

**Fourth Meeting of the Research Advisory Committee (RAC)**  
**ICAR-National Institute of Biotic Stress Management (ICAR-NIBSM)**  
**Baronda, Raipur, Chhattisgarh**  
**(July 3, 2019)**

**PROCEEDINGS**

The 4<sup>th</sup> RAC meeting (first of the present RAC) of the ICAR-NIBSM was held on 03<sup>rd</sup> July 2019 at National Institute of Biotic Stress Management (NIBSM) Campus, Baronda, Raipur, Chhattisgarh, under the Chairmanship of Dr. C.D. Mayee, Former Chairman, Agricultural Scientists Recruitment Board (ASRB), along with other members including Dr. V.V. Ramamurthy, Ex-Principal Scientist, Division of Entomology, ICAR-IARI, New Delhi, Dr. S.S. Singh, Ex-Director, ICAR-IIWBR, Karnal and Dr. M. Anandaraj, Ex-Director, ICAR-IISR Calicut and ICAR-IIHR, Bangalore, Dr. Jagdish Kumar, Director (Acting), ICAR-NIBSM and Dr. P. Kaushal, Joint Director (Research), ICAR-NIBSM & Member Secretary, Research Advisory Committee (RAC). Dr. P.K. Chakrabarty, Member, ASRB and Ex-Assistant Director General (PP&B), ICAR attended as a special invitee. Other RAC members, Dr. P. Ananda Kumar, Ex-Project Director, ICAR-NRCPB, New Delhi and Dr. Rajan, ADG (PP &B), ICAR could not attend the meeting. This meeting was also attended by Incharge PME (Dr Anil Dixit, Principal Scientist) and section incharges viz., Dr. S.K. Jain, Principal Scientist (Plant Pathology) & I/c Pathology Section, Dr. R.K. Murali Baskaran, Principal Scientist (Agricultural Entomology) & I/c Entomology and Nematology Section, Dr A. Dixit, Principal Scientist (Agronomy) and I/c Analytical and weed science section; and Dr. P.N. Sivalingam, Senior Scientist (Plant Biotechnology) and I/c Biotechnology Section.

In the forenoon session, the RAC members and ICAR-NIBSM authorities visited the institute buildings under construction and discussed the overview of the administrative, library, auditorium, schools and hostel buildings. After this visit, the Chairman RAC and other members inaugurated the Plant Growth Chamber and Whitefly Rearing Facility developed under ICAR-NASF project in the presence of staff of the NIBSM, followed with planting of tree saplings.

The proceedings of the meeting started with the welcome note of Dr. Jagdish Kumar. He also presented the genesis of the Institute, establishment, mandate and objectives of the schools as per Union Cabinet Report, research and proposed education programmes under various divisions and disciplines. Dr. Anil Dixit presented the action taken report on the recommendation of 3<sup>rd</sup> RAC meeting, which was adopted by the present RAC committee. Dr. P. Kaushal presented the achievements of research and outreach programmes of the institute. He also presented an overview of the publications, laboratory establishment, stream lining of research programme and formulation of sections, and indicated the potential areas for immediate attention, planning for short-term and long-term goals. Committee appreciated the research achievements made by the Institute.



During afternoon session on interaction between Scientists and RAC members, research interests, results and thrust areas were discussed. On this occasion, the Committee also released the publication “Weed Atlas of Chhattisgarh”, in both printed and e-copy form, as well as the ICAR-NIBSM Annual Report 2018-19.

Following points were specifically discussed during the meeting:

#### **Institute Mandate**

1. As per the Union Cabinet report and in accordance with the previous RAC comments, this committee endorsed and recommend that this institute should focus to work on biotic stress of the crops. This committee also recommended replacing the word “Agriculture” to “Crop” in the mandate of the institute.
2. RAC suggested revising the institute vision by replacing the word “Freedom” appropriately with “Effective mitigation”.

#### **Research**

1. NIBSM must work on current issues of basic and applied research. Uniqueness and novelties in research should be incorporated, including the latest technological interventions. In-fact, NIBSM should identify the areas addressing groups of biotic stresses/crops and identification of underlying common philosophy. Avoid duplicative research already being undertaken by commodity specific Institutes.
2. NIBSM should concentrate on deciphering molecular biology and cellular processes responsible for stress reaction, mapping of quarantine and invasive pests and molecular aspects of virus-vector relationships.
3. Some novel areas suggested by the committee, which can be appropriately taken up once the infrastructure and human resources are attained, included efficient diagnostics utilizing volatile compounds, usage of acoustic tools and softwares such as e-nose, forecasting model development, developing consortia of biocontrol agents and testing for a group of insect pests and pathogens affecting a crop species, influence of soil nutritional status/ deficiency on crop health, and development of genetic stocks for resistance to selected pests and diseases and for alien introgressions.
4. NIBSM must develop state-of-the-art phenomics and genomics facilities to undertake studies as a referral centre in future. Till then, phenomics facility available with other ICAR institutes may be explored to characterize and identify desirable features, the genomics studies must focus on generation and utilization of latest facilities including transcriptome/metagenome research, emphasis must be given on computational/ bioinformatic biology works, and


development of guidelines for the usage of nanotechnology and robotic technology in biotic stress management.

