

ANNUAL REPORT

2017-18



ASSAM AGRICULTURAL UNIVERSITY

JORHAT – 785013, ASSAM

Citation

(AAU 2018) Annual Report 2017-18
Assam Agricultural University, Jorhat, Assam, India

Published by

Vice-Chancellor, AAU, Jorhat -13, Assam

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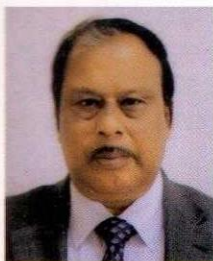
Printed at

Print21, R.G. Baruah Road, Ambikagirinagar, Guwahati 781024, E-mail:print21ghy@gmail.com

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Assam Agricultural University
Jorhat 785013, Assam, India

FOREWORD

I am happy to place the annual report of the Assam Agricultural University for the year 2017-18. This year was also a successful year as the university achieved excellence in the areas of teaching, research and extension, which are its mandate. A total of 900 students had enrolled and 665 students passed out (549 and 421 in the Faculty of Agriculture; 225 and 171 in Veterinary Science; 86 and 52 in Community Science and 40 and 21 in Fishery Science, respectively). 6.6% more students passed out this year in comparison to the earlier year. Besides this, 307 students were either qualified in various National Eligibility Tests or awarded fellowships, scholarships by several national and international agencies. A total of 888 publications in the form of research articles, books, book chapters, popular article, technical bulletins etc. were published by the faculty and students of the university. Continuation of the Student Exchange Programme with Cornell University of USA allowed 7 post-graduate students and 1 faculty member to visit USA and get exposure to latest ideas and developments in agricultural research.

The university continued its quest towards excellence in the field of research as well. A total of 251 externally funded research projects were in operation during this year. The Jorhat centre of AICRP on Potato received the prestigious "Best AICRP (Potato) Centre Award", whereas the AINP on Soil Arthropod project was adjudged the "Excellent Centre" consecutively for the third time. It is a matter of pride for the university that the project also set a national record by collecting 73,700 beetles from farmers field in 3 hours in collaboration with the farmers and entered into the "India Book of Records". The International Rice Research Institute recognised the leadership of Dr. T. Ahmed and RARS, Titabar in rice breeding by awarding a plaque of appreciation. Two submergence tolerant rice varieties, *Ranjit Sub1* and *Bahadur Sub1*, developed by the university, were notified by the Central Sub Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops and another submergence tolerant rice line *U-86* was tested under the AICRP network. Introgression of BLB tolerance in the submergence tolerant lines developed by the university were also initiated. A medium duration rice variety, *Numoli*, a finger millet variety, *IC-0624917*, and two soybean varieties *JS97-52* and *RKS-18*, were suggested for recommendation this year. Registration of indigenous cattle of Assam as breed '**Lakhimi Cattle**' and local duck of Assam as a breed '**Pati Duck**' were major achievements of the Faculty of Veterinary Sciences. Development and validation of multiplex diagnostic PCR array with uniform reaction conditions capable of screening samples for 12 swine pathogens simultaneously, development of two important cell culture adapted vaccines (CSFV & DPV), the GM Chickpeas lines developed by the university entering the deregulation process, development of protocols for genetic transformation of blackgram and pigeonpea, identification of 9 potential genes for acid tolerance through transcriptomic and proteomic analyses in *Bacillus mageterium* etc., were some of the significant advances in biotechnological research.

Upliftment of the farmers have always been the main focus of the university and this year also it arranged need-based and farmer-centric trainings. Capacity-building activities among the state government technical personnels as well as technical personnels from other states of the North-East India were taken up by the extension machinery of the university comprising of the Directorate of Extension Education both at Jorhat and Khanapara, KVKs, Extension Education Institute, ATIC as well as the colleges and research centres of the university. Altogether, 443 FLDs, 301 OFTs and 930 training programme benefitting

31,968 farmers were conducted by the KVKs alone besides those undertaken by constituent colleges, RARS and other components of the extension machinery during this year. Apart from these, a sizeable number of farmers visited the ATIC (8,174 – about 54% more than the last year). A total of 39 no. of farm publications, 127 radio-talks, 93 phone-in programmes, numerous Farmers' fairs, exhibitions etc. were conducted during this year – all of which were for the benefit of the farming community. The university also collaborated with various national and international agencies like PCRA, NABARD, USAID, Bayer Bioscience, ASSOCHAM, TERI etc. to bring awareness among the farming community. The University and all its KVKs organized the “*Sankalp Se Siddhi*” programme with the rest of the country, in which more than 15,700 people took part.

The university also hosted the 70th Annual Meeting of the Indian Phytopathological Society, the 49th Annual National Conference of Nutrition Society of India (NSI) and the 52nd Annual Rice Group Meeting during the year in which a large number of scientists from India and abroad as well as students took part.

I am grateful to the Govt. of Assam, ICAR, Govt. of India and other agencies for their financial and technical support to the university, which made the year a fruitful one. My sincere thanks are due to all the national, international, non-government as well as private organizations who contributed to our progress.

A handwritten signature in blue ink, consisting of a stylized 'K' and 'M' followed by a horizontal line and a diagonal stroke.

(K.M. Bujarbaruah)

1. The University

Assam Agricultural University, the first institution of its kind in the whole of north-eastern region of India was established on April 1, 1969 by an act called *The Assam Agricultural University Act, 1968* with its headquarters at Jorhat. The base of this new institution comprised of the erstwhile Assam Agricultural College at Jorhat and the Assam Veterinary College at Khanapara.

The seeds of agricultural education in the North Eastern part of the country were sown way back in the first quarter of the 20th century with the establishment of two rice research stations, one at Karimganj in the Barak Valley and the other at Titabor

in the Brahmaputra Valley in 1913 and 1923, respectively. Even while the stations were producing trainees, the need for an agricultural college was felt immediately after independence. Consequently, the Assam Agricultural College at Jorhat and Assam Veterinary College at Nagaon came into existence in 1948 as a result of exemplary willpower and dedication to service of Bharat Ratna Late Gopinath Bordoloi, the first Chief Minister of Assam. Both the colleges were affiliated to Gauhati University at first and then to Dibrugarh University before the Assam Agricultural University came into being embracing both the colleges.



Figure 1.1. The New Golden Jubilee Gate of Assam Agricultural University headquarter in Jorhat

1.1 Mandate

- *Imparting technical education in agriculture and allied branches of learning*
- *Furthering the advancement of learning through innovative research in agriculture and allied sciences, and*
- *Taking the technologies to the stakeholders' doorstep in an effort to harness optimum benefits in production, profitability and permanency in agriculture.*

1.2 Vision

Provisioning of quality human resource to facilitate technology-led agricultural renaissance revitalizing and rejuvenating post-green revolution agriculture ensuring both production and environmental sustainability targeting a minimum of 4% agricultural growth while addressing the issues of household food and nutritional security, farmers' distress, commerce in agriculture as well as regional, national and global food crisis taking the advantage of innovative technology, market reforms and liberalization.

1.3 Mission

To fill up talent gap in agriculture and allied sectors to preposition the state to combat the emerging challenges in agriculture and ensure productivity increase in agri-horti-animal-fish crops on the face of shrinking/ fragmented land holdings, ailing soil health, diminishing water resources and increased human population.

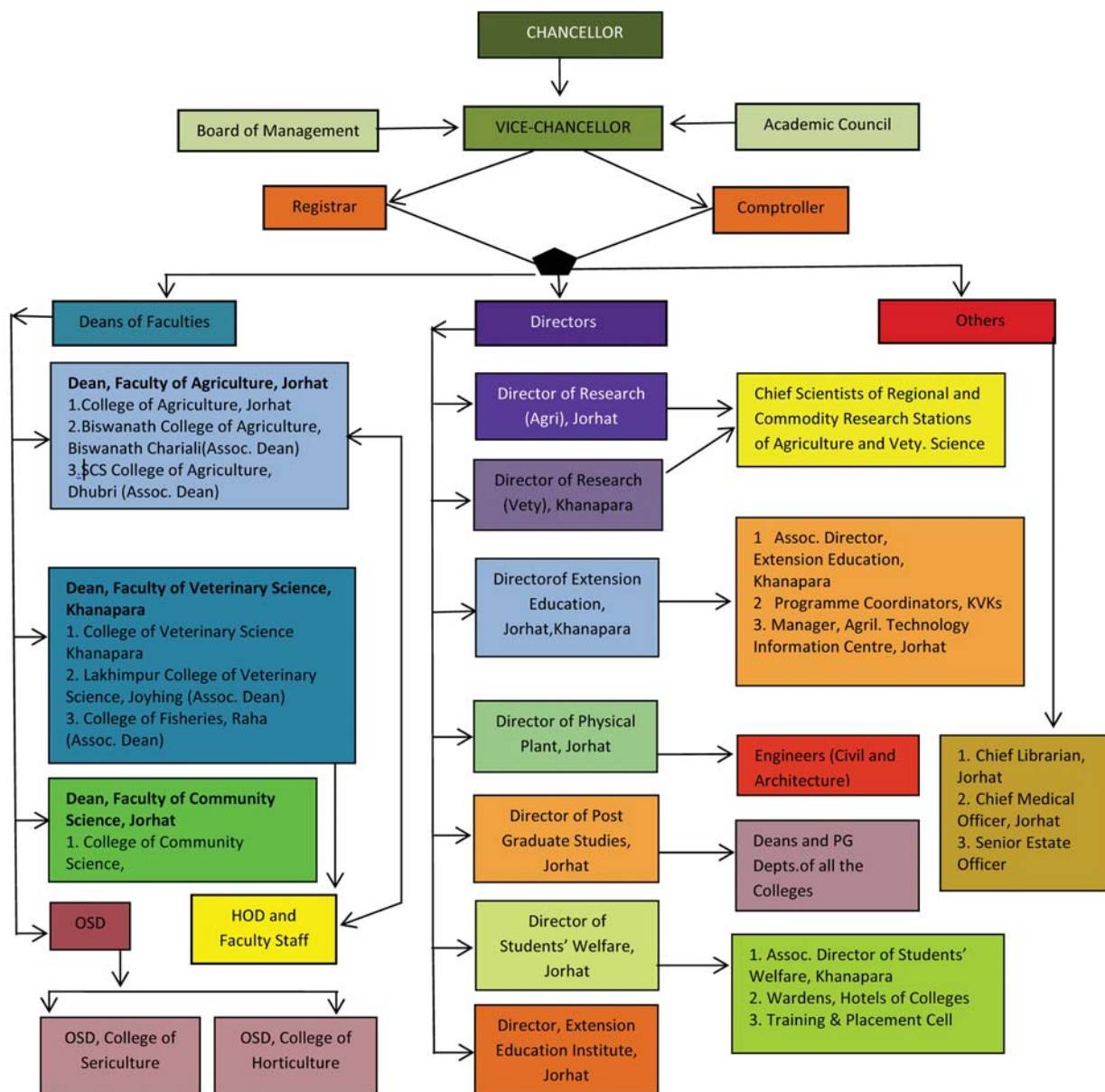
1.4 Goals

- q *Provide quality education and training in the areas of agriculture and allied sciences.*
- q *Undertake basic, applied and adaptive research relevant to the needs of the farmers and entrepreneurs of Assam.*
- q *Transfer the technologies to the stakeholders, particularly, farmers for increasing the production, productivity and income to ultimately improve the socio-economic conditions of the people, and*
- q *Play key role in transforming the state's agriculture of subsistence to agriculture of abundance.*

1.5 Organization

To carry out the education as per mandate, the University has six faculties in the fields of Agriculture, Veterinary, Community Science, Fishery, Horticulture and Sericulture with 9 constituent colleges - three in agriculture, two in veterinary science and one each in community science, fishery, horticulture and sericulture. Except horticulture and sericulture, all the other seven constituent colleges have their own state of the art facilities for imparting education in designated locations in the state. The Dean is the official head of the Faculty and Chairman of the Board of Studies of the respective Faculty. There is a Director of Post Graduate Studies to coordinate Post-Graduate Studies in all the departments and colleges of the University. To coordinate the research activities, the University has two full-fledged Directorates of Research, one for agriculture and community science

and the other for veterinary science and fisheries science, headed by a Director of Research. The extension programme of the University is carried out under the Directorate of Extension Education headed by a Director of Extension Education. In addition, the University has Director of Students' Welfare, Director of Physical Plant and Chief Librarian and other important officers as per the Statute. The Director of Students' Welfare is responsible for arrangement of housing for students, student counseling and placement besides supervising the extra-curricular activities and general needs of the students. The Director of Physical Plant is responsible for all construction related activities and repair/renovation of the University. The organizational structure of the University is depicted in the organogram presented in Fig 1.2.



Vice Chancellor also supervises the Extension Education Institute, Govt. of India and DBT-AAU Centre, AAU, Jorhat

Figure 1.2. Organizational structure of Assam Agricultural University, Jorhat

2. Award and Recognition

2.1 Institute Level Awards

2.1.1 Best Centre Award for AICRP Potato Project to Assam Agricultural University

The AAU, Jorhat Centre of all India Coordinated Research Project on Potato was conferred the prestigious “Best AICRP (Potato) Centre Award” during the 35th Annual Group Meeting of AICRP on Potato held at Bidhan Chandra Krishi Vishwavidyalaya, Kalyani, West Bengal on September 15, 2017. The award has brought recognition and laurels to the university at national level. Dr. P. C. Bhagawati, Principal Scientist & PI, Dr. Z. Ullah, Principal Scientist and Dr. M. K. Saikia, Senior Scientist received the award from Dr. D. D. Patra, the Hon’ble Vice-Chancellor, BCKV, Kalyani, West Bengal.



Figure 2.1. Dr. M. K. Saikia, Dr. P. C. Bhagabati and Dr. Zafar Ullah, Scientist of AICRP on Potato receiving the Best Centre Award.

2.1.2 Excellent Centre Award to AINP on Soil Arthropod Project, AAU

The AINP on Soil Arthropod Pests, AAU, Jorhat Centre, headed by Dr. Badal Bhattacharya, was adjudged as the “Excellent Centre” in the XIX Biennial Group Meeting held at Uttarakhand University of Horticulture and Forestry, Ranichuri during June 19-20, 2017 for the outstanding research activities with novel findings on *Lepidiota mansueta*, especially on pheromonal research and social engineering for the

adult management of white grubs at Majuli river island of Assam. The AAU Centre of the Project has received the “Excellent Centre” recognition consecutively for three times (2009-11, 2012-14, 2015-17).

