical cooperation in the Bivoltine Sericulture Development Project (hereinafter referred as "the Project"), the Government of Japan, through the Japan International Cooperation Agency (hereinafter referred as "JICA"), despatched to India the Project Appraisal Mission (hereinafter referred as "the Mission") headed by Mr. Kaoru Motohashi from 9th April to 25th April 1990.

The Mission had a series of meetings with the representatives of the Central Silk Board, Ministry of Textiles, the Government of India, (hereinafter referred as "CSB") and also conducted field surveys, so as to understand the detail of Project proposal from India, to exchange views on the Project and to form the frame work of Japanese technical cooperation.

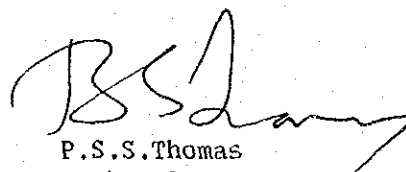
As the result of discussions, both parties agreed to report the major understandings made between them to the authorities of their respective Governments as "Minutes of Meeting" which is attached herewith.

April 21, 1990

Signed at the Headquarters of  
Central Silk Board, Bangalore,  
State of Karnataka, INDIA.



Kaoru Motohashi  
Head, Project Appraisal Mission,  
Japan International Cooperation Agency



P.S.S. Thomas  
Member Secretary,  
Central Silk Board,  
Ministry of Textiles,  
Govt. of India.

MINUTES OF MEETINGS BETWEEN  
JICA PROJECT APPRAISAL MISSION AND  
REPRESENTATIVES OF THE CENTRAL SILK BOARD ON  
THE PROJECT PROPOSAL FOR JAPANESE TECHNICAL COOPERATION IN  
BIVOLTINE SERICULTURE DEVELOPMENT PROJECT OF THE GOVT. OF INDIA

1. INDIAN PROPOSAL

1.1 Background of the Bivoltine Sericulture Development Project

As a background to the proposed Project, the Member Secretary of Central Silk Board (hereinafter referred as "CSB"), presented the current status of Sericulture Development in India as the paper "ATTACHMENT-A".

Questions were raised by the Mission in several parts for clarification and were answered by CSB.

1.2 Bivoltine Sericulture Development Project

Details of Bivoltine Sericulture Development Project was explained by the Member Secretary of CSB along with the Paper "ATTACHMENT-B". Clarifications were made where necessary.

1.3 Request for Japanese Technical Cooperation

1.3.1 Outline of Request

*D. M.*  
The Outline of Indian request for Japanese technical cooperation was proposed by the Member Secretary of CSB as "ATTACHMENT - C".

Questions were answered for clarifications.

*BS*

1.3.2 Sericulture Research Component

Detailed proposal for Japanese technical cooperation in Sericulture Research, at Central Sericultural Research & Training Institute (hereinafter referred as "CSR&TI") in Mysore was presented by its Director as "ATTACHMENT-D".

Questions were asked for clarification and answered by the Director and other Research Officers of CSR&TI accordingly.

1.3.3 Silkworm Seed Technology Component

"ATTACHMENT-E" was presented by the Director of National Silkworm Seed Project (hereinafter referred as "NSSP").

1.3.4 Post-Cocoon Technology Component

"ATTACHMENT-F" was presented by the Director of Central Silk Technology Research Institute (hereinafter referred as "CSTRI") regarding Japanese technical cooperation sought in silk reeling, silk conditioning and testing.

2. FEASIBILITY OF JAPANESE TECHNICAL COOPERATION

2.1 Outline of Japanese Technical Cooperation

The tentative observation of the Mission on the aim and feasibility of Japanese technical cooperation was outlined as follows:

Japanese technical cooperation;

- A. M.*
- (1) will aim to help boost the promotion of the Bivoltine Sericulture Development by CSB of the Indian Government,
  - (2) will be rendered particularly on the implementation of the Bivoltine Sericulture Technology Development Project (hereinafter the meaning of "the Project" is revised and referred as this)

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(3) will be in the forms of technology transfer and/or technical advices through despatch of Japanese experts and Indian counterpart training in Japan and equipment provisions necessary to pursue the activities in the areas of :

- i. Silkworm Breeding
- ii. Research in Silkworm Diseases
- iii. Development of Silkworm Rearing Technology
- iv. Mulberry Breeding and Cultivation
- v. Development of Silkworm Seed Technology
- vi. Development of Post-Cocoon Technology, and
- vii. Field Surveys,

(4) will be mainly concentrated in the areas listed as i to iv of (3),

(5) will be rendered in the specific field and activities of the areas listed in (3) according to the progress of Project, but where and when the Japanese resources are available, and

(6) will be executed in accordance with the laws and regulations in force in Japan.

## 2.2 Fields and Activities of Technical Cooperation

Considering the request made by CSB for Japanese assistance in different fields of sericulture research and development, and on the basis of results of discussions and surveys, comments were made by the Mission on the Project and feasibility of Japanese technical cooperation subject by subject and followed by the discussions between the representatives of CSB and the Mission as recorded below.

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### 2.2.1 Silkworm Breeding

The Mission expressed that improvement of the existing breeds is necessary. But it is difficult to evolve a breed which is hardy and also productive. There is a possibility to breed hardy races using the existing varieties in India. In the mean time, F1 hybrids presently available may be reared by farmers. Though pure Japanese races can not be provided, there may be a possibility of providing the F1 seed material and this can be used for comparative studies in breeding. The Mission felt that the Japanese cooperation may be possible for improvement of bivoltine silkworm races, making design and specification for rearing buildings and equipment.

### 2.2.2 Research in Silkworm Diseases

The Mission observed that there is a problem of silkworm diseases, especially with pebrine and viral diseases. There is a necessity to develop techniques for identification of different strains of microsporidians and viruses and their early detection and control. Japan may be able to extend cooperation in this field.

### 2.2.3 Development of Silkworm Rearing Technology

The Mission, while agreeing the need for development of suitable technology for young and late age silkworm, felt that there is also a need to improve the mounting system as it affects the cocoon characters and quality. They expressed that Japan may be able to extend cooperation in this regard.

R. M.



Responding to the CSB's request for cooperation in the field of mechanization of rearing and mulberry cultivation for larger scale farming, the Mission suggested a need of appropriate technology development in this field but reserved the comment on Japanese cooperation.

#### 2.2.4 Mulberry Breeding and cultivation

The Mission observed that there is a need for development of suitable mulberry varieties and cultivation practices for bivoltines both for young age and late age silkworms. Japan may be able to extend cooperation in this field. Regarding to tissue culture, the Mission felt that it may not have immediate effect on production, however, it is one of the important techniques required in mulberry breeding, to this extend, some cooperation may be considered.

#### 2.2.5 Development of Silkworm Seed Technology

With reference to CSB's request for cooperation in the field of developing hibernation schedules, short term chilling technique, embryonic studies and the improvement in techniques of mass production of eggs, Japan may consider a possibility of extending cooperation in hibernating, artificial hatching and mass production techniques.

#### 2.2.6 Development of Post Cocoon Technology

*R. M.*  
The Mission observed that silk testing at this stage may not be necessary and could be done at a later stage when good quality yarn is produced. There may be a possibility of giving cooperation at a later date.

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The Mission expressed that there is a need for improvement of methods in drying, cooking and reeling of bivoltine cocoons. Nevertheless, it is not immediately required as sufficient quantity of good quality bivoltine cocoons are not available at present. There may be a possibility of Japanese cooperation at a later stage.

#### 2.2.7 Field Survey

To respond to the CSB's request, the Mission felt that most of the problems in extension and commercial production are linked to social and cultural aspects. As such, the Japanese Experts may not be able to contribute much for the improvement. However, the Japanese Experts may be able to conduct field surveys, and will advise the extension programmes occasionally on specific technical issues. Further more, the result of surveys may be feed-backed to organize better research and development and to the management of CSB projects.

#### 2.3 Dispatch of Japanese Experts

The Mission explained that the Government of Japan may take necessary measures through JICA to provide, at its own expense, services of the Japanese experts, but where and when such Experts are available in accordance with laws and regulations in force in Japan.

##### 2.3.1 Long-term Experts

*R. M.*  
The Mission explained that long-term Expert means who is dispatched for more than one year including Team leader and Project coordinator. A Project like this may be provided with Team Leader, Project Coordinator and a few Experts in the four

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areas, namely ; (1) Silkworm Breeding, (2) Research in Silkworm Diseases, (3) Development of Silkworm Rearing Technology and (4) Mulberry Breeding & Cultivation. Team Leader may serve concurrently as an Expert in one of the areas mentioned above. Total number of long-term Japanese Experts to be despatched may not exceed five at one time including Team Leader and Project Coordinator.

CSB accepted all above regarding the long-term Experts.

#### 2.3.2 Short-term Experts

The Mission explained short-term Experts may be dispatched when necessity arises according to the progress of the Project, but total number of short-term Experts dispatched may not exceed five per annum.

CSB accepted the above regarding the dispatch of short-term Experts.

#### 2.3.3 Indian Counterpart Training in Japan

The Mission explained that the Government of Japan may take necessary measures through JICA to receive, at its own expense, Indian Personnel connected with the Project for technical training in Japan in accordance with the Laws and regulations in force in Japan. Such Indian counterparts to be accepted for training in Japan may not exceed five per annum. Selection of training fields and personnel shall be done at the Joint Committee.

CSB accepted the above.

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2.3.4 Equipment Provision

The Mission explained that, in accordance with the laws and regulations in force in Japan, the Government of Japan may take necessary measures through JICA to provide, at its own expense, equipment necessary for the implementation of the Project. The priority is given to the equipment in the fields of which Japanese experts are attached.

CSB accepted above regarding the equipment provision and provided the Mission with the list of equipment "ATTACHMENT-G" for its consideration.

3. REQUIREMENT FOR INDIAN INPUT

3.1 Sites & Physical structure

3.1.1 Project Site

Both sides agreed to set CSR&TI at Mysore as the main project site, and CSTRI and CSSTL in Bangalore and NSSP Grainage in Mysore as the sub-sites of the Project.

3.1.2 Land, Building and Facilities

CSB assured that it will provide land, buildings and facilities necessary to implement the Project. It will also construct new laboratories, mulberry gardens and other facilities with Japanese experts' advices. The list of existing and to-be-constructed facilities for the Project will be provided later by CSB for further discussions.

