

**World Bank financed Assam Agribusiness and Rural Transformation Project (APART)  
Operational Project Implementation Unit (OPIU): Directorate of Sericulture, Assam**

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**Draft Terms of Reference (ToR) for a study on “Threats to Assam Silk industry from Muga silkworm diseases and key solutions to manage them” under APART**

**1. Background:**

- 1.1 The Government of Assam (GoA) through Government of India (GoI) has received a loan from the World Bank for the Assam Agribusiness and Rural Transformation Project (APART). The ARIAS Society is the apex coordinating and monitoring agency for APART.
- 1.2 The APART development objective (PDO) is to “add and improve resilience of selected agriculture value chains, focusing on smallholder farmers and agro-entrepreneurs in targeted districts of the State of Assam”. The project will achieve the proposed PDO by: (i) promoting investments in agri-enterprises, reducing the business and transaction costs, facilitating access to finance for agribusiness entrepreneurs, and, where appropriate, push for process, regulatory and/or policy change; (ii) supporting the development of a modern agri supply chain; improved information communication technologies (ICT) based farm information and intelligence services, alternative marketing channels; (iii) improving producers’ access to knowledge, technologies and infrastructure so that they are better able to respond to market opportunities and climate variability.
- 1.3 The APART has four components: The 1st component is **Enabling Agri Enterprise Development**, with sub components being (i) enhancing state capacity to attract private investments, (ii) setting up of an Enterprise Development and Promotion Facility (EDPF) (iii) setting up of an Agribusiness Investment Fund (AIF) (iv) establishing Stewardship Councils. The 2nd component is **Facilitating Agro Cluster Development** with sub-components being- (i) support establishment of cluster level Industry Associations (IAs), (ii) supply chain support. The 3rd component is **Fostering Market Led Production and Resilience Enhancement** with sub components being (i) promoting climate resilient technologies and their adoption, (ii) Facilitating market linkages through market intelligence and product aggregation, (iii) Facilitating access to and responsible use of financial services. The 4th component is **Project Management, Monitoring & Learning**.
- 1.4 The Key Project level result Indicators (KPIs) of APART are:
  - i. Farmers reached with agricultural assets or services (number), of which female (percentage) achievement.
  - ii. Value addition measured by:
    - Increase in price premium of commodities sold by farmers/entrepreneurs in the selected value chains.
    - Share (%) of selected commodities sold through new marketing channels.
  - iii. Resilience measured by: Farmers adopting improved Agricultural technology (climate resilient gender disaggregated).
- 1.5 Sericulture Value Chain development under APART is one of the sub project focusing on end to end interventions to strengthen Sericulture in Assam. The major interventions planned in Sericulture Value Chain include:(i) increase production of raw silk, (ii) increase area under plantation, (iii) increase cocoon yield and reeling efficiency, and quality of silk (iv)increase incomes of producer-entrepreneurs and create employment opportunities across the value chain. The major investments will be in (i) organizing producer-entrepreneurs into Producer Groups and Farmer Producer Organization; (ii) establishing community-run Common Services Center (CSCs) to facilitate collective actions and provide extension services and handholding support (iii) creating cluster level infrastructure such as community rearing houses, nurseries, cocoon houses, cocoon drying chambers, grainage houses, and (iv) providing support though technical assistance and financial intervention packages that facilitate creation of productive assets by farmers. In this context it is required to undertake a study on **threats to Assam Silk industry from Muga silkworm diseases and key solutions to manage them”**.
- 1.6 OPIU - Directorate of Sericulture (hereinafter is referred to as ‘Directorate’) in co-ordination with PCU - ARIAS Society has intended to apply a portion of this loan for hiring a consultancy agency (hereinafter is referred to as ‘Consultant’) to conduct a **“threats to Assam Silk industry from Muga silkworm diseases and key solutions to manage them”** and hence the ToR has been framed.

**2. Objectives of the assignment:**

- 2.1 To understand the immune system of the Muga silkworm and range of conditions suitable for its survival and better growth, as it has very low tolerance to diseases. Variation of temperature and relative humidity during rearing period increases possibility of diseases attack.

- 2.2 To identify the extent of proliferation of pebrine which is the most serious disease plaguing the industry as 90% of the seed production is controlled by the farmers who do not follow any seed testing protocol. Such a practice causes unabated proliferation of diseases resulting in frequent crop failure and finally affects the overall raw silk production.
- 2.3 To find out possible solutions for abating the other major diseases of Muga silkworm identified as virosis, bacteriosis and fungal. Virosis is prevalent throughout the year and fungal infection is found highest during winter.
- 2.4 To develop technology/package of practices for indoor rearing to prevent the loss of early stage worms due to diseases.
- 2.5 To develop plant protection mechanism for muga silk worm diseases prevalent in Assam, so that this can be disseminated to the muga farmers through the extension programs.
- 2.6 To find out key solutions to manage and eradicate the diseases and the preventive measures during rearing.

