

## **MINUTES OF THE 45<sup>th</sup> MEETING OF THE RESEARCH ADVISORY COMMITTEE (RAC), HELD ON JANUARY 18<sup>th</sup> & 19<sup>th</sup>, 2017 AT CSR&TI, BERHAMPORE, WEST BENGAL**

The 45<sup>th</sup> Meeting of the Research Advisory Committee (RAC) of the Central Sericultural Research & Training Institute (CSR&TI), Berhampore was held on January 18-19, 2017 at Berhampore to review the progress of the R&D interventions made by the scientists of the Institute/Regional Sericultural Research Stations (RSRSs) during the last six months. The meeting was chaired by Prof. Saroj Kumar Sanyal, Former Vice-Chancellor, Bidhan Chandra Krishi Viswavidyalaya, Nadia, West Bengal.

Dr. D. Pandit, Scientist-D, CSR&TI, Berhampore welcomed the Chairman, Members of RAC, Invitees and the participants for the meeting.

At the outset, Dr. Kanika Trivedy, Director, CSR&TI, Berhampore welcomed Prof. Saroj Kumar Sanyal, Chairman, and all the distinguished members of the RAC, Dr. S. R. Bhat, Research Coordination Committee (RCC) member, CSB, invitees and the officers from the Eastern and the North-Eastern states and scientists of the Institute, nested RSRSs and RECs, invitees from the collaborative institutes and participants, and requested for their valuable suggestions for the benefit of the sericulture stakeholders in the Eastern and the North-Eastern regions. Thereafter, the Director presented the highlights of the R&D interventions and achievements of this Institute.

Prof. Sanyal, Chairman, RAC in his opening remarks extended his new year greetings to Dr. Kanika Trivedy, Member-Convenor, distinguished members of the RAC, member of the RCC, invitees, participants, representatives of Director of Sericulture from different States and scientists of the Institute and thanked all of them for their participation. He stated that the institute is doing quite well with the limited manpower available at all levels. He appreciated convening the RAC meeting in quick succession for reviewing the R&D activities for the development of sericulture industry in the concerned regions.

The list of participants is appended in **Annexure – I**.

### **RELEASE OF BOOKS / BOOKLETS / BROCHURES / PAMPHLETS/ MAGAZINES**

The following were formally released for the benefit of stakeholders.

**Book:** Farmers' directory of Murshidabad district

**Pamphlet:** Congenic Bivoltine breeds B.Con.1 & B. Con. 4 & their hybrids: A new approach in hybrid breeding

**Magazine:** Resham Krishi Barta (October, 2016)

Thereafter, agenda-wise items were taken up for discussion.

### **ITEM NO.1: CONFIRMATION OF THE MINUTES OF 44<sup>th</sup> MEETING OF RESEARCH ADVISORY COMMITTEE (RAC) HELD ON 20<sup>th</sup> JULY, 2016 AT CSR&TI, BERHAMPORE, WEST BENGAL.**

As no comment was received from the Members of the RAC, the Minutes of the 44<sup>th</sup> Meeting of the RAC were confirmed.

### **ITEM NO.2: REVIEW OF THE FOLLOW-UP ACTION TAKEN ON THE RECOMMENDATIONS/ DECISIONS OF THE 44<sup>th</sup> MEETING OF RAC HELD ON 20<sup>th</sup> JULY, 2016.**

Altogether seventeen decisions / recommendations of the last RAC meeting were discussed and the action taken report was noted satisfactory.

Regarding **PPA-3588: Evaluation of low-cost drip fertigation systems on yield and quality of mulberry leaves**, the PI was advised to relook at the suggestions given in the previous RAC meeting, namely..

- Use of solar pump as source of power for low-cost drip fertigation.
- To find out the subsidy given on solar pumps for farmers by the Ministry of New and Renewable Energy (MNRE).
- Water solubility of the fertilizers have to be checked and instead of going for acid treatment. The PI was advised to use large-scale filtration to avoid clogging of fertigation pipes.
- Calculated economics should be taken into consideration.

Accordingly, the PI was advised to address the comments.

[Action: Dr. R. Mahesh, Scientist-B, Mori-I Division]

### ITEM NO. 3: DIRECTOR'S REPORTS ON THE R&D PROGRESS MADE DURING JULY TO DECEMBER, 2016

Dr. Kanika Trivedy, Director, while focussing on the R&D strategies for the development of sericulture in the days to come in the Eastern and the North-Eastern regions, presented the achievements made on mulberry and silkworm productivity improvement, crop protection, innovations and cost reduction, human resource development, extension and developmental activities including adoption of Adarsh Resham Gram.

### ITEM NO. 4a: CONSIDERATION OF NEW RESEARCH PROJECT PROPOSALS OF THE MAIN INSTITUTE & NESTED UNITS.

Four new research projects proposals were critically reviewed and decisions taken were as follows:

1. Title of the Project: **Evaluation and identification of suitable Bivoltine hybrids for Odisha** – by Dr. K. C. Brahma, Scientist-C, RSRS, Koraput.