2.1.3. National Record of “Most Beetles collected”

The Centre has made a “National Record” of “Most Beetles collected in 3 hours” by collecting 73,700 numbers of white grub beetle (*Lepidiota mansueta*), in collaboration with 100 farmers of Majuli at Maharichuk Village on 9th April, 2018. This record was made under the guidance of Dr. Badal Bhattacharyya, Principal Scientist & PI of the project and Mr. Rakesh Kumar Verma acted as the adjudicator of the programme. This record attempt was made under the ongoing Mass Campaigning Programme against white grub beetles.



Figure 2.2. Dr. B. Bhattacharya and his team receiving the certificate from India Book of Records.

The outcome of the successful execution of the National Record on “Most Beetles collected in 3 hours” as a success story has been highlighted by all print and electronic media of Assam and the Times of India.

2.1.4 Appreciation for long term contribution to rice breeding

Dr. T. Ahmed, Chief Scientist, RARS, Titabar was awarded with a plaque of appreciation on 2nd May,

2017 at NASC complex, New Delhi for his significant long-term contribution to Rice research by International Rice Research Institute (IRRI) towards his substantial leadership in the development of submergence tolerant rice varieties.



Figure 2.3. Dr. T. Ahmed, Chief Scientist, RARS, Titabor receiving the long term contribution award.

2.1.5 First position in National SAPI Quiz by students of CVSc, Khanapara

The Dept. of Veterinary Physiology, CVSc, Khanapara, in collaboration with the Society for Animal Physiologists of India (SAPI), East Zone organised the 5th SAPI Institutional Quiz on Oct. 21, 2017. The team of Miss Bhaswati Kalita and Miss Prachi Singh, 3rd year students of CVSc, secured the first position.



Figure 2.4. The CVSc quiz team lifting the winner's trophy in the zonal competition

The team also secured the first position in the zonal level quiz followed by WBUAFS (second position) and OUAT (third position). The team also participated in the National SAPI quiz held at Veterinary College, Nandi Nagar, Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar in the XXVI Annual Conference of Society of Animal Physiologist of Indian National Symposium during Dec. 21-22, 2017.

2.1.6 AAU students shined in Cornell University, New York, USA

Cornell University and Sathguru Management Consultants hosted a short course on International Agriculture & Rural Development, during October 2017 at Cornell University, Ithaca, New York. A group of seven post graduate students selected from Assam Agricultural University along with Dr. Aditi Smith Gogoi, Asstt. Professor, Dept. of Tea Husbandry and Technology attended the programme. The programme comprised of both classroom teaching and field visits. The AAU team was highly admired by Professor K.V. Raman, Assoc. Director (Special Projects), International Programs & International Professor of Plant Breeding (Adjunct), College of Agriculture & Life Sciences, Cornell University.

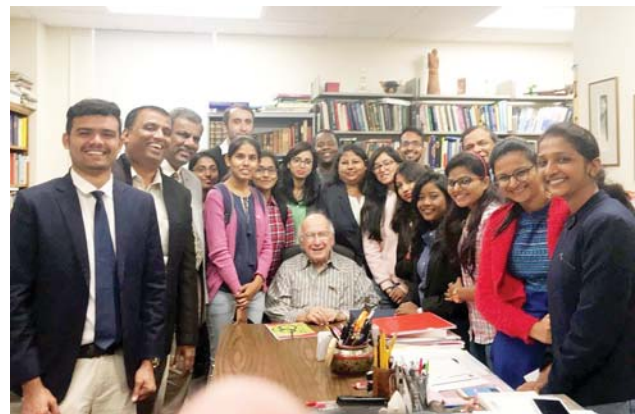


Figure 2.5. AAU students at Cornell University, USA

2.1.7 Fishery student receives Dr. E.G. Silas award

A signature of laurels was brought to AAU by its outgoing Bachelor of Fisheries Science (BFSc) student Mr. Aditya Baruah by bagging the Dr. E. G. Silas Award. Mr. Baruah came out as the 3rd Best Fisheries Graduate of India which was declared in October, 2017.



Figure 2.6. Mr Aditya Baruah, receiving the 3rd best graduate award

2.2 Award/Recognition to Teachers/Scientists and Students

2.2.1 Agriculture

2.2.1.1 Faculty/ Scientists

- Dr. S.C. Barua, Prof. & Head, Dept. of THT, CA, was Nominated as a member of the Technical Advisory Committee for STGs of M/s Amalgamated Plantations Pvt. Ltd. (Formerly Tata Tea).
- Dr. A. Baishya, Chief Agronomist, AICRP-IFS, CA, Jorhat, was honoured as an Associate Editor of International Journal of Agriculture Science, Bioinfo Publications (ISSN: 0975-3710 EISSN: 0975-9107). Membership Id: F25C1BD95C.
- Dr. A. Baishya, Chief Agronomist, AICRP-IFS, CA, Jorhat, was nominated as an expert member of the selection committee for promotion of faculty in the department of Agronomy, Institute of Agricultural Sciences, BHU by the Hon'ble Vice Chancellor, Banaras Hindu University, Varanasi, UP.
- Dr. A. Baishya, Chief Agronomist, AICRP-IFS, CA, Jorhat, was nominated as a member of monitoring team by the Indian Institute of Farming System Research (IIFSR), Modipuram, Merrut for monitoring research works under AICRP on IFS, ECF, NPOF experiments and TSP activities of AICRP –IFS, IGKV, Raipur.
- Dr. M.K. Modi, Professor & Head, Department of Agricultural Biotechnology was nominated as an expert member in the Technical Committee for Twinning programme on Basic & Modern Biotechnology by DBT, GOI.
- Dr. M.K. Modi, Professor & Head, Department of Agricultural Biotechnology was nominated as an expert member in the Expert Committee of BLiSS program for NER (Basic Science Labs in Senior Secondary School) by DBT, GOI.
- Dr. Pankaj Barua, Principal Scientist, AICRP on Irrigation Water Management, CA, Jorhat, was selected as the Director, NERIWALM, Ministry of Water Resource, Tezpur, Assam.
- Dr. R.P. Bhuyan, Professor, Dept. of THT, CA, was appointed as an expert member for the Aspee-L.M. Patel Farmer of the Year Award 2017 (Horticulture Category-Tea Cultivation).
- Dr. Abhijit Borah, Research Engineer and P.I of AICRP on PHET, Dept. of Agril. Engineering, CA, Jorhat was awarded the Best Paper Award for the year 2017 by Indian Society of Agricultural Engineers (ISAE) for the paper entitled, “Energy utilization efficiency and entrepreneurial potential of a solar-biomass integrated drying system” published in Journal of Agricultural Engineering 54 (2).
- Dr. Nibedita Deka, Professor, Dept. of Agril. Economics & F.M. CA, Jorhat received the Best Teacher Award in FA, AAU, Jorhat .
- Dr. S. K. Chetia, Principal Scientist RARS, AAU, Titabar, received the Best Researcher Award for the outstanding contribution in the field of rice research.
- Mr. Dipanjan Kashyap, Assistant Professor, Dept of Agril. Economics & F.M. CA, Jorhat begged the Best Trainee Award in ICAR sponsored Winter School on ‘Developments in organic farming in tropical islands in India’, held at Port Blair.
- Dr. Sunayana Rathi, Assistant Professor, Dept. of Biochemistry & Agril. Chemistry, CA, Jorhat received the Post-doctoral research fellowship funded by the BRAVE programme of European Union for ten months in Martin Luther University, Halle (Saale), Germany.
- Dr. Gobin Chandra Bora, Professor and Principal Scientist, Dept of Plant Breeding and Genetics, CA, Jorhat, received the National award for “Excellence in Research” in Agriculture and Allied Sciences by the Samagra Vikas Welfare Society, Lucknow.
- Dr. Badal Bhattacharyya, Principal Scientist, Dept of Entomology, CA, Jorhat, acted as the Chairperson of one technical session of the National Seminar on ‘Crop protection: current trends and future perspective’ held at School of Agricultural Sciences and Rural Development (SASRD), Medziphema campus, Nagaland University, Medziphema, Nagaland during 16-18th November, 2017.
- Dept of Entomology, CA, Jorhat, Headed by Dr. A. Rahman was a judged as the Best research centre of AICRP honey bee and pollinators at Dr. Y.S Parmar University of Horticulture & Forestry, Solan, Himachal Pradesh, India.
- Dr. Danish Tamuly, Dept of Soil Science, CA, Jorhat, was awarded the Commendation certificate from Indian Society of Soil Science for Best Ph. D Thesis Presentation (Final Round) during National Conference held at Amity University, Kolkata in December 2017.

- Dr. Satvinder Kaur, Dean, Faculty of Community Science, AAU, Jorhat was a member of the National Advisory Committee of the Golden Jubilee International Conference on Gender Issues and Socio-Economic Perspectives for Sustainable Rural Development GIRD-2017 organized by I.C. College of Home Science, CCSHAU, Hissar from 23rd to 25th Oct, 2017. Dr. Kaur chaired the session on “Heritage Conservation and sustainability” and also presented a lead paper on Heritage Conservation – A brief review of Textile Conservation on 24th Oct. 2017.
- Dr. B. K. Sarmah, Centre Director & Professor, Dept of Agricultural Biotechnology, CA, Jorhat, was awarded with a certificate of Outstanding Reviewer (2017) by Plant Science (Elsevier) journal.
- Dr. S. Singh, Professor, Dept of Agricultural Biotechnology, CA, Jorhat, was invited as Visiting Scientist in Washington State University, Pullman USA for three months for strengthening bilateral relationship and to develop new collaborative research programme on CRISPR/Cas9 between AAU and WSU.
- Dr. Sumita Acharjee, Dept of Agricultural Biotechnology, CA, Jorhat, was invited to perform collaborative research work at CSIRO Plant Industry, Australia, from July to December, 2018.
- Dr. T. J. Ghose, Principal Scientist (Soil Science), RARS, Titabar was conferred the award for his valuable contribution in agriculture in the International conference on Food & Agriculture held in Dhanbad, Jharkhand during 29-31st March, 2018.
- Dr. P. Saikia, Chief Scientist, RARS, North Lakhimpur, was selected as a Member, Board of Studies, North Lakhimpur College (Autonomous), Lakhimpur, Assam.
- Dr. P. Saikia, Chief Scientist, RARS, North Lakhimpur, was selected as a Member, Governing Body of North Lakhimpur Civil Hospital (2016-2019).
- Dr. P. Saikia, Chief Scientist, RARS, North Lakhimpur, was selected as a Member, IQAC & one of the Advisor of Placement Cell of NL College, Lakhimpur under the Human Resource Development Programme for Training Technologist for Life science and Biotechnology w.e.f 12.2.2009.
- Dr. P. Saikia, Chief Scientist, RARS, North Lakhimpur, was awarded as an Honorary Wildlife Warden, Dept of Environment & Forest, GOA for 2018-2020.
- Dr. P. Saikia, Chief Scientist, RARS, North Lakhimpur, was selected as a Member, District Pest Surveillance Advisory Unit (DPSAU), Dept of Agriculture, GOA Lakhimpur w.e.f 7.1.2009.
- Dr. P. Saikia, Chief Scientist, RARS, North Lakhimpur, was selected as a Technical member & Resource person of Zonal meeting of Dept. of Agriculture, Govt. of Assam North Zone II, District Development Committee, Lakhimpur, ATMA, Lakhimpur.
- Dr. P. Saikia, Chief Scientist, RARS, North Lakhimpur, was selected as a Member, Aerodrome Environment Management Committee (AEMC), Airport Authority of India, Lilabari airport, Lakhimpur, Assam.
- Dr. P. Saikia, Chief Scientist, RARS, North Lakhimpur, was selected as a Coordinator, Oryza Science Club, (VIPNET Club under DST, GOI), RARS, North Lakhimpur.
- Dr. P. Neog, Dept of Agrometeorology, BNCA received the “Award of Excellence for outstanding dissemination of Agromet Advisories to Famers” conferred by IMD, MoES, GOI during the ARM of GKMS project held at IGKV, Raipur from 15-17 Nov, 2017.
- Dr. Pranab Dutta, Scientist (S-II), AICRP on MAP and Betelvine, Dept. of Plant Pathology, CA, received the ICPP-2018 Bursary Assistance Award by American Phytopathological Society.
- Dr. Pranab Dutta, Scientist (S-II), AICRP on MAP and Betelvine, Dept. of Plant Pathology, CA, gave an Invited Lecture for the seminar entitled “Technological Intervention in Microbial Resources (TIMR2018), held at Tezpur University, Department of Molecular Biology and Biotechnology, Napam, Tezpur, Assam during 4-5 February, 2018.
- Dr. Pranab Dutta, Scientist (S-II), AICRP on MAP and Betelvine, Dept. of Plant Pathology, CA, served as Resource person at Farmers Day Programme organized by Sugarcane Research Station, Buralikson on 23 November, 2017 vide letter no. 7(11)/11/DRA(T)Pt-II/2017-18/17863-893 dated 20.11.17.

- Dr. Pranab Dutta, Scientist (S-II), AICRP on MAP and Betelvine, Dept. of Plant Pathology, CA, gave an Invited lecture on “Prospects of biological control in organic agriculture” on 25.11.2017 in CAFT (Centre for Advance Faculty) training on Culturing Techniques for biofertilizer and biopesticides at Department of Soil Science, Assam Agricultural University,
- Dr. Pranab Dutta, Scientist (S-II), AICRP on MAP and Betelvine, Dept. of Plant Pathology, CA, served as Resource person to the 5 days seminar cum workshop on “Bioinformatics, Molecular Biology and Plant Biotechnology” organized by Institutional Biotech Hub, D.K.D. College, Dergaon, Assam, India.
- Dr. Pranab Dutta, Scientist (S-II), AICRP on MAP and Betelvine, Dept. of Plant Pathology, CA, served as Resource person at ICAR sponsored short course on “Preparation of bioformulation of fungal and bacterial agents for management of biotic stress of agricultural crops” and delivered a lecture on technique for isolation of fungal biocontrol agents, endophytes and study on their evaluation” at Department of Plant Pathology, Assam Agricultural University, Jorhat, Assam.
- Dr. Pranab Dutta, Scientist (S-II), AICRP on MAP and Betelvine, Dept. of Plant Pathology, CA, gave an Invited lecture on “Prospects of bio-nano intensive agriculture in Indian condition” on 22.02.2018 in CAFT (Centre for Advance Faculty) training on Organic Agriculture at Department of Soil Science, Assam Agricultural University, vide letter no. AAU/FA-SS/CAFT-Lecture/2017-18/1558 dated 7 February, 2018.
- Dr. Pranab Dutta, Scientist (S-II), AICRP on MAP and Betelvine, Dept. of Plant Pathology, CA, served as Resource person at ICAR sponsored short course on Preparation of bioformulation of fungal and bacterial biocontrol agents for management of biotic stress of agricultural crops” and delivered a lecture on “Preparation of liquid bioformulation of fungal biocontrol agents and its shelf life study at Department of Plant Pathology, Assam Agricultural University, Jorhat, Assam . dated 1st Sept to 10th Sept, 2017.
- Dr. C. Sarmah, Head, KVK Bongaigaon received the Best Extension Scientist Award of AAU in the year 2017-18.
- Dr. Rajiv Kangabam, a Post-Doctoral Fellow, working under the mentorship of Dr. Madhumita Barooah in the Department of Agricultural Biotechnology was selected as a task force member by the International Water Resources Association (IWRA) a non-profit, non-governmental, educational Organization established in 1971. The task force members will be networking common research interest on water quality.
- Dr. Rajiv Kangabam got best poster award at the “Regional Conference to promote safe and secure science in Middle-East, South & South-East Asia” being held at Subway University, Malaysia from the 5th to the 9th February.
- Dr. Kamalakshi Devi, a BiO-CARE awardee, was awarded best paper award in International Conference in Environment Sustainability, Agriculture and Life Science - 2018 held at Goa.

