MINUTES OF THE 36th MEETING OF THE RESEARCH ADVISORY COMMITTEE HELD ON 19th JULY 2013 AT CSR & TI, MYSORE

The 36th meeting of the RAC of CSRTI, Mysore was held on Friday the 19th July 2013 at CSRTI, Mysore for reviewing the progress of research, extension, training and other activities of the Institute and its nested units during the period from October 2012 and to consider new project/programme proposals for implementation besides reviewing concluded projects/programmes. The meeting was chaired by Prof. K. Narayana Gowda, Hon'ble Vice-Chancellor, University of Agricultural Sciences, Bengaluru. The list of participants is appended at **Annexure-1.**

Dr. S. K. Ashwath, Scientist-D, PMCE cell welcomed the Chairman, Members and invitees and the scientists of the Institute and nested units to the meeting. The house congratulated the Chairman and VC, UAS, Bengaluru on the conferring of the ***Sardar Patel outstanding institution award*** by the ICAR on the UAS, Bengaluru.

In his opening remarks, the Chairman thanked the house for the congratulations and added that the credit goes to every single member of the large family of employees of the university. He also thanked other Institutions including CSRTI, Mysore who have in several ways been supporting the growth of the university. He expressed his appreciation over the progress made by the Institute in the previous years and hoped that the legacy would be continued under the leadership of Dr. B. B. Bindroo, Director, CSRTI, Mysore having taken over recently. He informed that sericulture has received greater importance at the national level than in the previous years. Although, more research is carried out by institutes like CSRTI and KSSRDI, large part of teaching is with the Universities that are better equipped to generate manpower. He recalled his visit to the Magadi silkworm seed area and expressed that he was proud of the dedication and sincerity among the personnel serving the area. He urged the scientists to plan strategic programmes to address burning issues in the field and also source RKV funds for such programme.

He observed that Sericulture which contributes over Rs. 90000 Cr. to the country's economy is far too less visible than crops like Coffee which contributes much less [Rs. 3000 Cr.]. He urged CSB and the State departments of Sericulture to organize sericulturists through effective training and extension so that their voice is heard at the national level. This he reiterated is very important in attracting more funds for the industry. Since sericulture is a labour intensive activity, concept of shared labour should be brought in. Similarly farm equipment and machineries should also be popularized and made accessible to the practitioners by way of adopting group approach.

Later on discussions on the agenda items were taken which are as follows.

Item No. 1: Confirmation of the minutes of the 35th meeting of RAC held at CSRTI, Mysore on 25-26th February 2013.

The committee confirmed the minutes of the previous meeting, since there were no comments from any of its members.

Item No. 2: Review of follow-up action taken on the decisions of the RAC in its 35th meeting of held at CSRTI, Mysore on 25-26th February 2013.

The report on the follow-up actions taken on the decisions of the previous meeting was presented by Dr. S. K. Ashwath, Scientist-D. The house deliberated on the action taken report and made the following observations.

1. *Identification and development of user friendly broad spectrum disinfectants for Indian sericulture*: If the project has not been approved by CSB for it is considered a repetition of the earlier work, proper justification to carryout the work as proposed, should be furnished to CSB and approval sought.
   [**Action: Mr. A. R. Narasimha Nayaka, Scientist-C, Silkworm crop protection**]

2. *Establishing Commodity based associations*: The Chairman opined that the action suggested needs more clarity. Organizing Commodity Based Associations [CBA] have distinct advantage over Cooperatives and SHGs. They are autonomous and do not suffer from government intervention unlike the cooperatives and are larger that the SHGs and capable of taking up programmes that can bring about credible changes. The extension group should rethink their strategies and seek the advice of people who have experience in the area. A few extension personnel may also be trained in the aspects of forming and nurturing CBAs.
   [**Action: Dr. G. S. Vindhya, Scientist-D, SEEM division**]

Item No. 3: Director's report.

Dr. B. B. Bindroo, Director presented the salient features of progress achieved by the Institute and its nested units during the reporting period. The presentation covered the following major aspects:

(i) Mulberry improvement, (ii) Mulberry production, (iii) Mulberry protection, (iv) Silkworm improvement, (v) Silkworm production (vi) Silkworm protection, (vi) Extension activities, (vii) Sericulture engineering and (viii) Human resource development

The Chairman appreciated the comprehensive report presented by the Director. The house discussed the difficulties faced in effective conduct of the Post Authorization Trials [PAT], especially regarding the non-availability of P1 dfls from the participating Institutes *viz.*, KSSRDI and APSSRDI. The Director, CSRTI, Mysore informed the house that a preliminary meeting was held during June 2013 and letters have been sent to the participating Institutions for meeting the shortfalls.

Item No. 4: Review of concluded projects / programmes / pilot studies.

