



PROCEEDING OF

International Satellite Symposium of VIROCON Brainstorming workshop on TADs/EIDs

*Transboundary and Emerging infectious Zoonotic diseases of Livestock including
Wildlife: Perspective and preparedness*

16th Feb, 2023

Time: 09:30 AM onwards

Organized by:

**Department of Veterinary Microbiology
College of Veterinary Science, Assam Agricultural University
Khanapara, Guwahati- 781022, Assam**

Under aegis of Indian Virological Society



SCHEDULE OF

International Satellite Symposium of VIROCON

Brainstorming workshop on TADs/EIDs Date: 16th Feb, 2023

| SCHEDULE | | TIME (IST) | DURATION |
|--|--|-------------|------------|
| Inaugural Session | | 9:30-10:30 | 60 minutes |
| High Tea | | 10:30-10:45 | 15 minutes |
| TECHNICAL SESSIONS | | | |
| Opening Remarks | Dr R.K Singh, Former Vice-Chancellor, ICAR-IVRI | 11:00-11:10 | 10 minutes |
| Sub Theme 1 Chairman: Dr V. K. Gupta, Director, ICAR-NRC on Pig Co-Chairman: Dr SK Das, Rt Professor Rapporteurs: Dr Shantanu Tamuli Dr LukumoniBuragohain | Molecular epidemiology of Transboundary and Emerging Zoonotic diseases. Speaker: Dr YPS Malik, Dean, College of Animal Biotechnology, GADVASU, Ludhiana | 11:15-11:35 | 20 minutes |
| | | 11:35-11:40 | 5 minutes |
| | Remarks from the Chairman | | |
| Sub Theme 2 Chairman: Dr P. Borah, Professor Co-Chairman: Dr Rajib Sharma Rapporteurs: Dr Shantanu Tamuli Dr LukumoniBuragohain | Risk assessment and early warning systems for TADs / EIDs Speakers: 1. Dr B. R. Gulati , Director, ICAR-NIVEDI, Bengaluru Risk assessment of TADs / EIDs and strategy for development of decision support system (DSS) | 11:45-12:00 | 15 minutes |
| | | 12:05-12:20 | 15 minutes |
| | | 12:20-12:25 | 5 minutes |
| | 2. Dr K. P. Suresh, Principal Scientist, ICAR-NIVEDI, Bengaluru Fore warning methods for TADs / EIDs Remarks from the Chairman | | |
| Sub Theme 3 Chairman: Dr A. Sen, Principal Scientist, ICAR-RC-NEHR Co-Chairman: Dr G K Saikia, Professor Rapporteurs: Dr Shantanu Tamuli Dr LukumoniBuragohain | Role of lower mammal and livestock at wild life-human-livestock interface in spillover of EIDs. Speaker: Dr Uma Ramakrishnan, Professor, NCBS, Bengaluru/ B R Ansil | 12:30-12:45 | 15 minutes |
| | | 12:45-12:50 | 5 minutes |
| | Remarks from the Chairman | | |

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| <p>Sub Theme 4 Chairman: Dr Praveen Malik, Former Animal Husbandry Commissioner Co-Chairman:Dr Swaraj Rajkhowa Rapporteurs: Dr Durlav Prasad Bora Dr Arijit Shome</p> | <p>Zoning and compartmentalization as a tool for improved resilience to control TADs. Speaker: Dr Dietze Klaas, FLI, Germany</p> <p>Remarks from the Chairman</p> | <p>12:55-13:15 (8:25 a.m in Germany)</p> <p>13:15-13:20</p> | <p>20 minutes</p> <p>5 minutes</p> |
| <p>Sub Theme 5 Chairman: Dr Sachin Kumar, Professor Co-Chairman: Dr Sutopa Das Rapporteurs: Dr Durlav Prasad Bora Dr Arijit Shome</p> | <p>Developing One Health Nipah virus vaccine for pig and Human. Speaker: Dr Simon Graham, Group leader, Vaccinology, Pirbright, UK</p> <p>Remarks from the Chairman</p> | <p>13:25-13:45 (7:55 a.m in UK)</p> <p>13:45-13:50</p> | <p>20 minutes</p> <p>5 minutes</p> |
| LUNCH BREAK | | 13:50- 14:50 | 60 minutes |
| <p>Technology Showcasing Chairman: Dr D. K. Sarma, Former National Fellow Co-Chairman:Dr K Sharma Rapporteurs: Dr Durlav Prasad Bora Dr Arijit Shome</p> | <p>Farmers-Academia- Industry interaction Speakers:</p> <ol style="list-style-type: none"> 1. Dr N.N Barman 2. Representative from Indian Immunologicals, Dr Surya Prasad 3. Representative from Hester Biosciences, Dr. Manoj Kumar 4. Representative from GeNext Genomics, Ms Prachi Tiwari <p>Remarks from the Chairman</p> | <p>14:50-15:00 15:05-15:15 15:20-15:30 15:35-15:45</p> <p>15:45-15:55</p> | <p>10 minutes 10 minutes 10 minutes 10 minutes</p> <p>10 minutes</p> |
| <p>Plenary Session Chairman: Dr K M Bujarbaruah Co-Chairman: Dr YPS Malik Rapporteurs: Dr Shantanu Tamuli Dr LukumoniBuragohain</p> | | 16:00-17:00 | 60 minutes |
| TEA | | 17:00 onwards | |
| DINNER | | 20:00 onwards | |

