Minutes of the 42nd Meeting of Research Advisory Committee (RAC) held on 09-10.07.2015 at CSR & TI, Berhampore, West Bengal

The 42nd meeting of the Research Advisory Committee (RAC) of the Central Sericultural Research & Training Institute (CSR & TI), Berhampore was held on 9th and 10th July, 2015 at the Institute to review the progress of R & D interventions made by the scientists of the Institute and its nested Regional Sericultural Research Stations (RSRSs) in the on-going and concluded research projects/ programmes during the last six months, besides consideration of the new research project/ programme proposals of the main Institute and RSRSs. The meeting was chaired by Prof. Saroj Kumar Sanyal, former Vice-Chancellor, Bidhan Chandra Krishi Viswavidyalaya, Nadia, West Bengal and the Chairman, RAC of this Institute.

Dr. S. Roy Choudhuri, Scientist-D welcomed the Chairman, members of RAC and the participants in the meeting. At the outset, Dr. S. Nirmal Kumar, Director, CSR&TI, Berhampore and Member-Convenor, RAC welcomed Prof. Saroj Kumar Sanyal, Chairman and all distinguished members of the RAC, invitees, Chairman of Regional Research Advisory Committee (RRAC), RSRS, Kalimpong, Ranchi, Koraput and Jorhat, Sericulture Officers from Eastern & North-Eastern states, invitees and scientists of the Institute, nested RSRSs and Research Extension Centres (RECs). He thanked all the members of the RAC, especially the Director of Sericulture from North-Eastern states for their participation for the first time in the meeting. He also thanked the Chairmen, RRAC, RSRSs of this Institute, who have honoured the invitation and participated in the meeting. Dr. Roy Choudhuri requested all the members and the participants for valuable suggestions to the scientists and also for the benefit of the sericulture stakeholders. Thereafter, he presented the highlights of the R & D interventions and achievements made by the scientists of the Institute and nested units.

Prof. Saroj Kumar Sanyal, Chairman, RAC in his opening remarks expressed thanks to Dr. S. Nirmal Kumar, Member-Convenor, RAC, distinguished members and participants, Chairmen of RRACs,, State representatives, farmers participants and scientists of this Institute for their presence. He appreciated the convening of the meeting of the RAC in quick succession for taking stock of the situation and also appreciated the works undertaken by the scientists for their great efforts in scientific work. He appreciated the Director for inviting the collaborators.

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

RELEASE OF BOOK/ BOOKLET /BROCHURE / PAMPHLETS

The following fifteen book/booklet/Brochure/Pamphlets were released for the benefit of stakeholders.

Book:

1. Annual Research and Administrative Report 2014-15, CSR&TI, Berhampore.
2. Pedigree and salient features of multi, bi & non-diapausing *Id* gene carrier silkworm strains *Bombyx mori* L.
3. SK6 x SK7 A Revolutionary Bivoltine Foundation cross in the Eastern & North Eastern States
4. Seri-farmers Directory of North-Eastern States of India.
5. Socio –Economic status of Sericultural farmers - A study in Maheshpur Raj, Pakur, Jharkhand.

Booklet

1. SERICILLIN - A disinfectant for silkworm body and bed.
2. Users' Manual: E^{3}WM©SH/PM (Efficient Economic Eco-friendly Weed Mower-cum-Shoot harvest / Pruning Machine).
3. Training Manual: Training Manual on silkworm Diseases of pests.

Brochure

1. Forewarning calendars for the major pests of Mulberry in West Bengal.

Pamphlet

1. C-2038: A new Mulberry variety for Irrigated zone.
2. Tut gacher shikarer rog, poka O tar pratikar (Bengali).

3. Management of Uzi fly for sustainable cocoon production.
4. Chalukia Pat Palu Palan (Assamese).
5. Pat Palur kani umni aru black boxing (Assamese).
6. Mulberry diseases and their management.

In addition, the machine Efficient Economic Eco-friendly Weed Mower-cum-Shoot harvest / Pruning Machine **(E3WM©SH/PM**) developed by the scientist of the institute was released and handed over to the In-charges of RSRS, Kalimpong, Jorhat, Ranchi and Koraput for popularization.

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

ITEM NO.1: CONFIRMATION OF THE MINUTES OF 41ST MEETING OF RESEARCH ADVISORY COMMITTEE (RAC) HELD ON 22ND JANUARY, 2015 AT CSR&TI, BERHAMPORE

As no comment was received from any of the members, the minutes of the meeting were confirmed.

ITEM NO.2: REVIEW OF THE FOLLOW-UP ACTION TAKEN ON THE RECOMMENDATIONS/ DECISIONS OF THE 41ST MEETING OF RAC HELD 22ND JANUARY, 2015.

In the 42nd meeting, follow-up of altogether fifteen decisions / recommendations of the last RAC meeting were discussed and found that the actions were taken as per the recommendations / suggestions.