5. Institute should emphasize on characterizing metabolomics/ secondary metabolites involvement in disease reaction and also should proceed towards *in silico* analysis of various potential molecules from microbes with a potential for drug discovery, especially anti-microbial peptides (AMPs). Intellectual property right (IPR) issues, especially the patentable technologies, must be prioritized. Efforts on developing super-donors in different crops may be strengthened to develop appropriate source material (donors) to the researchers (plant breeders, plant protection scientists and plant molecular biologists).
6. Committee appreciated the achievements made in Farmer FIRST Project, and advised for immediate publication as a success story.

#### **Compilation of information and developing software as lead centre**

1. NIBSM should attempt to compile the information on resistance sources available against major pests and diseases and also assemble resistance sources in less explored crop species like pulses, small millets, oilseeds, fodders etc.
2. NIBSM should concentrate on developing Pest Risk Analysis (PRA) model for important insect pests and diseases notified by Agricultural and Processed food products Export Development Authority (APEDA) as well as transboundary diseases/pests having potential threat of entry into India. This information should be linked/shared with other institutes. Collaborative work with ICAR-NBAIR on invasive pests and biological control with predators and parasitoides may be developed.
3. Establish high computing servers including software for computational science and annotation of genomic data. Suitable backup and safety must be ensured for these servers in upcoming buildings. Appropriate inclusions be made in forthcoming SFC/EFC document of the Institute.
4. Vision documents needs to be prepared with appropriate time-line for individual schools on research as well as education.

#### **Establishment and training**

1. Proposal to establish a "Pest and Pathogen Monitoring Cell" in the Institute for monitoring and surveillance of biotic stresses in the country with a leadership role in co-ordination with other related institutes be prepared and submitted to ICAR.
  2. Proposal may be followed up with the ICAR-HRD on advanced training of scientists of the institute to cater the needs of institute mandate, in the identified national and international laboratories. Suitable provision be included in forthcoming SFC/EFC.
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## **Education**

1. Establishment of education system must be given utmost priority. The information be collected on the best of the universities across the globe and that be kept as a benchmark. A proposal must be moved to University Grants Commission (UGC) for granting deemed varsity status mentioning about the Cabinet decision and the genesis of the institute.
2. Institute should describe the objectives of individual schools, disciplines, thrust areas of research etc. which should be unique in the country, identify the suitable research model to create platform for inter-institute research and education. Make immediate attempts to prepare the course curriculum and develop complete policy for education system with time line.


## **Brain storming session**

1. Institute should organize a brain storming session:
  - (i) to identify areas of basic and strategic research on biotic stress of crops where other institutes are not working,
  - (ii) to develop education programme, and
  - (iii) to prepare short term (5 years) and long term (20-25 years) goals.

The experts involved in plant protection research should be invited from ICAR, SAU, DRDO, DS, DBT etc. This brain storming session may be organized in the form of workshop on "PLANT HEALTH". After thorough discussion and avoiding duplication, the research programme should be formulated and submitted to ICAR for approval. Efforts be made to conduct this programme under chairmanship of highest authorities from ICAR headquarter.

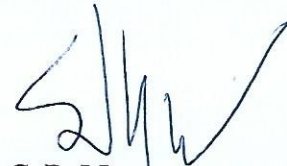
2. Efforts must also be made to conduct regular workshops involving institutes under Plant Protection and Biosafety (PP&B) section of the ICAR Crop Science Division, as well as the three sister institutes viz., Indian Institute of Agricultural Biotechnology (IIAB) Ranchi, National Institute of Abiotic Stress Management (NIASM) Baramati and NIBSM Raipur.
3. NIBSM should establish linkages and collaboration with related institutes on similar genesis and concepts.
4. NIBSM, with upcoming excellent infrastructure, must also think of establishing an "INTER-UNIVERSITY RESEARCH CENTRE" to invite researchers and educationists for short or long durations either on sabbatical or otherwise to pursue their research projects in related areas of the Institute. It will be very useful to fulfil the objectives of the institute through this program in view of the limited scientific manpower at NIBSM. It was suggested that a blueprint of this proposal be made available in the next meeting before it is sent for approval to ICAR. It was also suggested that Joint Director (Research) may visit such a centre of ASTRONOMY created by Dr Jayant Narlikar in Pune University, Pune, and other similar institutes, to get wider ideas on the creation of such a centre at NIBSM.