The Symposium was conducted in Hybrid mode (both Online and Offline) at Department of Veterinary Microbiology, College of Veterinary Science, AAU, Khanapara, Guwahati, Assam on 16th February, 2023.

The meeting commenced with a warm welcome to all the participants of the Brainstorming Session present in both Online and Offline mode from various parts of the country and abroad by Dr. N.N. Barman, Organising Secretary cum Professor and Head, Department of Veterinary Microbiology, CVSc, AAU, Khanapara. Dr. Barman welcomed Dr. Bidyut Chandan Deka, Hon'ble Vice Chancellor, Assam Agricultural University, Dr. YPS Malik, Dean, GADVASU cum Secretary General, Indian Virological Society, and Dr. Birendra Nath Bhattacharyya, Director of Research(Vety), AAU, Khanapara and ushered them the chair in the dais.



As per tradition of the host Institute, all the esteemed dignitaries & guests were felicitated with Fulam Gamocha and a memento. To commemorate 48 years of existence of the Department of Veterinary Microbiology, stalwarts of the Department were also felicitated with Cheleng Sador and a memento. Dr. Barman has also highlighted the endless contributions of former Professors towards the development of the Department and contribution to the society as a whole.

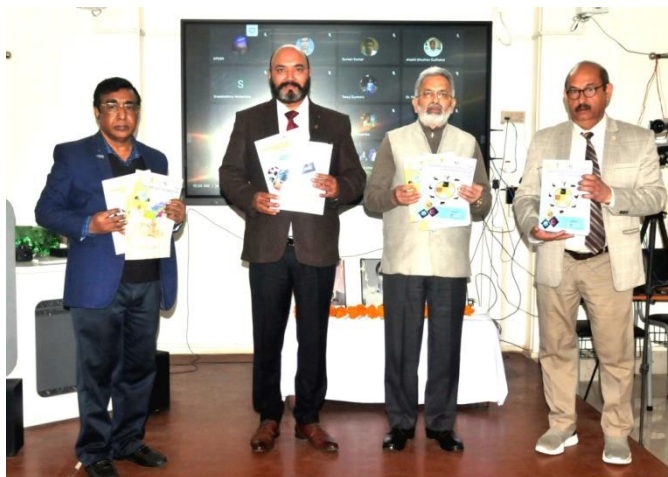
Dr. B.C Deka, Hon'ble VC, AAU has graced as chief guest and addressed the participants with his opening remarks. Dr. B.C. Deka has highlighted several measures to contain TADs/EIDs and also committed to provide all the possible support from the University side. Dr. Deka then declared the Brainstorming Session "Inaugurated".



Dr. YPS Malik, Dean, GADVASU cum Secretary General, Indian Virological Society, has addressed the house and highlighted the aims and objectives of Indian Virological Society. He is also a member of International Union of Microbiological Society (IUMS). Dr. Malik briefed about the history and achievements of the Society and has introduced the Past Presidents and Other members along with the Current Executive Committee's profile. Dr. Malik, highlighted about the various conferences, workshops, trainings etc which are frequently organised by the Indian Virological Society.