ITEM NO. 3: DIRECTOR'S REPORTS ON THE R&D PROGRESS MADE DURING JANUARY TO JUNE, 2015

Dr. S. Nirmal Kumar, Director presented an overview on the R & D interventions made by the scientists of the Institute and nested units during the period. Focussing on the R & D strategies for the development of sericulture in the days to come, he presented the achievements made on mulberry and silkworm crop improvement, productivity improvement, crop protection, innovations and cost reduction, human resource development, extension communication programmes, Institutes R & D publications and other various developmental activities undertaken, awards / appreciation received, notable achievements made, etc., during the last six months.

ITEM NO. 4: APPROVAL OF NEW RESEARCH PROJECTS / PROGRAMMES

Two new research projects and ten concept notes were presented and they were critically reviewed, while the decisions taken are as follows:

The Project proposals, namely "**Evaluation of bacterial leaf spot resistant improved progenies of mulberry for field utilisation"** presented by Dr. R. Banerjee, Scientist-D, Biotechnology Section and "**Development of weather based forecasting model for mulberry pests**" presented by Smt. N. Lalitha, Scientist-C, Entomology Section were approved. The concerned Principal Investigators of the projects were advised to submit the project documents to the Central Office, Bangalore for obtaining Code No.

[Action: Dr. R. Banerjee, Scientist-D, Biotechnology Section and Smt. N. Lalitha, Scientist-C, Entomology Section]

Out of the ten concept notes presented by the scientists of the Institute, the following concept notes were approved by the RAC. It was suggested that the concerned scientists may formulate the projects in these lines keeping in view the futuristic needs.

1. "Biotechnological approaches in bio-control of plant diseases" - by Dr. R. Banerjee, Scientist-D, Biotechnology Section.

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

2. "Candidate gene based Molecular marker(s) for screening, promising recombinants in mulberry Breeding" - by Dr. M. K. Ghosh, Scientist-D, Moriculture Division in collaboration with Bose Institute, Kolkata.

[Action: Dr. M. K. Ghosh, Scientist-D, Moriculture Division]

3. "Analysis of variant Nistari strains using molecular markers" - by Dr. Sreekumar, Scientist-D, Silkworm Physiology & RTI Section.

[Action: Dr. Sreekumar, Scientist-D, Silkworm Physiology & RTI Section]

4. "Physiological approaches for cocoon yield improvement in silkworm" – by Dr. A. K. Saha, Scientist-D, Sericulture Division.

[Action: Dr. A. K. Saha, Scientist-D, Sericulture Division]

5. "Role of trace elements in alleviating environmental stress in mulberry" – by Dr. R. Kar, Scientist- D, Soil Science. & Chemistry Section.

[Action: Dr. R. Kar, Scientist- D, Soil Science. & Chemistry Section]

6. "Crop water use efficiency on growth and yield – Role of aquaporin in determining transpiration and photosynthesis in water stressed mulberry genotypes" -- by Dr. P. K. Tewary, Scientist-D, Mulberry Physiology Section.

[Action: Dr. P. K. Tewary, Scientist-D, Mulberry Physiology Section]

Following four concepts notes were *not* approved by the RAC. However, the concerned scientists may rewrite the concept notes and present the same in the next meeting of RAC.

1. "Effect of alternative organic fertilizer on the nutritional value and yield in mulberry" - by Dr. S. Rajaram, Scientist-D, Agronomy Section.

[Action: Dr. S. Rajaram, Scientist-D, Agronomy Section]

2. "Protective foliar approaches against mulberry diseases" -- by Dr. S. K. Dutta, Scientist-D, Mulberry Pathology Section.

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

3. "Biochar- a carbon negative technology to combat climatic change and enhancement of soil resources"-- by Dr. Monica Chaudhuri, Scientist-D, Farm Management Section.

[Action: Dr. Monica Chaudhuri, Scientist-D, Farm Management Section]

4. "Sustainable intensification and improving crop management in reducing the yield gap" - by Dr. S. K. Mukhopadhyay, Scientist-D, Extension Division

[Action: Dr. S. K. Mukhopadhyay, Scientist-D, Extension Division]

ITEM NO. 5: REVIEW OF CONCLUDED PROJECTS / PROGRAMMES / PILOT STUDY

During the period, 3 projects, 7 programmes and 2 pilot studies from the Main Institute and 5 programmes and 1 pilot study of RSRSs, were concluded as per the time schedule.

1. **APS 3497**: Studies on the environmental effect on P1 rearing, its' grainage performance followed by commercial rearing of Silkworm B*ombyx mori* L., during unfavourable seasons of West Bengal.
2. **AIB 3531:** Authorization trial of silkworm hybrids in East and North Eastern India.
3. **PPS 3452:** Terrestrial carbon sequestration for sustained high productivity of quality mulberry.
4. **BPP (VP) 015:** Validation of E3 (Efficient Economic Eco-friendly) WM, SH / PM at nested units and farmers' field level.
5. **BPP (P) 020:** Evaluation of soil fertility for sustained production of quality mulberry leaf in Eastern India under long-term fertilization.