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3.2

Manpower Assignment

CSB assured the Mission that, Indian counterparts officials to Japanese experts, technical assistants, administrative clerks including secretaries to the Japanese Team Leader and Project Coordinator, drivers, labourers and other personnel needed for the implementation of the Project will be assigned. The list of personnel to be assigned to the project will be provided later by CSB.

3.3

Running Cost

Although the running cost of the Project is yet to be estimated, CSB assured the Mission that it will allocate enough budget for smooth implementation of the Project.

In response to the Mission's comment, CSB further accorded that it is the India's expense to bear the cost of :

- 1) Administration,
- 2) Construction of laboratories, mulberry gardens and other facilities,
- 3) Consumables for experiment,
- 4) Remunerations for Indian personnel,
- 5) Custom clearance, transportation, installation and maintenance of equipment provided by JICA,
- 6) Custom duties and taxes for Japanese experts' personnel effect, and
- 7) Travel expenses for Japanese experts on duty.

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3.4 Working conditions for Japanese Expert

3.4.1 Official Status

Both parties agreed that the Japanese shall be given the same official status as his counterpart Indian officer and offices will be provided accordingly. CSB accepted that Japanese to be allowed to leave the work if JICA permits such a leave as home leave, additional to the normal holidays given, i.e. 30 days per annum.

3.4.2 Privileges & Exemptions for Japanese Experts

CSB explained that the Japanese experts will be given the privileges and exemptions as stated in the office Memorandum "appears as "ATTACHMENT-H".

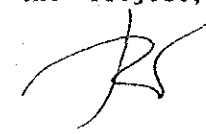
4. MANAGEMENT OF THE PROJECT

4.1 Administration of the Project

Both parties agreed on the administration set up for the management of Technical Cooperation Project on Bivoltine Sericulture Technology Development as follows :

- (1) The CSB represented by the Member Secretary as the Project Manager will bear overall responsibility for the implementation of the Project.
- (2) The Director (Tech), CSB as the Chief Coordinator of the Project will be responsible for the administrative and Managerial matters of the Project.
- (3) The Directors of different CSB institutions viz. CSR&TI in Mysore, CSTRI in Bangalore, CSSTL in Bangalore, and NSSP in Bangalore as the coordinators of the Project, will be

*R. M.*



- responsible for coordination and implementation of the programmes assigned to the respective institutions.
- (4) Japanese Team Leader, will advise his counterpart, the Member Secretary, CSB, on the managerial and technical matters of the Project.
  - (5) Japanese Project Coordinator will assist Japanese Team Leader in administrative matters and coordination of the Project, and will be the counterpart of the Indian Project Coordinator.
  - (6) The Japanese Experts will give necessary technical guidance and advice to the Indian counterpart personnel on matters pertaining to the implementation of the Project.
  - (7) The Director (Tech.), CSB will coordinate the activities of the Project with different CSB institutions and monitors the progress of implementation of the Project, which will be reviewed by the Member Secretary, Central Silk Board and the Japanese Team Leader once in three months.
  - (8) Collaboration of the activities of the Project will be made with CSR&TI in Mysore, CSTRI in Bangalore, CSSTL in Bangalore, and NSSP Graianage in Mysore.

4.2

The Joint Committee

It is agreed by both sides that for the effective and successful implementation of the Project, a Joint Committee shall be established. The function and composition assumed are as referred below :

The Joint Committee will meet at least once a year and whenever necessity arises, and work;

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- (1) To formulate the annual work plan of the Project in line with the the Master Plan which is yet to be agreed,
- (2) To review the overall progress of the technical cooperation programme as well as the achievement of the above mentioned annual work plan, and
- (3) To review and exchange views on major issues arising from or in connection with the technical cooperation programme.

4.2.2 Composition

(1) Chairman : Joint Secretary, Ministry of Textiles cum Vice-Chairman, CSB.

(2) Members :

i. Indian Side ;

- a. Member Secretary, CSB, Bangalore
- b. Director (Tech.), CSB-HQ, Bangalore
- c. Director, CSR&TI, Mysore
- d. Director, NSSP, Bangalore
- e. Director, CSTRI, Bangalore
- f. Director, CSSTL, Bangalore
- g. Representative, Department of Economic Affairs, Ministry of Finance.

ii. Japanese Side ;

- a. Team Leader
- b. Project Coordinator
- c. Other Experts and personnel concerned to be dispatched by JICA, if necessary
- d. Representative, JICA India Office.

(3) Observers :

Officials of Embassy of India

Others if permitted by the Chairman

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4.3 Schedule Henceforth

4.3.1 Discussions on implementation of the Project

In response to CSB's inquiry, the Mission replied that the Master Plan for the Project will be worked out in Japan and the draft will be sent to CSB. If the draft is agreeable by CSB, the Implementation Discussion Team will be despatched by JICA.

4.3.2 Preparatory Work

CSB suggested that preparatory work for the Project is needed before it commences, especially in designing facilities so that their constructions can take place at an early stage. Since, it requires expert point of views, CSB inquired whether JICA can dispatch experts who can make basic design of sericultural research facilities. The Mission replied that it will convey the need to the Japanese authorities.

CSB also requested for accepting its senior staff involved in the Project for study tour to acquire knowledge on the Japanese sericulture so that a better management of the Project will be performed. The Mission agreed on the benefit and will convey the request to the Japanese authorities.

END OF MINUTES

ATTACHMENT

TITLES

- A : Present Status of Indian Sericulture and Need for Bivoltine Sericulture Development.
- B : Action Plan for Production of 1000 MT of Bivoltine Silk in India

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- C : Proposal for Japanese Technical Cooperation for Bivoltine Sericulture Development
- D : Proposal for Japanese technical cooperation at Central Sericultural Research & Training Institute, Mysore
- E : Technical Consultancy in Silkworm Seed Technology
- F : Note on Programme of Experts from JICA, Silk Reeling
- G : Requirement of Equipment and Machinery
- H : Custom & Import facilities to Experts assigned to India

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PRESENT STATUS OF INDIAN SERICULTURE  
AND NEED FOR BIVOLTINE SERICULTURE DEVELOPMENT [CSB]

India is the World's second largest producer of raw silk. Presently, India produces about 9,700 M.T. of raw silk (1988-89). Since 1980 mulberry silk production has been growing rapidly at an average rate of 9% per annum. Domestic consumption has been ahead of raw silk production in the country, and demand has exceeded local production capabilities. Studies have indicated that the demand for silk will exceed domestic production for many years to come.

Raw silk production in India is largely of multivoltine variety, falling into the lowest grade (grade-H) by international standards which cannot be used in high speed looms. Indian raw silk yarn is suitable for the handloom and the low torque powerloom sector in India to manufacture traditional products for local consumption. Currently the bulk of exports from India is of handloom silk catering to a limited market (4-5% share of global market) because of its unique designs and production features. Nevertheless, there is a growing demand for superior quality silk to manufacture finer products for domestic consumption as well exports. To meet this demand India has been consistently importing about 2000 M.T. of superior grade raw silk every year, about 23% of the raw silk consumed in India.

SUBJECT : ACTION PLAN FOR PRODUCTION OF 1000 MT OF BIVOLTINE SILK IN INDIA

CONSOLIDATED ACTION PLAN FOR  
THE DEPARTMENTS OF SERICULTURE & CSB FOR 1990-91 TO 1994-95

The production of mulberry raw silk in India has touched an all time high record of 9700 metric tonnes in 1989. The current level of bivoltine production is only about 150 metric tonnes. Wider adoption of commercial bivoltine reeling cocoon production is of great significance in the present context as the bulk of Indian silk production emanates from multivoltine x bivoltine silk. The National sericulture project aided by the World Bank, despite the drawbacks in the current bivoltine programme, has aimed to make intensive efforts to promote bivoltine silk production. The powerloom industry's demand for bivoltine silk is on the increase and imports are of the order of 2000 metric tonnes annually valued at more than Rs.150 crores. Recently the Chinese have imposed restrictions on export of raw silk, which will predictably create a greater demand for high grade bivoltine silk of indigenous origin in the Indian market. The demand for high quality silk is thus already created in the country and what is required is a production link of appropriate quality (minimum 'C' grade) of bivoltine silk.

The Central Silk Board had constituted various bivoltine task forces and these have stressed the urgent need for the country to produce high grade bivoltine silk to meet the requirements of the organised textile industry. The approach of CSB to the bivoltine programme under NSP, draws heavily on the work hitherto done on bivoltine production, and seeks to adopt a complete package for its success. The elements of the package are given below, and the Directors of Sericulture are invited to offer their comments. At the end of discussion, an agreed programme with clear demarcation of responsibilities, may be drawn up.

## PRODUCTION TARGET

The target is to produce 1000 mt of raw silk. In terms of cocoons the target is 8000 mt of cocoon with 20% SR and defective cocoons below 15%. The multivoltine cocoons normally have about 8 - 10% defective cocoons. The cocoon price will be fixed on the basis of an agreed formula and will depend on SR & defective cocoons.

### I. IDENTIFICATION OF POTENTIAL AREAS FOR BIVOLTINE PROGRAMME

The bivoltine programme can become successful only when specific potential areas are identified with salubrious climate and required skill at farmers' level. Temperature range of 20 - 30 C, and annual rainfall of 40" are considered favourable.

In the 5 traditional states and 12 pilot states the areas identified for bivoltine cocoon production are categoried into two :

- a) Areas where two crops in a year can be of bivoltine.
- b) Areas where one or two crops (out of four to five crops) in a year are suitable for bivoltine.

Based on the above approach the locations are identified for production of bivoltine cocoons. (See Annex - I). However initially, other than in Jammu & Kahsmir and Uttar Pradesh, only about 2 crops will be attempted in favourable seasons ranging from September to February or March in most areas.