It was followed by release of Compendium of Virocon 2023, SDP, Connect NER vets by Dr. YPS Malik, Dean, GADVASU cum Secretary General, Indian Virological Society; Dr. P Malik, Chief Executive Officer, Agrinnovate India Limited, DARE, Department of Agriculture & Farmers welfare, Govt of India and Dr. Birendra Nath Bhattacharyya, Director of Research (Vety), AAU, Khanapara.



Dr. Birendra Nath Bhattacharyya, Director of Research (Vety), AAU, Khanapara, addressed the gathering with a warm welcome and presented his views on importance of transboundary and emerging infectious zoonotic diseases of livestock including wildlife. Dr. Bhattacharyya stated that climate change is one of the major factors influencing the emerging diseases and marks the end of the inaugural session.



Organising Secretary, Dr N N Barman after the Tea-Session invited Dr R.K Singh, President of the IVS and former Vice-Chancellor, ICAR-IVRI, and made opening remarks in Virtual mode. Dr. Singh has presented a very detailed and crisp presentation on Importance and economic significance of zoonotic diseases citing recently emerged COVID pandemic. Dr. Singh has emphasised on preparedness of laboratory facilities, SOPs, diagnostics along with trained manpower facility to deal with such pandemic. Awareness program is much needed to identify and tackle with such pandemic situation. Dr. Singh concluded his remarks with good wishes to the organizing committee along with the participants present in Virtual as well as Physical mode.



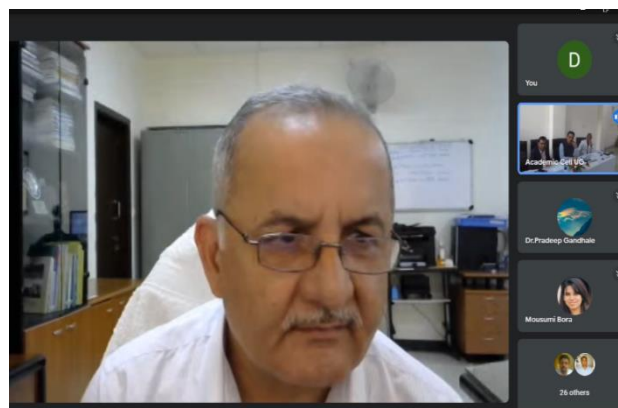
Following the President's opening remark, the Technical session was started on Sub Theme 1: **“Molecular epidemiology of Transboundary and Emerging Zoonotic diseases”**. The session was Chaired by Dr. V.K. Gupta, the Director, ICAR-NRC on pig and Co-Chaired by Dr. S.K. Das, Rt Professor. The Speaker of the session, **Dr YPS Malik, Dean, College of Animal Biotechnology, GADVASU, Ludhiana** presented his talk on **Transboundary and Emerging Zoonotic diseases**.



Important points discussed by Prof Malik were:

- With increasing human population, livestock industry needs to be upscaled to meet the growing demand of food. Livestock share an important role in contributing to Indian economy. With time there is a decrease in livestock population which is due to Emerging Infectious diseases. History records many such **deadly epidemics and global pandemic** diseases.
- Epidemiological data on the emerging, trans-boundary and zoonotic diseases of livestock needs to be developed with focus to identify the disease hotspots and associated risk factors. Emphasis should be on farm biosecurity strengthening at large and small scale farmer's level. Awareness amongst farmers and skilled man power to adopt better strategies for prevention and control of such diseases.
- Complete genome based molecular characterization of the emerging, transboundary, zoonotic and endemic viruses must be conducted at regular interval so that important mutations, genotypic shift and virulence patterns/factors of the viruses could be well understood to formulate need-based diagnostics and vaccines based on the circulating strains.

2.Next technical session in Sub Theme 2: **Risk assessment and early warning systems for TADs / EIDs** was chaired by Dr P. Borah, and **Co-Chaired** by Dr Rajib Sharma. The speaker of the session, **Dr B. R. Gulati , Director, ICAR-NIVEDI, Bengaluru**, presented his talk on Risk assessment of TADs / EIDs and strategy for development of decision support system (DSS) in virtual mode.