2.2.1.2 Students

- Mr. Kaushik P Bordoloi was adjudged the Best Debator award in all Assam level debate competition, ‘Lt. Col Depjyoti Gogoi Memorial Debating Competition’, held in College of Veterinary Science, Khanapara.
- Ms. Naimisha Choudhury bagged the Best Poster Award in Conference on Insect Molecular Biology held in AAU, 2017.
- Mr. Dipankar Paul was invited as the Guest Editor, Krishak Bandhu, an e-magazine.
- Mr. Manash Jyoti Boruah was awarded the second best Debator in 43rdNarenSarmah Memorial All Assam Inter College Debate competition held at DKD College Dergaon on 20/09/2017.
- Mr. Manash Jyoti Boruah was awarded the second best Debator in All Assam Open Debate Competition held at North Lakhimpur on 09/03/2018.
- Ms. Nibedita Taye was selected for the Best paper at Research Conclave, IIT, Guwahati.
- Ms. Jeemoni Gogoi was selected for the Best paper at Research Conclave, IIT, Guwahati.
- Mr. Sandeep was selected for the Best paper at Research Conclave, IIT, Guwahati.
- Mr. Sonbeer Chack got the Scientist Associate Award in MPAUP.
- Mr. Sarat Sekhar Bora was selected for the Best poster at Research Conclave, IIT, Guwahati.

- Mr. Sarat Sekhar Bora was selected for the Student of the Year award, 2017 by AIASA.
- Ms. Jamini Saikia and Ms. Subhashree Dihingia received the Bayer's Fellowship.
- Mr. Subhankar Saha was selected for the Second Best poster at Research Conclave, IIT, Guwahati.
- Ms. Sukanya Gogoi was awarded the Best oral presentation award in National Seminar held at ICAR, NEH, Umiam.
- Ms. Sukanya Gogoi received the Best Poster presentation in 49th National Conference, Nutrition society of India held at AAU, Jorhat.
- Ms. Sukanya Gogoi bagged the 2nd position in poster presentation in the 4th International symposium, CAU, Pasighat.
- Ms. Sukanya Gogoi was adjudged as the Best Poster presenter in 3rd National Youth Convention, AAU, Jorhat.
- Ms. Purnima Pathak received the 2nd position in Best poster presentation in 4th International symposium, CAU, Pasighat.
- Mr. Jagadale Mahesh Vasant Rao was awarded Best poster award with a cash prize of Rs. 2000 in the international conference at IITG.
- Ms. Trishnamoni Gautam bagged the Best poster award at International symposium of biodiversity and biobanking (Biodiverse 2018) under Microbial Diversity group at IITG.
- Mr. Rahul Verma received the best poster award at International rice research symposium at Cuttack, 6th February to 9th February, 2018.
- Two student teams (5 members in each team, one multi-institutional team led by Pranab Kumar Nath, the other a all-women team led by Sangeeta Bhandari), submitted project proposals. Both the teams were shortlisted listed to be among the Top 20 entries for BEST 2017 Competition for Biotech Entrepreneurship for Student Teams (BEST), organized jointly by ABLE and DBT, Govt of India to be held in Bangalore from 12 Feb to 16 Feb. 2018.
- Team lead by Mr. Pranab Kumar Nath Bagged third prize among the Top 20 entries for BEST 2017 Competition for Biotech Entrepreneurship for Student Teams (BEST), organized jointly by ABLE and DBT, Govt of India to be held in Bangalore from 12 Feb to 16 Feb. 2018 of Assam).

2.2.2 Veterinary

2.2.2.1 Faculty/ Scientists

- Dr. Probodh Borah Professor & Head, Dept of Animal Biotechnology, CVSc, Khanapara, was nominated as the Member of the Task Force for 'Research resources, Service Facilities and Platforms' and 'DBT-BUILDER Programme' (2017-19) of DBT, Govt. of India.
- Dr. Probodh Borah Professor & Head, Dept of Animal Biotechnology, CVSc, Khanapara, was nominated as the Member of the Expert Committee constituted by DBT, Govt. of India for the Review of Completed Indo-Japan Projects as well as to Review the proposal from AIST-Japan for up-gradation of DIALAB into DIACENTRE for 3 years from July 2017.
- Dr. Probodh Borah Professor & Head, Dept of Animal Biotechnology, CVSc, Khanapara, was nominated as the Member of the Expert Committee constituted by DBT, Govt. of India for the Atal Incubation Centres (DBT-NER AIC) Scheme launched by NITI Ayog for 3 years from September, 2017.
- Dr. Probodh Borah Professor & Head, Dept of Animal Biotechnology, CVSc, Khanapara, was nominated as the Member of the Expert Committee for "Establishment of Basic Science Labs in Senior Secondary Schools (BLiSS) in North Eastern States on India" constituted by DBT, Govt. of India w.e.f. December, 2017.
- Dr. Probodh Borah Professor & Head, Dept of Animal Biotechnology, CVSc, Khanapara, was nominated as the Chairman of the Institutional Ethics Committee of Gauhati Medical College since September, 2017.
- Dr. Probodh Borah Professor & Head, Dept of Animal Biotechnology, CVSc, Khanapara, was nominated as the External Member of the Departmental Research Committee of the Dept. of Molecular Biology & Biotechnology of Cotton University for 2 years since October, 2017.
- Dr. Probodh Borah Professor & Head, Dept of Animal Biotechnology, CVSc, Khanapara, was nominated as the External Expert Member of the Institutional Biosafety Committee (IBSC), IASST, Guwahati for the period 2018-2021.
- Dr. Luit Moni Barkalita Assistant Professor, Dept of Animal Biotechnology, CVSc, Khanapara,

received the Netaji-Subhas ICAR International Fellowship 2017-18

- Dr. Luit Moni Barkalita Assistant Professor, Dept of Animal Biotechnology, CVSc, Khanapara was invited as Nominee of CPCSEA, Ministry of Environment Forest and Climate Change, Govt. of India.
- Dr. K. K Sarma, Professor & Head Dept of Vety. Surgery & Radiology, CVSc, Khanapara, received 'Letter of Appreciation' from Prof. Gautam Biswas, Director, IIT, Guwahati for Life Long Dedication and Contribution to the field of Wildlife Health Care and Conservation on the occasion of ADNAT Silver Jubilee Convention, International Symposium on Biodiversity & Biobanking, 27-29th January, 2018
- Dr. K. K Sarma, Professor & Head Dept of Vety. Surgery & Radiology, CVSc, Khanapara, received the Best paper award under the category 'Short Communication'. {Sharma, P., Singh, C. K. & Sarma, K. K. (2017): Management of Ulcerative Wounds with Placental Extract in a White Bengal Tiger (*Pantheratigristigris*): Intas Polivet Vol. 18 (1)}
- Dr. K. K Sarma, Professor & Head Dept of Vety. Surgery & Radiology, CVSc, Khanapara, was selected as one of the Top 20 Leading Conservationist of the planet in Wild Lives, by Lori Robinson and Janie Chodosh, Skyhorse Publishing, New York, USA, 2017
- Dr. K. K Sarma, Professor & Head Dept of Vety. Surgery & Radiology, CVSc, Khanapara, bagged the Excellence Award from Mahatma Gandhi University, Meghalaya, on their annual Convocation on 12th March, 2018 by Hon'ble Governor of Assam Prof. Jagdish Mukhi that states "MGU honours the man who is popularly known as the "Elephant Man of Asia" for his outstanding contributions to the wildlife.
- Dr. Anubha Baruah, Professor, Dept of Vety. Physiology, CVSc, Khanapara, was invited as Co-chairman of the session "Climate change, stress physiology and bioenergetics on 21st December, 2017" at XXVI SAPI Annual Conference and National Symposium on Physiological Innovation to Forecast the Impact of Climate Change and Evolve Strategies for Sustainable Livestock Production in Bidar, Karnataka.
- Dr. Dulal Chandra Roy, Professor and PI, Dept of Pharmacology & Toxicology, CVSc, Khanapara,

bagged the award for Educational Leadership by Indus Foundation, USA

- Dr. Dulal Chandra Roy, Professor and PI, Dept of Pharmacology & Toxicology, CVSc, Khanapara was awarded the Mahatma Gandhi Excellence Award by IIF, New Delhi.
- Dr. Dulal Chandra Roy, Professor and PI, Dept of Pharmacology & Toxicology, CVSc, Khanapara received the Bharat Ratna Mother Teresa Gold Medal Award by GEPR, New Delhi.
- Dr. G. C. Das & Dr. G. Zaman had received the registration of Lakhimi cattle of Assamas breed (Accession Number: INDIA_CATTLE_0200_LAKHIMI_03041).
- Dr. Abdul Aziz & Dr. G. Zaman had received the registration of Sumi-Ne goat of Nagaland as breed (Accession Number is INDIA_GOAT_0200_SUMINE_06028).

2.2.2.2 Students

- Ms. Monalisa Ahmed received the Prof. Gunindra Nath Dutta Memorial Best Graduate Award, 2018.
- Ms. Jebin Gulnar bagged the Shri Dhurba Jyoti Sharma Memorial Award, 2018.
- Mr. Dhiman Patgiri was awarded the Best Debater award in India Tourism Present – Explore Youth Fair, 2018, Guwahati.
- Mr. Dhiman Patgiri received the 'Judges Special Award' in Assam Debate, 2017.
- Ms. Mandakranta Bhuyan, received the Second prize in Lokabandhu Dr. Bhubaneswar Barooah Memorial All Assam Inter College Debating Competition in Govt. Ayurvedic College, Guwahati.
- Dr. Simanta Koushik received the First prize in the Essay Writing Competition held on the occasion of National Science Day Celebration-2018 held in CVSc, Khanapara.
- Dr. Arpita Bharali received the Second prize in the Essay Writing Competition held on the occasion of National Science Day Celebration-2018 held in CVSc, Khanapara.
- Mr. Dilruba Hasin, Ms. Arundhati Bora, Mr. J. Goswami, Ms. Anubha Baruah, S. Saleque and Mr. B. K. Sarmah of Dept of Vety. Physiology, CVSc, Khanapara and Goat Research Station, Barnihat, received the NSR Sastry award from Indian Society for Animal Production and Management (ISAPAM) in its Annual Conference held on 17-

19th May, 2017 in Sri Nagar, India on the research topic “Effect of melatonin on blood electrolytes, biochemical profiles and SOD activity of Beetal and Assam Hill goat both exposed to direct sunshine in Assam”.

2.2.3 Community Science

- Dr. Pranati Das received the Best Researcher Award, Faculty of Community Science for 2017 from Assam Agricultural University, Jorhat.
- Dr. Pranati Das bagged the Excellence in Research Award, 2017 by Samagra Vikash Welfare Society and Babasaheb Bhimrao Ambedkar University, Lucknow on February 10-11, 2018.
- Dr. Mamoni Das received the Excellence in Teaching Award, 2017 by Samagra Vikash Welfare Society, Lucknow and Babasaheb Bhimrao Ambedkar University, Lucknow on February 10-11, 2018.
- Dr. Mamoni Das bagged the Best Teacher Award, Faculty of Community Science for 2017 from Assam Agricultural University, Jorhat on 1st April, 2017.

2.2.4 Fishery Science

- Dr. Bibha Chetia Borah, Principal Scientist & Officer-in-Charge, FRC, Jorhat, received the Best Researcher Award-2017, AAU for outstanding contribution to the field of Fisheries & Aquaculture.
- Dr. Bibha Chetia Borah, Principal Scientist & Officer-in-Charge, FRC, Jorhat, acted as Ph.D. Guide for students from ICAR-CIFE Mumbai & WBUFAS .
- Dr. Bibha Chetia Borah, Principal Scientist & Officer-in-Charge, FRC, Jorhat, acted as a Keynote speaker for National Conference on Agri-Business potential of Assam.
- Mr. Imran A. Hussain was invited by World Association for Scientific Research and Technical Innovation to attend prestigious 17th International Conference on Researches in Science and Technology (ICRST) held on 21-22 July, 2017 at Asian Institute of Technology, Bangkok, Thailand (Title of his paper: “Diffusion of Innovation and Technology for National Development: School of Innovation”).

3. Important Events

3.1 The 70th Annual Meeting of the Indian Phytopathological Society and National Seminar

The 70th Annual Meeting of the Indian Phytopathological Society (IPS) and a National Symposium on “Plant Health Management: Embracing Eco-Sustainable Paradigm” was held from February 15 to 17, 2018 at AAU, Jorhat, Assam. In the inaugural session, Dr. K. M. Bujarbaruah, Hon’ble Vice Chancellor was the Chief Guest while Dr. C. D. Mayee, former Chairman, ASRB, and Dr. A. N. Mukhopadhyay, former Vice Chancellor, AAU, were the Guests of Honour. The special guests were Dr. K. Shubbarao, Professor, University of California, Davis; Dr. N.K. Krishna Kumar, former DDG (Hort.), ICAR and Dr. P.K. Chakraborty, ADG (PP&B), ICAR. A key event was organized to exchange MoU between IPS and the publication house Springer which is considered to be a milestone in the history of IPS and Ms. M Kapila, Senior Editor, Springer was felicitated during the inaugural session. Altogether more than 300 delegates participated in the event from all over the country as well as abroad. Four numbers of keynote lectures were delivered by eminent personalities like Dr. A.N. Mukhopadhyay, Dr.K.Subbarao, Dr. S.S. Chahal and Dr. M.K. Bhattacharyya. The Presidential lecture was delivered by Dr. B.N. Chakraborty. At the beginning of the session Dr. K.C. Puzari welcomed the delegates, while Dr. Dinesh Singh briefed about



Figure 3.1. 70th Annual Meeting of the Indian Phytopathological Society

different activities of IPS. The Director of Research (Agri), AAU, Dr. Ashok Bhattacharyya, the Organizing Secretary, offered the vote of thanks. The Symposium was organized under 10 different sessions with a special session on wilt disease management. In addition another special session on strengthening human resource development (HRD) in Plant Pathology was also organized wherein the gap in HRD in plant pathology was thoroughly discussed and the future strategies devised.

