

MINUTES OF 40th RESEARCH ADVISORY COMMITTEE MEETING OF CMER&TI, LAHDOIGARH

The 40th RAC meeting of CMERTI, Lahdoigarh was held on 28th – 29th June 2022. In absence of Prof. P.J. Handique, Chairman-RAC & Vice Chancellor, Gauhati University, Guwahati, Prof. L. K. Hazarika, Former Dean, Faculty of Agriculture (FA), Assam Agricultural University (AAU), Jorhat and Dr. B K Sarmah, Director, DBT-AAU Centre, Jorhat chaired the meeting on 28th June 2022 & 29th June 2022, respectively. The list of participants for the meeting is appended as Annexure – I.

Welcome address by the Director, CMER&TI and felicitation

Dr. Kasthala Mary Vijaya Kumari, Director, CMER&TI welcomed Prof. L. K. Hazarika, Academic Registrar, AWU, Jorhat; Dr. Bidyut Kumar Sarmah, Director, DBT-AAU Centre, AAU, Jorhat; Mrs. Kajori Rajkhowa, Director of Sericulture, Govt. of Assam; Dr. B.K. Singh, Rtd. Director, CSB; Mr. Robin Bharali, Member (Rearer Representative), Sivasagar, Assam; Sri Jiben Deka, Deput Director, Representative for Commissioner, HT&S, Government of Assam; Sri P. Borpuzari, Scientist–D & Head, Muga Silkworm Seed Organization, CSB; Sri B.N. Choudhary, Scientist-D & Head PMC North East, Guwahati; Dr. S Manthira Moorthy, I/C Director (Tech); Sri Sheikh Nazeer Ahmed Saheb, Scientist-D, RCS, CSB and all other invitees, scientists from the main Institute and its nested units. The meeting started as per the set agenda.

Inaugural address by the Chairman, RAC

Prof. L. K. Hazarika, Acting Chairman, RAC, in his inaugural address, welcomed all the members of the RAC. He expressed happiness about the achievements of the Institute with the remarks that scientists need to focus more on emerging field problems in both muga and eri sector and come up with economically viable, environment and farmer friendly technologies including climate resilient innovations so as to attract youths to the sector.

R&D highlights of the Institute by Director, CMERTI

Dr. K.M. Vijaya Kumari, Director, presented the major R&D achievements of the Institute that have been made since the last RAC meeting held in November 2021. She gave an overall picture of the CMER&TI main Institute, nested units and their mode of working. Major achievements from the concluded, new and ongoing projects were presented. Technologies taken for OST/OFT, research publications, recognitions to scientists were highlighted. She emphasized on the need of cooperation from state DOSs for the commercialization of technologies in North Eastern states.

AGENDA NO 1: CONFIRMATION OF LAST RAC MEETING MINUTES

The minutes of the previous meeting was circulated to all the members and the committee confirmed the minutes of the previous RAC meeting with suggestion to henceforth include salient findings and outputs of projects in the minutes.

AGENDA NO 2: FOLLOW UP ACTION ON THE GENERAL RECOMMENDATION/ DECISIONS OF THE LAST RAC MEETING

Dr. Aftab A. Shabnam, Scientist-D, PMCE presented the follow up action on general recommendations / decisions of the last RAC meeting.

AGENDA NO 3: FOLLOW UP ACTION TAKEN ON THE PROJECT SPECIFIC RECOMMENDATION/ DECISIONS OF THE LAST RAC MEETING

As decided in the 38th RAC, the project specific recommendations/decisions were presented by the respective scientists while presenting the progress of the projects.

AGENDA NO 4: REVIEW ON CONCLUDED PROJECTS

#	DETAILS	
1	Project code and title:	BPP 05014CN: Standardization of Processing and Production of a Consumable Beverage from Mulberry Leaves and Blending with Green Tea
A	Investigators involved	Dr. K. Sathyanarayana, M Chutia (upto June, 2021), Dr. P Sangannavar, Sri P Kumerasen
B	Project period :	March, 2020 – June, 2021 (Extended to June 2022)
C	Objectives:	<ol style="list-style-type: none"> 1. Standardization of protocol for preparation of mulberry leaf for production of mulberry tea and mulberry green tea (blending of green tea with mulberry leaves). 2. Standardization of protocol for blending of processed mulberry leaf with green tea for value addition. 3. Evaluation of biochemical and organoleptic properties and customer's acceptance of the products.
D	Progress achieved:	<ul style="list-style-type: none"> • Preliminary trials of blending processed mulberry powder and CTC green tea have been done. • The processed mulberry and tea leaves and their blended products were tasted by tasters of different tea broker houses. Biochemical analysis is completed. • Work has been completed by TTRI and AAU as per industrial standards • Sample sachets are ready for customer trials and popularization.
E	Utility of outcome / Future course of action	<ul style="list-style-type: none"> • Process for preparing stand alone and blended mulberry beverage has been standardized. • The process will be patented and popularized
F	Budget and expenditure :	Rs. 30.075 Lakh (AAU: 11.26; TTRI: 14.215 and CSB: 4.60)
G	Suggestion of RAC	<ul style="list-style-type: none"> • Health benefits of mulberry consumable beverage may be specified for wider acceptability. • Quantify the presence of heavy metals in mulberry leaf and liquor (mulberry beverage), if any. • Commercialization and feedback study of the product is recommended.