The areas identified for bivoltine production programme of CSB for 1st year is indicated in Annex - II

## 2. IDENTIFICATION OF PROGRESSIVE FARMERS

Farmers identified for the bivoltine programme must fulfill the following conditions :

- (a) Mulberry garden should have with full irrigation facility with wider spacing (60 cm x 60 cm or 90 cm x 90 cm).
- (b) The mulberry gardens must have Kanva-2, S54 or MR2 varieties, raised in accordance with the package of practices in totality starting from Farm yard manure application (20 mt tonnes/ha/year), Chemical fertiliser application (300N:120P:120K/ ha/year), Soil reclamation measures, leaf plucking method.
- (c) The farmer should have a proper (preferably a separate) rearing house and be capable of conducting systematic rearing/disinfection.
- (d) The farmers should have a good knowledge on the rearing management skills and obtain only chawki reared worms from well organised young age rearing centres.
- (e) The farmers should be indentified separately for bivoltine seed crop and bivoltine hybrid rearing.

CSB and DOS may agree to limit the bivoltine production programme to such farmers who have farm of the nature discussed at Item 2. Farmers, through extension activity and credit support, may be brought to the Bivoltine programme by converting to the proper system of mulberry cultivation.

## 3. TECHNICAL SERVICES

An adequate number of TSCs will be established in identified areas. The locations will be fixed after proper survey for maximum acreage under each TSC. Each TSC will be expected to cover 200 - 250 acres of bivoltine farms. The Technical Service Centres/Chawkie Rearing Centres being set up under the National Sericulture Project will ensure proper technical guidance to the bivoltine cocoon growers in identified areas and closely monitor the progress of crop and give necessary assistance to the farmers in rearing, as well as tie-up for marketing of their cocoons. The TSCs will help the farmers in the correct method of mulberry cultivation,

disinfection and rearing. CSB proposes to setup 40 TSCs for bivoltine programme which will cover 8000 - 10000 acres and result in approx. 250 - 300 MT of raw silk or about 25% of the total target. This will be achieved by the end of project period.

Extension staff will be responsible for training of the farmers, CRC supervision, disinfection & supervision of rearing in farmers' houses. They will make 3 visits each crop in the selected areas.

#### 4. TRAINING

Training the technical staff and constant upgradation of skills of the farmers connected with the bivoltine programme needs to be organised. There should be regular workshops to generate meaningful interaction in each state which will help in identifying local problems and find appropriate solutions without much loss of time.

Training of farmers in mulberry cultivation, silkworm rearing, disease control measures is crucial and practical training will have to be organised in the Technical Service Centres.

All TSC staff will be put through a special course in bivoltine rearing in CSR&TI, Mysore & Berhampore, in 2 batches each for a period of 30 - 35 days. For traditional states, CSB can depute training staff for courses to be organised by DOS.

All farmers under bivoltine programme will be trained under the scheme of training of farmers submitted to the World Bank.

#### 5. 100% CHAWKI REARING SUPPORT

Each TSC will be provided with 5 CRCs under the NSP.

The bivoltine hybrid dfls will have to be chawki reared in well organised chawki rearing centres and worms will have to be distributed after second moult. The chawki rearing centres are to be organised in private farms, co-operatives or identified Government silk farms with specially raised chawkie gardens. Required quantities of farm yard manure, chemical fertilisers, adequate irrigational facilities will have to be assured to each of the chawki rearing centre with full details of package of practices for maintenance of chawki garden. The latest techniques of raising chawki garden developed at CSR&TI, Mysore can support organisation of CRCs for effective results.

Utilizing the provision under NSP, the CSB grainages and TSCs will engage suitable farmers or co-operatives to rear chawki worms under technical supervision of the extension staff. The TSCs will be responsible to obtain indent for chawki worms, according to which chawki rearing will be undertaken.

#### 6. DISEASE & UZI CONTROL

Technical Service Centres of CSB will undertake total disinfection of the rearing houses of bivoltine rearers. CSB will also stock and supply through the TSCs the following critical items for disease & uzi preventions :

Uzicide, RKO, Lime & bleaching powder : @ 50% cost.  
Uzinet & cleaning net : at cost.

It is recommended that the DOS may also adopt these measures.

#### 7. SILKWORM CROP INSURANCE

Even though Mulberry silkworm rearing is practiced under controlled climatic and hygenic conditions, report of losses due to disease/vagaries of climate are not uncommon. Inspite of rearing disease



free layings, feeding quality mulberry leaves following improved rearing techniques under the supervision of technical personnel, adopting disinfection and preventive measures etc., losses are encountered by farmers resulting in poor returns. Hence, to compensate the loss (total or partial) crop insurance scheme will be introduced through Insurance Companies.

#### CREDIT

All the bivoltine rearers will be provided credit through commercial banks according to need for construction of rearing house, sinking of wells and purchase of rearing equipments. Crop loans will also be arranged for establishment and maintenance of mulberry garden.

#### 8. RACES TO BE USED

CSB grainages will release only bivoltine hybrids of already established races. Pure races of bivoltine will only be released from the P2 farms, and these will be limited to rearers in seed areas and selected seed rearers outside the seed zones. Attempts will also be made to introduce new races suited to different regions during the project period.

#### 9. GRAINAGES AND SEED SOURCES

The technical Service Centres will be attached to an identified grainage. These grainages will supply seed to farmers through TSC's as and when required.

#### 10. AUGMENTATION OF SEED PRODUCTION

One factor inhibiting commercial (hybrid) bivoltine production is the high price of pure race cocoons. It is necessary to augment production of pure races in seed areas. A specific action plan for this by CSB and the DOS is required. Likewise, pure races should only be produced in seed areas

and by selected seed rearers. In times of shortage, there is no objection to using good quality hybrid cocoons.

#### 11. LINKAGE BETWEEN COCOON PRODUCTION AND REELING

The programme will yield desired results only when fair and remunerative price is offered for bivoltine cocoons matching with quality. This should also be ensured by establishing a linkage between production of bivoltine cocoons and reeling.

The cocoon marketing will have to be done in one or two specified cocoon markets where higher price for bivoltine cocoons are assured. All cocoons will have to be tested and graded before they are marketed. A floor price will have to be fixed to fetch atleast 20% premium for bivoltine cocoons, over multivoltine x bivoltine cocoons of matching quality.

#### 12. COCOON PRICING

The cocoon price will be fixed on the basis of the prevailing market rate for Multivoltine x Bivoltine raw silk / cocoon, so as to fetch a premium of at least 20% over and above the market rate for multi x bivoltine of matching quality. The formulae proposed to be adopted for fixing the price is described in Annex - III.

#### 13. FILATURE SUPPORT

The existing filature support at Kanakapura with its 6500 ends capacity can produce 30 mt of bivoltine silk annually in 2 shifts per day in 300 working days in a year. As such it is necessary to identify 35 such units to produce 1000 m.tonnes of bivoltine silk.

Similarly the KSIC reeling unit at T.Narasipur has got a production capacity of 375 kg per day (113 tonnes/year) and other modern reeling units will have to be designated for bivoltine cocoon reeling.

The multiend machine developed in CSTRI is suitable for bivoltine reeling. These machines will be propagated with the support of IDBI, SFCs and Commercial Banks. Hot air drying units will be established by CSB in Pilot States or where prolonged storage is required. All these units will be requested to adopt the pricing formulae.

#### 14. FINANCIAL SUPPORT TO REELERS

In order to promote improved reeling machinery (multiend) in the pvt. sector, the CSB has drawn a scheme to provide capital subsidy on the machinery, Rs.10,000/basin upto a maximum of Rs.60,000 for a 10 basin unit.

In addition under the National Sericulture Project a provision of Rs.40 million has been made for providing working capital credit to silk reelers in both the traditional and pilot states except Karnataka. The provision has tentatively been allocated as under

It is proposed to allocate Rs.5.0 Million to the Raw Material Bank functioning under Central Silk Board to strengthen its operations for undertaking direct purchase of cocoons from the rearers, where proper marketing facilities are lacking. This will, however, be accommodated within Rs.10 Million allocated to Central Silk Board. This will also be utilised for the bivoltine production programme. The balance provision of Rs.35 million is proposed to be utilised for extending working capital credit to the silk reelers in the 4 traditional states viz. Andhra Pradesh, Tamil Nadu, West Bengal and Jammu & Kashmir and 12 pilot states.

#### 15. TESTING & GRADING OF BIVOLTINE YARN

All yarn produced by approved reelers will be tested and graded according to the parameters of winding breaks, size deviation, maximum size deviations and conditioned weight. CSB will set up a unit for this purpose in the Silk Exchange, Bangalore.

16. PROJECT MONITORING

A senior officer at the level of Joint Director, well versed in bivoltine programme/promotion has to co-ordinate this project. He has to monitor the basic seed multiplication levels, establish close linkage between bivoltine cocoon production and its marketing at premium price. Besides he shall establish liason with the identified modern reeling establishments to ensure the production of bivoltine silk. He will also monitor the functioning of TSCs/CRCs/P3-P2 farms/seed cocoons production/F1 seed production.