6. **BAR (RP) 005:** Survey and surveillance of silkworm diseases in traditional Sericultural districts of West Bengal.
7. **B-KPG (RP) 010:** Survey & Surveillance of Mulberry and Silkworm Diseases & Pests in Kalimpong Hill.
8. **B-KPG (RP) 008:** Maintenance of Bivoltine Silkworm Germplasm Breeds.
9. **B-KPT (RP) 013:** Survey & surveillance for mulberry & silkworm diseases and their control.
10. **B-KPT (RP) 014:** Silkworm disease monitoring of seed and commercial crop silkworm rearing of non-traditional districts of Odisha.
11. **B-RNC (RP) 004:** Survey and surveillance of disease and pest of mulberry and silkworm.
12. **BPP (PS) 008:** Evolving growing degree day based integrated sericulture crop calendar.
13. **BPR (PS) 003:** Identification of DNA markers associated with bacterial leaf spot resistance in mulberry (*Morus* spp).

The concerned PI of the projects, programmes and Pilot studies were advised to submit the concluded reports in the Research Management Information System (RMIS) format immediately for submission to Central Office, Bangalore and to validate / popularize the technology / recommendation for field use.

The decisions / suggestions taken on the following projects / programmes are:

14. **BAR (VP) 013:** Validation-cum-refinement of open rearing house.

The RAC suggested to list out the lacunae and the refinement of technology made and recommended. The PI was advised to submit the concluded report in RMIS format immediately for submission to the Central Office, Bangalore.

[Action: Dr. A. K. Saha, Scientist-D, Sericulture Division]

15. **BAR (VP) 009:** Ghar Sodhon'- a fumigant room disinfectant for silkworm disease management.

The RAC suggested the PI to tie up with the DoT (Seri)/ DoS for dissemination of the technology in a large scale to the farmers if the acceptability in the field is found high. It was advised to submit the concluded report in RMIS format immediately for submission to the Central Office, Bangalore.

[Action: Dr. S. Chakraborty, Scientist-C, Silkworm Pathology Section]

16. **BAI (RP) 006:** Silkworm Disease Monitoring of Seed and Commercial Crop rearing of West Bengal (SDMSCC) [A collaborative programme with ZSSO, Malda & DoT (Seri), W.B.]

The house suggested the PI to find out the hot spot zone and judge the area specifically for pebrine infestation in future. It was also suggested to include the experts of mulberry diseases in the Disease Monitoring Committee. It was advised to submit the concluded report in MIS format immediately for submission to Central Office, Bangalore.

[Action: Dr. S. Chakraborty, Scientist-C, Silkworm Pathology Section]

17. **BMO(P) 032:** Institute Village Linkage Programme Phase IV (ADARSHGRAM)

The house advised to list out the activity carried out as per objectives and indicate the benchmark value for yield, cluster wise constraint analysis to be made in the future study. It was also advised to submit the concluded report in MIS format immediately for submission to Central Office, Bangalore.

[Action: Shri D. Das, Scientist - C, Extension Division]

18. **B-KPG (PS) 007**: An integrated approach to study the effect of potassium humate on soil health, yield and quality of mulberry leaves to promote sustainable sericulture in the Sub-Himalayan region of the Eastern and the North-eastern India.

The RAC advised the PI not to advocate excessive use of humic substances in the soil, particularly in the hilly region of Kalimpong, already rich in naturally occurring soil humic substances. The Chairman, RAC especially expressed his dissatisfaction at the indifference of the presenter as to the details of the programme as well as his complete unpreparedness for making the said presentation before the RAC. However, the PI was advised to submit the concluded report in RMIS format immediately for submission to the Central Office, Bangalore.

[Action: Shri S. Chatterjee, Scientist - D, RSRS, Kalimpong]

ITEM NO. 6: REVIEW ON THE PROGRESS OF ONGONG PROJECTS / PROGRAMMES / PILOT STUDY OF MAIN INSTITUTE AND RSRSs

MULBERRY BREEDING & GENETICS SECTION:

Progress of five on-going research projects, namely (1) **PIB 3424:** Development of low temperature stress-tolerant mulberry genotypes for sub-tropical plains, (2) **PIB 3479:** Development of high yielding mulberry varieties using physiological growth parameters as markers for selection, (3) **PIB 3481**: Evaluation of mulberry varieties suitable for low input soils, (4) **PIB 3505:** Development of drought tolerant mulberry variety for rainfed sericulture, and (5) **PIB 3515:** Evaluation of the newly developed triploid mulberry variety under irrigated condition, along with two programmes, namely (1) **AICEM:** All India Coordinated Experimental Trial on Mulberry (Phase-III) – it was suggested to prepare the performance of the variety of North and South zones in a slide and other variety TR23 of Kalimpong and Dehradun in another slide to present for better understanding, and **(2) BPI(P) 025**: Maintenance of mulberry germplasms bank at CSR&TI, Berhampore (West Bengal) was reviewed and found as per the milestones and satisfactory.