AGENDA NO. 5: CONCEPT NOTES OF NEW RESEARCH PROJECTS FOR PPROVAL

1	Project title :	Muga and eri silkworm disease monitoring in north east states
A	Investigators involved (PI & Co-I's)	<p>CMER&TI, Lahdoigarh: Dr. Reeta Luikham (PI)</p> <p>MESSO, Guwahati : Dr. Lopamudra Guha (Co-PI)</p> <p><u>CMER&TI</u></p> <ol style="list-style-type: none"> 1) Dr. James Keisa (CI) 2) Dr. Aftab A Shabnam (CI) 3) Dr. Bitupan Das (CI) 4) Dr. Arun Kumar KP (CI) 5) Dr. Omprakash Patidar (CI) 6) Dr. DK Jigyasu (CI) 7) Dr. Vijay N (CI) 8) Dr. Mahesh DS (CI) <p>Scientists of nested units (RSRS, Boko, RSRS Imphal and REC Lakhimpur) (CIs)</p> <p><u>MESSO, GUWAHATI</u></p> <p>All the scientists of MESSO including nested units (CIs)</p>
B	Objectives:	<ol style="list-style-type: none"> 1. To estimate the disease prevalence in Vanya silkworms (Muga and Eri) at seed farms, commercial farmers and grainages in North-eastern India. 2. To suggest timely remedial measures to ASRs, farmers and DoS personnel to manage the Vanya silkworm diseases and to prevent disease outbreak.
C	Expected outcome and utilization:	<ol style="list-style-type: none"> 1) Monitoring diseases in Muga and Eri silkworms 2) Reduced disease incidence in vanya sericulture in North-east India 3) Molecular biological identification of disease causing pathogens in vanya sericulture 4) Increased knowledge on seasonal nature of disease incidence in vanya sericulture.
D	Budget Proposed:	<p>Rs.31.0 L (CMER&TI) & Rs. 10.0 L (MESSO)</p> <p>Total: Rs. 41.0 L</p>
E	Suggestions of RAC	<ul style="list-style-type: none"> • The title may be modified. • Highlight the novelty of the proposed work compared to past works and published literatures. • Objectives may be limited to monitoring through periodic survey with the help of DOSs. Modify the methodology accordingly and remove work on molecular tools etc. • Revise the budget allocation under different heads to avoid ambiguity. • The project is recommended with above suggestions. • PI to submit the revised project within 15 days.
2	Project title :	Evaluation of role of polyamines; spermidine and spermine in enhancement of fecundity and egg production of muga (<i>Antheraea assamensis</i>) and eri (<i>Samia ricini</i>) silkworms.
A	Investigators involved (PI & Co-I's)	<p><u>CMER&TI, Lahdoigarh</u></p> <p>Dr. Aftab A Shabnam, PI & Dr. Om Prakash Patidar, CI</p> <p><u>GITAM, Visakhapatnam (AP)</u></p> <p>Prof. M Anitha, PI & Dr. GV Sireesha, CI</p>
B	Objectives:	<ol style="list-style-type: none"> 3. To standardize the effective dose of various polyamines that enhances egg production of muga and eri silkworms (CMERTI and

		<p>GITAM).</p> <p>4. To understand the mechanism by which polyamines enhance fecundity and egg production of muga and eri silkworms (GITAM).</p> <p>5. Field trials with selected concentrations of polyamine (CMERTI).</p>
C	Expected outcome and utilization:	<p>The problem of inadequate seed supply can be addressed if the enhancement of fecundity ratio by polyamines in muga and eri silkworms is proved at lab scale and is tested at farm level. Moreover, the problem of male sterility leading to poor hatching of muga silkworm eggs during summer can also be addressed.</p> <p>The new method developed in the project will be given to seed production centres for testing.</p> <ul style="list-style-type: none"> • Identification of genes involved in testicular development that help in enhancement of fertility. • Enhancement of sperm count, sperm maturity, sperm motility, fertilization, number of eggs produced and fertility ratio through application of polyamines. • Enhancement of farm level muga and eri egg production
D	Budget:	<p>Rs.87.27 L (CMER&TI) & Rs. 57.77 L (GITAM)</p> <p>Total: Rs. 145.04 L (DBT funding proposed)</p>
E	Suggestions of RAC	<ul style="list-style-type: none"> • The objective may be modified to address the issue of male sterility in muga silkworm. • Project document should optimize protocols to be followed in both the collaborating Institutes. • Include identification of gene responsible for fecundity & egg production. Modify the methodology accordingly. • Include one scientist with expertise in insect physiology/entomology. • The budget to be justified between the collaborating Institutes as per the allotted work load. • The project is recommended for onward submission to the DBT, New Delhi with the above suggestions.

AGENDA NO. 6: REVIEW OF THE PROGRESS OF ON-GOING PROJECTS

#	ON-GOING PROJECTS	DETAILS
1	Project code and title:	MOE05004-EF : Adoption of improved sustainable technologies of Muga culture for elevation of cocoon production in the tribal belt of Assam
A	Investigators involved	Dr. Vijay N, (PI), Dr. DK Gogoi, (CI, upto July 2021), Dr. D. Mech, (CI), Dr. SAS Rahaman, (CI), Dr K.Sathyanarayana, (CI)
B	Project period :	Aug 2019-July 2022
C	Objectives:	<ol style="list-style-type: none"> 1. To promote adoption of improved Muga rearing technologies among tribal rearers through sustainable NGO-rearer linkages facilitated by CMER&TI, Lahdoigarh. 2. To improve the socio-economic status of tribal population by enhancing cocoon production through improved muga culture
D	Progress achieved:	<ul style="list-style-type: none"> • Conducted 02 awareness programs on disease management of silkworm at Boko and Goalpara, 02 technology demonstrations on use of foot sprayer for spray of lahdoi for controlling of muscardine disease and flacherie disease. • Release of <i>Nesolynx thymus</i> for biological control of uzi fly in the farmers' field.

#	ON-GOING PROJECTS	DETAILS
		<ul style="list-style-type: none"> • Farmers were provided with inputs like nylon net, lahdoi, foot sprayer, DFLs and sodium hyochloride. Distribution of 1000gm DFLs to the beneficiary farmers at Boko, Kamrup. Preparation of videos of imporved technologies of muga culture under progress. • A Total of 14nos of programs was conducted <i>i.e.</i>, 9nos Awareness programs, 2 nos Group discussion, 1 no field day, 2nos Technology demonstration and 4nos training programs conducted at study area.
E	Specific outcome:	The farmers are adopting the improved technologies of muga culture which will help in increasing the cocoon production. Farmers are adopting the use of chemical disinfectants for the control of diseases which will help them to harvest good amount of quality cocoons compared to benchmark.
F	Suggestions of RAC	<ul style="list-style-type: none"> • Highlight the list of technologies promoted for adoption and the technologies that are most preferred by the farmers. • Record and statistically analyze target wise achievement of adoption and subsequent improvement in the cocoon production.
2.	Project code and title:	PIB-05005-SI: Genetic enhancement of Castor (<i>Ricinus Communis</i> L.) germplasm as a source material for development of productiveperennial varieties
A	Investigators involved	Dr. Aftab A Shabnam (PI) Dr. Amit Kumar (CI); Dr. DK Jigysu (CI), Dr. Somen Singh (CI)
B	Project period :	Oct., 2019 – Sept., 2022
C	Objectives:	<ol style="list-style-type: none"> 1. Genetic enhancement of castor germplasm. 2. Development of pre-bred intermediate castor with perennial Characteristics.
D	Progress achieved:	<p>Objective wise progress till date:</p> <ol style="list-style-type: none"> 1. Gene pool was enriched with 28 castor accessions [20 perennial and 03 annual castor accessions collected from North East region, 03 annual castor varieties (DCS-9, ICH-66 and DCH-519) collected from IIOR, Hyderabad, Kalpi-6 collected from UP and YTP-1 Collected from TNAU, Tamil Nadu]. 2. 1st crossing lot: 12 different reciprocal/cross combinations, F₁ generation plants selfed& F₂ seeds harvested. Selfed F₁ seeds of potential perennial accessions were also sown for mass selection. F₂ generation in progress. 2nd crossing lot: 17 cross combinations were carried out and F₁ seeds of 15 crosses harvested. 02 wide crosses (NBR-1 X NBR-P-Imphal and NBR-1 X SBR-P-Shillong) were successfully carried out and F₁ seeds harvested. F₁ generation in progress. <p>Progress during the period:</p> <ul style="list-style-type: none"> ➤ Preliminary selections in F₁ generation and selection of perennial trait (woody stem castor) were carried out from F₂ generation plantation and the selected hybrids were labeled for further studies and selfing to harvest pure seed. ➤ 01 new castor accessions was added to gene pool from Manipur. ➤ Biochemical characterization of left over accessions was carried out. ➤ Following plantations were maintained as per recommended package of practices: <ul style="list-style-type: none"> ❖ Plantation of 22 Castor accessions at farm-2. ❖ Plantation of F₁ and F₂ (1st and 2nd crossing lots) generations. ❖ Plantation of perennial castor plants selected from mass selection lot.