17. TIME TABLE

SURVEY & IDENTIFICATION OF LOCATIONS OF TSCs. :: End of April  
POSTINGS :: End of May  
TRAINING OF EXTENSION STAFF. :: May/June  
CRC ORGANIZATION. :: July

TECHNICAL DETAILS OF PRODUCTION OF 1000 MT OF BIVOLTINE RAW SILK

Target for bivoltine silk production	1000 mt
Reeling cocoons (8 renditta)	8000 mt
Hybrid seed requirement	200 lakh dfls
Number of grainages (30 lakh dfls/grainage/yr.) (45% biv. - 55% M x biv.)	15
Area required (400 dfls/ha; 40 kg cocoons/100 dfls)	50000 acres
No. of farmers (each with one acre avg.)	50000

BASIC SEED REQUIREMENTS

Seed cocoon requirement (P1)	1250 lakh
Seed area requirement	850 ha
Number of seed rearers(each with one acre)	850
P1 seed requirement	6.50 lakh
P2 cocoons requirement	32.5 lakh
P2 seed requirement	0.13 lakh
P3 cocoons requirement	0.65 lakh
P3 dfls to be reared	300 dfls

STATE	CATEGORY - A (2 crops)	CATEGORY - B (1 or 2 crops)
1. Karnataka	Hassan, Shimoga, Coorg, Uttar Kannada, Chikamagalur (6700 acres)	Mandya, Bangalore, Tumkur, Dharwad, Bijapur, Belgaum, Mysore, Kolar (25,000 acres)
2. Andhra Pradesh	Arkuvally (100 acres)	Madanapally, Ponganur, Palamner, Vikarabad, Karimnagar, Madakasira, Hindupur, (7,000 acres)
3. Tamil Nadu	Nilgiris, Koddaikanal (600 acres)	Salem, Dharmapuri, (5,000 acres)
4. West Bengal	Kalimpong, Darjeeling (500 acres)	Malda, Murshidabad, Birbhum (15,000 acres)
5. Jammu & Kashmir	Udampur, Ananthnag, Tral, (one or two crops only)  (1000 acres)	Shopian, Kokarnag, Sunderbani, Rajouri, Katna, Khistwar (4,000 acres)
<b><u>PILOT STATES</u></b>		
1. Kerala	Wynad, Idukki (500 acres)	Kanjirapally, Neduman, Iritti (500 acres)
2. Maharashtra	-	Akola, Buldana, Dhule, Sholapur, (250 acres)
3. Orissa	Koraput, Phulbani (250 acres)	
4. Madhya Pradesh	-	Bastar (100 acres)
5. Bihar	-	Purnea, South Bihar (Gumla, Lohardaga, Palome) (500 acres)
6. Assam	-	Jorhat, Sibsagar (200 acres)
7. Uttar Pradesh	Dehradun, Sahranpur (1000 acres)	
9. Gujrat	-	Mehsana, Baruch, Valsad (100 acres)
10. Himachal Pradesh, Punjab & Haryana	Panchkula, Solan, Palampur, Kangra, Simla (100 acres)	Hoshiarpur, Ambala, Chandigarh (200 acres)
<b>TOTAL</b>	<b>10,750 acres</b>	<b>57,850 acres</b>
<b>TOTAL AREA FOR BIVOLTINE COCOON PRODUCTION</b>		<b>68,600 acres</b>

## AREAS IDENTIFIED FOR CSB'S BIVOLTINE PROGRAMME DURING 1ST YEAR

STATE	DISTRICTS/AREAS IDENTIFIED	ACREAGE	
1. Karnataka	Belgaum	200	
	Uttar Kannada	100	
	Hassan	500	
	Chickmagalur	200	
	Bijapur	100	
	Mandya	400	
	Mysore	300	
	Bangalore	400	
	Kolar	200	
TOTAL			2400
2. Tamil Nadu	Nilgiris	200	
	Kodaikanal	200	
	Salem	200	
	Dharmapuri	200	
TOTAL			800
3. Andhra Pradesh	Karim Nagar	200	
	Chitoor	100	
	Ananthpur	100	
TOTAL			400
4. West Bengal	Malda	200	
	Murshidabad	200	
	Birbhum	200	
TOTAL			600
5. Jammu & Kashmir	Sundarbani		
	Rajouri		
	Katua		
	Kistwar		
	Udhampur	100	
	Pral		
	Shupian		
Kokarnag			
TOTAL			100
6. <u>PILOT STATES</u>			
a) Kerala	Idukki, Wynad	125	
b) Orissa	Koraput, Pulbhani	125	
c) Bihar	Purnea, South Bihar	250	
d) Maharashtra	Buldhana, Sholpur	125	
e) Assam	Jorhat, Sibsagar	60	
f) U.P., Punjab, Haryana and H.P.	Dehradun, Sahranpur, Tarai (U.P), Hoshiarpur (P), Panchkula (H), Solan, Kangra, Palampur (H.P.)	250	
TOTAL			935
GRAND TOTAL			5235

TO ASSESS THE PRICE OF COCOONS, THE FOLLOWING FORMULAE CAN BE VERY WELL USED IN THE MARKET FOR MULTIBIVOLTINE HYBRID AND BIVOLTINE HYBRIDS

- A. Multi-bivoltine hybrid cocoons having shell percentage in the range of 14-16, the constant used in 165.
- B. Bivoltine cocoons having shell percentage in the range of 17-20, the constant used is 150.
- C. Bivoltine cocoons having shell percentage in the range of 21-23, the constant used is 133.33.

Now calculated Renditta =  $\frac{\text{Constant}}{\text{Actual shell percentage of lots}}$

Procedure to find out the shell%

1. From a lot (normally of 50 kg. cocoons), select randomly 100 normal cocoons and assess the percnetae of shell.

Shell % =  $\frac{\text{Weight of 100 shells} \times 100}{\text{Weight of 100 cocoons}}$

2. Also without sorting, weigh one kg. cocoons and count the number of cocoons in 1 kg.

Type of cocoons	Number
i. Normal (reelable cocoons)	....
ii. Double cocoons	....
iii. Melted cocoons	....
iv. Flimsy etc.,	....

From this, percentage of defective cocoons would be assessed. From systematic series of experiments it has been found that if defective cocoon percentage is below 5 (including double) the above formula is very much satisfactory to assess the Renditta so that the difference between calculated and actual renditta would be about + 0.3.

Once we know the renditta, the cocoon price may be as follows:

Say silk price is Rs. A (per kg.)

Cost of manufacture B (Normally standardised for charkha, cottage basin and filature)

∴ Kakame Cost = A - B

∴ Cost of cocoon per kg =  $\frac{\text{Kakame cost}}{\text{Renditta}}$

for example : If shell % of a particular lot is 18

∴ Calculated renditta  $\frac{150}{33}$  = 8.33

Kakame cost = Rs.500/-

∴ Cost of one kg. cocoon =  $\frac{\text{Rs.500}}{8.33}$  = 60.02

i.e. Rs.60/-





PROPOSAL FOR JAPANESE TECHNICAL CO-OPERATION FOR  
BIVOLTINE SERICULTURE DEVELOPMENT (CSB)

Objective :

Japan is the world leader in Sericulture technology. Hence, Japanese Technical Co-operation is requested for transfer of technology for development of bivoltine silk in India and to support and guide the India research effort in this direction, as well as implement pilot projects for bivoltine production and reeling cocoons of a sufficiently high quality.

Project Area :

The main sites of technical co-operation would be Central Sericultural Research & Training Institute at Mysore, Central Silk Technological Research Institute and Silkworm Seed Technology Laboratory at Bangalore. A sub-site would be Regional Sericultural Research Station at Pampore (J&K) or Majra (Dehradun).

In addition, for effective demonstration and quick dissemination of the technology, a suitable area of about 250 acres of private farms will be identified where Japanese experts would organise a pilot project for bivoltine sericulture from mulberry cultivation to silk reeling and demonstrate the improved techniques/methodologies in each component listed under Technology Transfer and Demonstration of packages in the tabel below. It has tentatively been decided to locate the pilot project in the state of Karnataka, CSB will provide all organisational and other forms of support for the pilot project.

Project facilities and Functions :

a. Research :

The Central Silk Board will establish a Centre for Bivoltine Breeding in C.S.R & T.I, Mysore. The centre will be equipped and manned to take up bivoltine breeding programme by 3 groups of breeding scientists.

These scientists will work on evolving bivoltine breeds with good combining ability and survival, under the advise of a top level Japanese expert. Provision has been made to construct two rearing houses under the programme. Additional buildings as per requirement can be taken up after discussion. The Japanese expert will provide the design and specifications for the rearing house and its equipments. The CSR&TI, will also allocate/create necessary facilities and manpower in mulberry breeding laboratory, Agronomy, Silkworm Pathology, Silkworm Physiology and rearing laboratories to take up research programmes on the advise and guidance of Japanese experts.

Similarly, CSB will provide necessary facilities and man power to take up, seed related research in the Central Silkworm Seed Technology Laboratory, Bangalore and post Cocoon Technology research in the Central Silk Technology Research Institute, Bangalore, where Japanese experts would guide and advise the Indian researchers.

b. Pilot Project :

The pilot project for demonstration of bivoltine production system with Japanese assistance will have a P3 farms (Nagmangala), P2 Farm (Gavimata), F1 Grainage (Mysore), Technical Service Centres (One each in K.R.Pet and Pandavapura) and a limited number of seed farmers (K.R.Pet) and reeling cocoon growers (Pandavapura). All these institutions are located near Mysore in a compact area with in a radius of about 30-40 KMs. The Japanese experts will guide the Indian counterparts and establish a standardised production system in these institutions. In addition Japanese Extension expert will guide the extension staff of the TSC's for transfer of technology to the field.

The limited number of farmers adopted for demonstration will be given loan through commercial banks for sinking well and construction of

banks rearing houses. In addition these farmers will be given rearing kits to augment their rearing equipment and supplies such as chemicals, fertilizers etc.

The seed required for these farmers would be collected from the designated grainage (Mysore) or P2 Farm (Gavimata). They will be Chawki reared and supplied to the farmers. The extension staff of TSC's will frequently visit the farmers during the progress of the crop and provide guidance.

Specific areas of Technology transfer :

The requisite fields of technology transfer from Japan to India are, mulberry breeding and production practices, silkworm breeding and Genetics, silkworm rearing, silkworm seed technology, silkworm disease control, industrial seed production and post cocoon technology. These fields are research oriented in principle. Japanese experts will extend guidance to counterpart researchers in India and also train Indian researchers in Japanese research Institutions. In addition Japanese assistance/expertise would also be required to organise the pilot centre mentioned above from mulberry cultivation to reeling, developing and demonstrating a comprehensive bivoltine production system. The broad areas of technology transfer, objectives, research support and demonstration of packages for bivoltine production is presented below :

PROJECT ACTIVITIES AND WORK PLAN

Area of specialisation	Activities	Place of working
1. Bivoltine silkworm breeding	<p>a) Evolution of hardy and productive bivoltine breeds suited to Indian climatic and rearing conditions capable to yield high quality silk.</p> <p>b) Design a suitable rearing house with controlled climatic conditions for breeding</p>	Centre for Bivoltine Breeding, CSR&TI, Mysore
2. Silkworm Diseases		
a) Viral diseases	a) Develop techniques for early diagnosis of Infectious Flacherie virus (IFV) and control measures	S.W. Pathology Laboratory, CSR&TI, Mysore
b) Pebrine	<p>a) Develop techniques for isolation of different types of pebrine and culture them in laboratory</p> <p>b) Develop antibodies for early diagnosis and detection</p> <p>c) Develop a suitable system of moth examination in commercial grainages</p>	S.W. Pathology Laboratory, CSR&TI, Mysore and F1 Grainage of NSSP, Mysore SSSL, Bangalore
3. Silkworm Rearing & Mulberry cultivation	<p>a) Design and develop equipments for mechanisation of rearing and mulberry cultivation including harvesting of leaf</p> <p>b) Devise methodologies for shoot rearing (Tier/shelf rearing and floor rearing)</p>	S.W. Rearing & Farm management Laboratory, CSR&TI, Mysore
4. Mulberry breeding	a) Evolve suitable mulberry varieties (with adequate moisture & crude protein content) for bivoltine rearing and rearing of chawki worms.	Mulberry breeding lab. CSR&TI, Mysore