1. *Development of double haploids through in vitro technique for mulberry improvement* ***- Pilot study***
   The ploidy of the putative gynogenic plant needs to be confirmed and reported
   [**Action: Dr. S. Gandhi Doss, Scientist-C, Host plant improvement]**

2. *Studies on comparative yield potentiality & varietal response of promising mulberry variety under different sources of organic and inorganic nutrients-* ***PPA 3420***
   The results are encouraging. Come out with recommendations and go for field trials.
   [**Action: Dr. Dasappa, Scientist-C, Host plant production]**

3. *Development of bionematicide for management of mulberry root knot disease* ***- MPT 0040***
   The house took note of the efficacy of the new product Nemahari and advised the concerned to go for large scale popularization of the product.
   [**Action: Dr. D. D. Sharma, Scientist-C, Host plant protection]**

4. *Studies on hybrid evaluation & identification of new polyvoltine x bivoltine hybrids of the silkworm -* ***AIB 3437***
   One more trial of the hybrids may be carried out. KSSRDI may participate in the OFTs and also contribute its popularization.
   [**Action: Dr. Dayananda, Scientist-C, Silkworm improvement]**

5. *Bivoltine shuttle breeding for development of silkworms with better plasticity- Identification of new FCs and double hybrids-* ***SIM 0017***
   The house opined that the results are encouraging. The PI was advised to be more focussed and succinct while presenting results.
   [**Action: Ms. E. Rajalakshmi, Scientist-C, SSBS, Coonoor]**

6. *Field evaluation of colour cocoon production & thin denier silk, conversion to yarn & fabric for commercial use-* ***CSS 2110***
   The scientist should take up a techno-economic analysis of the technology of colour cocoon production and come out with clear information on its technical feasibility and economic viability for large scale production. The information should be presented in the next meeting of the RAC.
   [**Action: Dr. Kanika Trivedi, Scientist-D, SEEM]**

7. *Studies on performance of bio-control agent and seri-polyclinics established under CDP in sericulture clusters of AP & TN-* ***Pilot study***
   The technology of biological control of pests and diseases should be popularized. While finding entrepreneurs for multiplication of bio-control agents is rather difficult, making use of existing facilities in

institutions like the KVK, State government farms, district training centres etc., should be explored. Establishing strong linkages with the users is very important to ensure the sustainability of the mass multiplication units. The governments should also try to increase financial and training support.

[**Action: Dr. G. S. Vindhya, Scientist-D, SEEM division]**

8. *Assessment of women participation & time spent on different sericulture activities in three southern sericulture states-* ***MOE 3461***

The information generated is in no way different from the common knowledge and reports in the 1990s. Studies should be more comprehensive and address the requirements of the users of the information generated out of the studies.

[**Action: Dr. G. S. Geetha, Scientist-C, SEEM division]**

9. *Inheritance analysis of bimodal emergence pattern in Pure Mysore and its introgression into evolved polyvoltine breeds-* ***SIM 0012***

The target character is probably not single gene controlled and hence very difficult to introgress. The data needs to be revisited and detailed discussions be held in the next meeting of RAC.

[**Action: Dr. V. N. Sudha, Scientist-C, Silkworm improvement]**

8. *Studies to determine the process parameters for the new Multi x Bivoltine hybrids-* ***SIM 0038***

The laboratory data are encouraging. The scientists should ensure whether the package would be acceptable by the reelers. Field trials should be conducted and the scientists should interact with the reelers for a period of 4-6 months and come back with the feed back, refine the package, if required, and report in the next meeting of RAC.

[**Action: Dr. Kariyappa, Scientist-C, Post-cocoon evaluation unit]**

Item No. 5: Review of progress of ongoing projects / programmes / pilot studies.

The Chairman advised the scientists to present the progress achieved during the reporting period in respect of projects/programmes wherever certain deviations have been made or wherever directions of the RAC is required.

I. Host plant improvement:

The progress in respect of the following projects/programmes were reviewed and found to be as per the predetermined milestones for the reviewing period.

(i) Development of superior mulberry varieties suitable for moisture stress environments- **PIB 3268**

(ii) Development of superior mulberry varieties by exploitation of hybrid vigour based on molecular marker diversity of parental lines- **PIB 3370**

(iii) Development of disease resistant and productive mulberry genotypes with special reference to root rot and root knot diseases suitable for seri-zones of south India- **PIB 3457**

(iv) DNA marker aided analysis of mulberry gene bank towards a core assembly for sustainable conservation and enhanced utilization in crop improvement- **PIE 3451**

II. Host plant production:

(i) *Effect of conjunctive use of nitrification inhibitors for the efficient utilization of nitrogenous fertilizers for the sustainable mulberry production -* ***MPR 0047***

(ii) *Maintenance of the long term manorial plot*
The progress in respect of the above two projects was found to be as per the predetermined milestones for the reviewing period.

(iii) Studies on the factors influencing the nutrient uptake and its use efficiency in mulberry under field conditions – ***PIN 3442****.*
The Chairman noted that the study is still incomplete since the primary objective of the study is to unravel the influence of factors on nutrient uptake, which has not been reported. The scientist was asked to complete the analysis and report in the next meeting of the RAC.

[**Action: Ms. M. G. Sabitha, Scientist-C, Host plant improvement]**

(iv) Soil fertility management of mulberry gardens and quality control of disinfectants- ***MPR 0005***
Efforts should be made to get the feed back on impact of soil testing and consequent nutrient replenishment recommendations through the offices of the respective DoS.

[**Action: Dr. Sibayan Sen, Scientist-C, Host plant production]**

III. Host plant protection:

(i) Biological control of fungal root disease of mulberry by endophytic bacteria Burkholderia cepacia and Bacillus subtilis strains- ***PRP 3462***

(ii) Long-term ecological research - Effect of mulberry cropping system on soil biology and productivity- ***MPT 0046***
The progress in respect of the above two projects was found to be as per the predetermined milestones for the reviewing period.

