CENTRAL TASAR RESEARCH AND TRAINING INSTITUTE
RANCHI – 835 303, JHARKHAND

MINUTES OF THE 47TH MEETING OF RESEARCH ADVISORY COMMITTEE (RAC) OF CTR&TI HELD ON 18th January 2020 AT CTR&TI, RANCHI

The forty seventh meeting of Research Advisory Committee (RAC) of CTR&TI, Ranchi was held on 18th January 2020 under the Chairmanship of Prof. M.P. Sinha, Vice Chancellor, S.K.M. University, Dumka. At the outset, Dr. Alok Sahay, Director, CTR&TI welcomed the RAC Chairman, Members of RAC, invitees, representatives from DOSs and Scientists present in the meeting with "SUPRABHAT". Further, with due permission of the Chairman, Director expressed his views on few points as detailed below:-

1) Since last 55 years about 44 technologies have come out from different research projects but all the technologies have not reached to the stakeholders in existent therefore their field dissemination are also equally important.
2) Thrust areas should be addressed and projects should not be taken just to fulfil the targets of numbers.
3) Before conceiving any project, pilot study must be conducted and the information generated in the pilot study should be the foundation of the project. Director, CTRTI, Ranchi requested the members to give suggestions specific to the tasar culture rather than a general one.
4) He also requested all the members to stay till end of the meeting as the committee is ending its term in this meeting and give their valuable suggestions which can help the next committee members to take forward the flag of tasar industry ahead.

Director, CTRTI, Ranchi requested the Chairman, RAC to express his views and conduct the proceedings. Chairman expressed his gratitude and wished Happy New Year to all the participants. He stressed that researches should be field oriented to disseminate the findings to the stakeholders with the concept of lab to land and discuss the constraints of tasar and its stakeholders. He also opined that erratic transfer should not be done of those scientists who are perusing research projects. He observed this is the last meeting of the existing committee and in the next committee some faces may change but we belong to tasar family forever. The decisions taken by the RAC should be the recommendation and should be agreed upon by the CSB.

The Chairman, RAC also appreciated Dr. Alok Sahay, Director, CTR&TI, Ranchi for the initiative taken on utilization of by-products to make tasar culture more remunerative so that young people take it as entrepreneurship. The Chairman requested the RAC members to take active part in the discussion during the presentation on the

various R&D programmes being run at the Institute and give their valuable suggestions for the improvement. He also requested the DOSs and their representatives to appraise the scientist about the problem being face by farmers in their respective states.

The meeting then proceeded as per the agenda.

Agenda No. 1: Confirmation of minutes of 46th RAC meeting held on 15th June 2019.

Since no comments/suggestions have been received, the minutes of 46th RAC meeting were confirmed.

Agenda No. 2: Discussion on follow-up action taken on the decisions made in the 45th RAC meeting.

The follow-up actions taken on the decisions of last RAC with respect to projects were discussed along with the progress and findings of the projects.

Agenda No. 3: Review of the Concluded Research Projects

1. **[AIP-4711] Screening of fast growing drought tolerant *Terminalia arjuna* accessions for raising block plantation** (March 2016 – Feb. 2018) [PI: Dr. T. Pandiaraj, Scientist-B]

Dr. Bhat suggested to register the improved accessions (Acc. no. 102 & 123), selected improved hybrids of *Terminalia arjuna* and *T. tomentosa* and drought tolerant *T. arjuna* accessions in NBPGR, New Delhi along with all the relevant scientific data. He also suggested to compile the MLT data in form of some publication.

Director, CTRTI, Ranchi informed that multiplication and popularization of improved accessions (Acc. no. 102 & 123) and evaluation of selected improved hybrids of *Terminalia arjuna* and *T. tomentosa* and drought tolerant *T. arjuna* accessions will be taken in a project made in different tasar growing areas at different units of CTRTI, Ranchi as per the directions of RCS, Bangalore so that the scientists of RSRS & RECs should also be involved in the research done by the Institute.

(ACTION: Dr. Manjappa, Scientist-B & Dr. H. Yadav, Scientist-B)

Agenda No. 2: Discussion on follow-up action taken on the decisions made in the 46th RAC meeting.

Agenda No. 3: Review of the Concluded Research Projects

1. **[AIB-4706] Conservation of Andhra local ecorace *Antheraea mylitta* Drury through natural regeneration methods in Andhra Pradesh.** (April 2014 to March 2019) [PI: Mr. K.V.S. Rao, Scientist-C]

Director informed the house that focus on rearing, collection and multiplication of Andhra local for survival and conservation of the eco-race is in progress through the farmers and the State Govt. for conservation and judicious exploitation of this eco-race.