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- |                                |    |  |   |
|--------------------------------|----|--|---|
| 5. Silkworm Seed Technology    | a) | Develop suitable schedules for hibernation and short term chilling of bivoltine eggs.  | Silkworm Seed Technology Laboratory, Bangalore  |
| 6. Industrial egg production   | a) | Design and draw specifications of building equipments and cold storage for commercial grainage.  | F1, Grainage, NSSP, Mysore.   |
|                                | b) | Develop techniques and methods for operation and management of commercial grainages.   |   |
| 7. Silk Reeling                | a) | Evolve suitable techniques for stifling, cooking and reeling of bivoltine cocoons with an object to produce international A and 2A grade silk. | CSTRI, Bangalore  |
|                                | b) | Study existing units and suggest improvements in equipments, process and training for achieving international grade of silk                    |   |
| 8. Silk Conditioning & Testing | a) | Evolve and introduce a system for conditioning and testing of raw silk.  | SC&TH, Bangalore  |
| 9. Sericulture Extension       | a) | Develop a suitable method of transfer of sericulture technology to Indian farmers  | Tech. Service Centres of NSSP at Pandavapura and K.R.Pet - Expert stationed at Mysore |
|                                | b) | Advise and guide sericulture Extension Workers   |   |

PROPOSAL FOR JAPANESE TECHNICAL CO-OPERATION AT CENTRAL  
SERICULTURAL RESEARCH & TRAINING INSTITUTE, MYSORE

The following three areas have been identified for cooperation with JICA :

1. The Research on sericulture at CSRTI, Mysore and research on seed technology at SSTL, Bangalore.
2. The commercial production of silkworm seed with NSSP, Bangalore. NSSP also looks after the pilot project for commercial production of bivoltine reeling cocoons.
3. Aspects of silk reeling with the CSTRI, Bangalore.

Under the NSP, it is proposed that a Centre for Bivoltine Breeding has to be organised with four broad fields for which the co-operation of JICA, Japan is requested. These fields are :

1. Bivoltine Silkworm Breeding.
2. Mulberry breeding and genetics, specific to bivoltine rearing.
3. Silkworm pathology and
4. Bivoltine silkworm rearing.

Bivoltine Breeding :

Though the bivoltines were evolved at CSRTI, Mysore, during 1970s till today the bivoltines have not been used for preparation of bivoltine hybrids at commercial level. Discussions with Researchers of Silkworm Breeding and Genetci section

revealed that there is an urgent need to concentrate on the race evolution with special reference to farmers' conditions to improve upon the survival of the bivoltine hybrids, comparable to with multi x bivoltine hybrids. Silk percentage of bivoltine hybrids should be higher so that farmers will get more yield and price/profit for their produce. The Bivoltine Breeding Laboratory at CSRTI, Mysore headed by Mr.C.S.Nagaraj, Dy.Director and other researchers are working on a good number of breeding projects. However with the co-operation of JICA new breeding programme also have to be taken for evolving new generations of bivoltine breeds. It is suggested that there should be three terms of breeders working under the guidance of a Japanese expert. The promising breeds at 8/9th generation, should be tried at different climatic conditions and isolated. The strains with more number of good traits will be identified. The traits that are still lagging should be improved in these strains. JICA experts are required to be associated with this field of research for atleast two years. Since CSB scientists will be closely associated with them, they should be trained intensively in breeding technology. Japanese type of rearing house with controlled climatic condition is required for the breeding research. This rearing house should also have a mulberry preservation chamber of Japanese type. Researchers of CSRTI, Mysore who are associated with this type of research should also get advanced training at Japan.

#### Mulberry breeding and genetics :

Success of the bivoltine silkworm crop is mainly dependent on the quality of leaf. Quality of the mulberry varieties of India is not ideal for bivoltine rearings. The



mulberry varieties evolved at CSR&TI, Mysore are not yielding identically in different climatic conditions. Added to it the mulberry varieties are unable to retain moisture for longer durations. Hence, the bivoltine silkworms have not been provided with the optimum quality feed. The succulency of the leaf in India is not like that of Japan. Expertise is needed to identify and develop quickly suitable material which will work in varying pH soils. Our experiences revealed that the tissue culture technique could be used effectively for this purpose.

One Japanese expert for tissue culture and screening mulberry by invitro methods is needed while another expert in conventional mulberry breeder will be required for evolving new breeds. The team of the researchers from CSRTI, Mysore will be identified soon.

The mulberry side also requires co-operation of JICA in quality requirements of leaf for bivoltines, both for chawki and late age silkworms. For this purpose, some of our researchers could be deputed to Japan for training.

#### Silkworm Pathology :

The disease of silkworm is one of the important aspects contributing to the loss of bivoltine crops. Diseases like pebrine and viral diseases are important. The silkworm pathology division at CSRTI, Mysore is presently working on main diseases of the silkworm. So far, we are unable to differentiate the virulence of the pathogen. Hence, the techniques are to be learnt from the Japanese experts to isolate different types of pebrine and related germs and culture them with the aim of developing antibodies.

Similarity, in viral diseases there is clear expression of NPV. However, we are not able to identify the IFV (infectious Flacherie Virus) for classification. If the disease is diagnosed at early stage, we can save 1) Leaf wastage ; 2) Labour wastage 3) Avoid the spread of the disease. Many bivoltine crops are falling because of pebrine and viral diseases. Hence, it is proposed to have two experts from Japan, one for pebrine and one for viral diseases. The experts first visit the field, survey, collect the data and analyse the disease incidence. After identification of the disease it should be possible to develop the diagnostic kits. The experts could work in specific seasons. It is proposed to develop two separate laboratories, one for pebrine and the other for the viral diseases. Control measures for the diseases should also be developed. Some of the researchers associated on Silkworm Pathology could be sent to Japan for advanced training. Also a few equipments like simple inverted microscope, phase contrast microscope and controlled incubator with programmed shaker will be required from Japan.

#### Silkworm Rearing Technology :

The appropriate rearing technology starting from Rearing House to finalise stage of rearing is one of the branch that needs co-operation from JICA. JICA should develop a laboratory and this lab should also take care of developing packages for peak rearing and mechanised rearing technology since some farmers with moderately large land holdings are also in need for this type of technology. The machines like mulberry cultivator, weeding, harvesting etc. are to be developed. Also

methodologies like floor rearing/tier rearing should be developed. Some of the Japanese sericultural machines can be used as such or with some modifications suitable to Indian conditions. A workshop for this purpose is also be developed.

Technical Consultancy in Silkworm Seed Technology

Silkworm Seed Technology Laboratory

India has been producing a small quantity of bivoltine eggs mainly for the purpose of male parent to cross with multivoltine. Now it has become necessary to produce large quantity of bivoltine seed to promote bivoltine silk production in India to upgrade the quality of Indian silk. The technology of bivoltine seed crop rearing, preservation, production, processing and handling will have to be mastered in order to get consistent results of good hatching and stable crop. Fairly, simplified, yet sufficiently effective techniques to suit the tropical conditions will have to be developed and adopted. Therefore, the expert services of the Japanese scientists are required in the following discipline.

Standardisation of seed crop rearing

Quality of parent seed cocoon reflects on the quality of silkworm eggs. The seed crop rearing is not standardised as is done in Japan, some of the problems in our seed crop rearing are, the cocoon yield is not consistent, very low pupation rate and high meltage. Crop failures are more in P1 level. Majority of the seed cocoons will remain unfit for seed preparation is very poor. The survival rate, pupation rate, Egg production efficiency is very low at P1 & F1 level and the cocoons to dfls ratio is 7:1 as against 3:1 in Japan. All these indicate the poor standard of seed crops. Therefore, there is an urgent need to develop a suitable technology of seed crop rearing for improving quality and productivity of seed cocoons. The expert service can be utilised to evolve a standard technology of seed crop rearing to improve the ERR, pupation rate and egg recovery.

Industrial Egg Processing and Handling

Egg production in India is characteristically multivoltine oriented and only a limited quantity of bivoltines are produced. Generally

there is a complaint about the standard of bivoltine seed prepared. Very often low emergence, low egg yield, higher ratio of infertile eggs and low hatching are observed in many lots. Method of moth examination is cumbersome and there is no standardised sampling technique to eliminate the pebrine infection in eggs. Infact, even separation of unfertilized eggs following Japanese technique has not met with success. It is necessary to improve the general standard of seed production. The techniques followed and adopted are the Japanese technology developed for temperate breeds which have not given consistent results. Productive rate and egg recovery are very low in India. This poor recovery may also be attributed to lack of knowledge on techniques and methods of operation management of commercial grainages. The services of the technical consultant would be needed to train the staff in areas like large scale sex separation, egg processing, separation of unfertilized eggs etc. and to design and draw specifications of building, equipments and cold storage for commercial grainages.

Other area where expertise is very much essential is in the Seed Preservation technique. Embryological studies and hibernation schedule to suit our breed have not been developed. The hibernation schedules developed in Japan is presently followed and they often donot give consistant results. The hibernation potency of Indian breeds is not as strong as Japanses breed. There is a need to study embryological development, hibernation potency and cold storage requirement to draw a different schedule suited our tropical bivoltine breeds. It is absolutely essential to understand and determine the correct stage of development in which it responds possitively to aestivation, cold storage and acid treatment. There is also need to develop short-term hatching method by a combination of cold storage of eggs and acid treatment which has to be standardised for tropical bivoltine breeds.

The services of technical consultant would be very valuable to study the above related aspects.