**Duration:** 3 years

**Observation/ Suggestion:** The PI was advised to

- initially conduct experiment at the institute level for 2 years.
- keep the record of weather parameters such as maximum, minimum and mean temperature, maximum and minimum RH, total rainfall, etc., during the rearing seasons.
- monitor the quality of feed since it will have a profound influence on the results.
- statistically analyze the results.
- revise the budget accordingly.
- exploit the outcome (after completion) at the farmers level by proposing the same as a 2<sup>nd</sup> phase of the project.

**Decision of RAC: Approved for 2 years.** The PI was advised to modify the project following the above noted guidelines/suggestions and submit the modified project to this office for onward transmission to the Central office, Bangalore for necessary approval and obtaining the Code No.

[Action: Dr. K. C. Brahma, Scientist-C, RSRS Koraput]

2. Title of the Project: **Studies on irrigation scheduling through drum-kit drip technology on yield and water economy in mulberry by use of poly-acrylic acid-based water insoluble polymers - Hydrogels** – by Mr. S.K. Misro, Scientist-C, RSRS, Koraput.

**Duration:** 3 years

**Observation/ Suggestion:** The PI was suggested that

- Treatments should have clear-cut demarcation like drum-kit with hydrogel and drum-kit without hydrogel, so that the hydrogel effect may be assessed.
- Suitable statistical design should be used for conducting experiment.
- Irrigation schedule should be taken care with respect to water potential.
- Kinetics of hydrogel decay/ degradation over a period of time may be assessed.
- Kinetics of hydrogel loss due to rainfall may be assessed.
- Dr. Anup Kumar Barooah, Director, Tocklai Tea Research Association, Jorhat should be contacted for refining the project.
- Modify the title and the budget accordingly.

**Decision of RAC: Approved for 3 years.** The PI was advised to modify the project following the above noted guidelines/suggestions and submit the modified project to this office for onward transmission to the Central office, Bangalore for necessary approval and obtaining the Code No.

**[Action: Mr. S.K. Misro, Scientist-C, RSRS Koraput]**

3. Title of the Project: **Popularization of high-bush mulberry plantation techniques in Majuli, River Island of the Brahmaputra, Assam** – by Smt. M. Pamehgam, Scientist-C, RSRS, Jorhat.

**Duration:** 3 years

**Observation/ Suggestion:** The PI was suggested to

- Add another objective related to assessing the socio-economic benefit of the project since it is TOT-based.
- Take necessary care in selection of farmers who are willing to take up the technology or different sets of farmers with different background may be considered in the study.
- Rethink with respect to the package of technology.
- Correctly specify the budget that is required (3.5 lakh).

**Decision of RAC: Approved for 3 years.** The PI was advised to modify the project following the above noted guidelines/suggestions and submit the modified project to this office for onward transmission to the Central office, Bangalore for necessary approval and obtaining the Code No.

**[Action: Smt. M. Pamehgam, Scientist-C, RSRS Jorhat]**

#### **ITEM NO. 4b: CONSIDERATION OF NEED-BASED PROJECTS/ PROGRAMMES PROPOSALS OF DOS (T) LEVEL**

1. Title of the Project: **Development of mulberry sericulture in Ranchi zone of Jharkhand state** – by Ms. Mohisina Khatoon, Manager, Jharkhand Silk Development Institute Hehal Ranchi.

**Duration:** 4 years

**Observation/ Suggestion:** The PI was suggested that

- Advance technologies of the sericulture pertaining to the region should be considered.
- Before initiation of the project, the Director should visit the proposed areas and assess the potentiality of the same.

**Decision of RAC: Approved for 4 years.** The PI was advised to modify the project following the above noted guidelines/suggestions and submit the modified project to this office for necessary action.

**[Action: Ms. Mohisina Khatoon, Manager, Jharkhand Silk Development Institute, Hehal, Ranchi]**

#### **ITEM NO. 5: REVIEW OF CONCLUDED PROJECTS / PROGRAMMES**

During the period, as per the time schedule, six projects were concluded.

1. **PIB-3479: Development of high yielding mulberry varieties using physiological growth parameters as markers for selection** – Mr. Suresh K, Sci-B (from 01-06-2016), Dr. Jalaja S Kumar (up to 31-05-2016), Sci-D, MBG Section.

It was observed that the project has been concluded as per the milestones and approved for the next phase. The PI was suggested to consider physiological parameters during the next phase of the project.

**[Action: Mr. Suresh K, Scientist-B, MBG Section]**

**2. AICEM-III: All India Co-ordinated Experimental Trial on Mulberry (Phase-III) – Dr. R. Banerjee, Scientist-D, MBG Section.**

It was observed that the project has been concluded as per the milestones. In general, the mulberry breeders should give due importance to package of practice while releasing/developing new mulberry variety under specific condition. Also the PI was advised to submit the concluded report in the prescribed format for onward transmission to the Central Office (CO), Bangalore on or before **March 30, 2017**.

**[Action: Dr. R. Banerjee, Scientist-D, MBG Section]**

**3. AIB-3501: Development of multivoltine breeds with high shell ratio and neatness. - Dr. A. K. Verma, Scientist-D, SBG Section.**

It was observed that the project has been concluded as per the milestones and approved for the next phase. The PI was advised to submit the concluded report in prescribed format on or before **March 30, 2017**. The RAC suggested that on-farm trails of the newly developed hybrids (Multi x Bi) may be taken up in the next phase of the project which must also be submitted to the Central Office (CO), Bangalore for necessary approval.