3.2 The 49th Annual National Conference of Nutrition Society of India (NSI)

The 49th Annual National Conference of Nutrition Society of India (NSI) was organised by the Dept. of Food Science and Nutrition, Faculty of Community Science, AAU on Nov. 2-4, 2017. The conference highlighted the need of re-exploring and rejuvenating the biodiversity of the North East for better food and nutrition security. Mr. Ram Muivah, IAS, Secretary of North Eastern Council, Shillong, graced the inaugural function as the chief guest and stated that NE region had trends of ethnic food which was rich in nutrition, compatible to culture and ethnicity of the Northeast and naturally organic.

Dr. K. M. Bujarbaruah, the Hon’ble Vice-Chancellor, AAU opined that quality of food people consume was important in order to address lifestyle



Figure 3.2. The Vice Chancellor, AAU lighting the inaugural lamp in the Nutritional Conference of NSI in presence of dignitaries

issues. Dr. V. Prakash, the Vice-President of International Nutrition Society commented that agriculture technology had advanced tremendously and could provide whatever was needed for food crops with particular composition. More than 450 participants from different states of the country including Bihar, West Bengal, Jharkhand, Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Orissa, Punjab, Rajasthan, Delhi, Maharashtra, Haryana, Chandigarh, Manipur, Meghalaya, Assam and Kerala participated in the knowledge festival.

3.3 The 52nd Annual Rice Group Meeting

The 52nd Annual Rice Group Meeting (ARGM) was held in AAU during April 8-11, 2017 where more than 300 rice scientists/workers from all over the country participated. The meeting was also attended by the senior officers from the ICAR, New Delhi and 23 scientists from the International Rice Research Institute (IRRI). Besides, the meeting was also attended by directors of several ICAR institutes, delegates from large number of private companies working in rice and also 8 farmers from different states of the country. The inaugural function was attended by Sri Atul Bora, Hon'ble Minister of Agriculture, Assam.

Welcoming the gathering, Dr. K. M. Bujarbaruah, Hon'ble Vice Chancellor, AAU stressed on the need of better convergence and collaboration among disciplines with use of latest technologies for developing problem solving and demand driven technologies. He drew attention of the scientists towards the value of the rice germplasm of the Northeast India and suggested to carry out research for identifying and using novel genes/alleles in them. Dr. V. Ravindra Babu, Director, Indian Rice Research



Figure 3.3. Dignitaries releasing the abstract book of the 52nd Annual Rice Group Meeting

Institute (ICAR-IIRR), Hyderabad informed the house about the varieties released through State Variety Release Committee (SVRC) and Central Variety Release Committee (CVRC) and the flagship programs of IIRR were able to address multitude of issues facing the farming community. Dr. I. S. Solanki, Additional Director General [ADG (FFC)], ICAR complimented the contribution of All India Coordinated Rice Improvement Project (AICRIP) in the country's record food grain production and called upon the researchers to focus on productivity enhancing technologies including *indica* varieties with redesigned plant type. Seven leading centres of AICRIP were awarded for their significant contribution in different divisions of research and 6 innovative farmers from different parts of the country were also felicitated. Several publications in English and Hindi were released on the occasion.

3.4 "Sankalp Se Siddhi" : New India Manthan

To commemorate 75 years of the Quit India Movement, the Govt of India launched a new scheme named "Sankalp Se Siddhi", which was inaugurated by the honourable Prime Minister, Sri Narendra Modi on the 21st of August, 2018. The aim of the scheme is to create a New India that is strong, prosperous and all-encompassing; an India that will make our freedom fighters proud. It is the first time that a strategic planning has been done to double the income of our farmers. The "Sankalp Se Siddhi" programme was ceremonially celebrated all over India as well as Assam from August 19- 30, 2017. The Krishi Vigyan Kendras (KVK) across the country celebrated the same in a grand manner. The KVKs under Assam Agricultural University have played a vital role in organizing the event across different districts of Assam. The event was witnessed by Members of Parliament, Ministers, MLAs, ICAR officials & Govt. line department officials. A total of around 15792 participants took



Figure 3.4. Dignitaries on the dais in the "Sankalp se Siddhi" Programme



Figure 3.5. “Sankalp Se Siddhi” programme in KVK, Nagaon

part in the programme. The programme was a grand success all over India and Assam in particular. The farmers gave strong and positive feedbacks for this mega event. The College of Veterinary Science in collaboration with the Krishi Vigyan Kendra, Kamrup, organized state-level *Sankalp se Siddhi* programme on 28.08.17, which was sponsored by the ICAR.



Figure 3.6. Dignitaries taking *Sankalp* in the “Sankalp Se Siddhi” programme

3.5 Workshop on Agri-Clinic and Agri-Business Centre Scheme

A district level workshop on “Agri-Clinic and Agri-Business Centre Scheme” was held on March 28, 2018 at Jorhat campus of AAU. The workshop was organised by NABARD in collaboration with Directorate of Extension Education, Assam Agricultural University. Dr. M. Neog, Associate Director of Extension Education (Training) welcomed the dignitaries and participants. Mr. K. Vaiphei, District Development Manager, NABARD, Jorhat explained the objectives of the workshop followed by the inaugural address by Dr. D. K. Borah, Dean,



Figure 3.7. Workshop on Agri-Clinics and Agri-Business Centres organised by NABARD

Faculty of Agriculture. Dr. Borah explained the need of such workshops for encouraging the students to be real agri-entrepreneurs. Dr. P. K. Neog, Director, EEI, assured all possible help and cooperation from his side to the students. Mr. Samir Bordoloi, Agri-entrepreneur, in his presentation shared his journey of becoming a successful agri-entrepreneur and the ways of profitable entrepreneurship venture. The details of ACABA Scheme were briefed by Mr. K. Vaiphei, DDM, NABARD. Assistant Managers from IDBI bank, Mr. S. Howkip and Mr. Tonoy Das were also present in the workshop along with representative of SBI, Martina Das who discussed at length about the bank credit system. The heads of the departments of Agril Economics & Farm Management, Soil Science, Agriculture Engineering, Plant Pathology were also present in the workshop. A total of 56 students of ELP programme participated in the workshop. The workshop ended with vote of thanks from Mr. K. Vaiphei, DDM, NABARD, Jorhat.



Figure 3.8. Participants in the Workshop on Agri-Clinics and Agri-Business Centres

3.6 Third National Youth Convention at AAU, Jorhat

The 3rd National Youth Convention on “Transforming Agriculture for Agripreneurship and Employment Opportunities : The Youth Perspective” was organized jointly by Indian Council of Agricultural Research, Assam Agricultural University and All India Agriculture Students’ Association (AIASA) at AAU, Jorhat on February 23 and 24, 2018. Hon’ble Chief Minister of Assam Shri Sarbananda Sonowal graced the inaugural ceremony as Chief Guest, which was also attended by Sjt. Kamakhya Prasad Tasa, MP, Jorhat constituency; Sjt. Pradan Baruah, MP, Lakhimpur constituency and Rituparna Baruah, MLA, Lahowal constituency; Dr. K. M. Bujarbaruah, Hon’ble Vice-Chancellor, AAU, Jorhat; Mr. R.P. Singh, Patron, AIASA; Sonika Priyadarshini, President, AIASA and a host of others. Synchronising with the programme the Chief Minister also conferred award to different personalities in recognition to their excellence in different fields of agricultural practices.



Figure 3.9. Dignitaries lighting the inaugural lamp in the National Youth Convention



Figure 3.10. The Hon’ble Chief Minister, Assam presenting the awards in the Youth Convention

3.7 Technology and machinery demonstration mela

Under the aegis of All India Co-ordinated Research Project (AICRP) on Post-harvest Engineering & Technology and Farm Implements and Machinery, a “Technology and Machinery Demonstration mela” was organised in the premises of Dept. of Agricultural Engineering, Assam Agricultural University, Jorhat. Dr. K.M. Bujarbaruah, Hon’ble Vice-Chancellor, AAU, Jorhat while inaugurating the mela, emphasised on the benefits of mechanization of agriculture and appealed the farmers to embrace suitable technologies and machineries for better economic return. Apart from demonstration of different innovations of post-harvest technologies and farm implements of the two research projects, several business houses dealing in agricultural processing machines as well as farm implements participated in the mela. Active participation of university teachers, scientists and students made the mela a great success. Dr. A. Borah, PI & Research Engineer AICRP on PHET and Er. M. J. Barooah, P.I. AICRP on FIM elaborated on the different projects and programmes being conducted under the schemes.



Figure 3.11. The Vice Chancellor, AAU inaugurating the Technology and Machinery Demonstration mela

3.8 49th foundation day of AAU was observed

Assam Agricultural University observed its 49th Foundation Day with musical programmes, pragmatic lecture on flagship programmes in agricultural sector and a ceremony to award teachers, researchers and extension workers on April 1, 2017. Participating as the chief guest, Sjt. Atul Bora, Hon’ble Agriculture Minister, Govt. of Assam, said that the teachers, researchers and extension workers of AAU have been contributing immensely to the growth of agriculture,

veterinary science, fishery science and dairy through the university's extensive research and extension machinery to help the farming community.



Figure 3.12. Sjt. Atul Borah, the Minister of Agriculture, Assam, delivering his speech on the occasion of the 49th Foundation day of AAU

Dr. K. M. Bujarbaruah, Hon'ble Vice-Chancellor, AAU stressed on large-scale organic cultivation in the state as the Central and the State Governments had already announced many schemes to inspire the organic farmers in the resourceful state. As a part of the ceremony, awards were conferred to the Best Teachers for the year viz. Dr. Nivedita Deka; Dr. N.N. Barman and Dr. Mamoni Das from faculties of Agriculture, Veterinary Science and Community Sciences respectively. Similarly Best Research Scientist awards were given to Dr. Sanjay Kumar Chetia; Dr. Chandana Chowdhury Barua and Dr. Pranati Das from these faculties. The best extension scientist was awarded to Dr. Hiranya Kumar Bhattacharya while Dr. Bibha Chetia Bora of the Faculty of Fishery Sciences was honoured with Best Researcher Award. Best graduate in Tea Husbandry, Gargi Barua was awarded with Late Dharmananda Das cash prize. The other programmes of the Day included a friendly volley ball match and a colourful cultural evening.

3.9 World Veterinary Day observed

College of Veterinary Sciences, Khanapara observed the World Veterinary Day on April 29, 2017 at Teaching Veterinary Clinical Complex (TVCC), Khanapara, Guwahati with a day-long programme. The day started with plantation of 20 nos. of 'Bokul' tree in TVCC premises. A free endo-and-ectoparasitic control programme was also organized for animals in

Collaboration with SAVAVET Pvt. Ltd, where 100 pets and 30 livestock were benefited. A technical session was also organized in which Director of TVCC stressed on judicious use of antibiotic for animal welfare.

3.10 Training programme on "Value addition in Fresh Water Fish and Marketing"

A training programme on "Value addition in fresh water fish and marketing" for the women from different districts of Assam was held during April 4-8, 2017 at College of Fisheries, AAU, Raha; the programme was sponsored by the Deptt. of Fisheries, Govt. of Assam. A total of 20 women participated in the training. Guests present in the inauguration programme were: Mrs. Kasturi Niva Gogoi, DFDO, Morigaon district, Dept. of Fisheries and Mr. Manoj Das, FEO, Meen Bhawan, Guwahati. One training manual entitled "Mitha Panir Machor Mulya Xongjojan Aru Biponan" was also published on that occasion.

3.11 Gathering on the Agriculture Policy of Assam

The draft of the newly framed Agriculture Policy of Assam was presented by Dr. K.M. Bujarbaruah, Vice-Chancellor, AAU, in a meeting held at College of Veterinary Science, Khanapara on 12th June, 2017, in presence of the Hon'ble Agriculture Minister of Assam Sri Atul Bora; Sri K.K. Mittal, Addl. Chief Secretary & Agriculture Production Commissioner, Assam; Sri Amlan Baruah, Commissioner & Secretary, Agriculture Department, Assam; Statutory officers of AAU; Director of Agriculture, Assam; Director, NRC (Pig); Additional Secretary of Agriculture, Assam; and Heads of the Departments of College of Veterinary Science, Khanapara. The Agriculture Minister highly appreciated the draft policy paper drafted by AAU.



Figure 3.13. Sjt. Atul Borah, the Minister of Agriculture, Assam deliberating upon the Agriculture Policy of Assam with experts

3.12 College of Agriculture Celebrated its 70th Foundation Day

College of Agriculture, Jorhat celebrated its 70th Foundation Day on August 16, 2017 with a colourful start of the cultural procession by the students which was flagged off by Hon'ble Vice Chancellor, Dr. K. M. Bujarbaruah followed by flag hoisting by Dr. D. K. Bora, Dean, College of Agriculture. The GOC of Army's Dinjan-based 2 Mountain Division, Major General Ananta Bhuyan delivered the Foundation Day lecture and stated that Indian defence forces in general and the Army in particular, the world's fourth largest Army, was the "perfect" career option for those who wanted to serve the country and at the same time enjoy undertaking adventures, travelling and playing sports as the job in uniform had them all. He also said that the Indian Army which has a tradition of having high professional standards, earned laurels abroad as contingents deployed under UN missions across the globe have successfully discharged their duties and accomplished their tasks.

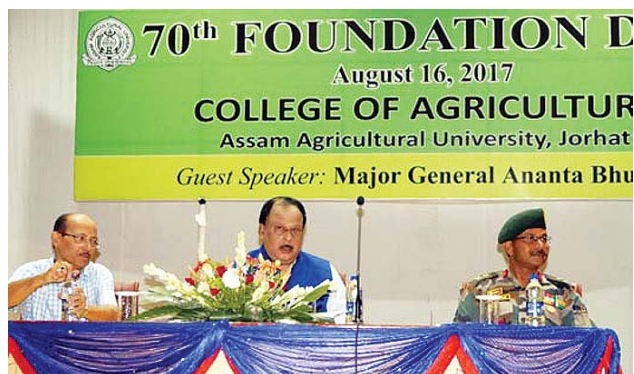


Figure 3.14. The Guest Speaker, the Vice Chancellor and the Dean, Faculty of Agriculture, in the dais, on the occasion of the College of Agriculture, AAU

Hon'ble Vice-Chancellor, AAU, Dr. K. M. Bujarbaruah, in his address, recollected the journey of the College of Agriculture and paid tributes to all those who had contributed to the development of the Institute, which is a major component of the University.