(ACTION: Dr. K.V.S. Rao, Scientist-C & PI & DOS, Andhra Pradesh and Telangana)

2. **[AIB-4709] Assessment of conservation status of tasar ecoraces in Odisha and their characterization including genetic diversity for delineation of conservation areas.** (November 2015 – October 2018) [PI: Dr. P.K. Kar, Scientist-D]

Director informed the house that as per the directions of the Central Office, Bangalore during Technical Audit meeting held on 19 & 20-12-2019, conservation of the tasar ecoraces in Odisha will be taken as a regular programme of work.

Dr. Bhat suggested Dr. Kar to go for ddRAD sequencing for characterising ecoraces and also to have proper sample size during the study (20-30 samples/ecorace)**.** Dr. Kulkarni expressed that effect of climate changes on insect movement/shifting also need to be studied. Director informed the house that under new project entitled "Study on existence of tropical tasar silkworm ecoraces and their subsist place with all the Geo-Tagged data" we are also focusing on this area.

(ACTION: Dr. P.K. Kar, Scientist-D & PI)

3. **[ARE-4710] Studies on the seasonal incidence, biology and management of yellow fly, *Xanthopimpla* sp. in tasar cultivation.** (March 2016 – February 2019) [PI: Dr. Jitendra Singh, PI, Scientist-B] - Collaborative with NCL, Pune

Dr. Jitendra Singh briefed the house that the identified chemicals will be validated at yellow fly infested centres (BSM&TCs/RSRSs/ RECs) during ensuing grainages.

(ACTION: Dr. Jitendra Singh, Scientist-B & PI)

4. **[CYR-4722] Development of ecorace specific package for production of quality tasar yarns. (**October 2016 - September 2018, extension request till March, 2020) [PI: Mr. Z.M.S. Khan, Scientist-D]

Director, CTRTI, Ranchi informed to the house that the package developed comprises of different concentrations and cooking/steaming time for Daba as well as Raily & Modal eco-races as these cocoon have different shells structures.

(ACTION: Mr. Debasish Chattopadhyay, Scientist-C & PI)

5. **[CYF-7077] Grading of tasar raw silk yarn - Development of method and procedures** (February 2016 – January 2019) [PI: Mr. Z.M.S. Khan, Scientist-D & Mr. Prakash Bhatt, Scientist-D, CSTRI, Bengaluru] - Collaborative with CSTRI, Bengaluru

Director, CTRTI, Ranchi informed that presently we don't have BIS data on Tasar and only twisted yarn should be sent to CSTRI, Bangalore for grading Dr. Sharma suggested that National Institute of Research on Jute and Allied Fibre Technology, a premier institute under ICAR and dedicated to the research of jute and allied fibres leading to the diversified use and industrial growth may be contacted for further refining the outcome.

(ACTION: Directors, CTR&TI, Ranchi & CSTRI, Bangalore; & Mr. Z.M.S.

Khan, Scientist-D, CTR&TI)

<u>Agenda No. 3</u>: Review of the Concluded Research Projects during 47th RAC meeting

1. **[PIP-4716] Gut-symbiont associations in *Antheraea mylitta* Drury feeding on Sal flora and their physiological implications.** (October 2017 – September 2019) [PI: Mr. M.M. Baig Scientist-B]

Mr. Baig presented the final report and progress made in the project.

Dr. Bhat asked the PI whether other stages of the silkworm have been studied to see the efficacy of Gut symbionts identified. Chairman, RAC expressed that a lots of ifs and buts are there in the outcome of this project. If the inoculates can survive in gut of the silkworm then only its action can be assessed and there is a need for antagonistic studies of these identified Gut symbionts. Dr. Kulkarni observed that if same species with different ecoraces are not completely surviving or feeding well, it may be due to allelopathic effect. He suggested that "Choice" & "No Choice" test may be done to ascertain the effect.

Director informed the house that many experiments have already been done on this aspect and the PI has been suggested to make grouping of the isolates and study the effect of its feeding / inoculation of isolates to the silkworm.