Important points discussed by **Dr B. R. Gulati** were

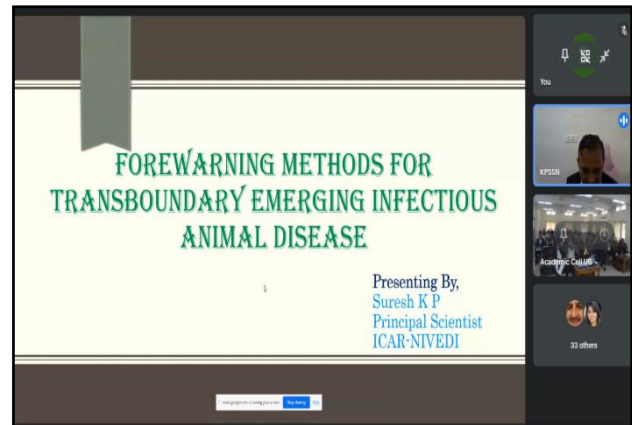
- There should be extensive survey to generate knowledge aptitude and practice (KAP) data, risk associated base line data for EIDs/TADs so as to formulate robust early

warning and decision support systems (DSS) against emerging and trans-boundary diseases for the stakeholders/farmers.

- Risk assessment is important to identify hazards, to evaluate the associated risk factors (Host associated, Agent related factors, Environmental and management factors) so as to determine appropriate ways to eliminate or control the EIDs and TADs.
- To control and prevention of TADs, vaccination and post- vaccination monitoring, control of vectors that can spread the disease and maintaining field Biosafety and Biosecurity should be done.

1. Next speaker of the session **Dr. K. P. Suresh, Principal Scientist, ICAR-NIVEDI, Bengaluru** presented his talk on **Forewarning Methods for Transboundary Emerging Infectious Animal Disease.**

Important points discussed by Dr. K. P. Suresh were



1. Dr. Suresh emphasized about NADRSEv2 web software and demonstrated how to use it for generation of disease map, risk map and for sampling plan preparation.
2. Artificial intelligence and IT based methods for disease mapping, outbreak prediction and disease diagnosis should be developed in the country.
3. He pointed out a farmers' friendly mobile App for disease reporting, for disease surveillance and to receive disease advisory so as to take immediate action on the outbreak.
4. According to him utmost priority should be given to strengthen the existing disease reporting systems. Similar to the World Animal Health Information System (WAHIS) of the World Organization for Animal Health, a national disease reporting system for all trans-boundary and emerging infectious diseases should be developed.

5. Next technical session in Sub Theme 3: **Role of lower mammal and livestock at wild life-human-livestock interface in spillover of EIDs** was chaired by Dr G K Saikia, Professor. The speaker of the session was **Dr Uma Ramakrishnan, Professor, NCBS, Bengaluru. On her behalf Dr. B R Ansil** presented his talk on **Role of bats, small mammals & Livestock in pathogen spillover at wildlife livestock human interface.**



Important points discussed were

1. Majority of emerging diseases are found to be zoonotic. Which could be due to many reasons such as Community composition changes, increased human wildlife interactions, potential pathogen spillover.
2. Environment stressors increases viral shedding & correlate with spillover events.
3. Habitat modification increases emerging infectious disease risk
4. Domestic mammals share various viruses with small mammals and bats
5. Long term studies will help understand ecological correlates of pathogen spillover
6. India has high risk of zoonotic spillover.
7. Extensive study should be carried out on spill over of Emerging Zoonotic pathogens at wildlife-domestic animals-human interface using lower mammal as sentinel animal.

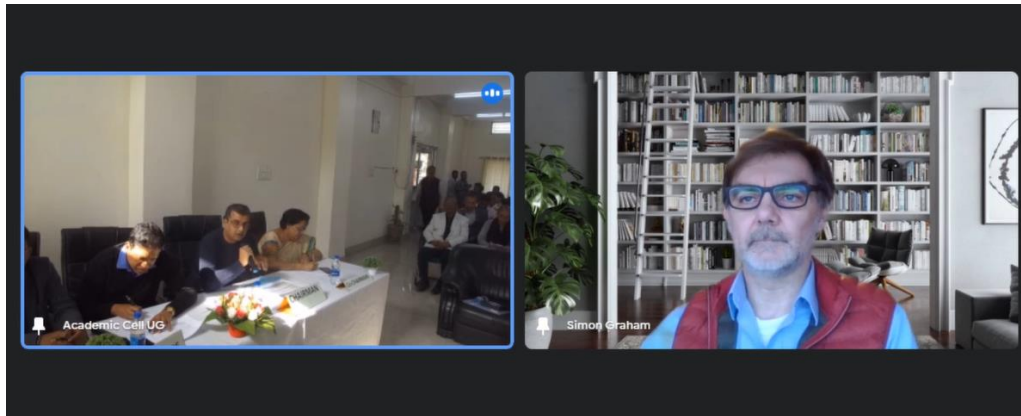
4. Next technical session in Sub Theme 4: **Zoning and compartmentalization as a tool for improved resilience to control TADs**. The session was chaired by Dr Praveen Malik, Former Animal Husbandry Commissioner and **Co-Chaired by Dr Swaraj Rajkhowa**, Scientist, NRC-Pig. The speaker of the session, **Dr Dietze Klaas, FLI, Germany** presented his talk on Zoning and Compartmentalization as a tool for improved resilience to control TAD's.