[Action: Dr. M. K. Ghosh, Scientist-D, Moriculture Division]

AGRONOMY SECTION

One on-going research project, namely (1) **PPA 3499:** Evaluation of field-level performance of Vishala mulberry variety at different locations under irrigated conditions in West Bengal, and six research programme namely (1) **BPP(RP) 001:** Maintenance of *Azotobacter chroococcum*, mother culture and mass production of Nitrofert biofertilizer, (2) **BPP(RP) 002:** Phosphofert bio-fertilizer: Arbascular Mycorhizal fungus (AMF) mother culture and mass production of Phosphofert biofertilisers, (3) **BPP (P) 036:** Development of protocol for mulberry cultivation for organic silk: a new approach, (4) **BPP(P)039**: Popularization of cost effective Drum–kit Drip irrigation system (CoD^{2}IS) in mulberry cultivation,(5) **BPP(P)035**:Integrated effect of certain proven technologies for crop productivity improvement and cost reduction in mulberry cultivation under West Bengal condition and **(6) BPP(P) 027**: Studies on improvement of mulberry productivity through foliar supplementation were reviewed and the progress was noted to be as per the milestones and satisfactory.

FARM MANAGEMENT SECTION

Progress of one on-going research project, namely **PPF 3532**: Assessment, development and management of area under mulberry in major Sericultural districts of West Bengal using geo-spatial technique – it was suggested to analyze the data statistically, particularly the valid multiple regression equation; and three programmes, namely (1) **BPP(VP):012:** Real-time spatio–temporal validation trial for mulberry weather model, (2) **BPP(RP) 012:** Optimum resource utilization through vermiculture for generating on-farm value-added compost, and **(3) BPI (P)033:** Screening of mulberry seedling for phenotypic plasticity of thermo-tolerance was reviewed and found satisfactory.

[Action: Dr. M. Chowdhuri, Scientist-D, Farm Management Section]

SOIL SCIENCE & CHEMISTRY SECTION

One on-going research programme, namely **BPP (VP) 010**: Multi-locational validation trial for application of cationic micronutrients, was reviewed and the progress was found satisfactory and as per the milestone.

MULBERRY PHYSIOLOGY SECTION

Progress of two on-going research programme **BPI (P) 026:** Popularization of waterlogging-tolerant mulberry variety C-2028 and (2) **BPP (P) 041:** Studies on quality status and leaf yield of short-listed early sprouters and late senescence mulberry accessions was found as per the milestone and satisfactory. The RAC suggested indicating the ploidy level of the identified accessions in the study.

[Action: Dr. P. K. Tewari, Scientist-D, Mulberry Physiology Section]

MULBERRY PATHOLOGY SECTION

Two on-going research projects, namely (1) **CSS-2107:** Forewarning of mulberry diseases of the Eastern and the North Eastern India, and (2) **PPS 3504:** Study on root rot disease of mulberry in the Gangetic plains of West Bengal and development of its control measure, were reviewed and the progress was noted to be as per the milestones and satisfactory.

SILKWORM BREEDING AND GENETICS SECTION

Six on-going research projects, namely (1) **AIB-3466:** Development of region-specific bivoltine breeds suitable for highly fluctuating and seasonally variable climatic conditions of the Eastern and the North-Eastern India, (2) **AIB-3496:** Development of high temperature and high humidity tolerant bivoltine breeds of silkworm (*Bombyx mori* L.), (3) **AIB 3480:** Development of silkworm *Bombyx mori* L. breeds from a gene pool with higher genetic plasticity, (4) **AIB 3514:** Development of multivoltine based congenic / NIL breed of silkworm (*Bombyx mori,* L.) through introgression of *Id* gene and its uses, (5) **AIB 3501:** Development of multivoltine breeds with high shell % and neatness, (6) **AIB 3531**: Authorization of silkworm hybrid in the Eastern and the North eastern states; and one programme, namely **BAI(RP) 003:** Maintenance of multivoltine and bivoltine germplasms, were reviewed and the progress was found to be as per the milestones and satisfactory.

BIOTECHNOLOGY SECTION

One ongoing research project, namely **PIB 3521:** Assessment of promising powdery mildew resistance lines for perspective commercial use and one programme, **BPI (P) 034:** Development, characterization and validation of the expressed sequence tag-derived microsatellite markers for mulberry (*Morus* spp.) was reviewed and the progress was as per the milestones.

ENTOMOLOGY SECTION

Progress of two on-going projects, namely (1) **PRE 3508:** Studies on standardization of the mass multiplication and field efficacy of *Scymnus pallidicolli* (Mulsant) for the eco-friendly management of "Tukra', and (2) **PPE 3517:** Population interactions of pests and natural enemies in mulberry eco-system - it was suggested to develop the predators profile first, and study the infestation of pest and predators throughout the year. The collaboration of the project with NBAIS, ICAR, Bangalore has been approved by the RAC and the said project to be sent to the Central Office, Bangalore for approval, (3) **PRE 3533:** Identification of whitefly resistance in mulberry germplasms accessions, and one programme, **BPR(P) 021**: Development of weather-based forecasting model for mulberry pest, was reviewed and found satisfactory.