(iii) Development of database for mulberry diseases- ***PRE 3486***
A very useful study**.** In addition to reporting on the occurrence and seasonal incidences, the diseases may also be classified as serious and less serious ones. List out diseases that could become serious in the years to come. The Director, CSRTI, Mysore advised the scientist to upload the information on CSB website in consultation

with Dr. C. J. Prabhakar, Scientist-D, CSB, since there is a dedicated portal for the purpose.

[**Action: Dr. P. M. Pratheesh Kumar, Scientist-C, Host plant protection]**

IV. Silkworm improvement:

The progress in respect of the following projects/programmes were reviewed and found to be as per the predetermined milestones for the reviewing period.

(i) Evaluation of three-way cross hybrids for commercial exploitation- ***SIM-0008***

(ii) Development of robust bivoltine hybrids of silkworm, Bombyx mori L, tolerant to high temperature environment of the tropics through DNA marker assisted selection- ***AIT 3445***

(iii) Development of Productive polyvoltine breeds and identification of M x B hybrids of the silkworm Bombyx mori L. tolerant to high temperature and BmNPV- ***AIB 3456***

(iv) Bivoltine shuttle breeding for development of silkworms with better plasticity- ***SIM 0017***

(v) Popularization of authorized silkworm hybrids among farmers of South India- ***AIB 3498***

(vi) Maintenance of bivoltine silkworm breeds- ***SIM 0006***

(vii) Maintenance of polyvoltine silkworm breeds- ***SIM 0009***

(viii) Pre-authorization field trials of L14 x CSR2- a new polyvoltine x bivoltine hybrid with superior fibre qualities- ***AIB 3488***

(ix) Maintenance of breeds developed through amylase marker assisted selection, NPV tolerance and morphological mutant stocks- ***SIM 0011***

(x) Maintenance of bivoltine silkworm breeders stock / germplasm- ***SIM 0016***

(xi) Bivoltine shuttle breeding for development of silkworms with better plasticity- ***SIM 0017***

(xii) Breeding for improvement of robustness in bivoltine silkworm under semi-temperate conditions of Nilgiris and shuttle breeding to have genetic variations and plasticity

(xiii) Bivoltine silkworm race maintenance and multiplication- ***SIM 0015***

(xiv) Maintenance of bivoltine and multivoltine semi-synthetic diet silkworm strains for original breed characters- ***SPR 0013***

(xv) Large scale in-house evaluation and validation of new breeds / hybrids of silkworm Bombyx mori L. developed by CSRTI, Mysore- ***SPR 0019***

(xvi) Studies on reproductive efficiency of newly evolved bivoltine and multivoltine breeds of silkworm Bombyx mori L. and egg production- ***SIM 0043***

(xvii) Evaluation of post cocoon parameters of cocoons generated from CSRTI, Mysore- ***SIM 0037***

The house suggested the following in respect of the two projects listed below.

(xviii) Popularization of productive bivoltine double hybrid (CSR6 × CSR26) × (CSR2 × CSR27) Krishnaraja with the farmers of Karnataka- ***MOE 3463***

The data on pupation rate and ERR should be presented in all future presentations.

[**Action: Dr. A. Naseema Begum, Scientist-D, Silkworm improvement]**

(xix) Development of productive NPV tolerant bivoltine breeds/hybrids using BmNOX marker assisted selection- ***AIB 3476***

The need for carrying on till 6th BC generation in an experiment based on marker aided selection needs to be justified. The scientists may have detailed discussions with experts like Prof. Maheswaram, Member, RAC and come out with clear future work plan.

[**Action: Dr. Veerendra Kumar, Scientist-C, Silkworm improvement]**

V. Silkworm crop production:

The progress in respect of the following projects/programmes were reviewed and found to be as per the predetermined milestones for the reviewing period.

(i) Studies on the development of indigenous method for culturing Cordyceps and other useful species- ***AIB 3449***
(ii) Studies of mulberry leaf nutrition on intermediary metabolism of silkworm Bombyx mori L.- ***AIP 3478***
(iii) Development of package for practices for silkworm rearing and their dissemination- ***SPR 0044***
(iv) Testing mountages and refinement of the existing mountages for large scale rearing.

VI. Silkworm crop protection:

The progress in respect of the following projects/programmes were reviewed and found to be as per the predetermined milestones for the reviewing period.

(i) Therapeutic control of Microsporidiosis in the silkworm through characterization of Methionine Amino Peptidase enzyme genes (MetAP2) in Nosema bombycis- ***ARP 3477***
(ii) Identification of factors responsible for silkworm crop loss due to diseases at field level and its impact on cocoon productivity- ***SPT 0039***
(iii) Evaluation of available management strategies of giant African snail, Achatina fulica Bowdich in mulberry eco-system- ***PRE 3467***
(iv) Forewarning and forecasting- ***CSS 2107***
(v) Maintenance of silkworm pathogens and testing their virulence at periodical intervals- ***SPT 0024***

(vi) *Identification of probiotic bacteria from the mulberry silkworm and study their antibacterial activity against the bacterial pathogens of silkworm Bombyx mori L. –* ***SPT 0045A***

(vii) *Maintenance of mother culture for production of recommended bio-control agents and mass release of recommended bio-control agents of sericultural pests in CSRTI, Mysore* ***– SPT 0014***

(viii) *Production and distribution of bio-control agents*

(ix) *Evaluation of thrips management package in mulberry-* ***CSS 2110***

The house suggested the following in respect of the one project indicated hereunder.