(<u>ACTION</u>: Mr. M.M. Baig Scientist-B & PI)

2. **[AIB-4717] Improvement of tropical tasar silkworm for high silk yield through recurrent selection.** (October 2016 - September 2019) [PI: Dr. Niranjan Kumar, Scientist-D]

Dr. Niranjan Kumar presented the final report and progress of the work done in the project and informed the house that findings of the project will be incorporated in the new proposed project *"Rejuvenation of ruling 'Daba' using Sal / Shorea based Daba through Shuttle breeding plan in its homeland of W. Singhbhum Jharkhand".*

(<u>ACTION</u>: Dr. Niranjan Kumar, Scientist-D & PI)

3. **[ARP-4718] Studies and use of selective metabolites extracted from the rhizosphere and phylloplane bacteria in control of AmCPV infecting the tropical tasar silkworm.** (October 2016 - September 2019, extended till December, 2019) [PI: Dr. G.P. Singh, Scientist-D]

Dr. G.P. Singh presented the final report and progress of the work done in the project. RAC members expressed that an early study should have been done prior to conceive such types of project. RAC Chairman expressed that the idea is ambiguous as it is known fact that bacterial can't have antagonistic effect against virus. Director suggested that the PI should study in other zone or places other than Ranchi to get some results and to come at some logical end of the project. For this one year extension and outsourcing will be required for identification of metabolites.

(ACTION: Dr. G.P. Singh, Scientist-D & PI)

4. **[ARE-4719] Studies on population dynamics of stem borers in tasar host plants and their management through IPM approach.** (September 2016 - August 2019) [PI: Dr. Jitendra Singh, Scientist-B]

Dr. Jitendra Singh presented the final report and progress of the project. Dr. Kulkarni asked to calculate LSD instead of P-values so that differences between the treatments are more evident.

Shri Uday Pratap Singh, IAS, Director, Sericulture (Jharkhand) observed that Neem based pesticide is an indigenous one, involves very low input and thus suitable for tasar farmers. He expressed that it will be quite beneficial to our farmers and recommended it for PPCs and nearby stakeholders. Director, CTRTI, Ranchi informed that MLT of the technology has been done during last year and this year also. This technology may be tried at PPCs level during next year.

(ACTION: Dr. Jitendra Singh, Scientist-C & PI)

Agenda No. 4: Review of the progress of Ongoing Research Projects.

1. **[PIB-4697] Development of superior hybrids of *Terminalia arjuna* and *Terminalia tomentosa for* higher leaf yield and quality:** Sub-project: "**Identification of hybrids by using molecular tools"** (May 2012 to Sept. 2018, extended up to March, 2020) [PI: **Dr. B. Surendranath, Sc-D**]

Dr. Surendranath presented the progress made under the project. Under sub-project: "**Identification of hybrids by using molecular tools"** the Chairman, RAC agreed upon to extend the period of sub project by 31-03-2020 to complete the work as requested by Dr. Surendranath and asked to submit the results under the project along with final report to this office.

(ACTION: Dr. B. Surendranath, Sc-D & PI of Sub project)

2. [ARP-4714] Identification of early sprouting and fast growing genotypes of *Quercus serrata* for raising block plantation in north-west India (March 2016 – February 2020) [PI: Mr. S. Paliwal, Scientist-D]

Mr. Paliwal presented the progress made under the project. The house observed that proper results have not come under this project. The PI was suggested to take the geographical data and passport data of the identified early sprouter and these data should be compared with data of those at RSRS, Bhimtal however the desirable results have been not achieved by the PI. Dr. Kulkarni expressed that the in some cases characters are also governed by the environmental factors and climatic zone-sprouting cycle of the selected plants may be different. He suggested that protocol available with FRI, Dehradun may be tried. The PI inform that the rooting could not be obtained even the technology developed by CTR&TI, Ranchi as well as those suggested by G.B Pant University, Pantnagar, Nainital and Forest Research Institute, Dehradun were tried.

Dr. Bhat suggested that cross pollinated progenies can be developed by applying growth regulators on dormant buds.

Director, CTRTI, Ranchi and Dr. Yadav suggested the PI to use cuttings of early sprouters in polyhouse at high altitude near Munshiyari area at Haldwani for low altitude and at RSRS, Bhimtal for middle altitude studies. Further, instead of cuttings, seeds can also be tried for developing seedlings. For the suggested work, six months extension was requested for which the Chairman agreed.

[ACTION: Mr. S. Paliwal, Scientist-D & PI]

3. **[PPA-4715] Effect of plant growth promoting rhizosphere microorganisms on leaf nutrient content of primary tasar host plants in forest and block plantation.** (October 2016- September 2019, extended till Sept, 2020) [PI: Dr. Manjappa, Scientist-B]

Dr. Manjappa presented the progress made under the project. Dr. Bhat suggested the PI to show some good photographs during the PPT presentation. He also stressed that at zero level the plants should be compared for proper results & no. of treatments for degree of freedom should be optimum and suggested to discuss with statistician to get best interpretation and results thereafter.