**[Action: Dr. A. K. Verma, Scientist-D, SBG Section]**

**4. AIB 3480: Development of silkworm *Bombyx mori* L. breeds from a gene pool with higher genetic plasticity. - Dr. A. K. Verma, Scientist-D, SBG Section.**

The PI was advised to conclude the project and Phase-II of the project for a period of three years with the objective of development of congenic lines, to be initiated after obtaining the necessary approval from the Central Office (CO), Bangalore. The PI was advised to submit the concluded report in prescribed format on or before **March 30, 2017**.

**[Action: Dr. A. K. Verma, Scientist-D, SBG Section]**

**5. AIB 3466: Development of region specific bivoltine breeds suitable for highly fluctuating and seasonally variable climatic conditions of Eastern and North-Eastern India - Dr. V. Lakshmanan, Scientist-D, SBG Section.**

The PI was advised to conclude the project and Phase-II of the project with the objective of preparing the hybrids from the newly developed shuttle breeds, while the evaluation of the same at different test centres must be initiated after obtaining the necessary approval from the Central Office (CO), Bangalore. The PI was advised to submit the concluded report in prescribed format on or before **March 30, 2017**.

**[Action: Dr. V. Lakshmanan, Scientist-D, SBG Section]**

**6. ARP 3516: Studies on synbiotics (combination of probiotic and prebiotic) induction for control of common diseases of silkworm *Bombyx mori* L. - Mr. K. Rahul, Scientist-B, SWP Section.**

It was observed that the project has been concluded as per the milestones. No significant and effective results were observed in respect of controlling of diseases in silkworm *Bombyx mori* L. by the application of synbiotics.

**[Action: Mr. Rahul. K, Scientist-B, SW Pathology Section]**

## ITEM NO. 6: REVIEW ON THE PROGRESS OF ON-GONG PROJECTS OF MAIN INSTITUTE AND RSRs

A total of 32 on-going CSB-Coded projects were reviewed and progress was as per the milestones.

### MULBERRY BREEDING & GENETICS SECTION

Progresses of four (4) on-going research projects were evaluated and the RAC made the following suggestions.

Regarding the project, **PIB 3481**: Evaluation of mulberry varieties suitable for low-fertility soils, it was observed that the title of the project is not matching with the objectives proposed and the progress of the work. Therefore, it was suggested to alter the title as “**Evaluation of mulberry varieties suitable for low-input soil**”.

[Action: Shri. D. Chakravarty, Scientist-D, MBG Section]

Regarding the project, **PIB 3515**: Evaluation of newly developed triploid mulberry varieties under irrigated condition, the PI was advised to consider the dry-weight parameter while assessing the triploid mulberry varieties as it has high water content.

[Action: Dr. P.K. Ghosh, Scientist-D, MBG Section]

Regarding the project, **PIC 3554**: As regards the candidate gene-based molecular marker(s) for screening promising recombinants in mulberry, it was suggested to assess the molybdenum status of the soil as it is a co-factor (prosthetic group) for nitrate reductase enzyme and correlate it with the corresponding enzyme activity, if possible. The PI was suggested to consider more number of markers and better recombinants with exact phenotyping in the study.

[Action: Dr. Rita Banerjee, Scientist-D, MBG Section]

Regarding the project, **PIB 3505**: Development of drought-tolerant mulberry variety for rainfed sericulture, the progress was found as per the milestone.

### MORICULTURE-I DIVISION

Progress of seven (7) on-going research projects, (1) **PPA-3499**: Evaluation of field-level performance of Vishala mulberry variety at different locations under irrigated conditions in West Bengal, (2) **PPF-3532**: Assessment, development and management of area under mulberry in major Sericultural districts of West Bengal using geo-spatial technique, (3) **PPF 3585**: Application of Growing Degree Days as a model driver for developing mulberry yield weather model, (4) **PPA 3588**: Evaluation of Low-Cost Drip Fertigation Systems on Yield and Quality of Mulberry Leaves, (5) **PIN 3587**: Improvement of leaf quality and productivity through external application of seaweed extracts in mulberry, (6) **PPS 3598**: Arsenic contamination in mulberry sericulture of Bengal Plain and its alleviation through application of zinc in soil, and (7) **PPS 3600**: Soil health card preparation for mulberry growing soils in the Eastern and North-Eastern India were reviewed and the progress was found satisfactory.

On the Collaborative project **PPF-3532**, it was suggested that the data collected regarding farmers profile should be coded properly, while the confidentiality has to be maintained as it contains personal information which can be misused.

[Action: Dr. Monica Chaudhuri, Scientist-D, Mori-I Division]

### MULBERRY PATHOLOGY SECTION

Progress of two (2) on-going research projects was evaluated and the RAC made the following suggestions.

Regarding the project, **CSS-2107**: Forewarning of mulberry diseases of the Eastern and the North-Eastern India, the progress was found satisfactory.