[Action: Smt N. Lalitha, Scientist-C, Entomology Section]

SILKWORM PATHOLOGY SECTION

Progress of on-going one project of **ARP 3516:** Studies on synbiotics (combination of probiotic and prebiotic) induction for control of common diseases of silkworm *Bombyx mori* L., (2) **ARP 3522:** Isolation, cloning and characterization of antibacterial proteins(s) from silkworm *Bombyx mori* L, and two new programmes, namely (1) Survey and surveillance of silkworm diseases in traditional Sericultural districts of West Bengal, and (2) Silkworm disease monitoring of seed and commercial crop rearing of West Bengal (SDMSCC), was reviewed and found satisfactory. Regarding the project, **ARP 3522,** it was suggested to

consult the experts to do the fruitful work. Regarding the two new programmes, it was suggested to submit the programmes at the earliest for obtaining the respective Code Nos.

[Action: Dr. S. Chakraborty, Scientist- C, Silkworm Pathology Section]

EXTENSION DIVISION

Progress of one on-going programme, (1) Institute Village Linkage Programme, Phase IV (ADARSHGRAM/ SERI MODEL VILLAGE) was reviewed and the progress found satisfactory. The progress of extension activities of 4 RSRSs, 12 RECs and 2 Sub-RECs were reviewed and the progress was found as per the milestones. The progress of **CPP 518:** Bivoltine Cluster Promotion Programme at 15 clusters, covering eight states in the Eastern (7 clusters) and the North-Eastern (8 clusters) zones, was reviewed and the progress was found satisfactory.

REELING & SPINNING DIVISION

Progress of one on-going programme, **BAI (VP) 014:** Field-level testing of the efficacy of surface-active agent and wetting agent for the improvement of reelability of cocoons during adverse and favourable climatic seasons was presented and found satisfactory.

REGIONAL SERICULTURAL RESEARCH STATIONS (RSRSs)

Collaborative projects of the Institute at RSRS, Kalimpong, Koraput, Jorhat and Ranchi were presented

RSRS, KALIMPONG

Progress of three on-going programmes, namely (1) **BKPG(VP) 011 :** Validation of test-based doses of fertilizers and lime application in soils of Kalimpong hills to increase the yield and quality of mulberry (*Morus spp*) leaves – it was suggested that the PI would collect complete information before presenting the data and he is advised to make a presentation in the next RAC meeting with complete information, (2) **BKPG (PS) 006**: Diagnosis of nutrient constraints and their management in mulberry field at farms and farmers' level at Kalimpong hills. – The RAC suggested the PI not to change the period of the Project/ Programme/Pilot study without permission of the RAC. It will be rectified as per the approved period. The PI was also advised to evaluate the efficacy of FYM. It was suggested that the PI should communicate with Dr. Dibyendu Mukhopadhyay, Department of Agricultural Chemistry & Soil Science of UBKV, Pundibari, Cooch Behar or with the scientists of UBKV units i.e., the Regional Research Station and the KVK at Kalimpong, and (3) Maintenance of Bivoltine silkworm germplasm was reviewed with the progress being found satisfactory.

RSRS, JORHAT

Progress of two on-going projects, namely (1) **PRE-3511:** Studies on predatory efficacy of coccinellid predator, *Scymnus posticalis* Sicard for management of whitefly on mulberry, and (2) **APS3539:** Characterization of mulberry growing soils for nutrient management in selected Seri-villages of Golaghat district of Assam, and one programme, **B-JRH (RP)-009:** Survey and Surveillance of mulberry and silkworm pests and diseases of the North Eastern States was reviewed. Regarding the project **APS3539,** it was suggested to present meaningful data/ information with photograph before the RAC and to clarify the significance of the study. It was also suggested to know the applicability of recommended package of fertilizer application at the field level of the Golaghat district

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

RSRS, KORAPUT

Progress of four on-going programmes, namely (1) **B-KPT (P) 030:** Studies on High Bush and Tree type mulberry plantation under rainfed condition of Odisha, (2) **B-KPT(P) 037:** Verification of predicted lime requirement for the acid soils of Koraput region under mulberry vegetation in the Eastern Ghat highland zone of Odisha, (3) Survey and surveillance of disease and pest of mulberry and silkworm (routine activity), and (4) Silkworm disease monitoring of seed and commercial crop silkworm rearing of Non-Traditional districts of Odisha, as well as one Pilot study, namely **B-KPT(PS) 009:** Effect of irrigation scheduling on yield and water

economy in mulberry by the use of Hydrogels-Poly acrylic acid-based water insoluble polymers were reviewed. Regarding the Pilot study **B-KPT (PS) 009,** the PI informed that as per the suggestion of RRAC, the methodology of the pilot study has been modified and accordingly he initiated the work, for which the modified programme period is from July, 2015 to June,2017. The RAC agreed with the modified period of the above said pilot study and suggested to gather information of the details of the hydrogel, its economics per hectare, applicability and usefulness.

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

RSRS, RANCHI

Progress of one on-going programme, namely (1) **B-RNC (P) 031:** Screening and identification of bivoltine hybrids suitable for Jharkhand, and (2) Survey and surveillance of disease and pest of mulberry and silkworm (routine programme) were reviewed. Regarding the programme **B-RNC (P) 031**, the RAC suggested the PI to present the rearing performance in details of all the breeds/ hybrids received from other organizations in each and every crop season. If the brushing per cent or survival per cent is low, data of rearing in detail should be presented.