The meeting ended with vote of thanks to the Chairman, the RAC members and invited guests by Dr. P. Kaushal, JD(R) & Member Secretary, RAC.



16/8/19.

**P. Kaushal**  
**(Member Secretary)**



**C. D. Mayee**  
**(Chairman)**

List of RAC members, special guest and invitees who attended the 4<sup>th</sup> RAC meeting held at ICAR-NIBSM, Baronda, Raipur, on 3<sup>rd</sup> July 2019:

1. **Dr. C. D. Mayee**, Chairman RAC and Former Chairman ASRB.
2. **Dr. V.V. Ramamurthy**, Member RAC, Ex-Principal Scientist, Division of Entomology, ICAR-IARI, New Delhi.
3. **Dr. S.S. Singh**, Member RAC, Ex-Director, ICAR-IIWBR, Karnal.
4. **Dr. M. Anandaraj**, Member RAC, Ex-Director, ICAR-IISR Calicut and ICAR-IIHR, Bangalore.
5. **Dr. Jagdish Kumar**, Member RAC, Director (Acting), ICAR-NIBSM Raipur.
6. **Dr. P.K. Chakrabarty**, Special Invitee, Member, ASRB and Ex-ADG (PP&B) ICAR New Delhi.
7. **Dr. Anil Dixit**, PS, I/c PME-NIBSM and section I/c Analytical and Weed Science Section, NIBSM Raipur.
8. **Dr. S.K. Jain**, PS & I/c Pathology Section, NIBSM Raipur.
9. **Dr. R.K. Murali Baskaran**, PS & I/c Entomology and Nematology Section, NIBSM Raipur.
10. **Dr. P.N. Sivalingam**, Sr Sci & I/c Biotechnology Section, NIBSM Raipur.
11. **Dr. P. Kaushal**, Joint Director (Research), Member Secretary, RAC, NIBSM Raipur.





Consolidated strategic recommendations of the fourth RAC meeting of the NIBSM Raipur, held on July 3, 2019.

S. No.	Recommendations
<b>Mandate of the Institute</b>	
1	The institute should focus on research on biotic stresses of the crops. The word 'Agriculture' may be replaced by 'Crop' in the mandate of the institute.
<b>Research</b>	
1	NIBSM should identify the areas addressing groups of biotic stresses/crops and identification of underlying common philosophy and concentrate on deciphering molecular biology and cellular processes responsible for stress reaction, mapping of quarantine and invasive pests and molecular aspects of virus-vector relationships.
2	Institute should emphasize on characterizing metabolomics/ secondary metabolites involvement in disease reaction, especially anti-microbial peptides (AMPs). Efforts on developing super-donors in different crops may be strengthened. Collaborative work with ICAR-NBAIR on invasive pests and biological control with predators and parasitoides may be developed.
3	NIBSM should also concentrate on developing Pest Risk Analysis (PRA) model for important insect pests and diseases notified by Agricultural and Processed food products Export Development Authority (APEDA) as well as transboundary diseases/pests having potential threat of entry into India
<b>Establishment and HRD</b>	
1	Proposal to establish a "Pest and Pathogen Monitoring Cell" in the Institute for monitoring and surveillance of biotic stresses in the country with a leadership role in co-ordination with other related institutes be prepared and submitted to ICAR.
2	NIBSM must proceed to establish an 'Inter-university Research Centre' to invite researchers and educationists to pursue their research work (short or long terms), and must develop suitable facilities to undertake studies as a referral centre in future.
3	Brain storming session may be organized for identifying thrust areas and developing education programme for various schools of the institute. Additionally, regular workshops may be conducted involving institutes under PP&B section, IIAB Ranchi and NIASM Baramati.
4	Establish high computing servers including software for computational science and annotation of genomic data. Appropriate inclusions be made in forthcoming SFC/EFC document of the Institute.
5	Proposal may be developed with ICAR-HRD section on advanced training of scientists of the institute at the identified national and international laboratories. Suitable provision be included in forthcoming SFC/EFC.
<b>Education</b>	
1	Establishment of education system must be given utmost priority. Immediate attempts be made to prepare the course curriculum and develop complete policy for education system with time line. A proposal must be forwarded to University Grants Commission (UGC) for granting deemed varsity status mentioning about the Cabinet decision and the genesis of the institute.