(x) *Habitat Studies - Impact of crop diversity on conservation and performance of natural enemies in mulberry crop system-* ***PPE 3455***

Since one cannot dictate the cropping patterns in the field surrounding the mulberry gardens for ones benefit through conservation of natural enemies of mulberry pests, the utility of the study needs to be justified. The scientist should come out with clear answers in the next meeting of RAC.

[**Action: Dr. J. B. Narendra Kumar, Scientist-C, Silkworm crop protection]**

VII. Extension:

The Committee reviewed the progress in respect of research project, model commercial rearing centre, monitoring and coordination of field trials, implementation of cluster promotion programme, TOT programmes, visitor's service etc.

(i) *A study on adoption of pest and disease management strategies in sericulture-* ***MOE 3458***

The study needs to address the reasons for low adoption through a thorough analysis of where the gap exists. The scientists should find out whether low adoption is due to research gap, technology gap, extension gap or adoption gap. A social scientist may also be involved in such studies.

[**Action: Dr. B. Gangadhara, Scientist-C, SEEM division]**

VIII. Sericulture engineering:

The committee reviewed the progress under research and development activities, fabrication and supply of machines, patenting and commercialization, extension and training activities undertaken by the division and suggested the following.

The equipment /machines should be designed for preparedness to meet the demands of the industry in the next 20-30 years. The scientists should present details of the material cost, impact in

terms of labour saving, cost benefit ratio for the equipment / machinery in the next meeting of RAC.

An appropriate mechanism for identifying potential entrepreneurs for large scale manufacturing of the inventions should be put in place. Exhibiting the equipment/ machines in the Market yards could be very effective in popularizing them.

[**Action: Dr. Satish Verma, Scientist-E, Seri-engineering division]**

IX. Projects / programmes being implemented at Regional Sericulture Research Stations:

The house reviewed the progress in respect of nine projects/ programmes being implemented at the four RSRSs and expressed its satisfaction over the achievements during the reporting period.

RSRS Kodathi

Monitoring of soil fertility status in Sericultural areas of Karnataka to improve soil health and nutrient management for enhancing quality mulberry leaf and cocoon production- ***CSS 2105***

RSRS Chamarajanagar

Development of seri-lac culture model for income augmentation- ***PPF 3500***

Hybrid authorization programme

RSRS Ananthapur

Evaluation of Elite mulberry varieties under semi- arid agro-climatic conditions- ***MIP(A) 5001***

RSRS Salem

(i) Studies on Rhizosphere microflora of mulberry varieties as Influenced by different cultivation practices under alkaline soil conditions- ***MPT 8002***

(ii) Effect of shoot harvest and biomass yield of mulberry on soil organic carbon depletion in mulberry fields- ***MPR 8003***

(iii) Studies on adoption of silkworm disease control measures and its impact on cocoon production in farmers' field under Tamil Nadu conditions- ***SEM (S) 8001***

(iv) Studies on adoption of mulberry and silkworm pest management Technologies (IPM) by the sericulturists in Tamil Nadu- ***SEM (S) 8004***

(v) *A study on the adoption of recommended packages of practices followed by sericulturists of different farm size in Tamil Nadu-* ***SEM (S) 8006***

(vi) Monitoring of soil fertility status in Sericultural areas of Karnataka to improve soil health and nutrient management for enhancing quality mulberry leaf and cocoon production- ***CSS 2105***

Item No. 6: Consideration of new project / programme proposals:

Dr. S. K. Ashwath, Scientist-D presented the details of the new project / programme proposals that have been prepared in line with the guidelines issued by CSB during discussions on the action plan for 2013-14. The concepts and work plan were discussed by the house and the following observations were made.

The Chairman requested the house to comment on relevance, utility, sustainability and cost effectiveness, so that the researchers could move forward with greater clarity.

Projects:

1. *Development of disease tolerant productive bivoltine silkworm breeds/hybrids of Bombyx mori* L. *with superior silk quality*.

   Observations/ suggestions: Justification for screening silkworm races already screened for NPV tolerance in the earlier inter-institutional networking programme should be provided. If markers for tolerance are being used, the stability of the markers should be ascertained.

   Decision: Approved. The project may be taken up incorporating the above suggestions.

   [**Action: Dr. N. Mal Reddy, Scientist-C, Silkworm improvement**]

2. *Pre-authorization field trials of newly developed improved cross breeds and bivoltine hybrids.*

   Decision: Approved. The project may be taken up as proposed.

   [**Action: Ms. V. Premalatha, Scientist-C, Silkworm improvement**]

3. *Popularisation of rotary mountages for quality cocoon production.*

   Observations/ suggestions: The number of rearers selected for demonstration is very small. Efforts to extend the study to large number of rearers should be made. The offer made by the DoS, Tamil Nadu to support the programme is very encouraging and should be accepted. The DoS in other states may also join the programme and offer similar support.

   Decision: Approved. The project may be taken up with the above modifications.