### 3. Scope of the Assignment & Tasks to be carried out by the Consultant:

- 3.1 Undertake baseline survey on the causes of occurrence of various diseases of Muga silkworm in the projected districts of Kamrup, Lakhimpur, Jorhat, Majuli, Sibsagar, Charaideo and Sonitpur.
- 3.2 Collect the secondary sources of information and generate information from additional primary data through surveys and Focused Group Discussions (FGDs) with stakeholders, interviews with farmers/entrepreneurs involved in the Muga Silk culture and analyze the data.
- 3.3 Assess the disease incidence of Muga silkworm in the projected districts and a model for forecasting and forewarning of Muga silkworm diseases may be prepared.
- 3.4 Prepare an action plan and road map for successful disease free rearing of pre-basic and basic seeds.
- 3.5 Suggest appropriate prophylactic measures that could be adopted to contain diseases as practiced in mulberry culture or technology may be adopted for season specific rearing.
- 3.6 Suggest rapid, low cost diagnostic field techniques for early detection of Muga silkworm diseases.
- 3.7 Strategy to be developed for Diseases Management.
- 3.8 Suggest strategies for maintenance of disease free seeds throughout supply chain from production till it ultimately go to the commercial rearers for production of commercial cocoons.
- 3.9 Strategies has to be developed to control diseases spread from infected areas to disease free areas
- 3.10 Suggest an action plan to transform existing state Government muga production Farms to model commercial disease free silkworm production farms
- 3.11 Assess infrastructure and human resource requirement to implement the above mentioned disease management program over a period of seven years.
- 3.12 To assess other threats to muga silkworm like from pesticides applied in the tea gardens, as well as air pollution due to burning of hydrocarbons in nearby oil and brick kilns and assess the extent of losses to the industry.
- 3.13 The need of any regulatory framework for creation of separate rearing zones both for seed and commercial rearing could be formulated to avoid contamination from diseases. If so, the major possible provisions of such a regulatory framework should be shared. The need of any regulatory framework for creation of separate rearing zones both for seed and commercial rearing could be formulated to avoid contamination from diseases. If so, the major possible provisions of such a regulatory framework should be shared.

### 4. Reports:

- 4.1 **Inception Report: The Consultant is required to submit the inception report within 15 (fifteen) working days from the date of signing the contract agreement. It is expected that the Consultant will mobilize their resources within 15 (fifteen) days from the date of signing the contract agreement. The report shall cover the following:**
  - i. Detailed methodology of the study to meet the requirement of the ToR including number of team members to be mobilized for deployment, scheduling of various activities to be carried out for completion of different stages of the assignment within the stipulated time schedule.
  - ii. Task assignment and work schedule.
  - iii. Work programme
  - iv. Proforma /Tools for data collection
  - v. Key personnel to be employed
  - vi. Time frame for submission of various reports

vii. The Consultant shall carryout the modification if required in the inception report based on the observations and comments of the Directorate. The approval of the inception report will be given by the Directorate within **7 (Seven)** working days of its submission with desired changes incorporated.

viii. **Review Committee: All reports will be examined and approved by a committee comprising of Members as deemed suitable by the CPIU with Director- Sericulture as the Chairman.**

**4.2 Interim Report:** The Consultant will be submitting a draft interim report, including preliminary findings from the two assessments in compliance with the scope of work of the Consultant. The draft interim report will also include the summary of interviews and discussions conducted in the project districts and effective case studies. The draft interim report has to be submitted within 60 (sixty) days from the date of signing of the contract agreement. The draft report will be approved by the Directorate within 7 (seven) working days of its submission with desired changes incorporated.

**4.3 Draft Final report:** The Consultant will submit the draft final report of the assignment in detail incorporating all the objectives and scope of the work within 130 (one hundred thirty) days from the date of signing the contract agreement. The feedback on draft final report will be given within 7(seven) working days of its submission with desired changes incorporated.

**4.4 Final Report:** The Consultant will submit the final report incorporating all the feedbacks on the draft final report, bibliography, acronyms, glossary, etc. within 180 (one hundred eighty) days from the date of signing the contract agreement. Comments of the Directorate on the draft report based on discussions with the Consultant would be given within 7 (seven) working days of its receipt. The Consultant shall incorporate modifications as required in the final report and submit within 7 (seven) working days the modified final report for approval..