(ACTION: Dr. Manjappa, Scientist-B & PI)

4. **[AIT04002SI] Selection of stable thermos-tolerant line(s) of tropical tasar silkworm *Antheraea mylitta* through scar markers.** (February, 2019 to January, 2022) [PI: Dr. I. G. Prabhu, Scientist-B]

Dr. Prabhu presented the progress of the work done in the project. The house took note of the progress made in the project.

(ACTION: Dr. Dr. I. G. Prabhu, Scientist-B & PI)

5. **[AIE-3555] Cryopreservation of tasar silkworm, *Antheraea mylitta* semen and its artificial insemination.** (February 2016 – January 2019, extention requested till Aug, 2020) [PI: Dr. J.P. Pandey, Scientist-D]

Dr. Pandey presented the progress of the work done in the project. He briefed the house that due to the earlier impasse & shifting of the project from CSGRC, Hosur eventual delay of the work has occurred and requested for extension of the project up to Sept 2021 so that at least 04 crops can be covered for various experiments under the project. The Chairman granted the extension to the project till Sept., 2021 and suggested the PI to develop the protocol for Daba and tune it for other eco-races also under the project within the extended period of the project without any further extension. Mr. Anil kumar , DOS (Jharkhand) asked the PI about hatching percentage and rearing aspects of Cryopreservation. The PI replied that the hatching percentage was good and good rearing has been observed. On query of Dr. Sharma, the PI informed that 200 microlitre semen can be collected from single male moth. Dr. Bhat suggested for taking care of viability and sample size of sperms during the course of study. Chairman, RAC

suggested to find out the dose & optimum preservation duration required for successful insemination.

(<u>ACTION</u>: Dr. J.P. Pandey, Scientist-D & PI)

6. [**AIT-4727] Integrated biotechnological approach towards improvement of quality and productivity of tropical tasar silk.** (March, 2018- February 2021)

<u>Sub-Project-1</u>: Sequencing of whole-genome of tasar silkworm, *Antheraea mylitta* (in collaboration with NIAB, Hyderabad) [PI: Dr. J. P. Pandey] Funded by DBT, New Delhi

Dr. J.P. Pandey presented the progress of the work done in the project. Dr. Bhat enquired about the No. of chromosomes and linkage groups, PI informed that there are 31 pairs i.e n=31.

(<u>ACTION</u>: Dr. J.P. Pandey, Scientist-D & PI)

<u>Sub-Project-2:</u> Genetic characterization of tropical tasar silkworm, *Antheraea mylitta* through single nucleotide polymorphism based molecular barcode (in collaboration with University of Hyderabad) [PI: Dr. I. G. Prabhu] Funded by DBT, New Delhi

Dr. Prabhu presented the progress of the work done in the project. Chairman, RAC expressed his concern regarding completion of the project within the time frame. He informed that Bhimrao Ambedkar University Aurangabad (MH) is working on barcoding of different animals and PI may consult for any doubt or suggestion in his project to them. Director, CTRTI, Ranchi once again suggested the PI to incorporate the genetic characterization of cocoons collected by Dr. P.K. Kar, Sci-D under the concluded project AIB-4709.

(<u>ACTION</u>: Dr. Dr. I. G. Prabhu, Scientist-B & PI & Dr. P.K. Kar, Scientist-D)

7. **[AIT-4728] Identification most-active cocoonase of sericigenous insects and its variant through molecular characterization. (in collaboration with IISER, Pune and BIT, Mesra)** (March, 2018- February 2021) [PI: Dr. J. P. Pandey] Funded by DBT, New Delhi.

Dr. J.P. Pandey presented the progress of the work done in the project. The house took note of the progress made in the project.

(<u>ACTION</u>: Dr. J.P. Pandey, Scientist-D & PI)

8. **[CED-4723] Studies on utilization of solar energy in tasar post-cocoon technology operations.** (October 2016 – September 2019) Funded by MNRE, Govt. of India, New Delhi. [PI: Mr. Z.M.S. Khan, Scientist-D]

Mr. Khan presented the progress of the work done in the project. The PI requested for extension of the project up to March, 2020 due to delayed receipt of the

funds from MNRE, New Delhi. The Chairman granted the extension to the project till March, 2020 without any further financial aid.

(ACTION: Mr. Z.M.S. Khan, Scientist-D & PI)

9. **[CFC-07006MI] Studies on tasar cocoon drying and cooking using CSTRI Conveyer Dryer and pressurized cooking technology.** (Mar. 2018-Feb. 2021) (In collaboration with CSTRTI, Bangalore) [CI: Mr. Z.M.S. Khan, Scientist-D]

Mr. Khan presented the progress of the work done in the project. The house took note of the progress made in the project.