Important points discussed were

- To control TADs, movement control, zoning and compartmentalization is important. Main purpose of zoning and compartmentalization is to restrict disease propagation. It is important to define which part is healthy and which is diseased.
 - Further Dr. N N Barman also presented a pictorial view of how compartmentalization can be arranged in ASF endemic areas for the safety of the farm as well as contain the spread of the outbreak.
 - A village-specific and farm-specific practical bio-exclusion and bi-containment SOPs need to be developed against EIDs/TADs for organised and backyard farming system separately.
 - A workable guideline following the WOAHP principles and adapted to local needs should be framed for Zoning and Compartmentalization of ASF and other trans-boundary diseases so as to continue livestock business in the affected regions of India.
6. Next technical session in Sub Theme 5: **Developing One Health Nipah virus vaccine for pig and Human**. The session was chaired by Dr Sachin Kumar, Professor, IIT, Guwahati and **Co-Chaired by Dr Sutopa Das, Associate Professor, College of Veterinary Science**. The speaker of the session, **Dr Simon Graham, Group leader**,

Vaccinology, Pirbright, UK presented his talk on Developing a ‘One Health’ Nipah virus vaccine to protect animal & public health.



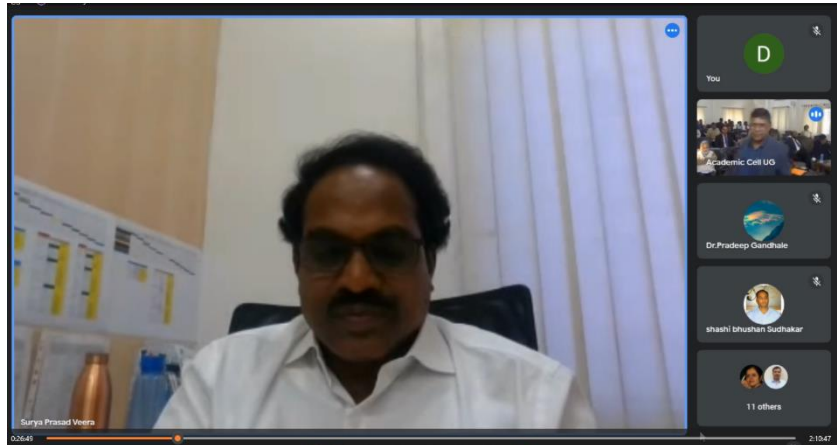
- Nipah virus is a highly pathogenic paramyxovirus, extraordinarily broad host range and a BSL-4 pathogen and potential agent of bioterrorism.
- *Pteropus* bat is Natural reservoir for the virus which can be transferred to pigs and human by different mode. In human causes severe disease.
- Dr Simon explained the complete procedure of how they develop Nipah virus vaccine starting from selection and comparison of vaccine candidate, evaluating immunogenicity and efficacy at field level.
- The recombinant vaccine comprising the surface proteins of NIPAH virus has a potential candidate to be used as a vaccine candidate with careful evaluation of recombinant adenovirus specific immune responses.

7. **Next session after lunch was Farmers-Academia- Industry interaction** which is **Chaired by Dr D. K. Sarma, Former National Fellow, and Co-Chaired by Dr K Sharma.**

- First talk in the session was delivered by **Dr. N N Barman**, Prof and Head, Microbiology Department, College of Veterinary Science. Dr. Barman highlighted the development of various **In-house vaccine & Diagnostics for viral diseases** in Microbiology Department as well as in ADMaC. Possibilities of association of Industry and other stakeholders were discussed.