Regarding the project, **PPS 3504**: Study on root rot disease of mulberry in the Gangetic plains of West Bengal and development of its control measure, the PI was advised to consider the control measures already available to tackle the pathogen that was isolated.

[Action: Dr. S. K. Dutta, Scientist-D, Mulberry Pathology Section]

## SILKWORM BREEDING AND GENETICS SECTION

Progress of four on-going research projects (1) **AIB 3547**: Development of high temperature and high humidity tolerant bivoltine breeds of silkworm (*Bombyx mori* L.), (2) **AIB 3514**: Development of multivoltine based Congenic / NIL breed of silkworm (*Bombyx mori*, L) through introgression of *Id* gene and its uses, (3) **AIB 3545**– Authorization Trial of silkworm hybrids in the Eastern and the North-Eastern states, and (4) **AIB-3602**: Development of thermo-tolerant Bivoltine Breeds / Hybrids of Silkworm, *Bombyx mori* L through Marker-Assisted Selection was reviewed and the progress was found satisfactory.

Regarding the project **AIB 3547**, the PI was suggested to conduct the experiment by considering parameters such as maximum, minimum and mean temperatures.

[Action: Mr. N. ChadraKanth, Scientist-B, SBG section]

Regarding the project **AIB 3514**, the PI was suggested to do rearing in large-scale across the seasons.

[Action: Dr. A. K. Verma, Scientist-D, SBG section]

## SILKWORM PHYSIOLOGY & RTI SECTION

Progress of on-going research project **AIT3557**: To conduct multi-locational field trial on Transgenic Bm NPV-resistant Silkworm strains to establish their efficacy and generate data for their regulatory approval was reviewed and found satisfactory.

[Action: Dr. Jayeta Sarkar, Scientist-D, Sw. Physiology & RTI Section]

## BIOTECHNOLOGY SECTION

Three on-going research projects (1) **PIB 3521**: Assessment of promising powdery mildew resistance lines for perspective commercial use, (2) **PIB3548**: Evaluation of bacterial leaf spot resistant improved progenies of mulberry for field utilization, and (3) **PRE 3589**: Assessment of designed antimicrobial peptides for mulberry protection against brown leaf spot and root rot: a biotechnological approach were reviewed and the following suggestions were made regarding the projects PIB3521 and PIB3548:

- Determine the segregation pattern of chosen /identified marker(s), and
- Co-segregation of marker with the trait should be ascertained

[Action: Dr. S. Chattopadhyay, Scientist-D, Biotechnology Section]

## ENTOMOLOGY SECTION

Progress of two (2) on-going projects, (1) **PPE 3517**: Population interactions of pests and natural enemies in mulberry eco-system, and (2) **PRE 3533**: Identification of whitefly resistance in Mulberry germplasm accessions was reviewed and the following suggestions were made.

Regarding the project **PPE 3517**: Population interactions of pests and natural enemies in mulberry eco-system, the progress was found to be satisfactory.

Regarding the project **PRE 3533**, it was observed that the title and objectives are not in harmony. Therefore, it was suggested to change the title as “**Incidence of whitefly in Mulberry germplasm accessions**” and modify the objectives accordingly. Regarding the study on mulberry varieties resistant to

whitefly, their evaluation by using the biochemical and physiological parameters may be taken-up in the next phase of the project with the help of scientists of MBG & Biotechnology sections.

**[Action: Dr. S. Chanda, Scientist-D, Entomology Section]**

### **SILKWORM PATHOLOGY SECTION**

Progress of two on-going projects, **ARP 3522**: Isolation, Cloning and Characterization of Antibacterial Protein (s) from silkworm, *Bombyx mori* L., and **ARP 3590**: Studies on the efficacy of phototrophic bacterial extracts as feed supplement for management of diseases in silkworm, *Bombyx mori* L., was reviewed and the following suggestions were made.

Regarding the project **ARP 3522**, the PI was suggested to collect flacherie infected larvae from the fields and isolate the bacteria responsible. Further the PI was also advised to infect the healthy larvae with the isolated bacterial strains and check whether antibacterial proteins were elicited or not. And regarding the project **ARP 3590**, the progress was found to be satisfactory.

**[Action: Mr. Z. Hossain, Scientist- D and Mr. Rahul, K., Sci.-B, Silkworm Pathology Section]**

### **PROJECT MONITORING, CO-ORDINATION & EVALUATION DIVISION**

Progress of the project, **MTS 3599**: Study on mulberry sericulture production in West Bengal: A statistical approach was reviewed, and the progress was found satisfactory.

### **EXTENSION & PUBLICITY DIVISION**

Progress of the project, **MOT 3601**: Skill-Gap Analysis and Capacity Building of Sericulture Extension Workers and Farmers in Traditional and Non-Traditional States, was reviewed and the progress was found satisfactory.

### **REGIONAL SERICULTURAL RESEARCH STATIONS (RSRSs)**

**RSRS, KORAPUT**: Progress of three on-going research projects (1) **PPA 3560**: Studies on High-Bush and Tree type mulberry plantation under rainfed condition of Odisha, (2) **PIB 3576**: Evaluation of New Mulberry Genotypes for Improvement in Productivity and Quality, and (3) **MOE 3604**: Yield-gap analysis in mulberry leaf and cocoon production-A study in the Eastern Ghat Highland zones of Odisha was reviewed and the suggestions made by the RAC were as follows:

Regarding the project **PPA 3560**, the PI was advised to retain either high-bush or tree in the title of the project.