#	ON-GOING PROJECTS	DETAILS
E	Specific outcome:	<ul style="list-style-type: none"> ➤ Bagging of F₁ plants for harvesting pure F₂ seeds. ➤ Raising of plant to row progenies in F₂ generation and selection of perennial trait hybrids in F₂ generation. ➤ Inclusion of 01 new castor accession collected from NE region has enriched the castor gene-pool. ➤ Biochemical characterization of castor germplasm will help in identifying the potential castor accessions for inclusion in future breeding programmes.
F	Suggestions of RAC	<ul style="list-style-type: none"> • 06 months extension of project period is recommended without any additional financial involvement for carrying out selection of perennial trait lines in F₂ generation of the 2nd crossing lot. • PI to ensure completion of all the project works within the extended period.
3. Project code and title:		
		AIB 05006 SI: Breeding of muga silkworms for improved silk quality and disease tolerance
A	Investigators involved	Dr. Arun Kumar K.P. (PI), Dr. Mahesh D.S. (CI) and Dr. Manjunath R.N. (CI)
B	Project period :	October,2019 to September,2022
C	Objectives:	<ol style="list-style-type: none"> 1. Selection of better parents by field collection of muga silkmoth samples. 2. Classical breeding studies to select better lines for muga silkmoths. 3. Mass production for limited trials.
D	Progress achieved:	<ul style="list-style-type: none"> • BP1 has been stabilized through continuous selection and rearing. Group rearing is going on and further selections will be performed to prepare DFLs for limited trial in next commercial season. • GBS based linkage analysis to identify the locus/loci linked to pupal hibernation during winter is going on. GBS sequencing is completed and analysis is going on. Initial analysis revealed that the wild stock showed high heterozygosity. The cultivated stock showed very low heterozygosity indicating the possible loss of vigor due to continuous selfing. • Wild muga genetic stock were included in breeding experiments and attempted for development of hibernating characters collected from different geographical region with better cocoon characters and fecundity. • Plastic collapsible moutage has been successfully used for mounting the breeding stock. It was found to be suitable mounting device for large scale production of quality muga cocoons. • Cold reeling technique has been modified through including of EDTA in the reeling solution, which further eased the reeling. It has been tested at commercial scale.
E	Specific outcome:	BP1 has been stabilized through continuous selection and rearing. Cold reeling has been tested in large number of cocoons at commercial scale and it was successful. GBS sequencing is completed and analysis is going on. Plastic collapsible moutage has been successfully used for mounting.
F	Suggestions of RAC	<ul style="list-style-type: none"> • Critical distinction of genotypes is very much important. The PI may go for large number of SNPs and look for distinct genotype. • Compare superiority of the selected line with that of the CMR-1 and CMR-2. • One year extension of the project duration is recommended without any additional financial burden for desirable output.

#	ON-GOING PROJECTS	DETAILS
		<ul style="list-style-type: none"> PI to ensure completion of all the project works within the extended period.
4.	Project code and title:	APR 05007 SI: Standardization of chawki rearing practices for Eri silkworm, <i>Samia ricini</i> (Donovan)
A	Investigators involved	Dr. Mahesh D S (PI); Dr. Arun Kumar K P (CI); Dr. Kh. Subadas Singh (CI)
B	Project period :	3 years (October, 2019 – September, 2022)
C	Objectives:	a) Establishment and management of eri host plant garden for eri chawki rearing. b) Design and fabrication of Eri silkworm chawki rearing equipment. c) Development of new rearing method and ideal environment for eri chawki rearing.
D	Progress achieved:	<ul style="list-style-type: none"> Selected farmers for distribution of chawki worms at Bokakhat region, Mariani region, BTC (DoS Udalguri) region of Assam and ESDP, Chungthia region of Nagaland and conducted field testing and onsite demonstration of eri chawki rearing technology and distributed the chawki worms among the lead farmers. Compared the results of chawki reared batch over conventional rearing. In chawki reared batch performed better in terms of less missing larvae (<0.5 %), more uniformity (almost 100 %), no diseased worms, less larval spinning/ripening duration (2-3 days) and more cocoon yield (80.15 Kg/100 DFLs). Whereas in conventional reared batch we noticed more missing larvae (>8 %), less uniformity (58%), more disease incidence (>11 %), more spinning/ripening duration (6-7 days) and less cocoon yield (61.38 Kg/100 DFLs). Edited and released a booklet on “Eri chawki rearing practices” in the workshop conducted by CMER&TI on 14/03/2022 at Guwahati. Designed and fabricated a model eri chawki rearing house at GCC, Chenijan, CMER&TI for demonstration and supply of chawki worms purpose.
E	Specific outcome:	<ul style="list-style-type: none"> Designed and fabricated a model eri chawki rearing house at GCC, Chenijan, CMER&TI. Selected farmers for eri chawki distribution at DoS Udalguri region (BTC), Bokakhat region, Mariani region of Assam and Chungthia region of Nagaland by conducted field testing and onsite demonstration of eri chawki rearing technology. Chawki reared batch performed better over conventional rearing in all the regions in terms of less missing larvae, more uniformity, very less diseased worms, less larval spinning/ripening duration and more cocoon yield. A booklet on “Eri chawki rearing practices” has been edited and published from CMER&TI.
F	Suggestions of RAC	<ul style="list-style-type: none"> 06 months extension of project period is recommended without any additional financial burden. PI to ensure completion of all the project works within the extended period.
5.	Project code and title:	APR 05008 SI: Standardization of Rearing and Grainage Technologies of <i>Antheraea frithi</i> Moore
A	Investigators involved	Dr. L. Somen Singh (PI); Dr. S. Subharani Devi (CI)
B	Project period :	October 2019- September 2022