   [**Action: Mr. S. Purushotham, Scientist-C, Silkworm crop production and Scientist-D, SEEM division**]

4. *Management strategy for eradication of uzi fly in Southern States*

Observations/ suggestions: Since most of the components of proposed IPM are old and time tested, CSRTI need not invest its limited resources on such activities. Any new addition to the package or any modifications in the recommended package may be communicated to the DoS and if required, the DoS personnel may be trained in the new technologies.

Decision: Could be taken up if fund is no constraint.

[**Action: Mr. Sathyanarayana Raju, Scientist-D, RSRS, Anantapur]**

5. *Promoting sericulture resource centres for sustainable sericulture development in Karnataka and Andhra Pradesh*.

Observations/ suggestions: The project is well conceived. The scientists should ensure greater participation of the state departments of sericulture. Specific mention should be made in respect of mulberry variety G2, labour saving technologies/ machines/ equipment. Please explore the possibilities of creating bio-energy centres with financial assistance from the Ministry of renewable energy.

Decision: Approved. The project may be taken up incorporating the above suggestions.

[**Action: Dr. G. S. Vindhya, Scientist-D, SEEM division]**

6. *Identification of efficient mulberry for changing climatic regime of increased temperature and CO_2 and trait association of sustainable crop improvement.*

Observations/ suggestions: Care should be taken not to duplicate the work already being carried out at SBRL, Bengaluru. The phenotypic characters should be decided before moving forward with the project.

Decision: Approved. The project may be taken up incorporating the above suggestions.

[**Action: Dr. V. Girish Naik, Scientist-C, Host plant improvement]**

7. *Pre-authorisation trial of G4/FYT99 mulberry variety in the field.*

Observations/ suggestions: The programme can be taken up as long as the variety is superior to V1 and no additional cost is involved in its cultivation. Information in support of the above aspects should be provided to the RAC.

Decision: Approved. The project may be taken up incorporating the justifications sought above.

[**Action: Dr. T. Thippeswamy, Scientist-D, Host plant division]**

8. *Development of Distinctiveness, Uniformity and Stability (DUS) descriptors for mulberry (Morus spp.) and its validation.*

Decision: Approved. The project may be taken up as proposed.

[**Action: Dr. V. Girish Naik, Scientist-C, Host plant improvement]**

9. *Development of drought tolerant transgenic mulberry using Agarobacterium tumefaciens mediated gene transfer (in collaboration with UAS Bangalore).*

Observations/ suggestions: The project is well conceived; collaborators are also competent.

Decision: Approved. The project may be taken up as proposed.
[**Action: Dr. S. Gandhi Doss, Scientist-C, Host plant improvement]**

10. *Biological control of fungal root rot disease of mulberry by endophytic bacteria Burkholderia cepacia, B. subtilis & Pseudomonas aeruginosa strains – Part II. Development of suitable bioformulations of endophytic bacteria for field application.*

Observations/ suggestions: The concept proposal may be sent to DBT for consideration and funding.

Decision: Approved.
[**Action: Dr. V. Gunasekhar, Scientist-C, Host plant production]**

11. *Biological control of root knot nematode disease (Meloidogyne incognita) of mulberry by endophytic bacteria (under women scientist scheme (WOS-A) of DST).*

Observations/ suggestions: The proposal may be sent to DST for consideration and funding.

Decision: Approved.
[**Action: Dr. V. Gunasekhar, Scientist-C, Host plant production]**

Programmes:

1. *Improvement of breed characteristics of L14 through multilocational breeding approach.*

Observations/ suggestions: The programme may be taken up as proposed.

Decision: Approved.
[**Action: Dr. S. K. Ashwath, Scientist-D, PMCE]**

2. *Demonstration of uzi fly management strategies in an adopted village of Srirangapatna Taluk.*

   Observations/ suggestions: The programme should also address social system concept. Involve a social scientist in the programme.

   Decision: Approved. The programme may be taken up incorporating the above suggestions.

   [**Action: Dr. Vinod Kumar, Scientist-C, Silkworm crop protection]**

3. *Silkworm disease monitoring of seed and commercial crop rearing of south Indian states (In collaboration with NSSO and DOSs of south Indian states).*

   Observations/ suggestions: Since a similar programme is already being implemented, the Director NSSO should send the details of the existing programme for disease monitoring to the Director, CSRTI, Mysore. It is desirable to strengthen the programme with inputs based on his experience in the state of West Bengal.

   Decision: Approved.

   [**Action: Dr. M. Balavenkatasubbaiah, Scientist-D, Silkworm crop protection]**

Item No. 7: Review of progress of trials/ demonstrations of technologies and feedback.

The Chairman observed that the methodologies being adopted to reach large number of stakeholders needs to be revisited. The present methods would take a whole year to reach the 30000 stakeholders being targeted under the Cluster Promotion Programme. The people down the line, including the personnel of the state departments of sericulture need to be trained, services of the lead farmers and innovative farmers should be roped in, mobile telephone and press conferences could also serve the programme in a big way, he suggested.

As regards cash incentives given by the DoS, Andhra Pradesh for bivoltine and CB crops, the Chairman expressed his appreciations and urged the representatives of DoS of other states to consider similar support.

The scientist of the regional research stations should analyse the economic impact of the individual technological interventions *vis- a- vis* packages and give the feed back.