**[Action: Shri. S. K. Misro, Scientist- C, RSRS, Koraput]**

Regarding the project **PIB 3576**, the PI was advised to work out the correlation between EC and cold temperature tolerance in Mulberry.

Regarding the project **MOE 3604**, the progress was found to be satisfactory.

**[Action: Dr. K.C. Brahma, Scientist- C, RSRS, Koraput and Mr. K. Suresh, Sci.-B, CSR&TI, Berhampore]**

**RSRS, JORHAT**: Regarding the project **APS3539**: Characterization of mulberry growing soils for nutrient management in selected Seri-villages of Golaghat district of Assam, the progress was reviewed and after threadbare discussion, the PI was advised to

- Justify how only one fertilizer dose recommended is valid for total Golaghat district as the soil fertility varies from place to place.
- Initial status of soil fertility of the samples collected from Golaghat and the fertilizer recommendations suggested to the farmers must be presented.
- Recheck the data of available Zinc in the soil samples.
- As the soil fertility varied at different places, the PI was advised to revalidate the common dose of fertilizer application that was suggested for the entire Golaghat district.

After a thread bare discussion on soil-health card project, the chairman suggested that

- The ready reckoner designed by Bose and Kar (2010) requires a relook.
- A special meeting may be conducted with experts of soil science before initiating the soil-health card project to delineate the ways for successful implementation of the project (PPS 3600).
- Dr. Pradip Kumar Dey, ICAR-Indian Institute of Soil Science, Bhopal may also be contacted for his expert advice on the implementation of the soil-health card project.

[Action: Dr. S. N. Gogoi, Scientist-D, RSRs, Jorhat]

**RSRS, Kalimpong:** Regarding the collaborative project (with all the RSRs) **PPS 3559:** Testing of Carbon Capturing Potential in Mulberry in different locations was reviewed and the investigators were advised to go in for multiple regression analysis (step-wise) to know the functional relationship of carbon capturing potential with weather factors in the different locations.

[Action: In-charges of all RSRs and REC, Bhandra]

#### **ITEM NO. 6a: REVIEW ON THE PROGRESS OF ON-GONG PROGRAMMES/ PS OF MAIN INSTITUTE AND RSRs**

Progress of six (6) institute-coded on-going programmes [BPI (P) 025, BAI (RP) 003, BAR(RP)021, BAR(RP)022, B- KPG (RP) 017 & B-JRH(P) 040] and one pilot study [BPI (PS) 010] were found satisfactory.

#### **EXTENSION & PUBLICITY DIVISION**

Progress of extension activities (at the Main Institute/RSRs/RECs) and programmes was reviewed and the following suggestions were made:

- Benefit: cost ratio should be assessed while working out the economics of farm enterprise.
- Intercropping benefits need to be also considered.
- Validate the farmers' innovations by taking the help of the National Innovation Foundation (NIF) and/or DST.
- Objectives of each extension programme should be mentioned.
- Impact assessment has to be ascertained after sending the messages from m-portal. The Chairman advised to conduct the impact analysis by requesting feedback messages in local language.
- Check the possibility of setting up a farmers' producer organization (FPO) with the help of NABARD.

[Action: Dr. T. Dutta, Scientist-D, Extension & Publicity Division]

The progress of **Bivoltine Cluster Promotion Programme** at 15 clusters in the Eastern and the North-Eastern zones covering eight states (7 clusters in the Eastern zone and 8 clusters in the North-Eastern zone) was reviewed and the progress was found satisfactory.



## TRAINING DIVISION

Progress of different training programmes - (1) Post-Graduate Diploma in Sericulture (15 months) training in two batches of 37 students - is in progress. (2) Technology Orientation Programme (TOP): 07 persons were sensitized. (3) Farmers' Skill Training (FST): 249 stakeholders were taught and four other need-based Training Programme: 424 persons were trained. The RAC reviewed the progress and advised to go in for impact analysis.

[Action: Smt. C. Maji, Scientist-D, Training Division]

### Comments of the RAC Chairperson, the Members and other distinguished participants:

**Dr. M. V. Samson**, Member, RAC, congratulated the Director for her dynamic leadership and guidance to the scientists in R&D interventions. He also appreciated the care taken by the Director in maintaining cleanliness around the campus. He advised the newly joined scientists to visit the fields regularly and notice the problems of the stakeholders and formulate projects to tackle them. He further advised the extension functionaries to take special care in respect of disinfection procedures at the farmers' level. He also advised that the farmers must be educated about the technological advancements in the reeling sector and technologies to be adopted for rearing in different seasons. He suggested that reeling machines should be popularised as the farmers are still practising the traditional ways of reeling. He also suggested that reeling clusters can be formed in different districts for the benefit of the farmers.