[Action: Dr. M. Alam, Scientist- C, RSRS, Ranchi]

Comments of the RAC Chairperson and the Members

Dr. S. Senthil Vinayagam, Member, RAC, appreciated the presentation of Scientists and activities of Training Division for dissemination of technologies developed by the Institute for the benefit of farmers of different regions. The training programmes are definitely helpful for the farmers for getting the benefit from the sericulture industry. He also appreciated the Biometric system of attendance for the trainees in the Training Division.

Dr. M. V. Samson, Member, RAC, thanked the Director for his dynamic leadership and guidance to the scientists in R & D interventions. He appreciated the efforts of the scientists of the Institute and suggested to conduct the field related programmes for the benefit of the industry.

Dr. A. K Tikadar, Scientist-D [Representative of Director (Tech)], CSB, Bangalore, Member, RAC] informed that the scientists should carry out their projects as per the milestones and Action Plan. He suggested not deferring the project period without prior permission of the RAC. He suggested taking up more number of collaborative projects with other Institutes. He also appreciated the extension activities at the field level and coordination with DoT (Seri), West Bengal and all the DoSs.

Shri Ranjit Bhattacharjee, Joint Secretary (Tech.), RO, Kolkata, Member, RAC, expressed thanks to the Director for R & D interventions and remarkable performance of the scientists of the Institute and nested units. He appreciated the presence of the Directors of North Eastern States. He also expressed thanks to the Directors for tremendous improvement and establishment of Bivoltine, specifically the foundation cross SK6 x SK7 in cocoon production in West Bengal climatic scenario. He further suggested utilizing Nistari in breeding programme.

Shri A. Mandal Joint Director, Representative of the Commissioner, DoT (Sericulture), West Bengal, Member, RAC, appreciated the joint efforts of the CSR&TI, Berhampore and DoT (Seri), West Bengal for the development of Bivoltine sericulture in the state. He appreciated the close relationship of the Institute and the DoT (Seri) and the dynamic leadership of the Director of the Institute. He also appreciated the R & D interventions of the Institute and presentation of different fruitful projects by the scientists.

Shri B. K. Misra, Assistant Director, Representative of Director, DoT & H, Odisha, Member, RAC, while appreciating the R & D interventions made by the CSB Institutes, expressed thanks to the scientists for development of farmers' need-based technologies for enhancement of crop production.

Shri G. C. Roy, Deputy Secretary (Tech.), RO, Bhubaneswar, Odisha, Member, RAC, opined that the yield gap in Odisha sericulture a vital issue. He suggested for supply of season-specific silkworm hybrid

Dfls for the month of September to benefit the sericulture farmers in Odisha state. As the Ambikapur region is affected with heavy infestation of whitefly, experts may be deputed to suggest the ways and means for minimizing the crop loss.

Md. Sufian Ali, Farmers' representative, Member, RAC, narrated his experience in rearing of Bivoltine dfls. He also informed that the room disinfectant, namely "Ghar Sodhan" and low cost Open rearing house are more economical and beneficial for the farming community of Malda district.

Prof. B. N. Chakraborty, North Bengal University, Siliguri and Chairman RRAC, RSRS, Kalimpong expressed his thanks to the Director and appreciated the R & D efforts of the scientists for the development of sericulture industry. He suggested preparing more projects jointly with the Biotechnology section for better development of the Industry.

Dr. M. Madhu, Head, ICAR-CSWCR &TI, Koraput, Odisha and Chairman RRAC, RSRS, Koraput expressed his thanks to the Director and urged that instead of running a single project by any section, it will be more effective if multidisciplinary projects are taken up. He suggested for long-term project instead of short-term one. He also highlighted the role of soil and water conservation measures in the allied fields.

Shri A. K. Pal, Scientist-C [Representative of Director, CSTRI, CSB, Bangalore, Member, RAC] informed that development of reeling sector is needed. He suggested that Ghosh Reeling Machine, if modified specifically for the elasticity of the fibre, the sericulture industry will be more benefitted.

Prof. Saroj Kumar Sanyal, Chairman, RAC, while appreciating the presence of scientists, collaborators, farmers' representative, CSB representatives and Invitees, expressed happiness, specifically for the presence of the chairmen, RRAC of the RSRSs. He appreciated holding of the RAC meeting for two successive days for better presentation and discussion of all the projects / programmes /activities satisfactorily. While expressing happiness at the excellent presentation and deliberation of most of the projects and the programmes, he wished that the remaining ones also followed suit. In particular, Prof. Sanyal noted with satisfaction the introduction of the concept notes. Furthermore, the excellent rapport with the State Governments was appreciated towards the improvement of sericulture in the states.

Director, CSR&TI, Berhampore, Member Convenor, RAC: Dr. S. Nirmal Kumar, Director expressed his happiness at the presence of the Directors of DoS of the North Eastern States, all RRAC Chairmen and scientists from different units, specifically from the North Eastern states. He stated that the interactions were meaningful and effective, particularly with the guiding role played by the RAC, Chairman. He thanked all the RAC members, RRAC Chairmen, invitees for their valuable suggestions. He assured that the suggestions given by the RAC will be duly followed.

The meeting ended with the vote of thanks to the Chair.