[**Action: Dr. G. S. Vindhya, Scientist-D, SEEM division and Heads of all RSRSs, CSRTI, Mysore]**

Item No. 8: Review of activities of RECs and Sub-units:

The progress in respect of activities undertaken at the RECs and sub-units was presented by the heads of the RSRSs concerned, which was appreciated by the house.

Item No. 9: Extension communication programmes:

The details of ECPs conducted during the period were presented by the heads of the RSRSs concerned, which was appreciated by the house.

Item No. 10: Training:

The house reviewed the training programmes conducted by the Institute and its nested units and appreciated the progresses well as efforts taken for generating income.

The Scientist concerned was advised to include more number of DoS personnel in the training programmes and indicate the percentage of DoS personnel trained in future presentations.

[**Action: Dr. S. D. Sharma, Scientist-D, Training division]**

Item No. 11: Technologies under patenting and commercialization:

The house noted with satisfaction that applications were filed for patenting two technologies- Navinya and Nemahari during the period. One product Poshan was commercialized and 13 technologies were offered to NRDC for commercialization.

Item No. 12: Discussion on recommendations of CSB-DOS collaborative on farm research projects / programmes [PAT, TOT etc.]

Dr. G. S. Vindhya, Scientist-D presented the progress in respect of the following projects / programmes.

1. Development of Seri-Lac culture model for income augmentation [In collaboration with Indian Institute of Natural Resins and Gums (IINRG), Ranchi]
2. Pre and Post Authorisation trials of silkworm hybrids with DOS Karnataka, Andhra Pradesh, Tamil Nadu, Maharashtra and Madhya Pradesh
   (i) Pre Authorisation field trials of L14 x CSR2: A new Polyvoltine x Bivoltine hybrid of silkworm *Bombyx mori* L with superior fibre qualities
   (ii) Popularization of authorized silkworm hybrids among the farmers of South India
3. All India Coordinated Experiment Trail for Mulberry [AICEM Phase-III]

4. Demonstration and transfer of technologies on spinning, mounting and cocoon harvesting to improve the quality of mulberry silkworm cocoon [In Collaboration with NRDC, Bangalore]

The house noted that the projects/ programmes are progressing as envisaged and congratulated the participating agencies.

Item No. 13: Review of recommendations of RC, EOM, RRAC & SLSCC meetings:

The house noted the suggestions / recommendations of the Research Council of the Institute held on 21st May 2013; Extension Officers Meeting held on 20th May 2013; Regional Research Advisory Committee of RSRS, Salem held on 18th March 2013 and Regional Research Advisory Committee of RSRS, Anantapur held on 7th July 2013 and expressed its appreciation for the efforts of the Committees.

Item No. 14: Subjects, if any, with the permission of the Chair:

Since no other subjects were raised for discussion the Chairman requested the members to give out their concluding remarks.

Concluding remarks:

The Chairman congratulated the scientists on the progress achieved during the reporting period and requested the members to give their remarks, that might have not been expressed during the days deliberations.

Sri. V. Prabhakaran, IFS, Director of Sericulture, Govt. of Tamil Nadu

The Director of Sericulture [TN] offered unconditional support to take up on-farm trials of technologies generated by the Institute in any of the 52 state farms. Production of dfls of improved hybrids may also be assigned to the state farms. He opined that there is a need to popularize moisture stress tolerant mulberry and hardy silkworm hybrids since large tracts of the sericulture belt are water deficit. He suggested that large tracts of coconut plantations in places like Pollachi could be brought under sericulture through popularizing the mulberry variety Sahana.

Further, he suggested that (i) early commercialization of cocoon harvesting machine and chawki tray washing machine (ii) designing low cost prefabricated silkworm rearing houses, (iii) designing effective rearing shed disinfection method based on the rearers model reported from Hassan, Karnataka (iv) introduction of artificial diet in chawki rearing centres, may be taken up on priority.

He opined that advocating intercropping in mulberry plantations needs to be re-looked in view of depletion of soil nutrients and inadequate replenishment.

Prof. Maheswaran, TNAU, Coimbatore, Tamil Nadu

It is very important that one acquires adequate knowledge of the phenotype and understands the biology of the host plant before employing molecular biology tools in plant improvement programmes. Drought tolerance and nutrient use efficiency are two important areas that the scientists should address. There is a need to strengthen the soil science department and also to induct a soil scientist in the RAC.

Dr. K. T. Sampath, Former Director NIANP, Bengaluru

The Institute should plan more inter-institutional programmes to address major problems faced by the industry.

Dr. C. S. Patil, Director, KSSRDI, Bengaluru

Labour saving and cost cutting should be the priority in developing any technology**.** Research on product/ by-product utilization should be taken up to augment income of the sericulturists.

Dr. Angadi, Director, NSSO, Bengaluru

The critical areas that need to be addressed by the scientists are (i) reducing drudgery, (ii) sex limited foundation crosses for CB dfl production, (iii) strategies to meet calamities / shortfalls, and (iv) establishing common facility centres in all clusters.

Sri. M. A. Rahaman, Joint Director, DoS, Karnataka

While appreciating the successful popularization of silkworm double hybrids in Srirangapattana, Mandya Dist., he was concerned for not up to date performance of double hybrids in some irrigated tracts. He also suggested that designing low cost rearing houses may also be taken up on priority since the cost of construction is rising by the day.