(ACTION: Mr. Z.M.S. Khan, Scientist-D & PI)

Agenda No. 5: Review of the Concluded & On-going Pilot Studies / Programme of Work

The progress of six on-going Programmes of Work (of continuous nature), as mentioned below, were reported to the RAC.

Ongoing Programmes of Work

1. **[CTR&TI/HPP/POW-02]Farm Management & Developmental works** [PI: Dr. H. Yadav Scientist-B]
2. **[CTR&TI/SWPT/POW-08]Application of disease management module (At CTR&TI Field).** [PI: Dr. G.P. Singh, Scientist-D]
3. **[CTR&TI/SWPT/POW-09]Laboratory production and supply of LSM** [PI: Dr. G.P. Singh, Scientist-D]
4. **[CTR&TI/SWPT/POW-17]Tasar silkworm disease management and monitoring system.** [PI: Dr. G.P. Singh, Scientist-D]
5. **[CTR&TI/HPP/ POW-22] Development of Package of Low Cost Based Organic Tasar Silk Production for Soil Health, Climate Resilience and Higher Productivity.** [PI: Dr. H. Yadav, Sc-B, Arboriculture & Dr. Manjappa, Sc-B, Soil Sci. & Chem.]
6. **[CTR&TI/HPP/POW-23]Eco-friendly management of parasitic nematode mermithids infesting tasar silkworm, *Antheraea mylitta* D.** [PI: Dr. B. Surendranath, Sc-D & Mr. M. M. Baig, Scientist-C]

Agenda No. 6: Evaluation of New Research Proposals

Current status of research projects submitted to CSB / DBT /DST for seeking the approval/ funding was appraised to the house.

A. Concept Notes on research proposals submitted / approved from C.O., Bangalore.

1. **Development of a package for optimum nutritional requirement of tasar host plants for producing quality tasar cocoons.**

The project has been approved by CSB, Bangalore and the project code [PIN04001SI] has been allotted. Dr. Jitendra Singh, Scientist-C is the new PI of this project.

[ACTION: PI: Dr. Jitendra Singh, Scientist-C]

2. **Decision support System for management of insect pests and diseases of tropical tasar silkworm *Antheraea mylitta* D.**

The project has been revised in the light of suggestions made in 42nd RAC and was sent to DST. At present according to DST norms the submission of the project is not allowed under Electronic Project Management Site (e-PMS). As per the 57th RC suggestions, budget is being sought from Department of Information & Communication, Tribal welfare and other such ministries. The Chairman, RAC suggested if this project is formulated on the basis of direct welfare of tribals then it can be perused in the Ministry of Tribal Welfare, Govt. of India.

[ACTION: Dr. Jitendra Singh, Sc-C & PI]

3. **Commercial scale purification of waste water sericin and its potential application in cosmoceutical industry.**

The PI informed the house that the project title has been revised as **"Mass level extraction of sericin from tasar cocoon cooking waste water and its cosmoceutical application"** and submitted to DBT for funding. Recently DBT has allotted Permanent Project Registration Number under Technology Development in Silk and its application in biomaterials Task force (The project is under active consideration).

[ACTION: Dr. K. Jena, Scientist-D & PI]

4. ***Cordyceps* production using tasar silkworm refuses for value addition.**

Mr. Baig presented the project proposal along with referee's comments and action taken by the PI. **House approved the project proposa**l and suggested to change the title as **"Tasar Waste to wealth by *Cordyceps*".**

[ACTION: M.M.Baig, Scientist-C& PI]

5. **Management of important pests of tasar silkworm *Antherea mylitta* (D) through botanical repellents.**

Dr. Gadad presented the project proposal along with referee's comments and action taken by the PI. Dr. Sharma suggested to expose the silkworm along with the other pests to the olfactometer to see the effect of the repellents on the silkworm also. **House approved the project proposal.**

[ACTION: Dr. Hanamant Gadad, Scientist-B & PI]

6. **Studies on the reproductive behaviour of tasar silkworm, *Antheraea mylitta* D with special reference to nutritional, physiological and mechanical approaches.**

Dr. Mala presented the project proposal along with the RCS comments and action taken by the PI. Chairman, RAC observed that concept and objectives are very good but the work plan is very vast and expresses his concern that whether the PI will be able to

complete the work within the stipulated time. Director, CTRTI, Ranchi observed that nutritional and mechanical approaches can be handled in first two years and then the physiological aspect can be addressed. On Dr. Bhat's query regarding RNA work plan in the project, the PI informed that quantitative based PCR expression will be taken for studying the vitellogenesis part. Chairman, RAC asserted that if referees' comments come positive, it can be sent to Central Office, Bangalore for final approval & allotment of Code no. Any query on referee can be addressed from the institute and if required may be referred to the Chairman, RAC.