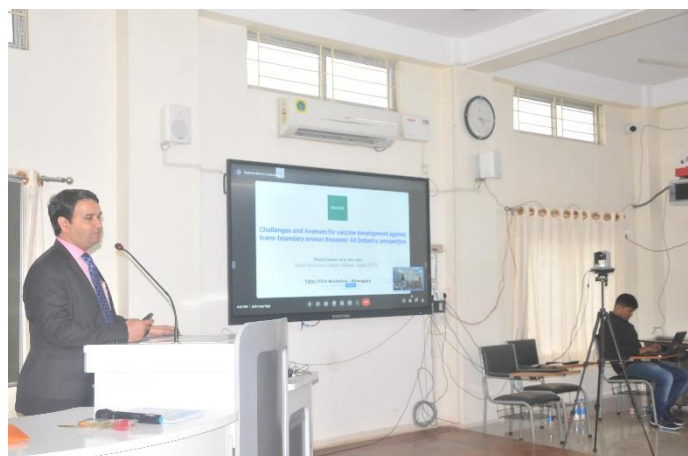
- Following this **Dr. Surya Prasad** from Indian Immunological Limited presented a talk on **Challenges in the field evaluation of a Vaccine**. Dr. Surya Prasad explained about the facilities provided by Indian Immunological Limited. Dr. Surya in his talk explained about the timeline required in Drug Development process and also about the Drug Approval process in India. Basic requirement for the Veterinary Clinical / Field trials were also discussed.



- In Scientist-field Vet interaction Dr Utpal Talukdar from Nagaon explained about his experience in controlling PPR, Goat pox outbreaks through vaccination. He stated that it was difficulties in handling outbreaks and problem faces during diagnosis of the diseases. So point of care diagnostic will be more useful. Again, farmers rearing goats and Pigs shared their problems and possibilities with scientist and industry.



- Next speaker was Dr. Manoj Kumar, Representative from Hester Biosciences delivered his talk on **Challenges and Avenues for Vaccine development against Trans-boundary animal diseases: An Industry Perspective**. Dr. Manoj Kumar informed about the process of getting licence of a vaccine. He also talked about Challenges and avenues in developing vaccines against TAD's in India. Dr. Manoj Kumar described about the



procedures of transfer of Technology.

- Next speaker was **Dr. Prachi Tiwari**, Representative from GeNext Genomics presented her talk on **One Stop Solution for quality proteins and Antibody**. Dr. Prachi Tiwari started her talk with a description about the company which is involved in recombinant protein and antibody production. They are involved in production of protein that is mainly used for diagnostic purpose.
- Next speaker was Mr Rajendra, founder of the Artec Diagnostic, who spoke about the company. The company is involved in development of veterinary diagnostics tools including molecular detection.



Next session was the **Plenary Session Chaired by Dr K M Bujarbaruah and Co-Chaired by Dr YPS Malik**.


Recommendation(s) from Plenary Session:

- Development of point-of-care diagnostics should be given priority for EIDs/TADs and endemic diseases of livestock.
- Workable SOPs on Bio-security measures to be adopted in organized as well as backyard farming systems by the farmers and their awareness for proper implementation should be worked out.
- Strong and organised disease reporting and data sharing mechanism should be build-up from farmers-level to the highest authority.
- There should be a strong and regular communication of the state Veterinary & Animal Husbandry Department with the central Animal Husbandry & Dairying Department.
- Cross border risk assessment of the incursion of TADs/EIDs from neighbouring countries must be conducted. There should be disease diagnostic facility at international boundary in NER states.
- Measures to be taken for Capacity building of veterinary services on disease epidemiology, diagnosis and control programs. Up gradation of laboratory facilities upto

BSL2+ must be undertaken particularly in northeast India. Generation of diagnostic lab on wheel for hilly border areas to cover international livestock migratory roots. Creation of regional bioinformatics infrastructure and repository for bio samples is also recommended.



The session ended with Vote of Thanks. Dr Pankaj Deka, Assistant Professor thanked the entire participants present in both Virtual and Physical mode. He also acknowledged the entire committee members of the Symposium, the University authority, the staff engaged, media and various stakeholders for making the entire Symposium a Grand Success!


Dr. N. N. Barman
Professor
Department of Microbiology
College of Veterinary Science
Assam Agricultural University
Khanapara, Guwahati-781022