Dr. B. B. Bindroo, Director, CSRTI, Mysore

The Director thanked the Chairman and the members for tirelessly reviewing the projects/programmes of the Institute and offering valuable suggestions, and assured he would strive for prioritizing and implementing the suggestions in all earnestness. He sought the cooperation of the State departments of sericulture, KSSRDI, APSSRDI and CSB organizations in serving the stakeholders.

Chairman's remarks

Prof. K. Narayana Gowda, Vice-chancellor, UAS, Bengaluru, expressed that he is proud of the concerns and dedication of the scientists. He also thanked the honourable members for their inputs. Further, he informed the house that UAS, Bengaluru as a part of its golden jubilee celebrations is organizing several events and listed some of the important events and invited scientists to participate in them.

(i) KVK National conference – III week of Oct., 2013

(ii) Urban farming- exhibition and deliberations – I week of Nov., 2013

(iii) International Krishimela – II week of Nov., 2013
(iv) International seminar on extension strategies-5-8th Dec., 2013
(v) Global farm innovators meet- II week of Feb., 2014

He reiterated the importance of sericulture in country's economy and urged the scientists to think how best the enterprise can be oriented for effective land, soil and water management in future. The enterprise should also be oriented to attract rural youth, he added.

The meeting ended with vote of thanks.

Sd/-
CHAIRMAN

ANNEXURE-1

List of members and invitees who attended the meeting and others who sought leave of absence during 36th meeting of RAC of CSRTI, Mysore held on 19th July, 2013

Sl. No.	**Members and invitees attended**	
1.	Prof. K. Narayana Gowda, VC, UAS, GKVK, Bengaluru	Chairman
2.	Dr. B. B. Bindroo, Director, CSRTI, Mysore	Member Convener
3.	Prof. Nagaraju, Former Prof. & Head, Plant Pathology, UAS, Bengaluru	Member
4.	Dr. C.S. Patil, Director, KSSRDI, Bengaluru	Member
5.	Dr. K.T. Sampath, Former Director, NIANP, Bengaluru	Member
6.	Prof. Maheshwaran, TNAU, Coimbatore	Member
7.	Sri. V. Prabhakaran, IFS, Director of Sericulture, Govt. of Tamil Nadu	Member
8.	Sri. M. A. Rahaman, Joint Director, – representing the Commissioner, Govt. of Karnataka	Member
9.	Dr. P. Jayarama Raju, Scientist-C, CSB, Bengaluru- representing Director, CSB, Bengaluru	Member
10.	Sri. Bhanuprakash Raj, Scientist-C, CSTRI, Bengaluru- representing the Director CSTRI, Bengaluru	Member
11.	Dr. K. M. Ponnuvel, Scientist-C, SBRL, Bengaluru- representing Director, SBRL, Bengaluru	Member
12.	Dr. K. L. Rajanna, Scientist-D, RSRS, Kodathi	Invitee
13.	Dr. Chikkanna, Scientist-D, RSRS, Salem	Invitee
14.	Mr. Ch. Sathyanarayanaraju, Scientist-D, RSRS, Anantapur	Invitee
15	Dr. B. Mallikarjuna, Scientist-C, RSRS, Chamarajanagara	Invitee
16	Mr. Kirubakaran, Deputy Secretary (Tech.), RO, CSB, Chennai	Invitee
17	Dr. Vijaya Kumar, Asst. Secretary, RO, CSB, Mumbai	Invitee
18	Mr. Satish Kumar, Deputy Secretary (Tech), RO, CSB, Hyderabad	Invitee
	Members and invitees who sought leave of absence	
1	Dr. R. J. Rabindra**,** Dean, College of Post Graduate Studies, CAU, Umiam, Barapani, Meghalaya	Member
2	Dr. R. R. Prasad, Prof. & Head, Centre for Equity and Social Development, NIRD, Hyderabad	
3	Dr. S. Vadivelu, Principal Scientist (Retd.), NBSS & LUP, Bengaluru	Member
4	Dr. Rajeev Varshney, Principal Scientist & Director, Centre for Excellence in Genomics, ICRISAT, Hyderabad	
5	Dr. P. J. Raju, Director, APSSRDI, Andhra Pradesh.	Member
6	Dr. A. Manjula, Director, CSGRC, Hosur	Member
7	The Commissioner of Rural Development, Government of Kerala, Thiruvananthapuram, Kerala	Member
8	The Director of Sericulture, Govt. of Maharashtra, Nagpur	
9	The Commissioner of Sericulture, Govt. of Andhra Pradesh, Hyderabad	Member
10	The Commissioner of Sericulture, Govt. of Madhya Pradesh, Bhopal	Member
11	Mr. M. Ravi, Reeler, Salem, Tamil Nadu	Member
12	Mr. D. Ahammed Sab, Reeler, Hindupur, Andhra Pradesh	Member
13	Mr. N.R. Ramachandran, Sericulturist, Villuppuram, Tamil Nadu	Member
14	Mr. Somashekar, Sericulturist, K.R. Pete, Karnataka.	Member
15	Mr. Gurumurthy Chetty, Sericulturist, Chittoor, Andhra Pradesh	Member