[ACTION: Dr. Mala. N, Sc-B & PI]

7. **Study on existence of tropical tasar silkworm ecoraces and their subsist place with all the Geo-Tagged data.**

Dr. Prabhu presented the project proposal along with one referee's comment and action taken by the PI. Dr. Sharma observed that Radio technology was not found effective in case of big animals even. In a particular area, there may be several ecoraces and how they can be differentiated. Shri Dhirendra Kumar observed that such type of work has been done in case of mulberry. If this study becomes successful, it will be a great asset for tasar culture. Director, CTRTI, Ranchi briefed the house that during his visit to NESAC, Umiam, Meghalaya, a detailed discussion was held on this project proposal. House approved the project proposal. Chairman, RAC appreciated the project proposal and asserted that if referees' comments come positive, it can be sent to Central Office, Bangalore for final approval & allotment of code no.

[ACTION: Dr.D. I. G. Prabhu, Sc-C, & PI]

B. **Concept Notes submitted to C.O., Bangalore / Working Group on by-product utilization, C.O., Bangalore.**		
1.	**Application of natural green surfactants during softening/cooking of tropical tasar silk cocoons.** [PI: Shri Z.M.S. Khan, Scientist-D, CTR&TI, Ranchi	Concept Note was not considered by the RCS, C.O., Bangalore.
2.	**Biomedical application of tasar silk waste for preparation of wound dressing.** [PI: Shri Debasis Chattopadhyay, Scientist-C, CTR&TI, Ranchi]	*Project has been referred to the Working Group on by-product utilization. The project concept was also discussed during 46th RAC and resubmitted to the Working Group for further necessary action.*
3.	**Development and studies on effective valorization of silkworms (Vanya pupae) and mulberry waste based fish feed".** [PI: Dr. K. Jena, Scientist-D, CTR&TI, Ranchi]	Concept Note submitted to Working Group on by-product utilization, C.O., Bangalore and *awaiting the further necessary action by the Working Group.*

4.	**Application of Vanya silk protein sericin as an ideal source of nutraceutical component**. [PI: Dr. K. Jena, Scientist-D, CTR&TI, Ranchi]	Concept Note submitted to Working Group on by-product utilization, C.O., Bangalore for the needful.
5.	**Preparation and characterization of hydrogel from tasar silk wastes for bio- medical application**". **[PI: Shri Debasis Chattopadhyay, Scientist-C]**	Concept Note submitted to RCS, **fibroin** Bangalore for the needful.

Agenda No. 7: Technologies under trial and demonstration & results.

The house was informed that trials and demonstrations of following technologies were conducted at nested Units of the Institute.

1. Trial of Pebrine Visualising Solution (PVS) for mother moth examination were taken at RSRS Dumka (to be provided to 09 no. PGs), RSRS Baripada (to be provided to 20 no. PGs), RSRS Warangal (to be provided to 20 no. PGs), and REC Kapistha (to be provided to 01 no. PG).
2. Large scale field trials of Neem based pesticide for control of bark eater at farmers' level were taken by RSRS Baripada (100 no. farmers), RSRS Jagdalpur (70 no. farmers), RSRS Dumka (25 no. farmers), RSRS Warangal (50 no. farmers), REC CKP (50 no. farmers) and at unit level for rest of the units.
3. Multilocational trials of developed technology "Development of *in situ* soil health and nutrient management for tasar food plants" were taken at RSRS Dumka, REC Seoni-Champa and REC Chakradharpur.
4. Feasibility of Enzyme/pH based protocols for early detection of diseased larvae in 2nd crop rearing (Sept. – December) were tested at REC Seoni-Champa.
5. Brushing of Dfls at 5 days interval in 4 phases to identify the most suitable time for brushing and brushing direction in each crop were tried at all the RSRSs and RECs (Tropical).
6. Pruning of 30 plants (10 plants in 3 replications) at 10 days interval, starting from last week of February to May for monitoring Gall infestation and leaf yield were tried at all RSRSs and RECs (Tropical).
7. Demonstration of technique for separation of Sericin from tasar cocoon cooking waste water were given at REC Seoni-Champa (Chhattisgarh), DOS office, Bhagamunda (Odisha) & DOS, Jharkhand.
8. Practices regarding management of abiotic factors to regulate emergence in diapausing seed cocoons were demonstrated at BTSSO Bilaspur, DoS Baripada (Odisha), PPO Bengabad & Giridih (Jharkhand).