#	ON-GOING PROJECTS	DETAILS
C	Objectives:	To standardize the rearing and grainage technologies to suit for commercial adoption
D	Progress achieved:	Emergence behaviour of <i>A. frithi</i> moths studied from 2nd crop harvested cocoons and observed moth emergence after undergoing 138-150 days of pupal diapause. Seed cocoons are under preservation.
E	Specific outcome:	➤ Moth emergence observed after undergoing 138-150 days of pupal diapause from 2 nd crop harvested cocoons.
F	Suggestions of RAC	<ul style="list-style-type: none"> • Continue the work as per the milestones. • After completion of the project period, the work may be continued as a regular programme.
6.	Project code and title:	AIB 05009 SI: Isolation of thermo-tolerant line(s) of Oak tasar silkworm <i>Antheraea proylei</i> J.
A	Investigators involved	Dr. Y. Debaraj (PI); Dr. S. Subharani Devi (CI); Dr. R. Debnath (CI)
B	Project period :	October 2019- September 2022
C	Objectives:	<ol style="list-style-type: none"> 1. To isolate thermo-tolerant line of oak tasar silkworm, <i>Antheraea proylei</i> 2. Characterization of Heat shock protein gene in thermo-tolerant line.
D	Progress achieved:	Spring crop rearing completed and seed cocoon are under preservation. Amino acid sequencing studies conducted for detection of heat shock proteins in RTRS 1 at Dept. of Biotechnology, Manipur University. <u>RTRS 1:</u> <ol style="list-style-type: none"> 1) Expression of HSP 19.9 was not observed. 2) Expressions of HSP 60 and HSP 90 decrease at 32°C but further increase with increase in temperature. 3) No significant differences were found in the expression of HSP70 protein. 4) Expression of HSP 21 increases with increase in temperature.
E	Specific outcome:	Protein profiling studies of RTRS 1 showed expression of HSP 21, HSP 60 and HSP 90 and showed increase or decrease with temperature. Seed cocoons of heat tolerant population are preserved for continuing the generation.
F	Suggestions of RAC	<ul style="list-style-type: none"> • The results obtained may be peer reviewed for analysis and necessary suggestions towards validation. • Expertise of Dr. Arun Kumar, Scientist-C may be utilized for drawing meaningful conclusions. • 06 months extension of project period is recommended without any additional financial burden. • PI to ensure completion of all the project works within the extended period.
7.	Project code and title:	APR 05010 SI: Evaluation of Eri Silkworm Races suitable for different agro-climatic conditions of Manipur.
A	Investigators involved	Dr. Y. Debaraj (PI); Dr. L. Somen Singh (CI)
B	Project period :	October 2019- September 2022
C	Objectives:	To identify the best performing eri silkworm race in different agro-climatic conditions of Manipur.
D	Progress achieved:	Eri food plants are being maintained for next crop rearing. Rearing of different eco-races and strains under progress. Worms are in spinning stage.
E	Specific outcome:	Nil
F	Suggestions of RAC	Continue the project as per the milestones

#	ON-GOING PROJECTS	DETAILS
8.	Project code and title:	AIT 05011 EF: Molecular investigation into the lignocellulolytic system of a few wild silkmoths of North East India
A	Investigators involved	Dr. Arun Kumar KP (PI), Dr. Rajal Debnath (CI)
B	Project period :	Sep 2019-Sep 2022
C	Objectives:	<ol style="list-style-type: none"> 1. Impact of host plant range on the <i>Antheraea assamensis</i> Helfer and <i>Samia ricini</i> Donovan associated microbial community 2. Lignocellulose degradation by the gut microbes associated with <i>Antheraea assamensis</i> Helfer and <i>Samia ricini</i> Donovan 3. Molecular characterization of the lignocellulolytic biomass degrading enzyme 4. Developing microbial pathogen resistance through induction of immunity in silkworms through gut microbiome manipulation (Additional objective from CSB included)
D	Progress achieved:	<ul style="list-style-type: none"> • Whole Genome Sequencing of 10 bacterial strains with highest cellulase and xylanase activity has been completed and analysis is going on. • Rearing of Eri silkworms was carried out in 3 different host plants for metagenomic DNA isolation. Metagenomic DNA has been isolated from gut of 2 eri coraces viz. Kokrajhar and Borduar. • Two bacterial strains MS29 and MM43 isolated on Lactic bacteria agar media were selected for carrying out immunity boosting assay in Muga silkworms. Accordingly, two groups (50 each) of hatched muga larvae were first fed with Som leaves sprayed with MS29 and MM43 bacterial strains respectively for 24 hours. Another group with 50 muga silkworms were taken as control and fed with non-treated leaves. Similarly, 3 replicates were made and are brushed on Som trees after 24 hours of feeding. Rearing is going on.
E	Specific outcome:	Whole Genome Sequencing of 10 bacterial strains with highest cellulase and xylanase activity has been completed. Metagenomic DNA is isolated from flacherie infected muga silk worms. Metagenomic DNA is isolated from eri gut of 2 eri corace viz. Kokrajhar and Borduar reared on 3 different host plants. Immunity boosting assay is being carried out in muga silkworms using 2 bacterial strains isolated in lactic bacteria agar media.
F	Suggestions of RAC	Committee observed, since objective no. 04 was added by CSB and is not a part of original project approved by DBT, the investigators could not do much work to achieve this objective. Hence, the objective may be dropped from the study and PI is advised to conclude the project by Sept. 2022 without seeking any extension.
9.	Project code and title:	AIB 05012 SI: Inter and intra-specific hybridization for improvement of eri silkworm, <i>Samia ricini</i> Donovan
A	Investigators involved	Dr. Reeta Luikham (PI), Dr. Aftab A. Shabnam (CI).
B	Project period :	4 years (March, 2020 – February, 2024)
C	Objectives:	To develop improved cross breeds/hybrids of Eri silkworm with higher fecundity and silk yield for commercial exploitation.
D	Progress achieved:	Intra-specific hybridization was carried out by selecting pureline parents of ecoraces & C2 breed to cross in full diallel fashion to produce F ₁ crossed seed was completed. Selfing and grainage activities to produce crosswise F ₂ seed are under progress. Inter-specific hybridization was carried out by utilizing pure wild eri <i>S. canningi</i> as male parent and crossed with two ecoraces (Borduar