Scientists of CSRTI, Mysore and its nested units who attended the meeting

Sl. No.	Name	Designation
CSRTI, Mysore		
1.	Dr. Satish Verma	Scientist-E
2.	Dr. Vindhya, G. S	Scientist-D
3.	Dr. Kanika Trivedy	Scientist-D
4.	Dr. Naseema Begum, A.	Scientist-D
5.	Dr. Ashwath, S. K.	Scientist-D
6.	Dr. T. Thippeswamy,	Scientist-D
7.	Dr. Balavenkatasubbaiah, M.	Scientist-D
8.	Dr. Surendra Dutta Sharma	Scientist-D
9.	Mr. Munikrishnappa, H. M.	Scientist-C
10.	Mr. Rajashekar, K.	Scientist-C
11.	Dr. Raveendra M. Mattigatti	Scientist-C
12.	Dr. Vineet Kumar	Scientist-C
13.	Ms. Rekha, M.	Scientist-C
14.	Dr. Prithvi Raje Urs, M. K.	Scientist-C
15	Ms. Sabita, M. G.	Scientist-C
16	Dr. Girish Naik Vorkady	Scientist-C
17	Dr. Gandhi Doss, S.	Scientist-C
18	Dr. Dasappa	Scientist-C
19	Mr. Renukeswarappa, J. P.	Scientist-C
20	Dr. Gunasekhar, V.	Scientist-C
21	Dr. Sibayan Sen	Scientist-C
22	Mr. Vinod Kumar Yadav	Scientist-C
23	Dr. Dinesh Datta Sharma	Scientist-C
24	Dr. Nishitha Naik, V.	Scientist-C
25	Dr. Pratheesh Kumar, P. M.	Scientist-C
26	Dr. Virendrakumar	Scientist-C
27	Dr. Munirathnam Reddy, M.	Scientist-C
28	Dr. Mal Reddy, N.	Scientist-C
29	Dr. Sharmila, K. K.	Scientist-C
30	Dr. Dayananda	Scientist-C
31	Dr. Manthira moorthy, S.	Scientist-C
32	Mr. Purushotham, S.	Scientist-C
33	Dr. Somaprakash, D. S.	Scientist-C
34	Dr. Santha, P. C.	Scientist-C
35	Mr. Satish B. Kulkarni	Scientist-C
36	Dr. Vinod Kumar (dr.)	Scientist-C
37	Dr. Mary Shery (Joseph), A. V.	Scientist-C
38	Mr. Narasimha Nayaka, A. R.	Scientist-C
39	Mr. Narendra Kumar, J. B.	Scientist-C
40	Mr. Nagaraja, S. B.	Scientist-C
41	Mr. Srinivasa, B. T.	Scientist-C
42	Dr. Gangadhar, B.	Scientist-C
43	Dr. Rajendra Singh Katiyar	Scientist-C
44	Dr. Geetha, G. S.	Scientist-C
45	Dr. Mahima Santhi, A.	Scientist-C
46	Mr. Parameshwara, C.	Scientist-C
47	Dr. Pallavi, S. N.	Scientist-C
48	Ms. Suma, A. S.	Scientist-C
49	Dr. Bhagya, R.	Scientist-C
50	Dr. Radhalakshmi, Y. C .	Scientist-C

51	Dr. Kariyappa	Scientist-C
52	Dr. Shivakumar, K. P.	Scientist-C
53	Mr. Kirsur Mukund Venkat Rao	Scientist-C
RSRS, Anantapur & nested units		Scientist-C
54	Dr. Sivarami Reddy	Scientist-C
55	Dr. T. Mogili	Scientist-C
56	Dr. G. Narasimha Murthy	Scientist-C
57	Mr. M. A. Shanthan Babu	Scientist-C
58	Mr. M. Chandrasekhar	Scientist-C
59	Dr. M. Venkatachalapathi	Scientist-C
RSRS, Chamarajanagara & nested units		
60	Dr. K. Kesawacharyulu	Scientist-C
61	Dr. K. Srikantaswamy	Scientist-C
62	Dr. K. C. Mahalingappa	Scientist-C
RSRS, Kodathi & nested units		
63	Mr. N. Shivashankar	Scientist-C
64	Dr. P. Sudhakara Rao	Scientist-C
65	Dr. P. Sudhakar	Scientist-C
RSRS, Salem & nested units		
66	Mr. Rajkumar	Scientist-C
67	Mr. O. K. Gopinath	Scientist-C
68	Mr. A. G. K. Daniel	Scientist-C
69	Mr. B. Mohan	Scientist-C
70	Ms. K. Sarala	Scientist-C
71	Ms. P. V. Soudamini	Scientist-C
72	Dr. S. Balasaraswathi	Scientist-C
73	Mr. N. G. Selvaraju	Scientist-C
74	Dr. S. Radhakrishnan	Scientist-C
75	Dr. P. Samuthiravelu	Scientist-C
76	Dr. N. Dhahira Beevi	Scientist-C
77	Mr. T. Thirunavukkarasu	Scientist-C
78	Dr. S. Masilamani	Scientist-C
REC, Hoshangabad [M.P.]		
79	Dr. Rajesh Kumar Khare	Scientist-C
REC Sub-unit, Shimoga		
80	Dr. H. Jayaram	Scientist-C
SSBS, Coonoor		
81	Mr. R. Gururaj	Scientist-D
82	Mr. E. Rajalakshmi	Scientist-C
P4 Basic Seed Farm, Hassan		
83	Dr. K. B. Chandrashekhar	Scientist-C