**Dr. S. Senthil Vinayagam**, Member, RAC, appreciated the research progress of the institute and congratulated the Director for the same. He also appreciated the Chairman and the other members for their valuable suggestions. He stressed upon the industry-based extension activities and also advised to follow a strategic plan to double the farmers' income in a year. He further advised to go in for an evaluation to study the impact of the technologies disseminated. He also advised to check the possibility of setting up a farmer's producer organisation (FPO) with the help of NABARD.

**Prof. Kanchan Baral**, Member, RAC, thanked the present and the former Directors and appreciated the efforts of the scientists of the Institute. He urged to put stress on organic farming practices, marketing strategies, while cautioning about the pests and the predators.

**Prof. Sunirmal Maity**, Member, RAC, appreciated the efforts of the scientists. He suggested that more projects on Agronomical practices have to be taken up and also advised to encourage the intercropping system.

**Prof. S.R. Bhat**, Member, RCC, CSB appreciated the Director for her vibrant leadership and also remarked that he was delighted at the maintenance of cleanliness in and around the campus, especially the experimental plots and the garden. He suggested that scientists should frequently visit the farmers' field to collect grass-root level information about the field-level problems and formulate need-based projects. He advised the scientists to take up more projects on mechanization. He advised the scientists of the institute to participate in more research-oriented training and communication programmes in allied disciplines in order to get acquainted with the research advancements which can be replicated in Sericulture.

**Dr. S.K. Ray**, Invitee, RAC appreciated the Director for the research progress and thanked her for the kind hospitality.

**Shri Rajesh Baghel**, JD, Rep. DOS, Chhattisgarh mentioned that Mulberry sericulture is in a primitive stage in the state of Chhattisgarh and requested cooperation from CSR&TI, Berhampore for the development of the same.

**Shri R. K. Gupta**, AD, DOS, Chhattisgarh appreciated the efforts of the silkworm breeding scientists and requested the scientists to develop region- and season-specific breeds.

**Shri A. Mandol**, JD, Rep. DOS, West Bengal stressed the point to develop the Nistari (multivoltine breed) as mother component for West Bengal state till the popularization of other multivoltine breeds becomes a reality.

**Shri Sourav Majumder**, Rep. CSTRI, Bangalore advised the extension functionaries to take special care in educating the farmers about the technological advancements in the reeling sector as most of the farmers in the region are still practising traditional ways of reeling which is hampering their profits. He also advised the representatives of the DoS, West Bengal to give incentives for the farmers rearing Bivoltine and to make marketing system more transparent.

**Shri Anil Kumar**, PPO, HQ Representative, DoS. Jharkhand, thanked the Director for permitting them to present a project which focuses on development of Mulberry Sericulture in their state.

**Dr. A. K. Saha, Representative ZSSO**, Malda congratulated the Director for the research progress achieved by the scientists of the institute. He urged the Scientists to take up projects on popularisation of the newly developed hybrids at the farmers' level. He appreciated the Chairman and other members of the RAC for their constructive suggestions and critical comments which will be very helpful for fine-tuning of the proposed research projects.

**Shri. B.K.Mishra, ADS, Representative DoT, Odisha** remarked that he that he is very happy to know that the two projects which are involved in development of Sericulture in the state of Odisha has been approved by the 45<sup>th</sup> RAC.

**Md. Sufian Ali**, Farmers' representative, Member, RAC, shared his experience in rearing of ICB and Bivoltine hybrids and expressed happiness for the present price of cocoons in Malda and other districts of West Bengal.


**Shri Prafulla Kumar Mandal**, Reelers' representative, Member, RAC, expressed his satisfaction at the improvement in price of mulberry cocoons and yarn but due to upsurge in input cost, the *net* income has come down as compared to earlier years, he noted.

**Dr. Kanika Trivedy**, Director, CSR&TI, Berhampore, Member-Convenor, RAC, expressed her happiness and gratitude for active participation of the RAC members, invitees from the collaborating units, Directors' representatives of DoSs and scientists from different units of the Central Silk Board. She stated that the interactions were meaningful and effective, particularly the guiding role played by the Chairman, RAC. She expressed her gratitude to Prof. S.R. Bhat for his presence and valuable suggestions. She thanked all the RAC members, experts for their critical comments. She also thanked the DoSs for coordination received for development of sericulture in the Eastern and the North-Eastern regions.

**Prof. Saroj Kumar Sanyal, Chairman, RAC**, expressed his sincere thanks to the RAC members, the Director of the Institute, Former Director of the Institute, Directors, collaborators, farmers' representative, CSB representatives, scientists of the Institute and the Invitees for their participation and active interaction in the meeting. He specially thanked Prof. S. R. Bhat, Member, RCC for his presence and making valuable suggestions. He expressed his satisfaction at the precise and well-focussed quality presentations made by the scientists. He expressed his concern over the decline in manpower. He expressed his disappointment as no representative of CSB could attend the present meeting of the RAC, and also expressed his concern at the apparent neglect in recruiting scientists of certain disciplines, especially Soil Science and Chemistry, which plays a vital role in the development of Sericulture. He stressed that all the scientists should take care of natural resource management for sustainable development of Sericulture. The Chairman also suggested exploring the possibility of the implementation of soil-health card project in collaboration with the soil science

subject-matter experts from NBSS & LUP, Regional Centre, Jorhat. Prof. Sanyal also advised the young scientists to improve the quality of work and interact more with the subject-matter specialists of allied sectors by participating in various seminars, conferences and symposia to gain knowledge about the research advancements. He also appealed to the RAC members from the DoSs of different states to play a more proactive vital role in ensuring effective transfer of technology (ToT) as they appear to be the main players in the extension activities. The Extension units at the RSRs/RECs should also ensure the involvement of the state departments in the execution of the extension activities. Finally, he appreciated the excellent rapport of the Institute with the State Governments for improvement of the livelihood security of the sericulture farmers and the sericulture industry, at large, in the region.