3.13 International Elder Abuse Awareness Day

The Dept. of Human Development & Family Studies (HDFS), College of Community Science observed the International Elder Abuse Awareness Day on June 15, 2017 at 'ProshantiNiloy' old age home of

Country Women's Association. A lecture was delivered by Dr. Minoti Phukan, Professor & Head, Dept. of HDFS on different types of elderly abuse, its identification and management. The members of Country women's Association (CWA) participated in the programme and also shared their views.



Figure 3.15. A scene from the observation of the International Elder Abuse Awareness Day

3.14 Other important events in 2017-18

3.14.1 Agriculture

- World Water Day was observed by AICRP on Irrigation Water Management, AAU, Jorhat on 22.03.2018 in Neul Gaon, Jorhat. The event was sponsored by ICAR, New Delhi.
- A CAFT course on Culturing Techniques for Biofertilizers and Biopesticides was organized by Department of Soil Science from 7th to 27th November, 2017.
- Another CAFT course was organized by Department of Soil Science from 7th to 27th February, 2018 on Recent Developments in Organic Production Systems.
- Dept. of Agricultural Economics organized a National Conference on 'Agribusiness Potentials of Assam' from 30 to 31 January, 2018 in AAU. The event was sponsored by Indian Society of Agricultural Marketing, Hyderabad
- Dept of Agricultural Economics & Farm Management organized national level PAD Workshop on 28th January 2017. The event was sponsored by NIAP-ICAR.
- Dept of Agricultural Statistics organized state level training on Introduction to "C" Programming from 09.11.2017 to 09.12.2017. The event was sponsored by Training & Placement Cell, AAU.
- Dept of Agricultural Statistics organized state level training on MS-Office Software in Office

Administration from 20.12.17 to 02.01.18, from 17.01.18 to 01.02.18 and from 05.02.18 to 15.02.18. The events were sponsored by Office of the Registrar, AAU.

- Dept of THT organized a Summer Study Course on Tea Production entitled ‘Farm to Cup’ for students of Rutgers University, New Jersey, USA for a period of 21 days.
- Method demonstration on Tipping and Plucking on Tea was organized by Dept of THT in Tuensang, Nagaland during June, 7-10. 2017 under National Rural Livelihood Mission.
- A regional level Training Programme on Husbandry Practices and Processing of Organic Tea for Small Tea Growers’ of Nagaland was organized by Dept of THT during October, 22-28, 2017. The training was sponsored by North East Livelihood Promotion Society (DoNER).
- Technology and Machinery Demonstration *Mela* was organized under AICRP on PHET & AICRP on FIM on 21st February, 2018. The *Mela* was sponsored by ICAR.
- A one day national level workshop on Lac cultivation was organized by Dept. of Entomology on 19th April, 2017 with the sponsorship of NABARD and Kolashib KVK, Mizoram.
- An ICAR sponsored 10 days short course on “Preparation of bioformulation of fungal and bacterial biocontrol agents for management of biotic stress of agricultural crops” was organized by Dept of Plant Pathology, CA, from 1st to 10th Sept, 2017.
- 70th Annual Meeting of the Indian Phytopathological Society and National Symposium on ‘Plant Health Management: Embracing Eco-Sustainable Paradigm’ was organized in AAU by Indian Phytopathological Society and Assam Agricultural University during 15-17 Feb, 2018. The Meeting was sponsored by IPS, New Delhi, AAU, NEC, NABARD etc.
- A village level ICAR-sponsored training on Oyster Mushroom Cultivation was conducted in Bahphala Gaon on 12.04.17 by AICRP on Mushroom.
- Another state level ICAR-sponsored training on Oyster Mushroom Cultivation was conducted in AAU, Jorhat on 03.06.17 by AICRP on Mushroom. A national level training on Package of Agri.-Machinery for Paddy Cultivation was organized at BNCA and NICRA Village Chamua by FMPTI, Biswanath Chariali in collaboration with AICRPDA Biswanath Chariali Center from 10.07.2017 to 14.07.2017. The programme was sponsored by Ministry of Agriculture and Farmers welfare and AICRPDA, NICRA.
- A village level sensitization programme on SHG/JLG was organized by NABARD in collaboration with NICRA Biswanath Chariali Center on 09.03.2018 in the Training Hall and NICRA Village Chamua.
- RARS, Titabar organized the 52nd All India Annual Rice Group Meeting during April 8-11, 2017 at AAU. The meeting was sponsored by ICAR.
- HRS, Kahikuchi organized a state level training on “Organic Grower” during 31.10.17- 04.12.17. The training was sponsored by IIE, Guwahati.
- HRS, Kahikuchi organized a state level training on “Vermicompost Producer” during 31.10.17- 04.12.17. The training was sponsored by IIE, Guwahati.
- HRS, Kahikuchi organized a state level training on Skill Development of Gardeners during 05.01.18- 26.02.18. The training was sponsored by IIE, Guwahati.
- HRS, Kahikuchi organized a state level one month Skill Development Programme on job role “Green House Operator” during 26/02/2018 to 27/03/2018. The training was sponsored by NCPH, MoA& FW, GoI.
- RARS Shillongani organized a State Level Training on Jute & Allied Fibres on 19 January, 2018. The training was sponsored by Directorate of Jute Development, Govt. of India, Kolkata.
- RARS Shillongani organized an awareness-cum-training programme under ICAR Seed Project on Quality Seed Production of Wheat for adoption of New Varieties on 12 March, 2018. The training was sponsored by ICAR-IIWBR, Karnal, Haryana.
- RARS Shillongani organized a state level training on Linseed for Extension Officers and Input Dealers on Mar 28, 2018. The programme was sponsored by Indian Institute of Oilseed Research and AICRP on Linseed, ICAR, Govt. of India.
- KVK, Karbi Anglong organized a district level World Environment Day on 05.05.2017 at Kania Enghi. The programme was sponsored by ICAR, Govt. of India.
- KVK, Karbi Anglong organized a district level World Honey Bee day on 19.08.2017 at KVK,

KarbiAnglong. The programme was sponsored by ICAR, Govt. of India.

- KVK, Karbi Anglong organized a district level *Sankalp Se Siddhi* on 17.09.2017 at Diphu Club. The programme was sponsored by ICAR, Govt. of India.
- KVK, Karbi Anglong organized a district level *Swachta Hi Sewa* on 01.10.2017 at KVK, Diphu. The programme was sponsored by ICAR, Govt. of India.
- KVK, Karbi Anglong organized a district level Mahila Kisan Diwas on 15.10.2017 at KVK, Karbi Anglong. The programme was sponsored by ICAR, Govt. of India.
- KVK, KarbiAnglong organized a district level World Food Day on 16.10.2017 at Nilapur, K/A. The programme was sponsored by ICAR, Govt. of India.
- KVK, KarbiAnglong organized a district level Krishi Siksha Divas on 03.12.2017 at Klirdap High School. The programme was sponsored by ICAR, Govt. of India.
- KVK, KarbiAnglong organized a district level World Soil day on 05.12.2017 at RARS, Diphu. The programme was sponsored by ICAR, Govt. of India.
- KVK, KarbiAnglong organized a district level Workshop on Petroleum Conservation on 11.12.2017 at KVK, KarbiAnglong. The programme was sponsored by PCRA, Govt. of India.
- KVK, Karbi Anglong organized a district level Workshop on National Science day on 28.02.2018 at Klirdap High School. The programme was sponsored by ICAR Govt. of India.
- KVK, Karbi Anglong organized a district level Workshop on Biennial conference of KVK (webcasting of inaugural session on 17.03.2018 at Diphu club. The programme was sponsored by ICAR Govt. of India.
- KVK, Karbi Anglong organized a district level Workshop on Training cum Awareness on PPV & FR Act on 29.03.2018 at KVK, Karbi Anglong. The programme was sponsored by PPV& FR Authority.
- KVK, Karimganj organized a National Level Agricultural workshop on petroleum conservation on the period of 2017-18 at Nalua, Karimganj. The programme was sponsored by PCRA.
- KVK, Karimganj organized a National Level Training on Improved practice of mushroom cultivation on the period of 2017-18 at Nalua, Karimganj. The programme was sponsored by ATMA.
- KVK, Karimganj organized a National Level Training on Improved practices of vermin-composting on the period of 2017-18 at Nalua, Karimganj. The programme was sponsored by ATMA.
- KVK, Karimganj organized a National Level Training on Store grain pest management on the period of 2017-18 at Nalua, Karimganj. The programme was sponsored by ATMA.
- KVK, Karimganj organized a National Level Training on Improved farming practices of poultry on the period of 2017-18 at Nalua, Karimganj. The programme was sponsored by ATMA.
- KVK, Karimganj organized a National Level Training on Improved farming practices of duckery on the period of 2017-18 at Nalua, Karimganj. The programme was sponsored by ATMA.
- KVK, Karimganj organized a National Level Training on Jam-Jelly preparation on the period of 2017-18 at Nalua, Karimganj. The programme was sponsored by ATMA.
- KVK, Karimganj organized a National Level Training on Pickle-squash preparation on the period of 2017-18 at Nalua, Karimganj. The programme was sponsored by ATMA.
- KVK, Karimganj organized a National Level Training on SRI method of Paddy cultivation on the period of 2017-18 at Nalua, Karimganj. The programme was sponsored by ATMA.
- KVK, Karimganj organized a National Level Training on improved farming practices of fishery on the period of 2017-18 at Nalua, Karimganj. The programme was sponsored by ATMA.
- KVK, Nalbari organized Mahila Kisan Divas on 12th Oct 2018 at Goshala. KVK, Nalbari organized National Science day on 28/02/2018 at Ulubari, Chengnoi LP School.
- KVK, Nalbari organized World Soil day on 5th Dec, 2017 at Nitya Mandir Nalbari.
- KVK, Nalbari organized International women's day on 8th March, 2018. KVK, Nalbari organized Agriculture Education day on 3rd Dec, 2017.

- KVK, Nalbari organized World Environment day on 5th June, 2017 at Janakalyan High School, Akhra, Nalbari
- KVK, Nalbari organized World Food Day on 16th Oct, 2017 at Dakshin Nalbari College, NizBahjani, Nalbari .
- KVK, Nalbari organized World Fishery Day on 21st November, 2017 at GosalaSariahtoli
- KVK, Sonitpur Organized World Environment Day on 05.06.2017 at Gohpur. The Programme was sponsored by ICAR.
- KVK, Sonitpur Organized a Workshop on organic farming on 29.06.2017 at KVK, Sonitpur. The Programme was sponsored by KVK, Sonitpur.
- KVK, Sonitpur Organized World Honey Bee Day on 19.08.2017 at KVK, Sonitpur. The Programme was sponsored by ICAR.
- KVK, Sonitpur Organized *Sankalp Se Siddhi-Sankalp* for New India on 26.08.2017 at District Library, Tezpur. The Programme was sponsored by ICAR.
- KVK, Sonitpur Organized Gandhi Jayanti along with Swaccha Bharat Campaign on 02.10.2017 at KVK, Sonitpur. The Programme was sponsored by ICAR.
- KVK, Sonitpur Organized Mahila Kisan Divas on 15.10.2017 at Parmaighuli. The Programme was sponsored by ICAR.
- KVK, Sonitpur Organized World Food Day on 16.10.2017 at Bhalukjarani. The Programme was sponsored by ICAR.
- KVK, Sonitpur Organized Training on Water management in multiple cropping system on 02.11.2017 to 03.11.2017 at KVK, Sonitpur. The Programme was sponsored by NERWALM, Tezpur.
- KVK, Sonitpur Organized Training on Workshop on Petroleum Conservation on 21.11.2017 at KVK, Sonitpur. The Programme was sponsored by Petroleum Conservation Resource Association, Govt. of India.
- KVK, Sonitpur Organized Agricultural Education Day on 03.12.2017 at KVK, Sonitpur. The Programme was sponsored by ICAR.
- KVK, Sonitpur Organized World Soil Health Day on 05.12.2017 at District Library, Tezpur on. The Programme was sponsored by ICAR.
- KVK, Sonitpur Organized a Training on Precision farming on 07.02.2018 at KVK, Sonitpur. The Programme was sponsored by PFDC, HRS Kahikuchi.
- KVK, Sonitpur Organized National Science Day on the period of 28.02.2018 at Napam M. V. School. The Programme was sponsored by ICAR.
- KVK, Sonitpur Organized International Women's Day on 08.03.2018 at Napam. The Programme was sponsored by ICAR
- KVK, Sonitpur Organized Webcasting programme at KVK, Sonitpur campus in context to the Krishi Unneti Mela, 2018 held at IARI, Pusa, New Delhi on the period of 17.03.2018 at KVK, Sonitpur. The Programme was sponsored by ICAR.
- KVK, Tinisukia Organized Sankalp se Siddhi at District Library, Tinsukia. The Programme was sponsored by GOI.
- KVK, Tinisukia Organized World Soil Day at Sadia. The Programme was sponsored by GOI.
- KVK, Nalbari organized World Water day on 22nd March, 2018 at KVK, Nalbari

3.14.2 Veterinary

- Dept of Veterinary Extension Education conducted a state level training on "Value addition of meat for income diversification and livelihood subsistence of fringe area villagers of Joint Forest Management Committee, Assam" from 21st to 22nd August, 2017. The programme was sponsored by IIE, Guwahati.
- Dept of Veterinary Extension Education conducted a state level training on "Pig farmers Orientation cum Exposure Visit Programme Enhancing Rural livelihood" from 23rd to 24th Feb, 2018. The programme was sponsored by IIE, Guwahati.
- Dept of Veterinary Extension Education conducted a state level training on "Pig farmers Orientation cum Exposure Visit Programme Enhancing Rural livelihood" from 26th to 27th Feb, 2018. The programme was sponsored by IIE, Guwahati.
- Dept of Veterinary Extension Education conducted a state level training on "Pig farmers Orientation cum Exposure Visit Programme Enhancing Rural livelihood" from 6th to 7th March, 2018. The programme was sponsored by IIE, Guwahati.
- Dept of Veterinary Extension Education conducted a state level training on "Pig farmers Orientation cum Exposure Visit Programme Enhancing Rural livelihood" from 9th to 10th March, 2018. The programme was sponsored by IIE, Guwahati.
- Dept of Veterinary Extension Education conducted a village level "Capacity Building and Skill