#	ON-GOING PROJECTS	DETAILS
		and Kokrajhar) out of 04 ecoraces and C2 breed to produce F ₁ crossed seed is completed. Grainage activities to produce F ₂ crossed seed is under progress. Analysis of GCA & SCA is under progress.
E	Specific outcome:	<ul style="list-style-type: none"> • Selection of pureline parental stock for utilization in actual breeding programme. • Crossing of pureline selected parents will lead to selection of improved Eri silkworm hybrid/breed. • Estimation of GCA & SCA will be helpful to identify suitable cross combinations for future breeding programmes.
I	Suggestions of RAC	<ul style="list-style-type: none"> • The PI should discuss with a breeder having expertise in silkworm breeding for better insight on the execution of the breeding programme. • Continue selection of pure line strains based on larval colour and markings till 100% homogeneity of the population is achieved. • Selection of pureline parents for crossing should include top as well low ranking strains. Possible cross combinations should be carried out accordingly.
10.	Project code and title:	AIB 5013 SI: Impact of elevated CO₂ and temperature on muga silkworm and its primary host plant
A	Investigators involved	Dr. Amit. Kumar (PI); Dr. Aftab A. Shabnam (CI); Dr. D.K. Jigyasu (CI)
B	Project period :	March 2020 to Feb 2023
C	Objectives:	<ol style="list-style-type: none"> 1. To assess the influence of elevated CO₂ and temperature on growth and yield attributes of primary host plant (Som). 2. To assess the impact of elevated CO₂ and temperature on muga seed crop production, cocoon characteristics and fecundity. 3. To design strategies for adoption in muga silk worm rearing under the changing environmental scenario in Assam.
D	Progress achieved:	The project is running behind the schedule due to non-procurement of OTCs. However: <ul style="list-style-type: none"> • Som plot selected for the experiment was maintained as per recommended package of practices. • The treatment on the host plants will be given after the establishment of the Open Top Chambers. • The long-term weather data of the Meghalaya has been completed. • Long-term weather data of Assam is updated with available production data for publication as “Seri-climatic manual of muga growing districts of Assam”.
E	Specific outcome:	Maintenance of the Som plantation as per the recommended package and practices
F	Suggestions of RAC	<ul style="list-style-type: none"> • The project is running behind the schedule due to delay in procurement of Open Top Chambers (OTCs). • In view of transfer of Dr. Amit Kumar (PI) to CSR&TI, Mysore, Dr. D.K. Jigyasu, who is having expertise in Environmental Science, may take the lead role in execution of the project. • Dr. Amit Kumar, Scientist-C may be included as Co-PI from CSR&TI, Mysore for the effective implementation of the project. • Take immediate measures to publish the book on ‘Seri-climatic manual of muga growing districts of Assam’.
11	Project code and title:	ARP 05015 SI: Development of chemical based control measures for management of pebrine disease in Muga silkworm, <i>Antheraea</i>

#	ON-GOING PROJECTS	DETAILS
		<i>assamensis</i> Helfer
A	Investigators involved	Dr. Arun Kumar K.P (PI)
B	Project period :	Jan 2021 – Dec 2023
C	Objectives:	<ul style="list-style-type: none"> • Effect of different chemical disinfectants and antifungal substances on survivability and infectivity of microsporidian spores • Efficacy analysis and field application of chemical disinfectants suitable for management of pebrine disease.
D	Progress achieved:	<ul style="list-style-type: none"> • The experiment on treatment of pebrine infected eggs was repeated and rearing of treated eggs completed. Pebrine infected layings were divided on the basis of density of spores (low and high). Two disinfectants 0.2% NaOCl and 2% Nirmool were used to disinfect the eggs. • Testing of different fungicides on survivability of pebrine spores is going on. • Germination assay with these fungicides is also being carried out simultaneously.
E	Specific outcome:	Both 0.2 % NaOCl and 2% Nirmool can be used to treat low density pebrine infected eggs. 0.2% NaOCl was found to be more effective as it resulted in less number of pebrine positive samples, whereas less emergence was seen in 2% Nirmool. But both the disinfectants were found to be ineffective in curbing pebrine disease in samples with highly dense <i>Nosema</i> spores.
F	Suggestions of RAC	<ul style="list-style-type: none"> • Focus exclusively on developing best chemical based control measures for management of pebrine disease. • Ascertain the field utility of the shortlisted chemicals. • Work on genome studies should be eliminated as it does not fall under the purview of this project. • Continue the project as per the objectives
12	Project code and title:	AIT 05016 MI: Integrating genomic and transcriptomics resources for functional insight into the biology of muga silkworm <i>Antheraea assamensis</i>.
A	Investigators involved	Dr. Arun Kumar K.P. (PI)
B	Project period :	January, 2021 to December, 2023
C	Objectives:	<ul style="list-style-type: none"> • Development of web accessible database 'Mugabase' to host the muga sequence data, initially within CSB and later for public access. • Refining of assembly and annotation of the whole genome and transcriptome sequence data. • Identification and validation of functional genes associated with insect behavior, silk quality and immunity.
D	Progress achieved:	<ul style="list-style-type: none"> • Development of 'Vanya Silkbase' is under progress. • Standalone BLAST database of all the wild silkworm genomes have been created. • Annotation of muga genome completed. • Synteny analysis with against <i>Antheraea pernyi</i> genome is completed. • SNPs identified in both wild type and cultivar muga genome. • Experimental infection of muga silkworm is completed and tissues collected for gene regulation analysis.
E	Specific outcome:	<ul style="list-style-type: none"> • Homologs of silk protein Sericin is identified in other saturniid silkworms. • Candidate silk character gene identified. • Around 5 Lakhs SNPs detected in both Wild type and cultivar muga genome.

#	ON-GOING PROJECTS	DETAILS
		<ul style="list-style-type: none"> • Synteny analysis in comparison to <i>Antheraea pernyi</i> genome is completed.
F	Suggestions of RAC	<ul style="list-style-type: none"> • Authenticate the status of CMR-1 & CMR-2 through molecular markers. • Continue the project as per the milestones
13.	Project code and title:	CFC 5017 MI: Exploration and adoption of novel solvent based muga cocoon cooking technology for increasing its reelability and raw silk quality
A	Investigators involved (PI & Co-I's)	Dr. Manjunath R. N (PI), Dr. Dip Kumar Gogoi, RSRS, Khoraput (CI), Dr. Rajiv Munshi, RSTRS Khanapara (CI)
B	Project period :	March 2021 – Feb 2023
C	Objectives:	<ol style="list-style-type: none"> 1. To study the efficacy of enzymatic and non-enzymatic (chemical) approaches in muga cocoon cooking/softening. 2. To develop a new solvent based cocoon cooking technique to improve the reelability & raw silk quality in muga cocoons dried under different techniques 3. To carry out large scale Multi-location trials at CSB and DoS reeling units for validating the efficacy of the newly developed cooking method. 4. To create awareness among the reeling beneficiaries to adopt/popularize the new solvent based muga cocoon cooking technique for efficient reeling and quality raw silk production.
D	Progress achieved:	<ul style="list-style-type: none"> ➤ A new cooking formulation that offers quick and efficient/uniform cooking of muga cocoons has been developed and validated for its efficacy and shelf life at laboratory trials (in comparison to traditional soda based cooking methods). ➤ Further, the formulation was test verified at reelers level in Palasbhari, Guwahati and Sivsagar regions in coordination with DoS.
E	Specific outcome:	The trial results were ascertained by reduced cooking duration, reduced breakages (by ~20%), improved reelability and recovery during the reeling process.
F	Suggestions of RAC	<ul style="list-style-type: none"> • The PI should re-work the economics based on with large scale trials and take up a statistical analysis. • Study the effect of formulation on the physical properties of the silk. • Ascertain the impact of seasonal variation, if any, on the formulation. • Continue work as per objectives.
14.	Project code and title:	APR-05018 MI: Effect of various host plants separately and in combination on Rearing and grainage performance of Muga silkworm, <i>Antheraea assamensis</i> Helfer
A	Investigators involved (PI & Co-I's)	Dr. Kh. Subadas Singh (PI), SA.S. Rahman, RSRS Boko (Co-PI), Dr. D.K. Jigyasu (CI), Dr. M. Deka, RSRS Boko (CI), Dr. Vikram Kumar, MSSO Rompara (CI)
B	Project period :	March 2021 – Feb 2024
C	Objectives:	<ol style="list-style-type: none"> 1. To study the effect of various host plants separately and in combination on rearing performance of muga silkworm. 2. To study the effect of various host plants separately and in combination on grainage performance of muga silkworm.
D	Progress achieved:	Experimental rearing of muga silkworm on different host plants Viz.,