**5. Schedule for submission of Reports & Payments:** The Consultant shall furnish to the Directorate, the following reports.

Sl.	Activity	Number of Copies	Timeline	Payment
i	Inception report	6	Within 15 days	10%
ii	Interim progress report	6	Within 60 days	20%
iii	Draft final Report	6	Within 130 days	35%
iv	Final report	10	Within 180 days	35%

Note: All reports will be submitted in both hard (print) and soft (email and CD) copies in English language. After submission of each report, the consultant would make a presentation to the Client on mutually agreed date and time. Any suggestions will be incorporated within the stipulated time.

**6. Consultancy Period:**

The Consultant's services shall commence with effect from the date of signing of the contract agreement for a period of 180 days i.e approximately six (6) months. The Directorate will monitor the performance of the Consultant periodically and will have the right to foreclose the contract in case the performance of the Consultant is not satisfactory according to the agreed scope of work and schedule for completion of various tasks.

**7. Services and facilities to be provided by the Directorate:**

- i. Necessary coordination and cooperation from CPIU, relevant local officials from the 5 project districts will be ensured by the Directorate.
- ii. Access to available information, data, documents, etc. as deemed necessary to carry out the assignment
- iii. The consultant will have to arrange for all other facilities/services required to carry out the assigned work and they should take a note of this in submitting the financial proposal.

**8. Key professionals:** The consultant should engage following personnel for the study. The presence of the key personnel is mandatory for the entire period of consultancy. The availability of the non-key personnel can be based on the requirement of the study especially for field works. The CVs of the key personnel's will be evaluated for deciding the merit of the proposal:

Sl	Designation	Qualifications and Experiences	Roles and responsibilities
1	Key position 1:Team Leader Subject matter Specialist in Silkworm Seed production.	PG /PhD in Zoology/ Sericulture or a closely related field for minimum 10 years experience in silkworm Seed production,	<ul style="list-style-type: none"> <li>• Responsible for the entire study and is the focal contact person. Conceptualizing the study approach and methodology.</li> <li>• Responsible for preparation of the tools, designing the study methodology, analysis of the findings, preparation of reports of the study.</li> </ul>

		silkworm pathology and disease management. Should have experience of conducting survey/ studies/assessment/ publications related to silkworm Seed production, silkworm pathology, disease management and entrepreneurship development. Retired person from any Govt. organization in the relevant field also may be considered.	<ul style="list-style-type: none"> <li>• Participate in the key stakeholder consultations and visit to the field of the project districts.</li> <li>• Handle the financial issues involved with the study.</li> </ul>
2	Key position 2: <b>Specialist in Silkworm Seed Production</b>	PG in Zoology/ Sericulture or a closely related field Minimum 5 years experience in the field of silkworm seed production and management. Retired person from any Govt. organization in the relevant field also may be considered.	<ul style="list-style-type: none"> <li>• Developing of survey schedules, coordinating field visits, data collection and analysis</li> <li>• Organizing FGDs for field data validation</li> <li>• Providing inputs on seed production, epidemiology, disease forecast and forewarning, productivity enhancement, ensuring quality in seed production etc.</li> </ul>
3	Key position 3: <b>Microbiologist</b>	M.Sc/Ph.D Agri/Seri in horticulture/ Botany microbiology from a recognized University/ Institute of repute and closely related in field Works. Must have at least 10 years of relevant work experience. Should have experience of conducting survey/ studies/ assessment/ publications related to vegetative propagation and entrepreneurship development. Retired person from any Govt. organization in the relevant field also may be considered.	<ul style="list-style-type: none"> <li>• Developing of survey schedules, coordinating field visits, data collection and analysis</li> <li>• Organizing FGDs for field data validation Providing inputs on plant diseases and forecast and forewarning, productivity enhancement, ensuring quality food plants producing quality leaves production etc.</li> </ul>
4	Key position 3: <b>Statistical Analyst</b>	M.Sc from a recognized University with minimum 5 years of experience in data analysis and use of soft ware for the analysis. Retired person from any Govt. organization in the relevant field also may be considered.	Work closely with other team members and is responsible for designing the study, tools of the study and analyzing the findings of the study. Prepare the analytical part of the reports using the appropriate statistical methods. Responsible for handling the data collected from the field. Analyse the data in compliance with the study.

**9. Reporting:** The Consultant will report to the Director, Sericulture, Assam.

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