- Development Training Programme” on 9th and 10th January, 2018 at Nijaraguri JFMC, Swmkue JFMC, East Mahendrapur JFMC of Kokrajhar District. The programme was sponsored by IIE, Guwahati.
- Dept of Veterinary Extension Education conducted a village level “Capacity Building and Skill Development Training Programme” on 21/12/2017 at No 1 Bapapung EDC and Khagoripothar EDC of Tinsukia District of Assam. The programme was sponsored by IIE, Guwahati.
 - Dept of Veterinary Extension Education conducted a village level “Capacity Building and Skill Development Training Programme” on 22/11/2017 at Amguri JFMC and Baragarh Suden JFMC of Kokrajhar District of Assam. The programme was sponsored by IIE, Guwahati.
 - Dept of Veterinary Extension Education conducted a village level “Orientation and Hand Holding support with piglet distribution” on 31/10/2017 at Bithoria EDC and madlijhar EDC of Kokrajhar District. The programme was sponsored by IIE, Guwahati.
 - Dept of Veterinary Extension Education conducted a village level “Orientation and Hand Holding support with piglet distribution” on 27th and 28th October, 2017 at Thaijuwari JFMC of Dima Hasao district. The programme was sponsored by IIE, Guwahati.
 - Dept of Animal Reproduction, Gynaecology & Obstetrics in collaboration with ADEE organized a National level Refresher training of Veterinary Officers on A.I. in Cattle and Buffalo from 13.11.2017 to 22.11.2017. The training was sponsored by District A.H. & Vety. Officer, East Siang District, Pasighat, Arunachal Pradesh.
 - Dept of Animal Reproduction, Gynaecology & Obstetrics in collaboration with ADEE organized a National level Refresher training of Veterinary Officers on A.I. in Cattle and Buffalo from 04.09.2017 to 8.09.2017. The training was sponsored by District A.H. & Vety. Officer Namsai District, Arunachal Pradesh.
 - The Dept of Animal Reproduction, Gynaecology & Obstetrics organized a the Department of Biotechnology, Govt of India sponsored National level Awareness cum training Programme on Artificial Insemination in Pigat Baihata Chariali, Kamrup on 16th May, 2017; at Karara, Kamrup on the 18th May, 2017; at Ramdia, Kamrup on the 9th September, 2017; at Maligaon Kamrup on the 16th December, 2017; at Sonapur, Kamrup on the 13th February, 2018; at Chepti, Rangia on the 13th March, 2018.
 - The Dept of Animal Biotechnology organized national level Hands on trainings on Mammalian Cell Culture, Oocyte Manipulation and In-vitro Fertilization from the 2nd May, 2017 to the 6th May, 2017.
 - Dept of Veterinary Pathology organized a regional level training Programme on “Molecular diagnosis and Pathology of emerging diseases of Livestock and Poultry in Assam” on 25th February, 2018. The training was sponsored by Indian Association of Veterinary Pathologists.
 - Dept of Animal Biotechnology organized national level Capacity Building training of Teachers, Researchers and Bio-Medical Practitioners of North Eastern Region on Advanced Techniques in Molecular Biology and Microbiology from 30-05-2018 to 08-06-2018. The training was sponsored by Ministry for Development of North Eastern Region, Govt. of India.
 - Dept of Animal Biotechnology in association with Advanced State Biotech Hub organized national level Hands on trainings on Molecular Tools for Genomics & Proteomics Research during 20th-24th November, 2017. The training was sponsored by DBT, GoI.
 - Dept of Animal Biotechnology in association with Advanced State Biotech Hub organized national level Hands on trainings on *Animal Cell Culture and Molecular Typing of Microbes* during 12th-16th February, 2018. The training was sponsored by DBT, GoI.
 - Dept of Animal Biotechnology in association with Advanced State Biotech Hub organized national level Hands on trainings on Basic tools and Techniques in molecular Biology during 12th-16th March, 2018. The training was sponsored by DBT, GoI.
 - Dept of Animal Biotechnology in association with Advanced State Biotech Hub organized state level trainings on Biomolecular Structures, X-ray Crystallography and Computer aided Drug Designing during 20th-23rd March, 2018. The training was sponsored by DBT, GoI.
 - Dept of Veterinary Public Health & Jurisprudence organized regional level Community awareness

programme on Disaster Management on 20/05/2017. The training was sponsored by NDRF.

- Dept of Veterinary Public Health & Jurisprudence organized regional level Officers' Meet on PERIMILK Study on Small Holder Peri-Urban Dairy Farms on 24/10/2017. The training was sponsored by PHFI.
- Dept of Veterinary Livestock Products Technology in association with AICRP on PHET organized state level Training program Processing & Value addition of meat & meat Products during 20-22 March, 2018. The training was sponsored by ICAR-CIPHET Ludhiana.
- Goat Research Station, Byrnihat in association with AICRP on Goat Improvement, (Assam Hill Goat Unit) organized training on Scientific breeding and management of goat on 03.05.2017.
- Goat Research Station, Byrnihat in association with AICRP on Goat Improvement, (Assam Hill Goat Unit) organized training on Scientific breeding and management of goat on 17.05.2017.
- Goat Research Station, Byrnihat in association with AICRP on Goat Improvement, (Assam Hill Goat Unit) organized training on Scientific breeding and management of goat on 20.05.2017.
- Goat Research Station, Byrnihat in association with AICRP on Goat Improvement, (Assam Hill Goat Unit) organized training and awareness camp on Scientific breeding and management of goat on 30.05.2017.
- Goat Research Station, Byrnihat in association with AICRP on Goat Improvement, (Assam Hill Goat Unit) organized trainings on Scientific breeding and management of goat on 20.07.2017, 03.08.2017, 09.08.2017, 25.09.2017, 29.10.2017, 09.11.2017 and 01.02.2018.
- Goat Research Station, Byrnihat in association with AICRP on Goat Improvement, (Assam Hill Goat Unit) organized awareness camp on goat keeping on 06.09.2017.
- Goat Research Station, Byrnihat in association with AICRP on Goat Improvement, (Assam Hill Goat Unit) organized training on Artificial Insemination of Goat on 12.03.2018.
- Goat Research Station, Byrnihat in association with AICRP on Goat Improvement, (Assam Hill Goat Unit) organized training on Scientific intervention for increasing goat production on 12.03.2018.

3.14.3 Community Science

- Dept of TAD organized Macramé Work from 29th March to 6th April 2017 in regional level.
- *Swachh Bharat Abhiyan* programme was observed on 25th, September, 2017 by AICRP, Home Science in Pirakata Bhorolua Gaon, Jorhat, Assam.
- An exposure visit of farm women to AAU, Jorhat was organized by AICRP, Home Science on 31st October, 2017.
- World Disability Day was observed on the topic on "Early Identification of Disability of Children" on 8th December, 2017 in Peerakota, Bharaluwa Gaon, Jorhat, Assam by AICRP, Home Science.
- An awareness camp on Reproductive Health was organized on four days – 7th, 14th and 28th March, 2018 and on 25th April, 2018 in Peerakota village, MudoijanBharaluwa village, NapamBharaluwa village and Mudoijan, respectively by AICRP on Home Science Child Development Component.
- World literacy day was observed by AICRP on Home Science on 8th September, 2017 at Peerakota Bharaluwa Gaon.
- Dept of Food Science and Nutrition, CCSc, organized 49th National Annual Conference of Nutrition Society of India from 2nd to 4th November, 2017. The event was organized by several Government Organisations and Private Organisations, and Multinational Companies.
- Dept of Food Science and Nutrition, CCSc, conducted a Certificate course on Bakery from March 5^{to} April 5, 2018 in regional level. The course was sponsored by NABARD, Jorhat.
- RARS, Karimganj organized Zonal Research & Extension Advisory Committee Meeting for Rabi, 2017 on 06.10.2017.
- RARS, Karimganj organized an Agri Fair-cum-Exhibition from 26.02.2018 to 27.02.2018 in the RARS. The event was sponsored by Govt. of Assam.
- "New India Manthan: *Sankalp se Siddhi* Programme" was organized jointly by RARS, & KVK, Karimganj on 22.08.2017; the programme was sponsored by ICAR.
- With sponsorship of ICAR, World Soil Day was observed on 05.12.2017 by RARS, Karimganj.
- AICRP, Home Science organized a Training on International Literacy Day, in Pirakota Bhorolua Gaon, Jorhat, Assam on the 8th September, 2017

- AICRP, Home Science organized a state level Training on mushroom Cultivation on the 4th December, 2017
- AICRP Home Science organized a state level Training on Extraction of banana fibre & product preparation on the 21st March, 2018
- AICRP Home Science organized a national level Training on Capacity building programme, entitled 'Empowerment farm women on climate change and climate smart village from the 17th to the 20th January, 2019, which was sponsored by VRTI, Mandvi, Gujrat.



Figure 3.16. Training Programme on Poultry Farming

3.14.4 Fishery

- National Fish Farmers' Day was observed by Fish Research Center (FRC), AAU on the 10th of July, 2017
- A State-level Career Oriented Course on Industrial Fish & Fisheries was conducted by FRC, AAU & DR College, Golaghat from the 20th to the 22nd July, 2017. The course was sponsored by OGC, Govt. of India.
- Annual Mega Fish Sale was organized by FRC, AAU on the 12th January, 2018



Figure 3.17. His Excellency Prof. Jagdish Mukhi, The Governor of Assam, visiting the Fisheries Research Centre at AAU, Jorhat

- A National training programme on *Mitha Panir Machor Mulya Songjojan aru Bipanan* was organized by Dept of Fish Processing Technology, College of Fisheries, Raha. The training was sponsored by Dept of Fisheries, Govt. of Assam from the 4th April to the 7th April, 2017.

4. Education

4.1 Faculties

Being the sole agricultural university of the state, education is the frontier mandate of the University like any other agricultural university in the country. There are four faculties in the University to carry out this mandate. They are (1) Faculty of Agriculture with its headquarters at Jorhat (2) Faculty of Veterinary Science at Khanapara (3) Faculty of Community Science at Jorhat and (4) Faculty of Fishery Science at Raha, Nagaon. Colleges of Horticulture and Sericulture are under the Faculty of Agriculture.

4.2 Degree Programme

Assam Agricultural University offers courses in six areas of science viz., Agriculture, Veterinary, Community Science, Fishery Science, Horticulture and Sericulture. Bachelor's Degree is offered in all the six areas while postgraduate (Master's and Ph. D.) Degree is offered in the first four areas viz., Agriculture, Veterinary, Community Science and Fishery Science. With the implementation of the 5th Deans Committee's recommendation from the academic session 2016-17 (in all the Faculties except Veterinary), the 4 year Bachelor's Degree is broken into two parts. The first three consecutive years are devoted to course work and in the final year the students are exposed to the 'Student READY' (Rural Entrepreneurship Awareness Development Yojana) Programme of 40 credits – 20 credits each in the 7th and 8th semester. The duration of the B.V.Sc. Degree also has been increased in the same academic session from 5 years to 5 ½ years comprising course work of 4 ½ years and internship for 1 year. Besides, the nomenclatures of the degrees have also been changed in the areas of Agriculture, Community Science, Horticulture and Sericulture in accordance with the recommendations of the ICAR.

In addition to the degree courses, the University also offered 9 Certificate courses during the year through its Directorate of Extension Education, Jorhat. These courses include (i) Bakery (ii) Tea Production Technology & Management and (iii) Pig farming. (iv) Apparel Designing & Construction (v) Aquaculture Production and Management (vi) Poultry Production Technology and Management (vii) Master Goat Production (viii) Cut Flower Production, and (ix) Dyeing & printing of Textiles.

4.3 Course Curricula

Assam Agricultural University is implementing the undergraduate Course Curricula prescribed by the 5th Deans Committee of ICAR in the Faculty of Agriculture, Community Science and Fishery Science. However, the colleges under the Faculty of Veterinary follow the course curricula approved by the Veterinary Council of India as per the MSVE, 2016. The present UG Curricula is a market/time driven curriculum as it includes the 'Student READY' Programme (prescribed by the ICAR 5th Deans Committee from the year 2016-17) designed to develop much needed skill and entrepreneurial mind-set among the graduates to take up self-employment. The 'Student READY' Programme is being offered in all the colleges of the University from the academic Session 2016-17.

4.4 Intake and Output

During 2017-18, 900 students were admitted in the University of which 477 in Bachelor's, 297 in Master's and 126 in Ph.D. degree programmes. In regards to output, 665 students obtained degrees during the year, of which 368 were Bachelor's Degree, 244 Master's Degree and 53 Ph.D. Degree holders. The constituent college wise student enrollment and output under different degree programmes is shown in Table 4.1 and Figure 4.1

Table 4.1: Fresh students enrolled and students passed out in different degree programmes of the University during 2017-18

| Colleges | Bachelor's Degree | | Master's Degree | | PhD Degree | | Total | |
|---|-------------------|------------|-----------------|------------|------------|------------|------------|------------|
| | Enrolled | Passed out | Enrolled | Passed out | Enrolled | Passed out | Enrolled | Passed out |
| College of Agriculture, Jorhat | 143 | 144 | 188 | 131 | 79 | 29 | 410 | 304 |
| Biswanath College of Agriculture, BiswanathChariali | 45 | 36 | 13 | 15 | - | - | 58 | 51 |
| SCS College of Agriculture, Dhubri | 30 | 21 | - | - | - | - | 30 | 21 |
| College of Veterinary Science, Khanapara | 104 | 76 | 64 | 79 | 27 | 16 | 195 | 171 |
| Lakhimpur College of Vety. Science, Joyhing | 30 | - | - | - | - | - | 30 | - |
| College of Community Science, Jorhat | 45 | 28 | 24 | 16 | 17 | 8 | 86 | 52 |
| College of Fisheries, Raha | 29 | 18 | 08 | 03 | 03 | - | 40 | 21 |
| College of Sericulture, Jorhat | 26 | 23 | - | - | - | - | 26 | 23 |
| College of Horticulture, Jorhat | 25 | 22 | - | - | - | - | 25 | 22 |
| Total | 477 | 368 | 297 | 244 | 126 | 53 | 900 | 665 |

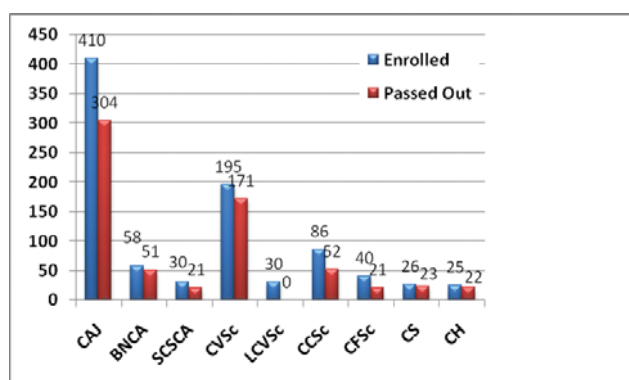


Figure 4.1. College wise students enrolled and passed out in AAU in 2017-18

4.5 Total Students on Roll

Altogether 3398 students were on roll in the University during 2017-18 academic year of which more than 53 per cent were girl students (1808). Out of the total students on roll, 1850, 531 and 1017 were in Bachelor's, Master's and PhD degree programmes, respectively. The college wise details of total and girl students are given in Table 4.2 and Figure 4.2.