The meeting concluded with vote of thanks.

  
(Dr. Kanika Trivedy)  
Director & Member Convenor,



**(Prof. Saroj Kumar Sanyal)**  
Chairman, RAC,  
CSR&TI, Berhampore

**Dated: \_March 18, 2017**

## ANNEXURE -I

**LIST OF PARTICIPANTS IN THE 45<sup>TH</sup> MEETING OF RESEARCH ADVISORY COMMITTEE (RAC) HELD ON 18-19.01.2017 AT CSR & TI, BERHAMPORE, WEST BENGAL**

Sl. No.	Name	Designation
1.	Prof. Saroj Kumar Sanyal, Former Vice-Chancellor, BCKV, Mohanpur, Nadia, West Bengal	Chairman
2.	Dr. Kanika Trivedy, Director, CSR&TI, Berhampore	Member Convenor
3.	Prof. S. R. Bhat, NRC, New Delhi & Member, RCC, CSB, Bangalore	RCC Member [Invitee]
4.	Prof. Kanchan Baral, Department of Plant Protection, Palli Siksha Bhavana, Sriniketan, Birbhum	Member
5.	Dr. M. V. Samson, Former Director, Central Silk Board, Bangalore	Member
6.	Dr. Sunirmal Maity, Professor (Retired), BCKV, Mohanpur, Nadia, West Bengal	Member
7.	Dr. S. Senthil Vinayagam, Professor & Principal Scientist, ICAR-NAARM, Hyderabad	Member
8.	Dr. S. K. Ray, Principal Scientist & Head, Regional Centre, ICAR-NBSS&LUP, Jorhat, Assam	Invitee
9.	Shri. A. N. Mandol, JD, Dos, WB (Rep. Commissioner, DOS, WB)	Member
10.	Shri. Rajesh Baghel, JD & Dr. R. K. Gupta, AD, DOS, Chhattisgarh (Rep. Director, DOS, Chattisgarh)	Member
11.	Shri. Anil Kumar, PPO & Ms. Mohisina K, Manager, DoS, Jharkhand (Rep. Director, DoS, Jharkhand)	Member
12.	Shri. B. K. Mishra, ADS, DOT, Odisha (Rep. Director, DoT, BBSR, Odisha)	Member
13.	Shri S. Majumdar, Scientist-D, STCH, Malda (Rep. Director of CST&RI, Bangalore)	Member
14.	Dr. A. K. Saha, Scientist-D, SSPC, Malda (Rep. ZSSO, Malda)	Invitee
15.	Shri S. N. Acharya, Deputy Secretary (Tech.), R.O., CSB, Bhubaneswar, Orissa	Member
16.	Shri R. P. Mandal, Assistant Secretary (Tech.), R.O., CSB, Patna, Bihar	Member
17.	Shri R. Pramanik, Asst. (Tech.), RO, Kolkata (Rep. R.O., CSB, Kolkata)	Member
18.	Shri Sufian Ali, Farmers Representative, Malda, West Bengal	Member
19.	Shri Prafulla Kumar Mandal, Reeler's Representative, Malda, West Bengal	Member
20.	Dr. Ranjit Kar, Scientist-D, RSRS, Kalimpong, West Bengal	Member
21.	Dr. S. N. Gogoi, Scientist-D, RSRS, Jorhat, Assam	Member
22.	Dr. K. C. Brahma, Scientist-C, RSRS, Koraput, Odisha	Member
23.	Dr. G. S. Singh, Scientist-D, REC, Bhandra (Rep. closed unit RSRS, Ranchi)	Member

<b>Absentee:</b>		
1	Dr. R. K. Varshney, Director, Centre of Excellence in Genomics, Applied Genomics Laboratory, Patancheru, Andhra Pradesh	Member
2	Director (Tech.), Central Silk Board, Bangalore	Member
3	Director, NSSO, CSB, Bangalore	Member
4	Director, DoS, Gangtok, Sikkim	Member
5	Director of Handloom & Sericulture, Government of Bihar, Patna	Member
6	Director of Sericulture & Weaving, Government of Meghalaya, Shillong	Member
7	Director of Handloom, Handicrafts & Sericulture, Government of Tripura, Agartala, Tripura	Member
8	Director of Sericulture, Government of Mizoram, Chaltlang, Aizawl, Mizoram	Member
9.	Director of Sericulture, Government of Assam, Guwahati, Assam	Member
10	Director of Sericulture, Government of Manipur, Imphal	Member
11	Director of Textiles and Handicrafts, Government of Arunachal Pradesh, Itanagar	Member
12	Joint Secretary (Tech.), R.O., CSB, Guwahati	Member
13	Director of Sericulture, BTC, Kokrajhar, Assam	Member
14	Director of Sericulture, Government of Nagaland, Kohima	Member