#	ON-GOING PROJECTS	DETAILS
		<p>Som (<i>Perseabombycina</i>), Soalu (<i>Litseamonopetala</i>), Dighloti (<i>Litseasalicifolia</i>) and Mejankori (<i>Litseacubeba</i>) in different crop seasons is being conducted. Like in previous crops, muga silkworm rearing was conducted both solo and combinations of host plants during Chotua (Feb-March 2022).</p> <ol style="list-style-type: none"> 1. In Chotua (Feb-March 2022), rearing on Som (<i>Persea bombycina</i>) showed better results in terms of ERR% (52) among solo rearing. 2. Combination of Soalu + Som perform better than solo rearing in terms of ERR% (54) 3. Highest fecundity was found from silkworm rearing on Soalu (242). 4. Som exhibited shorter larval duration (29 days and 31 days on Soalu) as compared to other host plants. 5. Longer larval duration was observed in case of combination rearing with host plants Mejankori and Dighloti.
E	Specific outcome:	Rearing of muga silkworm on different host plants in different crop seasons reveals the role of host plants in muga silkworm rearing and grainage parameters. Different host plants are showing different results in different crops. Most of the cases, Soalu exhibited better results in terms of larval weight, cocoon weight and fecundity. Som exhibited better results in terms of short larval duration (22 days in summer and 40 days in winter), shell weight, shell ratio% and ERR% as compared to Soalu and other food plants. However, in Chotua crop, best rearing performance was observed in the combination of Soalu with Som in terms of ERR%.
F	Suggestions of RAC	<ul style="list-style-type: none"> • In view of transfer of Dr. Subadas Singh (PI) to RSRS, Imphal, Dr. D.K. Jigyasu may take the lead role as PI for execution of the project. • Record data on disease incidence. • Take the help of statistician for data analysis.
15.	Project code and title:	MFM 5019MI Development of Honeycomb Mountages and Harvesting Technology for Muga Cocoon Production with Improved Uniformity and Raw Silk Recovery.
A	Investigators involved (PI & Co-I's)	Dr. Manjunath R. N (PI), Dr. Mahesh D.S (CI) Dr. Urmimala Hazarika, MSSO (CI)
B	Project period :	March 2021 – Feb 2023
C	Objectives:	<ol style="list-style-type: none"> 1. Fabrication of honeycomb mountages and suitable harvesting technology for uniform Muga cocoon production. 2. Impact assessment of honeycomb mountages on cocoon production, cocoon characteristics and reeling performances. 3. To conduct on-station feasibility trials of the mountages at CSB/DoS units for prototype test verification.
D	Progress achieved:	<ul style="list-style-type: none"> ➤ Optimization of honeycomb moutage dimensions has been completed through lab scale prototypes and trials. ➤ Fine tuning and Fabrication of Honeycomb mountages (for commercial scale) having optimized cell dimensions & good ventilation with suitable harvesting technology (keeping low-cost, eco-friendly, durability and affordability aspects in mind) is under progress through outsourcing.
E	Specific outcome:	A new type of moutage with a possibility to produce uniform cocoon production.
F	Suggestions of RAC	<ul style="list-style-type: none"> • Effect of mountages on the silk recovery % should be calculated and depicted in the results. • Analyze the data statistically and workout the economics of the mountages.

#	ON-GOING PROJECTS	DETAILS
16.	Project code and title:	APS 05020 MI - Commercial egg production technology for ericulture
A	Investigators involved (PI & Co-I's)	Dr. Mahesh D S, Sci-B (PI), Dr. Lalith Natarajan, Sci-D, EBSF, Topatoli, (Co-PI), Dr. Arunkumar K P, Sci-C (CI)
B	Project period :	February 2022 to January 2024
C	Objectives:	a. Standardization and selection of suitable egg laying device for commercial loose egg production in eri. b. Synchronization of hatching and subsequent rearing. c. Popularization of loose egg production in Ericulture.
D	Progress achieved:	The standardization and selection of suitable egg laying device is under progress.
E	Specific outcome:	Nil
F	Suggestions of RAC	<ul style="list-style-type: none"> • Replicate the data initially at Institute level. • Continue the project as per milestone
17.	Project code and title:	APS 05021EF: Studies on population diversity and role of host plant volatile cues for enhancing egg laying in temperate tasar (Vanya) silk moths <i>Antheraea proylei</i>.
A	Investigators involved (PI & Co-I's)	Dr Sinam Subharani Devi (PI), Dr. Y. Debaraj (Co-PI) Dr.Kasthala Mary Vijaya Kumari (PI)
B	Project period :	Oct 2021- Sep 2024
C	Objectives:	<ul style="list-style-type: none"> • To survey and establish population diversity of oak tasar silk moths across NER. • To establish potent food plants (Host) for oak tasar silk moths, <i>A. proylei</i> for egg production. • To isolate and evaluate highly suitable host plant volatiles to activate/increase egg laying in oak tasar silk moth. • To standardize the synthetic oviposition stimulant blends to enhance egg production in oak tasar silk moths and establishing the efficacy of developed technology. • To evaluate the synthetic volatile blend in large scale at oak tasar seed production centers.
D	Progress achieved:	Initiated survey and collection of oak tasar silk moths from different regions of Manipur. Collected wild population of <i>Antheraea roylei</i> and <i>Antheraea frithi</i> from different districts of Manipur. Study the egg laying potential of <i>Antheraea proylei</i> on five different food plants viz. <i>Quercus serrata</i> , <i>Quercus griffithii</i> , <i>Lithocarpus dealbata</i> , <i>Quercus incana</i> and <i>Quercus semicarpifolia</i> under progress. Rearing of <i>Antheraea proylei</i> on three different food plants viz. <i>Quercus serrata</i> , <i>Quercus grifithi</i> , <i>Lithocarpus dealbata</i> , under progress. Worms are in spinning stage.
E	Specific outcome:	Nil
F	Suggestions of RAC	<ul style="list-style-type: none"> • Communicate to funding agency (DBT) regarding change in selection of markers. • Continue the project as per objectives
18.	Project code and title:	MOE 05022 MI: Evaluation and popularization of improved technologies developed in the field of Muga, Eri and Oak sector for Northeastern India (On-station/On-farm Trials of CMER&TI, Lahdoigarh)
A	Investigators involved (PI & Co-I's)	Dr. D K Jigyasu, CMERTI (PI), Sri Suraj Pal, REC-Fatehpur (CI), Dr. James T Keisa, CMERTI (CI), Dr. Y Debaraj, RSRS-Imphal (CI), Dr.