## Seed Pathology

The pathological aspects of seed, transmission and contamination of seed borne diseases have been a major problem of sericulture industry. Though pathogens have been identified and techniques have been developed especially in pebrine for prevention and control. The transmission, spread and build up of pathogen and severity of loss is more due to varied climate, number of crop cycle rearing hygiene and intensity which have not been thoroughly studied. In addition, there are different species of nosema spores. The techniques for identification of these spores has also not been developed.

In large scale seed production sampling mass examination is followed as is done in Japan. The sampling format in Japan was evolved after systematic studies taking in to consideration, the intensity of infection existing in the parent crop, the size of cocoon lots and the level of disease that can go undetected in the unexamined sample. These parameters are grossly different under Indian condition. Added to this lower technical level of Indian farmer and the rearing environment also contribute much to this problem. Hence, a standardised technique will have to be developed for adoption in the commercial grainages.

The services of a seed pathologist is essential to study the above aspects to achieve disease free stable crop.

NOTE ON PROGRAMME OF EXPERTS FROM JICA

SILK REELING :

a) Expert from JICA :

One expert in silk reeling should be deputed by JICA to India for one year in the 1st phase. The period may be extended for another 6 months. He should first survey the working conditions of reeling in India specially with reference to Bivoltine cocoon reeling. In this context, charkha reeling may not be considered whereas cottage basin units and filature units should be thoroughly examined. The expert will investigate this work in co-ordination with CSTRI. We may attach two technologists with him for co-ordination. The expert should also critically study the work done in CSTRI in improving reeling devices, particularly Multiend reeling unit and also technique evolved (cocoon drying, cooking and reeling) by the Institute to reel bivoltine cocoons. He should suggest methods for improving the existing system. The suggestion should be in conformity with our working conditions prevailing in India as well as the quality of raw material i.e. cocoons. It should not be based on Japanese technique. The suggestions should be simple so that Indian reelers should adopt easily. He should also devise very quick and easier method in cocoon testing and verify the method already evolved in the Institute. He should also conduct certain experiments on Indian bivoltine cocoons for drying, storing, cooking and reeling on commercial level. He should study as how best the Indian bivoltine cocoons should be reeled economically to produce international grade (Above A) silk from our reelers on multiend reeling machines. He should also study the reeling

technique of multi x Bivoltine hybrid cocoons to produce still better quality silk. He should also train our technologists in all aspects of reeling technique.

b) Training to be given to our Technologists in Japan :

Three technologists from CSTRI should be deputed to Japan for 6 months each for training. It is suggested that one technologist should be fully trained in cocoon properties i.e. cocoon assessment and drying. He should be trained in cocoon should be fully trained in cocoon cooking/boiling. He should be trained in cooking for both inferior bivoltine cocoons as well as superior bivoltine cocoons and also multivoltine hybrid cocoons if possible. He should also be trained in utilisation of proper water for cooking purpose. The third technologist should be trained in reeling i.e. maintenance of reeling machineries, reeling efficiency, production, quality of raw silk, time and motional studies etc. He should also be trained in re-reeling right from soaking, lacing, examining and packing. He should also be trained in big reputed filature. The three technologists should visit important cocoon testing houses and big filature in Japan.

SILK CONDITIONING AND TESTING HOUSE :

a) Expert from JICA :

One expert in testing from JICA should be deputed for one year to set up a full fledged big silk conditioning and testing house in Bangalore and three small units in Andhra Pradesh, West Bengal and Kashmir. He should work out planning of Silk Conditioning and Testing House, equipments required and working conditions (atmospheric conditions required). He should



also study the silk marketing system in India. He should suggest as to how marketing system should be linked with raw silk reeling and grading. He should also analyse the important characteristics to be tested since Indian reelers demand quick payment, otherwise, it will take more than 2-3 days to complete testing of all characteristics. He should also examine the present system of silk testing already being practised in the Institute. He should also examine the silk reeled on different devices in different regions and devise proper method of testing according to the variations. He should also train our technologists in raw silk testing and grading. Two technologists will co-ordinate with him during his work. His work should be co-ordinated with CSTRI in general. He should also formulate standards suitable to Indian raw silk reeled on different devices. He may also examine the standards devised by the Institute which are already submitted to Bureau of Indian Standards.

b) Training of Indian Technologists :

Two technologists from CSTRI should be deputed to Japan for 6 months each for training. They should be trained in silk conditioning and testing house at Yokohama or Kobe. They should be trained in all aspects of raw silk testing and maintenance of testing house with reference to atmospheric conditions and compiling of data for commercial testing purpose. They should also be trained in maintenance of machinery and testing equipments in testing house. Preferably one technologist should be trained in detail in drawing samples, visual test and conditioning. The other technologist should be trained fully in conducting mechanical tests i.e. winding, size test, tenacity, elongation, evenness, neatness, cleanness and cohesion. They should also be trained in compilation of data and presentation in

proper proforma and issuing certificate in commercial testing house. These technologists should also visit all the silk testing houses in Japan.

Bivoltine Sericulture Development Project

ATTACHMENT-G

Requirement of Equipments and Machinery

Rs. '000

Institution and Equipment		Qty	Total
<b>1. CSR&amp;TI, Mysore</b>			
<b>a. Centre for Bivoltine breeding</b>			
i)	Central Air conditioning equipment for rearing houses	1	3000
ii)	Electronic Cocoon Assessment balance with digital display	4	400
iii)	Environmental Chamber	2	400
iv)	Incubators	4	120
v)	Room humidifiers	8	240
vi)	Deep freezer (small unit for lab)	1	100
vii)	Cold Room	1	500
viii)	Hirano pebrine separator	1	500
<b>Total</b>			<b>5260</b>
<b>b. S.W.Pathology</b>			
i)	Inverted Microscope	2	600
ii)	Phase contrast with flouroscent attachment	1	250
iii)	Laminator air flow	2	200
iv)	CO2 Incubator	1	200
v)	Ultrasonicator	1	150
vi)	Deep freezer (-80 C)	1	150
vii)	Lyophiliser	1	150
viii)	Liquid fraction collector	1	200
ix)	ELISA	1	250
x)	Multichannel Micro pipette	1	50
xi)	P.H.Meter with Micro probe	1	50
xii)	Quarto distillation unit (Trible)	1	50
xiii)	Microtome	1	100
xiv)	Ele. precision balance	1	100
xv)	Centrifuge	1	50
x)	Horizontal Electrophoresis	1	250
<b>Total</b>			<b>2800</b>

...2.

Institution and Equipment	Qty	Total
<b>c. Silkworm Rearing</b>		
i) Leaf harvester	1	300
ii) Leaf chopping machine	1	100
iii) Deflossing unit	5	100
iv) Collapsible mountage	1000	100
v) Japanese model rearing trays	100	20
vi) Mist blower	4	100
vii) Rearing stand with rail to move trays	1	200
viii) Cocoon harvester	1	20
ix) Prototype mech. rearing unit (latage)	1	1000
x) Prototype mechanised youngage rearing unit	1	1000
xi) Jumo contact Thermometer	10	10
xii) Equipment for air pollution detection	1	200
xiii) Weeding/intercultivator	1	200
Total		3350
<b>d. Mulberry breeding</b>		
i) Leaf area meter	1	100
ii) Moisture meter	1	50
iii) P.H.Meter with microscope	1	20
iv) Electrophoresis apparatus	1	150
v) Aminoacid analyser	1	250
vi) Microtome	1	100
vii) Stereozooms	4	400
viii) Electronic precision balance	1	100
ix) Centrifuge	1	25
Total		1195

...3.

Institution and Equipment	Qty	Total
e. S.S.T.L., Bangalore		
i) Hirano pebrine seperator		500
ii) Prefabricated cold rooms		2000
iii) Equipment for measuring CO2 and O2		200
iv) Microtome		200
v) Loose egg washing unit		50
vi) Acid treatment equipment		25
vii) Deflossing machine		20
viii) Cocoon cutting machine		100
ix) Unfertilized egg separator		20
x) Electronic balance		100
xi) Egg incubator chamber		100
xii) Japanese model grainage trays		20
xiii) Sex sep <sup>a</sup> erator (Pupae)		200
xiv) Deaf freezer		150
Total		3685

No.F. 12/22/65-UN  
 Government of India  
 Ministry of Finance  
 Department of Economic Affairs

New Delhi, the 28th May, 1965

Office Memorandum

Sub : Customs and import facilities to experts assigned to India under the various Aid Schemes viz. UNEPTA, UN and its Specialized Agencies (Regular) Programme, UN Special Fund Programme, Colombo Plan, Indo-French Programme and other bilateral Technical Cooperation Agreements with Foreign Countries.

The undersigned is directed to state that the question of granting customs facilities uniformly and on a more liberalised scale to the experts assigned to India under the various Aid schemes viz. UNEPTA, UN and its Specialized Agencies (Regular) Programmes, UN Special Fund Programme, Colombo Plan, Indo-French Technical Cooperation Agreement and other Bilateral Technical Co-operation Agreements with Foreign Countries, has been under the active consideration of this Department for sometime past. After a careful review of the position, it has been decided that in supersession of all existing instructions on the subject, the following revised facilities be granted to these experts:

(A) Duty free import of the following articles subject to the execution of the usual certificate of undertaking by the experts.

- i) one personal automobile or motor-cycle;
- ii) One radio or radio gramophone;
- iii) One refrigerator and/or home freezer;
- iv) two air-conditioners;
- v) Professional equipment and gadgets; and
- vi) Minor electrical accessories and appliances.

(The experts who are already in India may be allowed to import a second air conditioner, which is being permitted now, if they so desire provided that they are likely to spend the current summer in India i.e. are likely to stay here beyond September, 1965 or so).

- vii) T.V. Set.

...2/-

Since revised to  
i) Rs. 6,000/-  
ii) Rs. 10,000/-  
vide Deptt of Economic Affairs O.M.  
No. 12/22/65-UN  
dt 13-8-75. Revised rates effective w.e.f. 1-8-1975.

(B) Duty free import of certain consumer articles (foods, drugs, medicines, liquor, tobacco, books and periodicals, toilet articles etc.) upto the following monetary ceilings:

- i) Rs. 3,000 per year, if single ; and
- ii) Rs. 5,000 per year, in the case of those with families (irrespective of the number of children).