4.6 Fellowships Awarded to Students and National Tests Qualified

During the year, 307 students of the University were either awarded fellowships or qualified for

Table 4.2: Total students on roll in different colleges of the University during 2017-18

| Constituent Colleges | Bachelor's Degree | | Master's Degree | | PhD Degree | | Total | |
|---|-------------------|------------|-----------------|------------|-------------|------------|-------------|-------------|
| | Total | Girl | Total | Girl | Total | Girl | Total | Girl |
| College of Agriculture, Jorhat | 579 | 350 | 284 | 169 | 128 | 71 | 991 | 590 |
| BNCA, BiswanathChariali | 162 | 89 | 28 | 10 | - | - | 190 | 99 |
| SCS College of Agriculture, Dhubri | 94 | 21 | - | - | - | - | 94 | 21 |
| College of Veterinary Science, Khanapara | 485 | 214 | 142 | 75 | 720 | 324 | 1347 | 613 |
| Lakhimpur College of Vety. Science, Joyhing | 99 | 35 | - | - | - | - | 99 | 35 |
| College of Community Science, Jorhat | 154 | 116 | 56 | 55 | 49 | 49 | 259 | 220 |
| College of Fisheries, Raha | 93 | 45 | 21 | 08 | 120 | 54 | 234 | 107 |
| College of Sericulture, Jorhat | 93 | 55 | - | - | - | - | 93 | 55 |
| College of Horticulture, Jorhat | 91 | 68 | - | - | - | - | 91 | 68 |
| Total | 1850 | 993 | 531 | 317 | 1017 | 498 | 3398 | 1808 |

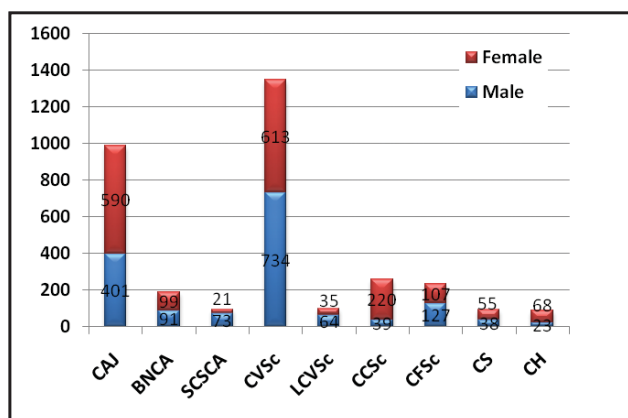


Figure 4.2. College wise male and female students enrolled in AAU in 2017-18

national or state test of which 18 were awarded Junior Research Fellowship, 5 Senior Research Fellowship, 19 DBT Fellowship and 55 qualified for NET. In addition, 108 students (UG & PG) enjoyed merit scholarships during the year. Meanwhile, 102 students received other fellowships/ scholarships such as ICAR NTS, ICCR, IASF-III, ICPP etc.

4.7 Publication

The teachers and scientists of the University have published altogether 888 publications during the year. Out of these 458 were research papers in journals, 169 research abstracts in journals and proceedings, 6 books, 80 practical manuals, 70 book chapters, 66 popular articles, 26 technical bulletins and 13 other publications. College of Agriculture had the maximum number of publications (423), which was followed by College of Veterinary Science with 283 publications. The college wise breakup of the publications is shown in Table 4.3 and depicted in Figure 4.3.

The publication profile of the university in 2017-18 is shown in Figure 4.3.

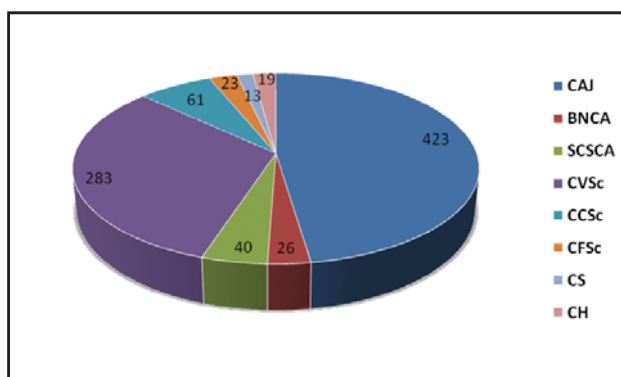


Figure 4.3. College wise publications in AAU in 2017-18

4.8 Human Resource Development

Altogether 604 teachers/scientists of the University were deputed for attending regional/national/international level training/workshop/seminar etc during 2016-17. The College of Agriculture deputed the maximum number of teachers (457). The college wise and event wise breakup of the number of teachers deputed from the University is given in Table 4.4 and Figure 4.4.

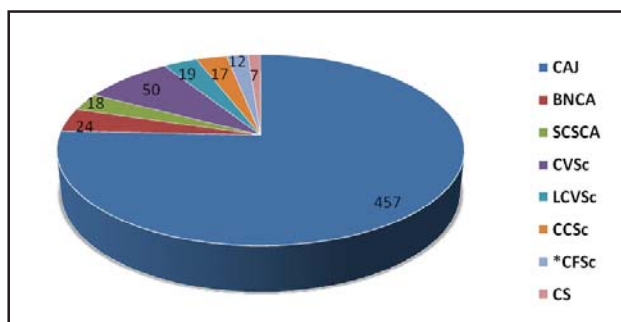


Figure 4.4. College wise number of teachers attending trainings, workshops etc. from AAU in 2017-18

Table 4.3: Publications of different constituent colleges of the University during 2017-18

| Particular of publication | Number of publication in constituent colleges | | | | | | | | Total |
|----------------------------------|---|-----------|-----------|------------|-----------|-----------|-----------|-----------|------------|
| | CAJ | BNCA | SCSCA | CVSc | CCSc | CFSc | CS | CH | |
| Research paper in journal | 204 | 17 | 4 | 173 | 26 | 14 | 1 | 19 | 458 |
| Research abstracts in proceeding | 72 | 6 | 10 | 44 | 31 | 2 | 4 | 0 | 169 |
| Books | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 6 |
| Practical manual | 19 | 2 | 25 | 34 | 0 | 0 | 0 | 0 | 80 |
| Book Chapter | 52 | 0 | 1 | 3 | 4 | 2 | 8 | 0 | 70 |
| Popular articles | 49 | 0 | 0 | 12 | 0 | 5 | 0 | 0 | 66 |
| Technical bulletin | 17 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 26 |
| Others | 8 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 13 |
| Total | 423 | 26 | 40 | 283 | 61 | 23 | 13 | 19 | 888 |

Table 4.4: Teachers deputed for attending training, seminar, workshop etc. during 2016-17

| Training, seminar, conference attended | Teachers (No.) attending training, seminar, workshop etc. | | | | | | | | |
|--|---|-----------|-----------|-----------|-----------|-----------|-----------|----------|------------|
| | CAJ | BNCA | SCSCA | CVSc | LCVSc | CCSc | *CFSc | CS | Total |
| International level training | 14 | 2 | - | 1 | - | 1 | | - | 18 |
| National level training | 131 | 3 | 2 | 20 | 14 | 8 | 8 | 5 | 191 |
| Regional level training | 159 | 11 | - | 02 | 2 | 2 | 4 | - | 180 |
| International level seminar | 6 | - | - | 05 | - | - | - | 1 | 12 |
| National level seminar | 29 | 3 | - | 04 | - | - | - | - | 36 |
| Regional level seminar | 3 | 2 | 14 | 11 | - | 4 | - | 1 | 35 |
| International level conference | 8 | - | 1 | - | - | - | - | - | 9 |
| National level conference | 18 | 3 | - | - | 03 | - | - | - | 24 |
| Regional level conference | 1 | - | - | 03 | - | 1 | - | - | 5 |
| International level workshop | 4 | - | - | 03 | - | 1 | - | - | 8 |
| National level workshop | 39 | - | 1 | - | - | - | - | - | 40 |
| Regional level Workshop | 21 | - | - | - | - | - | - | - | 21 |
| Others | 24 | - | - | 01 | - | - | - | - | 25 |
| Total | 457 | 24 | 18 | 50 | 19 | 17 | 12 | 7 | 604 |

*Including Fishery Research Centre, Jorhat

4.9 Training/Seminar/Workshop Organized

The University organized 141 regional /national level trainings/ workshops/ seminars etc. during the year. The College of Agriculture, Jorhat (organizing 90 events) was ahead of other colleges of the University in organizing such events. The breakup of the organized events in different colleges of the University is presented in Table 4.5 and Figure 4.5.

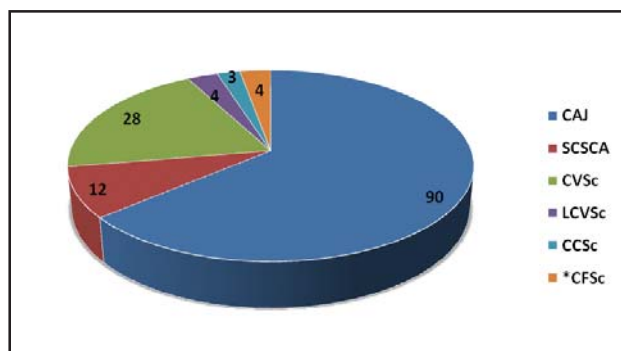


Figure 4.5. College wise number of trainings, workshops etc. organized in AAU in 2017-18

4.10 Library

The Rev. B M Pugh Library (RBMPL) is serving as the knowledge resource centre on Agriculture and

Table 4.5: Training, seminar, workshop organized in the colleges during 2017-18

| Particulars of Events | Training, seminar, workshop etc organized (No) | | | | | | | | |
|---|--|----------|-----------|-----------|----------|----------|----------|----------|------------|
| | CAJ | BNCA | SCSCA | CVSc | LCVSc | CCSc | *CFSc | CS | Total |
| International level training, Seminar, Workshop | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 7 |
| National level training Training, Seminar, Workshop | 31 | 0 | 0 | 3 | 0 | 1 | 2 | 0 | 37 |
| Regional level training Seminar, Workshop | 5 | 0 | 0 | 12 | 2 | 1 | 0 | 0 | 20 |
| State Level training, Seminar, Workshop | 13 | 0 | 2 | 0 | 2 | 1 | 2 | 0 | 20 |
| Others | 41 | 0 | 10 | 6 | 0 | 0 | 0 | 0 | 57 |
| | | | 0 | | | | | | |
| Total | 90 | 0 | 12 | 28 | 4 | 3 | 4 | 0 | 141 |

*Including Fishery Research Centre, Jorhat

allied areas since its inception in the year 1969 to the myriad user community consisting of students, teachers/scientists, research scholars and the staff concerned. The RBMPL offers its Library and Information Services to the four colleges housed within the University Head Quarter, Jorhat viz., College of Agriculture, College of Community Science, College of Horticulture and College of Sericulture. Besides RBMPL, the University has its branch libraries in the following other colleges such as College of Veterinary Science, Khanapara, Guwahati; College of Fisheries Science, Raha; Biswanath College of Agriculture, Biswanath Chariali; Lakhimpur College of Veterinary Science, Joyhing, Lakhimpur and SCS College of Agriculture, Dhubri.

4.10.1 Library Holdings

The total library holdings in the University during 2017-18 were 2,66,966 which include 1,83,706 text books, 46,384 reference books; 12,634 journals / periodicals; 19,786 back volume of periodicals and 4 456 other miscellaneous publications. The Rev. B. M. Pugh Library, Jorhat constitutes the maximum (approx. 77 per cent) of the total holdings of the University and the LCVSc, Joyhing the minimum (15). College-wise details of the types of printed collection during the year are given in Table 4.6. The e-resources available in the RBMPL are accessible to registered users from the other colleges and research station through the EZ-Proxy server.

Table 4.6 : Books and other printed collection of the libraries of constituent colleges of the University during 2017-18

| Particulars of printed collection | Libraries of the constituent colleges of the University | | | | | | | Total |
|-----------------------------------|---|--------------|-------------|-----------------------|-----------|-------------|-----------|---------------|
| | CAJ (The Rev. B M Pugh library) | BNCA | SCSCA | CVSc. | LCVSc, | CFSc. | CH | |
| Text Books | 143628 | 11841 | 3137 | 20100 | - | 5000 | 55 | 183706 |
| Reference Books | 35330 | 96 | - | 10328 | - | 630 | - | 46384 |
| Journals | - | 3 | 42 | 6 | 15 | 2 | - | 68 |
| Periodicals | 50 | 4 | 6 | 11 | - | 238 | - | 309 |
| e - book | 2286 | - | - | 472 | - | 50 | - | 2808 |
| e - journals | 3968 (CeRA) +900 (DeLCON) | - | - | 4581 | - | - | - | 9449 |
| Back Volume of Periodicals | 16711 | 210 | - | 2710 | - | 155 | - | 19786 |
| Theses | Mast.-2600 Ph.D- 472 | Mast.41 | Mast.10 | Mast.1112 Ph.D-211 | - | Mast.10 | - | 4456 |
| Total | 205945 | 12195 | 3195 | 39531 | 15 | 6085 | 55 | 267021 |

The library resources of various constituent colleges of AAU are represented in Figure 4.6.

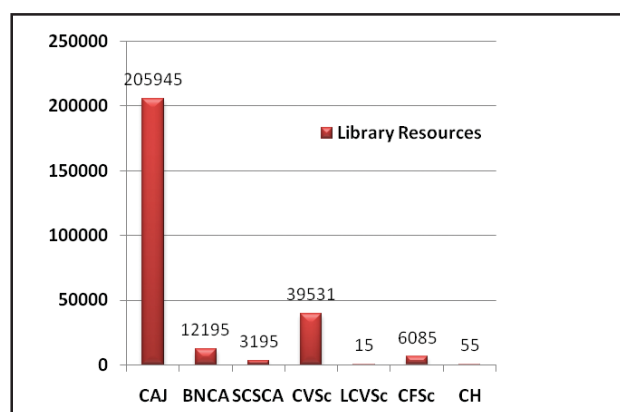


Figure 4.6. The library resources of various constituent colleges of AAU in 2017-18

4.10.2 “Rev. B M Pugh Library” (RBMPL) and its Activities

Some of the facilities/services of “Rev. B M Pugh Library” (RBMPL) and its activities during the year under report are discussed below.

4.10.2.1 E-Resources Availability

- **CeRA:** Consortium of e-resources in Agriculture: Access to full text electronic journal on Agriculture and allied areas. About 3765 e-journals are available under CeRA and Access is available to full text 1174 e-books along with 17 e-book series of Elsevier.