#	ON-GOING PROJECTS	DETAILS
		L Somen Singh, RSRS-Imphal (CI), Sri. B N Choudhury, RSRS-Boko (CI), Sri SAS Rahman, RSRS-Boko (CI), Dr D. Mech, REC-Lakhimpur (CI), Dr. Aftab A Shabnam, CMERTI (CI), Dr. S. Subharani Devi, RSRS-Imphal (CI), Dr. Arun Kumar KP, CMERTI (CI), Dr. Amit Kumar, CMERTI (CI), Dr. Kh. Subadas Singh, CMERTI (CI), Dr Vijay. N, CMERTI (CI), Dr. Mahesh D S, CMERTI (CI), Dr. Manjunath R N, CMERTI (CI), Mr. Abhishek Singh, MESSO (CI)
B	Project period :	February 2022 to January 2024
C	Objectives:	<ul style="list-style-type: none"> • To popularize various technologies in different stages developed by the Institute • To further create awareness for technological intervention among the farmers and beneficiaries • To increase the overall cocoon production.
D	Progress achieved:	<ul style="list-style-type: none"> • OFT of 12 technologies was carried out at 7 locations covering 111 beneficiaries against a target of 680 beneficiaries. • The OST of 09 technologies was also conducted at 11 locations. • The OST for validation of IPM technology for control of uzi fly in oak tasar culture was carried out in one location at DOS farm. Rearing under progress. Worms are in 5th and spinning stage. • The OST for validation of IPM technology for control of major insect pests infesting <i>Quercusserrata</i> was carried out in two locations at DOS farm. • The OFT of popularization technologies at farmers level was carried out at 15 locations covering 101 beneficiaries. 2600 Kesseru (HF-008 & HF-005) seedlings and 11.5 kg castor (NBR) seeds were distributed to Eri beneficiaries in Sivasagar area of Assam. • The OFT for establishment and popularization of new oak tasar silkworm breed C27 was carried out in three location covering three farmers. Rearing is under progress. • The OFT for validation of use of PET bottles for uzi trap in oak tasar silkworm rearing was carried out in three location covering ten beneficiaries. Rearing is under progress. Worms are in 5th and spinning stage. • The OFT for validation of use of Sodium hypochlorite for seed treatment against tiger band disease of oak tasar silkworm was carried out in three location covering three beneficiaries. Rearing is under progress. Worms are in 5th Stage.
E	Specific outcome:	Awareness and popularization of technologies in muga, eri and oak tasar.
F	Suggestions of RAC	Continue the project as per objectives
Collaborative projects with other institute as CI		
19.	Project code and title:	CYF 07014 MI: Development of 3D Woven Silk Fabrics and their Applications
A	Investigators involved	H Shambulingappa, PI, CSTRI, CI: Manjunath R.N, CMERTI,
B	Project period :	June, 2020 to May, 2022 (Extended upto Nov. 2022)
C	Objectives:	<ul style="list-style-type: none"> ➤ To modify the existing 2D weaving loom suitably for producing industrial scale 3D woven fabrics. ➤ To produce 3D woven silk fabrics with various fiber architecture and fabric parameters. ➤ To characterize the properties of 3D fabrics made from different varieties of silk yarns to suit them for various textile and technical applications.

#	ON-GOING PROJECTS	DETAILS
D	Progress achieved:	<ul style="list-style-type: none"> • Retrofication of the rapier loom completed. • Various trials for developing 3D fabrics have been completed. • Physical testing and product developed undertaken
E	Specific outcome:	Weaving machine for producing 3D woven fabrics is ready for trials.
F	Suggestions of RAC	Continue the project as per milestone
20.	Project code and title:	BPS 01013CN- Utilization and diversification of silkworm pupae products for human & animal consumption and composting.
A	Investigators involved	PI: Dr. Mahesh DS, CI: Dr. James Kiesa,
B	Project period :	2 years (September 2020 – August 2022)
C	Objectives:	<ul style="list-style-type: none"> ➤ To evaluate nutrients and bioactive compounds in silkworm pupae of Eri and Muga. ➤ To characterize proteome of Eri and Muga silkworm pupae.
D	Progress achieved:	<ul style="list-style-type: none"> • The sensory evaluation tests for preserved eri pupae provided by CFTRI at different interval have been completed to identify the shelf life of eri pupae. • Eri pupal snacks prepared by CFTRI are also tested through sensory evaluation by the panellists of traditional area (Assam) and collected the observations made by the panellists and submitted to CFTRI for further studies. • Submitted 7 nucleotide sequences to NCBI GenBank and obtained accession numbers in connection with bacterial species identified from spent muga silkworm pupae. • The proteome characterization for both eri and muga pupae are under progress.
E	Specific outcome:	<ul style="list-style-type: none"> • Identified 7 bacterial species in the spent muga pupae by sequencing and submitted 7 nucleotide sequences to NCBI GenBank and obtained accession numbers in connection with bacterial species identified from spent muga silkworm pupae. • Protein characterization to identify the different proteins present in eri pre pupae, matured pupae and muga pupae is under progress.
F	Suggestions of RAC	<ul style="list-style-type: none"> • Co-PI is advised to select some shortlisted products for popularization. • Seek extension of the project period for completion of the incomplete part.

AGENDA NO. 7: R&D HIGHLIGHTS OF THE INSTITUTE Nov. 2021 – May 2022.

Director of the Institute presented the R&D highlights of the institute in the beginning of the meeting. Chairman and members appreciated the progress made by the Institute.

AGENDA NO. 8: TRANSFER OF TECHNOLOGY (TOTS) PROGRAMMES

1. The progress of ToTs was presented in the ongoing project MOE05022MI.
2. It was suggested to complete the target as envisaged in the action plan for the year 2022-23.

AGENDA NO. 9: EXTENSION COMMUNICATION PROGRAMMES

1. More than 100% achievement in coverage of stakeholders under various extension communication programmes for the year 2021-22, which was appreciated.

2. It was suggested to achieve the target on as envisaged in the action plan for the year 2022-23.

AGENDA NO. 10: CAPACITY BUILDING & TRAINING PROGRAMMES

1. 95.5% achievement in trainings for the year 2021-22 was appreciated.
2. It was advised to make necessary efforts to achieve the set annual target for the year 2022-23.

AGENDA NO. 11: ANY OTHER POINTS

- Delay in timely execution of project works due to procurement of equipments was discussed. It was suggested that in future, while formulating a project such type of delays should be kept in mind and sufficient time should be kept for procurement & installation of equipments.
- Scientists should engage in discussion with subject specialists to streamline their programmes.