These facilities will be admissible to experts already in India with effect from 1st May, 1965. In the case of experts whose stay in India is less than one year these ceilings may be adjusted proportionately on monthly basis.

(C) Instructions are also being issued separately by the Department of Revenue to the Collectors of Customs for the grant of the following additional facilities under the Baggage Rules:

(i) The limit of Rs. 75 (Seventy-five) for individual articles mentioned on page 5 of the Passengers (non-tourist) Baggage Rules, will not be applied in these cases. In other words, this would mean that whatever goods the experts bring in, within the total monetary allowance permissible under the Passengers (non-tourist) Baggage Rules, would be admitted free of duty and without any ITC restrictions, irrespective of the value of any individual article;

Since revised to  
Rs. 1,500/- vide Deptt of Economic Affairs O.M.  
No. 12/22/65-UN  
dt. 27-9-1966. Revised rates effective w.e.f. 1-8-1966.

ii) In some cases an expert may bring in some articles which are relatively minor in value (compared to expensive articles like an automobile or a refrigerator which are allowed without payment of duty to the expert but one which duty is borne by the sponsoring body) but which may not be strictly covered by the normal interpretation of Baggage Rules. Over and above the concessions already available to these experts, duty on such other minor items may also be waived provided the amount of duty thus waived does not exceed Rs. 1000. These would also be exempt from the usual ITC restrictions.

These concessions will be admissible only at the time of first arrival of expert.

iii) the articles consisting of the unaccompanied baggage of these experts are, at present, required to be imported within the time-limit prescribed under the Baggage Rules which is 4 months. The customs authorities are being authorised, in their discretion, to waive that time-limit in cases of delayed arrival of the unaccompanied-baggage-of-the-experts, provided there is no reason to believe that the concession is being abused.

...3/-

2. The Ministries/Departments, State Governments and other organisations who are present bearing the customs duty in respect of these experts will bear the duty on the additional articles also now being allowed to be imported by them.

3. It would be appreciated if the Ministry of Food & Agriculture etc could devise suitable procedure to ensure that:-

- a) The annual monetary limit for the import of consumer articles is not exceeded;
- b) not more than the prescribed number of articles allowed are imported; and
- c) an effective check is exercised with regard to the disposal of the articles listed in para 1(A) above and in cases where the articles excepting a motor car or motor cycle are sold to a non-privileged person, customs duty paid by the Ministry etc is recovered from the expert. The procedure regarding the sale of motor car or motor cycle through the State Trading Corporation of India is already known to all the Ministries.

4. With the issue of these orders liberalising the duty-free concessions, it is hoped that there will be no occasion for Ministries/Departments to consider or recommend any further relaxation in this respect.

5. The Local Missions of concerned foreign Governments and Agencies have been informed about these changes.

Sd/-

( R.A. Naik )

Deputy Secretary to the Govt of India

To

All Ministries/Departments of the Government of India.



No.F. 12/22/65-UN  
Government of India  
Ministry of Finance  
Department of Economic Affairs

New Delhi, the 27 September 1966.

Office Memorandum

Sub: Customs and import facilities to experts assigned to India under the various Aid Schemes viz UNEPTA, UN and its Specialised Agencies (Regular) Programme UN Special Fund Programme, Colombo Plan Indo-French Programme and other Bilateral Technical Cooperation Agreements with Foreign countries.

The undersigned is directed to refer to this Department's O.M. of even number dated the 28 May 1965 on the subject mentioned above and to say that it has been decided that with effect from the 1st August, 1966 the monetary ceilings indicated in para 1(B) of this O.M. will be raised as under:

- i) Rs. 4,500/- per year, if single; and
- ii) Rs. 7,500/- per year, in the case of those with families (irrespective of the number of children).

2. It has also been decided that with effect from 1st August 1966, the limit of Rs 1000 mentioned in para 1(c) (ii) of this Department's O.M. of even dated 28 May 1965 should be raised to Rs. 1,500/-.

Sd/

( GV Ramakrishna )  
Deputy Secretary to the Govt of India

To

All Ministries/Departments of the Govt of India.

No.F. 12/22/65-UN  
Government of India  
Ministry of Finance  
Department of Economic Affairs  
North Block

New Delhi, the 13 August 1975.

Office Memorandum

Sub: Customs and import facilities to experts assigned to India under the various Aid Scheme viz UN and Its Specialised Agencies (Regular) Programme, UNDP, Colombo Plan, Indo-French Programme and other Bilateral Technical Cooperation Agreements with foreign countries.

The undersigned is directed to refer to this Department's O.M. of even number dated 28 May 1965 and 27 Sept 66 on the subject noted above and to say that it has been decided that with effect from 1st August 1975 the monetary ceiling indicated in para 1(B) of the O.M. dated 28 May 1965 will be raised as under:

- i) Rs. 6,000/- per year, if single; and
- ii) Rs. 10,000/- per year in case of those with families (irrespective of the number of children).

Sd/-

( N Natarajan )  
Under Secretary to the Govt of India

To

All Ministries/Departments of the Govt of India.

Copy to Deptt of Revenue & Insurance (Shri H Narayana Rao, Under Secretary) (50 copies) with reference to their U.O.No. 423/14/74-Cus-IV dated 28 July 1975. It is requested that the above orders may be communicated to all Collectors of Customs under intimation to us.

Sd/-  
(N Natarajan)  
Under Secretary to the Govt of India.

Copy (with 5 spare copies) to CP/TCM/FV/IA Section.

No.F. 12/1/85-UN  
Government of India  
Ministry of Finance  
Department of Economic Affairs  
North Block

New Delhi, the 17 December 87

Office Memorandum

Sub: Custom & Import facilities to Experts assigned to India under the various Aid schemes viz UN and its Specialised Agencies (Regular) Programme, UNDP, Colombo Plan, Indo-French Programme & other bilateral Technical Cooperation Agreements with Foreign Countries.

The undersigned is directed to refer to this Department's O.M. No. 12/22/65-UN dated 28 May 65 (Annex-I) amendment of even number 27 Sept 1966 (Annex-II) and further amendment of even number dated 13 Aug 1975 (Annex-III) (copies enclosed) on the subject mentioned above and to say that it has been decided that with effect from the date of issue of this office memorandum, the monetary ceiling indicated in para I(B) of the O.M. dated 28 May 1965 will be raised as under:

- i) Rs. 10,000/- per year, if single; and
- ii) Rs. 17,000/- per year in case of those with families (irrespective of the number of children).

  
( Dilip Rath )

Under Secretary to the Govt of India  
Tel: 3013505

To

All Ministries/Department of the Govt of India.

Copy to:

1. Deptt of Revenue (Shri DS Solanki, Director(Custom), North Block, New Delhi with reference to their U.O.No. 4510-Cus-IV dated 18 Nov 87. It is requested that the above order may be communicated to all Collectors of Customs under intimation to this Department.
2. Ministry of External Affairs (Shri Rajat Saha, Dy Chief of Protocol(P), Akbar Bhavan, New Delhi with reference to their O.M. No. D-11/451/8216/9 dated 22 July 87.
3. All Divisions in the Deptt of Economic Affairs.

  
( Dilip Rath )

Under Secretary to the Govt of India



別添資料②

インド側要請(改訂第3版)原文



केन्द्रीय रेशम बोर्ड  
(वस्त्र मंत्रालय — भारत सरकार)

CENTRAL SILK BOARD  
(Ministry of Textiles — Govt. of India)

यूनाइटेड मैन्शन्स, दूसरा तल,  
39, महात्मा गांधी रोड,  
बंगलूर-560 001, भारत

United Mansions, 2nd Floor,  
39, Mahatma Gandhi Road,  
BANGALORE-560 001, INDIA

DO.No.CSB/46/1/JPN/89-90-TS

दिनांक/ Date: 01-03-1990

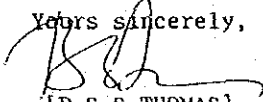
**P.S.S.THOMAS**  
**MEMBER SECRETARY**

Dear Mr.Kurabayashi,

I am enclosing a copy of the CSB's revised proposal for Technical Co-operation of JICA. I will be grateful if you can kindly send this to the concerned in the JICA office at Tokyo, JAPAN and inform the latest position of this project.

With regards,

Yours sincerely,

  
[P.S.S.THOMAS]

Mr.Kurabayashi,  
Co-ordinator for JICA,  
Embassy of Japan in India,  
NEW DELHI

दूरभाष  
Phone : 568194, 568444, 568666

टेलिक्स  
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तार  
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पी.बी. सं.  
P.B. No. : 5317

PROJECT FOR TECHNICAL CO-OPERATION OF JICA

Technology Transfer for Bivoltine Production

India is the world's second largest producer of raw silk. Presently, India produces about 9700 M.T. of raw silk (1988-89). Since 1980 mulberry silk production has been growing rapidly at an average rate of 9% per annum. Domestic consumption has been ahead of rawsilk production in the country, as the demand exceeded local production capabilities. Studies have indicated that the demand for silk cannot be satisfied for many years to come.

Raw silk production in India is largely of multivoltine variety, falling into the lowest grade (grade - H) by international standards which cannot be used in high speed looms. Indian raw silk yarn is suitable for the handloom and the low torque powerloom sector in India to manufacture traditional products for local consumption. Currently the bulk of exports from India is of handloom silk catering to a limited market (4 - 5% share of global market) because of its unique designs and production features. Nevertheless, there is a growing demand for superior quality silk to manufacture finer products for domestic consumption as well exports. To meet this demand India has been consistently importing about 2000 M.T. of superior grade raw silk every year, about 23% of the raw silk consumed in India.



Background :

The present production of superior grade bivoltine raw silk in India is limited to about 150 M.Ts. (1.5% of total raw silk production). A greater emphasis and a wider adoption of rearing bivoltine breeds is of critical importance for upgrading the quality of Indian silk. One of the key objectives of the National Sericulture Project is therefore the promotion of bivoltines aimed to produce 1000 M.T. of bivoltine raw silk by 1995. The project is now under implementation (1989-90 to 1994-95) with financial assistance from World Bank and Swiss Development Co-operation and covers the major sericultural regions of India.