Sd/-
Director &
Member Convenor, RAC

Approved
(Prof. Saroj Kumar Sanyal)
Chairperson, RAC, CSR&TI, Berhampore
Date 14th July, 2015

ANNEXURE - I

LIST OF PARTICIPANTS IN THE 42nd MEETING OF RESEARCH ADVISORY COMMITTEE HELD ON 9th and 10th JULY, 2015, CSR&TI, BERHAMPORE

Sl. No.	Name	Designation
1.	Prof. Saroj Kumar Sanyal, Former-VC, BCKV, Mohanpur, Nadia, West Bengal	Chairman
2.	Dr. S. Nirmal Kumar, Director, CSR&TI, Berhampore	Member Convenor
3.	Prof. Kanchan Baral, Dept. of Plant Protection, Palli Siksha Bhavan, Sriniketan	Member
4.	Prof. Sunirmal Maity, Former Professor, BCKV, Mohanpur, Nadia, West Bengal	Member
	Dr. S. Senthil Vinayagam, Prof. & Principal Scientist, ICAR-NAARM, Hyderabad	Member
5.	Dr. M. V. Samson, Ex-Director, Central Silk Board, Bangalore	Member
	Mrs. Soma Bhattacharya, IAS, Commissioner, DoT (Seri), West Bengal	Member
6.	Dr. A.Tikader, Scientist-D, Rep. Director (Tech.), Central Silk Board, Bangalore	Member
7.	Shri Jogesh Deuri, Director, DoS, BTC, Assam	Member
8.	Shri Bakul Chandra Hajong, Director, DoS&W, Meghalaya	Member
9.	Shri Peto Ete, Director, DoT&Handicrafts, Arunachal Pradesh	Member
10.	Shri P. Demo, Joint Director, Rep. DoS, Nagaland	Member
11.	Shri Anath Nath Mandal, Jt. Director, DoT(Seri.), Govt. of West Bengal	Member
12.	Shri B. K .Misra, Asst Director, Rep. Director, DoT& H, Govt. of Odisha	Member
13	Shri N. P. Verma, ADS, Rep. Director, DoH&S, Govt. of Bihar	Member
14	Dr. K. Mandal, Scientist-D, ZSSO, Malda; Rep. Director, NSSO, CSB, Bangalore	Member
15.	Shri A. K. Pal, Scientist-C, Rep. Director, CSTRI, Bangalore, SCTH, Malda	Member
16.	Shri R. Bhattacharya, Joint Secretary (Tech.), R.O., CSB, Kolkata	Member
17.	Shri Sarat Dewri, Joint Secretary (Tech.), R.O., CSB, Guwahati	Member
18.	Shri G. C. Ray, Deputy Secretary (Tech.), R.O., CSB, Bhubaneswar, Orissa	Member
19.	Shri R. P. Mandal, Asstt. Secretary (Tech.), R.O., CSB, Patna, Bihar	Member
20.	Dr. S. N. Gogoi, Scientist-D, RSRS, Jorhat, Assam	Member
21.	Dr. M. Alam, Scientist-D (I/C), RSRS, Ranchi, Jharkhand	Member
22.	Dr. N. R. Rao, Scientist-D (I/C), RSRS, Koraput, Odisha	Member
23.	Shri S. Chatterjee, Scientist-D, RSRS, Kalimpong, West Bengal	Member
24.	Shri Sufian Ali, Farmers Representative, Malda, West Bengal	Member
26.	Prof. B. N. Chakrabarty, Chairman, RRAC, RSRS, Kalimpong, West Bengal	Invitee
27.	Dr. M. Madhu, Chairman, RRAC, RSRS, Koraput, Odisha	Invitee
28.	Dr. R. P. Singh Ratan, Chairman, RRAC, RSRS, Ranchi, Jharkhand	Invitee
29.	Dr. Pranab Kumar Talukder, Chairman, RRAC, RSRS, Jorhat, Assam	Invitee
30.	Shri H.K. Hazarika, Asst.Director, DoS, Udalguri, BTC, Assam	Invitee
31.	Shri P. K. Das, EO, DoS, Darrang, Assam	Invitee
32.	Shri A.K. Pani, Dy. Director, DoT(Seri), West Bengal	Invitee
33.	Dr. Gourab Gangopadhyay, Associate Professor, Bose Institute	Invitee

Absentée :		
1	Dr. R. K. Varshney, Director, Centre of Excellence in Genomics, Applied Genomics Laboratory, Patancheru	Member
2.	The Special Secretary & Director, DoHS&H, Jharkhand	Member
3.	The Commissioner, DoT (Seri), Govt. Of Chattisgarh, Chattisgarh	Member
4.	The Additional Director (Seiculture), DoS, Forest Secretariate, Govt. of Sikkim	Member
5	The Director, Handloom, Handicrafts & Sericulture, Govt.of Tripura, Agartala, Tripura	Member
6.	The Director of Sericulture, Govt. of Mizoram, Chaltlang, Aizawl, Mizoram	Member
7.	The Director of Sericulture, Govt. of Assam,Guwahatj, Assam	Member
8.	The Director, Govt. of Manipur, Imphal, Manipur	Member
9.	Shri Prafulla Kumar Mandal, Farmers Representative, Murshidabad, West Bengal	Member