9. Demonstration of cooking and reeling/spinning methods for tasar cocoons were conducted at RSRS Bhandara (Tagged up with STSC Dharwad), RSRS Dumka (Tagged up with STSC Bhagalpur), RSRS Jagdalpur (Tagged up with ZO, CSTRI, Bilaspur), RSRS Baripada (tagged with STSC Cuttack), RSRS Warangal (tagged with SCTH, Dharmavaram), RSRS Bhimtal (tagged with DCTSC, Dehradun & TTL, Varanasi) and REC Kapistha (tagged with STSC, Malda).

Agenda No. 8: **Progress under training programme and HRD**

Dr. A. H. Naqvi, Scientist-D, Training section appraised the house that during the period under report, a total of 305 persons were imparted training under in-house and on-field training programmes organized at this Institute and its nested units. The house took note of the progress.

[ACTION: Dr. A. H. Naqvi, Scientist-D & Head, Training section]

Agenda No. 09: Any other subject with permission of the Chair

Director informed the house that we are working on rejuvenation of Daba for improvement in quality & quantity of Raw Silk production. He informed that under utilization of by-products the bark & leaf tablet as a medicine has been developed. Chairman, RAC observed that the scientific base of the product should be studied and established besides to work out the modus operandi, side effects, shelf life etc.

Dr. Sharma expressed that since long, IINRG is associated with this Institute. Now the time has come that we should move further for high value products for turning tasar waste in to wealth and from cultivation to commercialization to industrialization like sericin. Regarding eco-races, he observed that which ecorace is superior in which aspect and whether they can be combined through hybridization, needs to be studied. Host plant interaction is also one of the aspects which need to be addressed. He also opined that scientists are over loaded with the projects. He emphasized that 75%time should be for research and 25% for ToT, administration etc. and there should be core group concept so that if some scientists resigns or transferred the projects should run smoothly. Co-ordination and collaboration with other scientific Institutes are also need of the hour.

Dr. Bhat appreciated the presentations made by scientists and thanked for giving opportunity for association for last three years. He expressed that out of 44 technologies how much has gone to the stakeholders need to be reviewed. Project formulation should be on wider aspects to address the goals in a very effective manner as per the requirement of identified thrust areas and concrete objectives should be broken down to the proper activities. Output and outcome of the concluded project should be properly analysed in the form of product, quality or its commercialization. Research wealth in terms of host plants (341) and 44 ecoraces need to be addressed for whether these are really distinct or are just due to climate variation. The molecular work if done well, will add precision to those projects. He stressed that the results of the project should be published intermediately to show the confidence of the scientist on his/her findings.

Mr. Dhirendra Kumar, Member, RCC, CSB congratulated the scientists for working hard for the development of the tasar sector. He suggested that a model of rural development should be formulated based on tasar culture involving production of nucleus & basic seeds, rearing for production of cocoons, reeling and weaving. In Sikni a zero waste model has been developed and the yarn quality is better than the Chinese one. The technologies developed should be implemented there to make a showcase of the technological feasibility. He observed that tasar culture has the potential to support about 30 lakhs people. He offered his 100% support in any such endeavour. The problem/constraints felt by the scientists can be shared with him and he can discuss it with Govt. of India during discussion on Textile & Handloom policy of India. He urged the scientist to always keep trying hard with a positive attitude. He once again congratulated all the scientists and wished them all the best.

Dr. A.K. Yadav, DOS, Uttarakhand appreciated the Chairman, Director and the scientists for their hard and effective research work and observed the this should percolate from labs to the fields. He observed that everywhere there is emphasis on some innovative work and utilization of by-product is an important step in this direction. He stressed that utilization of by-products should be explored with scientific evidence till marketing / commercialization along with the economics. He also urged that oak tasar should also be given due care by CSB and Govt of India and requested for development of field level model or technology package for rearing of Oak tasar.

Mr. S. Majumdar stressed that pupae waste should be transformed into protein and should be utilized for value addition. Dr. Rathore thanked the institute that some of the technologies developed by this Institute have helped BSM&Cs in achieving their target by improving the host plant and silkworm health.

Director, CTRTI, Ranchi informed the house that we have mandate for project of academic as well as applied nature. Recently we have undergone MOU with BIT, Mesra and are trying to utilize Artificial intelligence with their help in identification of pebrine spores and grading of cocoons. We are having collaboration with IISER, Pune, Hyderabad University, NBAIR, Hyderabad, BIT, Mesra, IIT, Delhi and other institutes/colleges. For addressing the academic research we are working with faculties of Nirmala College and St. Xavier College, Ranchi. The possibility of utilizing the services of KVIK and NGOs are being explored. He observed that earlier the Institute was working on centrally decided thrust area but now a day we conduct exhaustive discussion in our RC for 4-5 days and after discussion with the scientist, thrust areas are decided. He stressed that we are working hard and managing in the crunches but every project cannot result in to a technology. He urged DOS, (UK) to strongly monitor the Oak Tasar Development Project for enhancement of production in terms of MT and also strengthen their stakeholders. He appreciated all the scientists working in RSRSs & RECs for their support to the tasar industry.