Earlier efforts of bivoltine raw silk production have not been very successful. For example, under the World Bank assisted Karnataka Sericulture Project, the achievement of bivoltine raw silk production was barely 100 tonnes against the project target of 1000 tonnes. Several factors have inhibited expansion of bivoltine production. Rapid development of bivoltine silk in India depends on the availability of quality mulberry leaf, hardy silk worm breeds, choice of areas climatically suitable for bivoltine rearing, technology for production of quality seeds, rearing, reeling, processing of bivoltine silk. At the same time continuous and sustained research support to up-grade the technology in various sectors would also be of paramount importance for the growth of bivoltine.

Objective :

Japan is the world leader in sericulture technology. Hence Japanese Technical Co-operation is requested for transfer of technology for development of bivoltine silk in India and to support and guide the Indian research effort in this direction.

Project Area :

The main sites of technical co-operation would be Central Sericultural Research & Training Institute at Mysore, Central Silk Technological Research Institute and Silkworm Seed Technological Laboratory at Bangalore. The sub-site would be Regional Sericultural Research Station at Pampore (J & K) or Majra (Dehradun).

In addition, for effective demonstration and quick dissemination of the technology, a suitable area of about 250 acres of private farms will be identified where Japanese experts would organise a pilot project for bivoltine sericulture from mulberry cultivation to silk reeling and demonstrate the improved techniques/methodologies in each component listed under Technology Transfer and Demonstration of packages in the table below. It has tentatively been decided to locate the pilot project in the state of Karnataka. CSB will provide all organisational and the forms of support for the pilot project.

Specific areas of Technology transfer :

The requisite fields of technology transfer from Japan to India are, mulberry breeding and production practices, silkworm breeding and Genetics, silkworm rearing, silkworm seed technology, silkworm disease control, industrial seed production and post cocoon technology. These fields are research oriented in principle. Japanese experts will extend guidance to counterpart researchers in India and also train Indian researchers in Japanese research institutions. In addition Japanese assistance/expertise would also be required to organise the pilot centre mentioned above from mulberry cultivation to reeling, developing and demonstrating a comprehensive bivoltine production system. The broad areas of technology transfer, objectives, research support and demonstration of packages for bivoltine production is presented below :

TECHNOLOGY TRANSFER FOR BIVOLTINE PRODUCTION

SL.NO.	OPERATION OF PRODN. INFRASTRUCTURE	OBJECTIVES	RESEARCH SUPPORT & TECHNOLOGY TRANSFER	DEMONSTRATION OF PACKAGES
1.	Mulberry production for Biv.s	Establish a system for prodn. of Mulberry suitable for biv.rearing in different seasons.	a) Screening/breeding of mulberry varieties suited to bivoltines. b) Evolution of suitable cultivation practices	Demonstration of Mulberry production for Bivoltines.
2.	Bivoltine Silk Worm breeds	Develop a system for production of quality bivoltine cocoons.	a) Screening/breeding of suitable biv.breeds. b) Establish a suitable time schedule for rearing biv.'s and develop techniques of rearing c) Study nutritional requirements and evolve a system of leaf harvest and feeding	Demonstration of Biv. Silkworm Rearing
3.	Silk worm pathology	Evolve prevention and control measures to contain silkworm diseases.	Study disease incidences in different seasons and evolve techniques for identification prevention and control of diseases.	Demonstration of disease identification and control measures
4.	Industrial Bivoltine Silk worm seed production	Establish a system of silkworm seed production, Basic Seed Multiplication, Processing and storage including cold storage for bivoltine egg handling and incubation.	Study Silkworm seed physiology / embryology evolve parameters for seed treatment, seed processing, aestivation, hibernation and handling & incubation of bivoltine eggs.	Demonstration of biv. silk worm seed prodn. and processing. Developing an appropriate seed organisation consisting of Govt.Seed Farms, Private Seed Bearers and Govt. & Private Grainages.
5.	Bivoltine silk reeling, Weaving and processing.	Develop system for biv. silk reeling, weaving, processing and finishing.	Evolve suitable methods for cooking and reeling of biv. cocoons, weaving, processing and finishing of raw silk and silk fabrics.	Demonstration of biv. silk reeling weaving and processing.
6.	Silk Conditioning and Testing	Designing a system for establishment and operation of SCTH.	Evolving a system for organising and establishing raw silk testing in India.	Organise and demonstrate raw silk testing & conditioning operations.
7.	Silk Worm Genetics.	Assist to undertake genetical studies in silkworm to support breeding programmes.	Identification of gene markers and mapping using conventional as well as bio-chemical techniques.	
8.	Germplasm	Evolve a system for maintenance of silkworm and mulberry germplasm.	Develop suitable methodology for maintenance of silkworm and mulberry germplasm.	

TIME SCHEDULES AND TARGETS

The project will be implemented over a period of 5 years. During first year the experts will identify the needs and initiate the programme. The Indian Scientists will work with their counterpart Japanese experts during first year and their training programme will commence from second year onwards. The requirement of experts, the area of specialization, the duration and period of their services as also the training requirements of Indian scientists are detailed below :

SL.NO.	FIELD OF TECHNOLOGY TRANSFER	FIELD OF SPECIALIZATION	NO. OF EXPERTS	DURATION	PERIOD [Year]	NO. OF TRAINEES	DURATION	PERIOD [Year]
1.	Mulberry production for Bivoltines	a) Mulberry breeding	1	2 yrs	First	2	1 yr	Second
		b) Mulberry cultivation	1	2 yrs	First	1	1 yr	Second
2.	Biv. Silkworm Rearing	a) Silkworm breeding	2	2 yrs	First & Third	4	2 yrs	Second
		b) Rearing	1	1 yr	First	1	1 yr	Second
		c) Nutrition	1	1 yr	Second	1	6 M	Third
3.	Silkworm pathology	a) NPV and CPV	1	1.5 yr	First	2	1 yr	Third
		b) Pebrine	1	1 yr	First	1	1 yr	Second
4.	Biv. Silkworm Seed Production	a) Seed organisation	1	6 M	Second	2	1 yr	Third
		b) Ind. egg production	1	1 yr	First	6	6 M	Second
		c) Embryology	1	6 M	Second	2	1 yr	Third
		d) Reproductive physiology	1	1 yr	First	1	6 M	Second
		e) Cold Storage Technology	1	6 M	First	1	6 M	Second
5.	Biv. Silk Reeling, Weaving & Processing	a) Reeling	1	1 yr	Third	2	6 M	Third
		b) Weaving & finishing	1	1 yr	Fourth	2	6 M	Fifth
6.	Silk Conditioning & Testing	a) Silk Conditioning & Testing	1	1 yr	Third	3	6 M	Fourth
7.	Silkworm Genetics	a) Genetics	1	1 yr	Second	2	1 yr	Third
		b) Bio-chemical genetics	1	1 yr	Third	2	1 yr	Fourth
8.	Germplasm	a) Silkworm Germplasm	1	1 yr	Third	2	1 yr	Fourth
		b) Mulberry Germplasm	1	1 yr	Third	2	6 M	Fourth

Budget :

The GOI/CSB will provide counterpart budget and assign full-time counterparts for the project. The counterpart budget will be used for land, building and running cost. The Japanese side would provide experts, meet the cost of training of Indian Scientists in Japanese institutions and equipments required for the project. Both the countries will also extend other facilities as provided in the Colombo plan for exchange of Scientists/experts.

Evaluation :

The project will have a midterm evaluation by the end of 2nd year and terminal evaluation at the end of 5th year. The project will provide for flexibility to modify the project at midterm evaluation on mutual consent, if required.

The JICA project is identified as a separate project outside of the National Sericulture Project. While the results achieved under the JICA Project may be made use of for sericultural development in the country, the JICA project effort will not be duplicated either by CSB or any other agency under NSP or any other project with private consultants or others, though individual experts may be engaged by CSB for discrete research and for training etc. The JICA project will be the sole integrated project for the development of appropriate breeds, technologies and operating system for large-scale production of bivoltine raw silk in India.



別添資料③

持ち帰り資料一覧





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収集資料リスト

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1. Sericulture in India
2. Annual Report 1988-89

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3. Annual Report 1988-89
4. Appropriate Sericulture Techniques
5. A Guide for Bivoltine Sericulture
6. Economics of Sericulture under Rained Conditions
7. Mulberry Cultivation as High Bush and Small Tree in Hilly Regions
8. Organization of Industrial Bivoltine Grainage for Tropics
9. Economics of Sericulture Under Irrigated Conditions
10. Vijay : Improved Reeling Machine
11. Ushna Kothi
12. Package of Practices for Irrigated Mulberry

地 図

13. Indian Subcontinent
14. Mysore Guide
15. Bangalore with Bus Routes

長期調査員（平成元年10月～11月）による  
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1. Organizational Chart of Ministry of Textile

中央蚕糸局（CSB）発行

2. CSB-A Feel for Silk
3. The National Sericulture Project in Pilot States
4. National Sericulture Project
5. Why Sericulture
6. Annual Report ; CSB 1988
7. A Brief Note on the Regional Research Station, Chamarajanagar
8. Indian Silk
9. Silk in India

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11. Report of Sub-Group on Sericulture for VII Plan

中央蚕糸研究訓練所 (C S R & T I)

12. Annual Report : CSR & TI 88/89
13. A Guide for Bivoltine Sericulture
14. Newsletter, CSR & TI
15. ICTRETS News
16. ICTRETS
17. CST & TI

中央製糸技術研究所 (C S T R I)

18. Glossary of Silken Terms
19. CSTRI Brochure
20. Influence of Softened Water in Malkery Silk
21. Reeling Technique for Quality Strength
22. CSTRI Bulletin

カルナタカ州 (K S)

23. Organizational Chart of Department of Agriculture and Cooperation
24. Karhataka Sericulture Project ; World Bank Assistance
25. Evaluation of Sericulture Activities, KSP (84-85)
26. List of TSC' s Set Up under KSP-1
27. Distribution of Technical Service Center Extention (KSP)

カルナタカ州養蚕開発試験場 (K S S D I)

28. Karnataka State Sericulture Development Institute
29. Karnataka State SPI Project
30. Details of Japanese Experts, KSSDI
31. Details of Overseas Training, KSP

世界銀行 (WB)

32. Staff Appraisal Report, National Sericulture Project

その他

33. Map of India
34. Map of Karnataka State
35. India ; Insite Guide

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JICA