Scientists/ participants attended the Meeting

Sl. No.	Name	Designation	Address
1.	Dr. A. K. Saha	Scientist-D, Seri. Division	CSR&TI, Berhampore
2.	Dr. M. K. Ghosh	Scientist-D, Mori. Division	CSR&TI, Berhampore
3.	Dr. S. Roy Chowdhuri	Scientist-D, PMCE Division	CSR&TI, Berhampore
4.	Dr. U. K. Bandyopadhyay	Scientist-D, PMCE Division	CSR&TI, Berhampore
5.	Dr. Jayeeta Sarkar	Scientist-C, PMCE Division	CSR&TI, Berhampore
6.	Dr. S. K. Mukhopadhyay	Scientist- D, Extension Division	CSR&TI, Berhampore
7.	Dr. P. K. Ghosh	Scientist- D, Extension Division	CSR&TI, Berhampore
8.	Shri. D. Das	Scientist- C, Extension Division	CSR&TI, Berhampore
9.	Shri G.C.Das	Scientist- C, Extension Division	CSR&TI, Berhampore
10.	Shri T.N. Sreekanth	A.D. (Stat.), Extension Division	CSR& TI, Berhampore
11.	Dr. Jalaja S.Kumar	Scientist-D, Training Division	CSR& TI, Berhampore
12.	Dr. S. Chanda	Scientist-D, Training Division	CSR& TI, Berhampore
13.	Shri Zakir Hossain	Scientist-C, Training Division	CSR& TI, Berhampore
14.	Shri D.Chakravarti	Scientist-C, Training Division	CSR& TI, Berhampore
15.	Dr.(Mrs) R. Banerjee	Scientist-D, Biotechnology Section	CSR& TI, Berhampore
16.	Dr. S. Chattopadhyay	Scientist-D, Biotechnology Section	CSR& TI, Berhampore
17.	Dr. Monica Chaudhuri	Scientist-D, Farm Mangement Section	CSR& TI, Berhampore
18.	Dr. S. Rajaram	Scientist-D, Agronomy Division	CSR& TI, Berhampore
19.	Dr. P. K. Tewary	Scientist-D, Agro. & FM Division	CSR& TI, Berhampore
20.	Dr.S.K. Datta	Scientist-D, Mulberry Pathology Section	CSR& TI, Berhampore
21.	Dr. N. Suresh Kumar	Scientist-D, Silkworm Breeding & Genectis Section	CSR& TI, Berhampore
22.	Dr. A. K. Verma	Scientist-D, Silkworm Breeding & Genectis Section	CSR& TI, Berhampore
23.	Dr. R.Kar	Scientist-D, Soil Science & Chemistry Section	CSR& TI, Berhampore
24.	Dr. S. Sreekumar	Scientist-D, RTI & Silkworm Physiology Section	CSR& TI, Berhampore
25.	Dr. Satadal Chakrabarty	Scientist-C, Silkworm Pathology Section	CSR& TI, Berhampore
26	Smt. N. Lalitha	Scientist-C, Entomology Section	CSR& TI, Berhampore
27	Shri.N.B.Kar	Scientist-D, Reeling & Spinning	CSR& TI, Berhampore
28	Dr.Y.Debraj	Scientist-D, RSRS	Jorhat, Assam
29	Smt. M. Pamegam	Scientist-C, RSRS	Jorhat, Assam
30	Shri Uttam Ch. Baruah	Scientist-C, RSRS	Jorhat, Assam
31	Shri S. K. Misro	Scientist-C, RSRS	Koraput, Odisha
32.	Dr. D.P. Das Mahapatro	Scientist-D, REC	Deogarh, Odisha
33	Dr. Ghanashyam Singh	Scientist-D, REC	Bhandra, Jharkhand
34	Dr. Ramkumar,	Scientist-C, REC	Gumla, Jharkhand
35	Dr. Dipesh Pandit	Scientist-D, REC	MPRaj, Jharkhand
36	Dr. (Mrs) Manoja Pattanaik	Scientist-D, REC(SU)	Kolitha, Birbhum
37	Dr.(Mrs) Tapati Dutta Biswas	Scientist-D, REC	Kamnagar, MSD
38	Shri.Aloke Kumar Dutta .	Scientist-C, REC	Mothabari, Malda
39	Dr.G.B.Singh	Scientist-D, REC	Agartala, Tripura
40	Dr. B.N.Chaudhuri	Scientist-D, REC	Aizawl, Mizoram
41	Dr. A. Borah	Scientist-D, REC	Dimapur, Nagaland
42	Shri B. K. Basumatari	Scientist-C, REC	Mangaldoi, Assam
43	Dr.L.Somen Singh	Scientist-C, REC	Imphal,Manipur
44	Shri S.T.Lepcha	Scientist-C, REC	Rangpo,Sikkim
45	Shri.Subrata Sarkar	Technical Assistant	PMCE Division
46	Shri T.K. Maitra	Technical Assistant	Computer Section
47	Shri. Madhusudan Kumar	Steno, Establishment Section	Establishment Section