**List of Scientists/ participants attended the Meeting**

<b>Sl.No.</b>	<b>Name</b>	<b>Designation</b>	<b>Address</b>
1.	Smt. Chanda Maji	Scientist-D, Training Division	CSR&TI, Berhampore
2.	Dr. Dipesh Pandit	Scientist-D, PMCE Division	CSR&TI, Berhampore
3.	Dr.Sandip Kr. Datta	Scientist-D, Moriculture Division-II	CSR&TI, Berhampore
4.	Dr. V. Lakshmanan	Scientist-D, Sericulture Division	CSR&TI, Berhampore
5.	Dr. T. Dutta (Biswas)	Scientist- D, Extension & Publicity Division (Deputation)	CSR&TI, Berhampore
6.	Dr. Monica Chaudhuri	Scientist-D, Moriculture Division-I	CSR&TI, Berhampore
7.	Dr. A. K. Verma	Scientist-D, Silkworm Breeding & Genetics Section	CSR&TI, Berhampore
8.	Dr. Jayeeta Sarkar	Scientist-D, RTI & Silkworm Physiology Section	CSR&TI, Berhampore
9.	Dr. S. Chattopadhyay	Scientist-D, Biotechnology Section	CSR&TI, Berhampore
10.	Shri. N. B.Kar	Scientist-D, Reeling & Spinning	CSR&TI, Berhampore
11.	Dr. Subhra Chanda	Scientist-D, Entomology Section	CSR&TI, Berhampore
12.	Dr. Rita Banerjee	Scientist-D, Mulberry Breeding & Genetics Section	CSR&TI, Berhampore
13.	Dr. P. K. Ghosh	Scientist-D, Mulberry Breeding & Genetics Section	CSR&TI, Berhampore
14.	Shri D.Chakravarti	Scientist-D, Mulberry Breeding & GeneticsSection	CSR&TI, Berhampore
15.	Shri Zakir Hossain	Scientist-D, Silkworm Pathology Section	CSR&TI, Berhampore
16.	Shri. Debojit Das	Scientist- D, Extension & Publicity Division	CSR&TI, Berhampore
17.	Dr. U. C. Baruah	Scientist-D, RSRS	RSRS, Jorhat
18.	Dr.G. B.Singh	Scientist-D, REC	Agartala, Tripura
19.	Shri S.T.Lepcha	Scientist-D, REC	Rangpo, Sikkim
20.	Shri. B.N. Choudhury	Scientist-D, REC	Aizwal
21.	Shri Gopal Ch. Das	Scientist-C, BV- Cell Section	CSR&TI, Berhampore
22.	Dr. Sukhabrata Sarkar	Scientist-C, Training Division	CSR&TI, Berhampore
23.	Smt. Mina Pamegam	Scientist-C, RSRS	Jorhat, Assam
24.	Shri S.K.Misro	Scientist-C, RSRS	Koraput, Odisha
25.	Shri Satyabrata Dey	Scientist-C, REC	Dhenkikote, Odisha
26.	Dr. D.P. Das Mahapatra	Scientist-C, REC	Dhenkikote, Odisha
27.	Shri. B. K. Basumatary	Scientist, REC	Mongaldai, Assam
28.	Dr. L. Pachuau	Scientist, REC	Aizwal, Mizoram
29.	Dr. Z. R. Collin	Scientist, REC	Shillong, Meghalay
30.	Dr. V. Vijay	Scientist- B, Soil Science & Chemistry Section	CSR&TI, Berhampore
31.	Dr. Manjunatha, G. R	Scientist- B, PMCE Division	CSR&TI, Berhampore
32.	Dr. R. Mahesh	Scientist- B, Mori-I	CSR&TI, Berhampore
33.	Shri Anil Pappachand	Scientist- B, Mulberry Pathology Section	CSR&TI, Berhampore
34.	Shri N. Chadrakanth	Scientist-B, Silkworm Breeding & Genetics Section	CSR&TI, Berhampore
35.	Shri Suresh K.	Scientist-B, Silkworm Breeding & Genetics Section	CSR&TI, Berhampore
36.	Shri K. Rahul	Scientist-B, Silkworm Pathology Section	CSR&TI, Berhampore
37.	Ms. Pooja Makwana	Scientist- B, Biotechnology Section	CSR&TI, Berhampore
38.	Md. Safi Afroz	Scientist B, Extension & Publicity Division	CSR&TI, Berhampore
39.	Shri.Subrata Sarkar	Technical Assistant, PMCE Division	CSR&TI, Berhampore
40.	Shri T.K. Maitra	Technical Assistant, Computer Cell	CSR&TI, Berhampore
41.	Shri Gaurab Ray	JRF, Silkworm Pathology Section	CSR&TI, Berhampore,
42.	Shri S. Manna	JRF, Soil Science & Chemistry Section	CSR&TI, Berhampore
43.	Ms. Kanika Karan	JRF, Soil Science & Chemistry Section	CSR&TI, Berhampore