The Chairman narrated that a lot of discussion has been taken place. Every scientists sitting here is a master of some aspect of tasar culture and nowadays tasar is being listened at every forum. He stressed that we must have separate Vision plans & Action plans. Research is a step ahead in understanding the existing knowledge and adding new information to that knowledge. Tasar is providing livelihood to lakhs of farmers. He stressed that we can see the trunk of a tree but roots can't be seen. What is visible from outside depends upon the roots underlying. He emphasized that Research is a passion rather than a profession and the scientists should work day and night in their brain for betterment of the nation. He stressed that being critical about any project is for benefit of the project only to make it of high standards. He observed that there should a strong co-ordination among the Institutes like IFP, IINRG and others. He hoped that this Institute will keep moving ahead with strong commitment and conviction.

The Director, Dr. Alok Sahay thanked all the RAC members for their active participation in the meeting & also during last the three years, giving significant and worthy suggestions to the scientists.

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

(Prof. M.P. SINHA)

LIST OF PARTICIPANTS

CHAIRMAN:

1. Prof. M.P. Sinha, **VC,** S.K.M. University, Dumka & **Chairman**

MEMBERS:

1. Shri. Uday Pratap Singh, IAS and Director, DOS (Jharkhand)
2. Shri. Dhirendra Kumar, Member, RCC, CSB, Bangalore
3. Dr. K.V. Bhat, Principal Scientist, ICAR-NBPGR, New Delhi
4. Dr. Nitin Kulkarni, Director, IFP, Lal Gutuwa, Ranchi
5. Dr. K.K. Sharma, Director, IINRG, ICAR-Namkom, Ranchi
6. Dr. A.K. Yadav, Director, DOS, Uttarakhand
7. Dr. Subhas Naik.V, Director, CST&RI, Bangalore
8. Shri Sourab Majumdar, Sci-D & Representative CSTRI, CSB, Bangalore
9. Dr. Alok Sahay, Director, CTR&TI, Ranchi - **Member Convenor**

SCIENTISTS - INSTITUTE	**SCIENTISTS - NESTED UNITS / INVITEES**
1. Mr. Z.M.S. Khan, Scientist-D	19. Mr. Suresh Rai, Scientist-D, REC , Kapistha
2. Dr. Niranjan Kumar, Scientist-D	20. Dr. P.K. Kar, Scientist-D, RSRS, Baripada
3. Dr. G.P. Singh, Scientist-D	21. Dr. A.P. Bagade, Sc-D, RSRS, Bhandara
4. Dr. A. H. Naqvi, Scientist-D	22. Mr. Smoesh Paliwal, Sc-D, RSRS, Bhimtal
5. Dr. B. Surendranath, Scientist-D	23. Mr. A.S. Verma, Scientist-D, RSRS, Bhimtal
6. Mr. M.D. Tiwari, Scientist-D	24. Mr. Sunil Kumar Mishra, RSRS, Jagdalpur
7. Ms. Susmita Das, Scientist-D	25. Mr. S. Giri, Sc-D, RSRS/P-4, Dumka
8. Dr. J. P. Pandey, Scientist-D	26. Dr. M.S. Rathore, Sc-C, BTSSO, Bilaspur
9. Dr. K. Jena, Scientist-D	27. Dr. R.L. Ram, Sc-C, P-4-TBS, CKP
10. Dr. Vishal Mittal, Scientist-D	28. Dr. J. Binkadakatti, Sc-C, REC, Palampur
11. Mr. Debasish Chattopadhyay, Sc-C	29. Shri Anil Kumar, AD, DOS (Jharkhand)
12. Dr. Harendra Yadava, Scientist-B	30. Shri Lalan K. Singh, AD, DOS (Jharkhand)
13. Md. Muzeruddin Baig, Scientist- C	31. Shri R.P. Mondol, DS, RMB, Chaibasa
14. Dr. D.I.G. Prabhu, Scientist-C	
15. Dr. Jitendra Singh, ScientistC	
16. Mr. Manjappa, Scientist-B	
17. Dr. Hanmant Gadad, Scientist-B	
18. Dr. N. Mala, Scientist-B	