AGENDA NO. 12: CONCLUDING REMARKS FROM RAC CHAIRMAN& MEMBERS

1. **Smt. Kajori Rajhkowa** appreciated all the Scientists for their research work and expressed her happiness in reviewing the R&D activities of the Institute. She agreed to extend all possible help from the State Government for transfer of technology to the farmers. She also affirmed that she has already initiated various steps at appropriate level to address the problem of pesticide usage by planters nearby sericulture fields during the rearing season.
2. **Dr. Bidyut Kumar Sarmah** appreciated the uploading of status paper on the website reflecting strategies to enhance the silk production in Northeast India during next 10 years. Further, he suggested adopting the peer review process to analyze the experimental results and outcome of various R&D projects for effective implementation. He stressed to effectively utilize the allotted fund in the budget under different projects.
3. **Dr. B.K. Singh** advised the scientists to follow the time schedule of the projects meticulously. The suggestions given by the experts should be followed for the betterment of the industry. He stressed to work-out the economics of the new findings before their release to the field. The work at muga conservation sites should be taken more seriously to increase the muga silkworm population at these sites.
4. **Sh. P. Borpuzari** insisted that focused research needs to be carried out to address the issue of muga silkworm summer crop failure (pre-seed & seed crops).
5. **Dr. S.M. Moorthy** advised the scientists to carry out extensive review of literature before formulating the new research projects and follow up the outcome of research projects to ensure farmers are getting benefited. He suggested carrying out more focused research for breed development in muga and eri and enhanced muga seed production.
6. **Sh. S. Nazeer A.S.** advised the scientists to effectively utilize the budget under the projects as the budget utilization in the projects is poor. He stressed to effectively utilize the services of statistician posted in the Institute. He advised the scientists to formulate new need based research projects to meet the target of initiating 06 new projects during the year 2022-23 by CMER&TI.

7. **Sh. Robin Bharali** informed that there is a major muga crop loss due to outbreak of flacherie and grasserie especially during the 4th and 5th Instars which should be addressed through R&D. Further, he requested to frame local administrative rules for strictly restricting pesticide usage in the tea gardens during the rearing season in order to prevent muga crop loss. He also requested to arrange exposure visits of farmers to the sericulturally advanced states in order to acquaint themselves with improved technologies and machineries adapted by their counterparts in those states.

8. **Prof. L. K. Hazarika** congratulated the scientists for publishing their works in high Impact factor journals. He insisted that more work needs to be done for the conservation of muga silkworm. He advised CMER&TI to share scientific data on the effect of agrochemicals used in tea gardens on muga silkworm with the DOS, Assam so that a strategy on scientific lines can be adopted to address this burning issue. It must be kept in mind that whatever the institute does it should be always for the benefit of farmers only.

The meeting was ended with vote of thanks by Dr. Manjunath R.N., Scientist-B, PMCE Division, CMER&TI, Lahdoigarh.



Prof. L.K. Hazarika
Acting Chairman-RAC

Annexure-I
LIST OF PARTICIPANTS OF THE 40th RESEARCH ADVISORY COMMITTEE MEETING
OF CMER&TI, LAHDOIGARH HELD ON 28th & 29th JUNE, 2022

#	Name & Designation
Members/Chairman	
1.	Prof. L.K. Hazarika, Retd. Professor & Head of Entomology, AAU & Academic Registrar, Assam Women University, Jorhat (Assam)
2.	Dr. Bidyut Kumar Sarmah, Director, DBT-AAU Centre & ICAR-National Professor Assam Agricultural University, Jorhat - 785 103 (Assam)
3.	Dr. B.K. Singh, Rtd. Director (CMER&TI, Lahdoigarh) Tarun Nagar, Bye lane-5, House No. 8, Dispur, Guwahati-781005 (Assam)
4.	Sh. Jiban Deka, Deputy Director of Sericulture, Govt.of Assam Representative of Commissioner, Handloom, Textiles & Sericulture, Govt, of Assam, Guwahati
5.	Sri Robin Bharali, Rearer, Representative Sericulture Farmer, Sivasagar-785640
6.	Dr. P. Borpuzari, Scientist-D & Head, MESSO, CSB, Guwahati - 781 002 (Assam)
7.	Dr.M.Moorthy, Director (Tech) Incharge, Central Silk Board, Bangalore
8.	Dr.Nazir Ahmed, Scientist-D, RCS, Central Silk Board, Bangalore
9.	Dr. K. M. Vijaya Kumari; Director, CMER&TI, Lahdoigarh
Scientists	
10.	Dr. Yumnam Debaraj, Scientist-D, RSRS, Imphal
11.	Dr. Reeta Luikham, Scientist-D, CMER&TI, Lahdoigarh
12.	Dr. D. Mech, Scientist-D, REC, Lakhimpur
13.	Shri S A S Rahman, Scientist-D, RSRS, Boko
14.	Dr. Laishram Somen Singh, Scientist-D, RSRS, Imphal
15.	Dr.T. James Keisa, Scientist-D, CMER&TI, Lahdoigarh
16.	Dr. Aftab A. Shabnam, Scientist-D, CMER&TI, Lahdoigarh
17.	Sh. Bitupan Das, Scientist-D, CMER&TI, Lahdoigarh
18.	Dr. Sinam Subharani Devi, Scientist-D, RSRS, Imphal
19.	Dr. H Barman, Scientist-C, RSRS, Boko
20.	Dr. Amit Kumar, Scientist-C, CMER&TI, Lahdoigarh
21.	Dr. Arun Kumar K.P., Scientist-C, CMER&TI, Lahdoigarh
22.	Dr. D.K. Jigyasu, Scientist-C, CMER&TI, Lahdoigarh
23.	Dr. K. Subadas Singh, Scientist-C, CMER&TI, Lahdoigarh
24.	Dr. Vijay N., Scientist-C, CMER&TI, Lahdoigarh
25.	Dr. Mahesh D.S., Scientist-C, CMER&TI, Lahdoigarh
26.	Dr. Manjunath R.N., Scientist-C(R&S), CMER&TI, Lahdoigarh
27.	Dr. Om Prakash Patidar, Scientist-B, CMER&TI, Lahdoigarh
Invitees	
28.	Smt. Kajori Rajkhowa, DoS, Assam
29.	Sh. B.N. Choudhury, Scientist-D & Head, PMC Cell, MESSO, Guwahati
Research Fellows	
30.	Ms.Priya Boro, PA
31.	Ms. Padmini Baruah, JRF
32.	Sh. Kalpajyoti Gogoi, JRF
33.	Sh. Dhurba Jyoti Gogoi, SRF
34.	Sh.Dibya Jyoti Hazarika, PA
35.	Sh. Jyoti Ranjan Mishra, JRF
36.	Sh. Suraj Kumar Shah, JRF
37.	Sh. Pranjal Borah, Trainer
38.	Ms. Priyanka Sahu, PA
39.	Ms. Wahengam Sapana Devi, PA
40.	Ms. Kongashree Duarah, JRF
41.	Ms. Lukumoni Borah, JRF
42.	Ms. Raisa Begum, PA
43.	Sh. Debojit Nath, PA