URL: <http://cera.iari.res.in/>

URL: <http://jgateplus.com/search/>

- **DeLCON:** DBT-Electronic Journal Consortium: About 900 full text journals are covered under DeLCON

URL: <http://delcon.gov.in/eresources.htm>

- **Krishprabha:** It is a Full text electronic Database of Agricultural Doctoral dissertations submitted by research scholars of the 45 State/ Deemed Agricultural Universities during the period from 1.1.2001- 31.12.2006

<http://14.139.232.167:8080/equesthesis/IPLogin.do>

<http://krishikosh.egranth.ac.in/handle/1/466>

- **Krishikosh Repository**
<http://krishikosh.egranth.ac.in/>
- CAB Abstract available online at www.cabdirect.org and those from 1972 to 2013 are available on CD ROM at RBMP Library, AAU.
- International E-Book Packages, CRC Press, Taylor & Francis (617)

1. AGRICULTUREnetBASE (288)

2. NUTRITIONnetBASE (112)

3. VetnetBASE(147)

4. Agri Economics netBase (70)

Online Access Link: www.crcnetbase.com

- Cabi E-Books on Veterinary(166)
 - Indian E-Book Packages (456)
 1. E-Books on Horticulture (101)
 2. E-Books on Agriculture (223)
 3. E-Books on Aquaculture and Fisheries (10)
 4. E-Books on Veterinary (122)
- Online Access Link: www.asapglobe.com
- India AgriStat Database
<http://www.indiaagrstat.com/default.aspx>
 - ISO Agriculture in CD ROM (575 E-Resources)
Online Access Link: <http://standards.bsbedge.com>

E-books & E-Journals of Rev B.M Pugh Library are accessible remotely through OCLC Ezproxy software for all registered members including those from outstations of AAU.

4.10.2.2 User Service Provided

- **Users Enrolled:** A total of 2644 users have been enrolled in the library during the year which include students (1581 M.Sc / PhD students in Agri / Community Science), Faculty/scientist (523) and Non-teaching/others (540).

- **Library Membership to Enrolled Users:** In Circulation section, readers (Library Users) can get themselves registered as members of the library by abiding library rules. After enrolment as bonafide member, they have the privilege to borrow books (Figure 4.7). Books are issued for a period of one month. Number of books to be issued for different categories of students are (i) Under Graduate students : 5 books (ii) Post Graduate students : 7 books and (iii) Research Scholars : 10 books



Figure 4.7. Students undergoing registration for membership in the circulation section of the RBMP Library at AAU, Jorhat

- **Consultation Services to Outside Scholars:** The library provides consultation facilities to outside scholars on the basis of letter of introduction. Consultation fee @ Rs 10/- per day and Rs 50/- per month is charged.
- **Library Services:** The library provides the services such as Lending service, Reference/ Information service, Current Awareness Service, Documentation service, Internet/E-mail facility, E-journal/ eBook and CD-ROM database searching facility, Resource-sharing facility, User education programme, Document delivery service and Reprography facility.
- **Lending Service to Readers through Text Book Bank:** This section of the library provides minimum five to six books to every enrolled student for the semester and the number of borrowed books depends upon availability of books in this section.
- **Library Service to Patron:** The RBMPL provides service to patrons with an average of 10,000 students and 400 faculty & research scholars annually. The number of faculties and students that used library during the year was 600 and 12,936, respectively.

- **Services to Visitors:**An average of 50 visitors (both national and international) visit the library annually for accessing information in their respective areas of interest and discipline. The number of visitors during 2017-18 was 60 which were around 20 per cent higher than that of 2016-17.
- **Internet Services:**The internet browsing facility is available in the library premises on the basis of a user account created in the AAU Portal which is strictly provided by the System Administration i.e. ARIS cell of the AAU. There is also the provision of access to the internet by the visitors on request of a guest account created by ARIS accordingly. There were altogether 4206 internet users during the year which is about 10 per cent higher than the previous year (Figure 4.8).



Figure 4.8: E-resources Centre of R.B.M. Pugh Library, Jorhat

- **User Education Programme Provided:**The RBMPL, apart from providing dedicated user service, is also extending quality user education programmes. This includes:
 - **Library orientation** which is one of the most common user education programmes is provided to the users of AAU, in particular the under graduate patrons, maintaining a proper discipline wise streaming in the early part of their formal vocations.
 - **Education on Library and Information Service in the form of a non-credit compulsory course (PGS 501)** is also conducted to impart appropriate knowledge in the field of information retrieval and dissemination, technical writing stressing more on literature review and citation analysis as well as the proper techniques in browsing the different resources present in the library.
- **On-request User Service:**Most users, the faculty and research scholars, in particular enjoy the on request information service from CeRA in print form for those information resources are available only in electronic form and are not downloadable.
- **Automation and Digitization:** Recently, Rev B. M. Pugh Library has implemented library automation and digitization process with KOHA LMS software under ICAR library strengthening project. Presently KOHA LMS database has been migrated to Open LX Platform-Best Book Buddies (on Cloud) as per ICAR instructions. Proposal has been made to include all the libraries of the outstation constituent colleges under library automation in a single platform. Rev B M Pugh Library is already a member of Krishikosh / E-granth repository and Ph.D theses uploading on Krishikosh is going on.
- **RFID Library Security System:** Library has been implementing the Radio Frequency Identification (RFID) security system for security of rare and reference documents of the library.

4.10.2.3 Activities of RBMP Library during 2017-18

During 2017-18, RBMP library received approx. Rupees Two Crore for library strengthening under the scheme “Strengthening & Development of Higher Education in India”. The fund has been utilized for strengthening the followings of AAU libraries:

- Subscribing of e-book packages on Agriculture, Agricultural Economics and Veterinary Science.
- The Rev. B M Pugh Library acquired approx. 4000 books during the year besides acquisition of books by other constituent libraries in colleges through ICAR fund.
- Under ICT infrastructure for the year 2017-18, Rev B M Pugh library implemented RFID security system for rare and reference book collections.

4.11 Student Welfare

The student welfare activities are looked after by the Directorate of Students’ Welfare of the University. Some of the important student welfare activities carried out during the year by the constituent colleges of the University are presented below.

- **Annual College Meet** was organized by all the constituent colleges as usual during the year.
- **It was decided that the Inter College Meet** which was an Annual event would be held every alternate

year from this year onward and hence no Inter College Meet of the University was held this year.

- **AGRIUNISPORTS: The Assam Agricultural University** participated in the 18th All India Inter Agricultural Universities Games and Sports meet held at UAS, Bangalore w.e.f 30th Jan to 3rd Feb, 2018. A group of 24 student-members participated in the event and MrAlongbarBasumatary, BNCA, AAU, bagged the bronze medal in Long Jump (mens) event.
- **AGRIUNIFEST: The Assam Agricultural University** team participated in the 18th All India Agricultural University Youth Festival (Agriunifest) which was held at Sri Venkateswara Veterinary University, Tirupati, AP during February 12-16, 2018. **The AAU team bagged the Best Disciplined team award.**
- The **Educational tours** of the Under Graduate 3rd year Students of College of Agriculture, College of Horticulture, College of Sericulture and College of Community Science were organized during the month of January, 2018. The students visited various educational and research institutes, different departments, regional centres and other places and were much benefitted from the exposure.
- The Annual conference of All India Agricultural Students Association (AIASA) was held in the Jorhat campus of the University on 23rd & 24th Feb, 2018. About 720 delegates and participants from more than 15(Fifteen) Agricultural Universities across the country participated in the conference. Sri Sarat Sekhar Bora, a final year student of MSc.(Agri) was selected as the student of the year in the conference.
- The students of the University participated in various debating and quiz competitions at national & state level and brought laurels to the university a few of which are listed below.
 - o Students of the College of Agriculture bagged the best team award in **43rdNarenSarmah Memorial All Assam Inter-College/ University Debate Competition** held at D.K.D. College, Dergaon on September 20, 2017
 - o **The Best Rebuttlal Award was bagged by ArunavKhound**, 3rd year student of College of Agriculture in the **YUVA National Debate Competition** held at G.B. Pant University of

Agriculture and Technology, Uttar Pradesh on 15th January, 2018

- o MsBhanita Baruah bagged the **2nd Best Debater award in the Cotton Fest** held at Cotton College, Guwahati on 9th April, 2017

4.11.1 Activities carried out by NSS units of AAU in the year 2017- 18

The students of eight constituent Colleges of the University except College of Veterinary Science, Khanapara, are enrolled as NSS volunteers. Various activities like regular camps, special camps, celebration of important days etc. are carried out by the NSS volunteers. Some of the important activities are highlighted below.

4.11.2 World Environment Day

The World Environment Day was observed in eight NSS units (colleges) of AAU NSS Cell. Tree plantation programme at Kachukhat (SAGY village), Titabar, Jorhat was also organized on the day.



Figure 4.9. World Environment Celebrated in AAU, Jorhat Campus

4.11.3 Swachhta Pakhwada by NSS Cell in constituent colleges of AAU during August, 2017

As encouraged by the Ministry of Youth Affairs and Sports (Govt. of India) with the NSS Regional Office, Guwahati the Assam Agricultural University in its constituent colleges organized a massive **Swachhta Pakhwada** (Cleanliness fortnight) in August, 2017.

Along with the rest of the country, this NSS Cell in collaboration with the Students' Societies, observed **Swachhta Pakhwada** during the month of August, 2017 at AAU campus. It was also observed in the other constituent colleges of AAU where the following activities were carried out.

- **Aug 1 to 14 , 2017 :** Cleanliness drive (*Swachh Bharat Abhiyan*) by boarders in respective hostels



Figure 4.10. NSS Activity in Lakhimpur College of Veterinary Science

and campuses were held in NSS Units of constituent colleges of AAU Jorhat and in the Jorhat university campus too.

- **Aug 15, 2017** : Swachh Bharat Awareness procession by NSS volunteers in NSS Units of constituent colleges of AAU Jorhat was organised. In the AAU Jorhat campus, a Placard Competition amongst NSS volunteers was held. The volunteers held placards with slogans and messages on cleanliness. The response from the local residents was quite encouraging throughout the drive. The College of Fishery Science, Roha organized plantation of saplings on the day.

4.11.4 Theme was Swatch Bharat – Clean India, Beautiful India

Above 800 NSS volunteers / students joined in the programmes above as a tribute to the nation on the eve of its Independence Day on August 15, 2017

4.11.5 Disaster – Preparedness Programme:

A disaster - preparedness talk and demonstration for NSS volunteers, students and other officers/staff was organised on **Sep 8, 2017** in the Dr.MC Das Memorial auditorium, AAU Jorhat Campus with the help of the personnel and volunteers of the Civil



Figure 4.11. Disaster Preparedness Programme observed in Dr. MC Das Memorial Auditorium

Defense team, Jorhat District Administration. The programme was organised by NSS Cell and EEI, AAU, Jorhat.

More than 300 NSS volunteers, students and other officers/staff attended the programme and expressed their satisfaction on the same.

4.11.6 NSS Day

NSS Day 2017 was successfully observed on 24th September with the theme “**Swachhta hi Seva (Cleanliness is service)**” by NSS, AAU, Jorhat . On the occasion of NSS Day, a talk was delivered on the “Swachhta hi Seva (Cleanliness is service)” followed by discussion, presentation of cultural items, an essay competition. A Volunteer’s Rally with placards was brought out with the active support of Students’ Society, AAU, Jorhat. More than 500 UG and PG students participated in the event. All the eight NSS units observed the NSS Day. Biswanath College of Agriculture also observed the day under the same theme.



Figure 4.12. World NSS Day Celebrated in AAU, Jorhat Campus

4.11.7 Pre-RD Camps and republic day Parade Camp

Two students, Mr. Rituraj Hazarika & Ms. Archita Goswami of College of Agriculture participated in the Pre-Republic Day Parade Camp, 2017-18 at Kalinga Stadium, Bhubaneswar, Orissa on 7th to 16th November, 2017. Ms. Archita Goswami, student of College of Agriculture attended the National Parade of Republic Day Celebration in New Delhi on 26th January, 2018 representing the University as NSS Volunteer.

4.11.8 Blood Donation Camp held at AAU, Jorhat

A Blood Donation Camp was organised by the National Service Scheme (NSS) Unit in collaboration with the Students’ Society and JMC Blood Bank at Assam Agricultural University, Jorhat. Shri V Nimbalkar, IPS, Superintendent of Police, Jorhat and Md Imdad Ali, Addl. SP, Jorhat were present as distinguished guests in the inaugural session of the

Camp who both stated that it was a noble act to donate one's blood and encouraged all present. Dr D K Bora, DSW cum NSS Prog Coordinator, AAU delivered the Welcome Address and Dr D K Borah, Dean, College of Agriculture, AAU, Jorhat exhorted all students to keep up the rich tradition of AAU in donating blood as social service. In the Camp, about 20 students from all the colleges in the AAU, Jorhat campus voluntarily donated blood which was collected by the Blood Bank of Jorhat Medical College.

4.11.9 National Unity Day

The 'Run for Unity' was organised today at Assam Agricultural University, Jorhat Campus on Rashtriya Ekta Divas (National Unity Day) to commemorate the birth anniversary of the first Home Minister and Deputy Prime Minister of India, Sardar Vallab Bhai Patel where students and NSS volunteers as well as the University teachers and employees participated. It was flagged off by Dr. Dipak Kumar Bora, Director of Students' Welfare, AAU, Jorhat.

In addition to the four NSS units (colleges), National Unity Day was also observed in the four other NSS units, viz.,LCVSc, Lakhimpur, SCS, CA, Dhubri, CFSc, Roha, and BNCA, Biswanath Chariali.

4.11.9 Special Camp

A 7-Days Special Camp under NSS was organized at Baghchung area, Jorhat from the 13th to 19th November, 2017 where about 250 NSS volunteers from College of Agriculture, Community Science, Sericulture and Horticulture took part. The volunteers organized street plays on Social issues, Cultural programmes, plantation of saplings, training etc.

4.11.10 Communal Harmony Campaign

As a part of Quami Ekta from 19th to 25th November, 2017 a series of programmes were



Figure 4.13. 'Run For Unity' Day observed at AAU, Jorhat Campus

organised by NSS volunteers of the constituent colleges, to campaign Communal Harmony and promote it among the students as well as the community through village awareness programmes.

A series of talks and cultural presentations were made to highlight the themes (national integration, secularism, non-violence, linguistic harmony, anti-communalism, cultural unity, development of weaker sections).

4.11.11 Training & Placement Cell, AAU, Jorhat

The Training and Placement Cell under the Directorate of Students Welfare, organizes trainings for the students to increase their professional efficiency and arrange for placement of the students in different organization. The major activities of the cell are highlighted below.

• Coaching and trainings:

1. A Coaching camp for the students was organized from 6th to 17th June, 2017 to prepare the students for APSC preliminary examination.
2. A workshop on "Life skills: key to future success" was organized on 30th August, 2017. Final year students of College of Community Science, Agriculture, Horticulture & Sericulture participated in the workshop. The participants were actively engaged in the learning process, had the opportunity to practice and enhance new skills and gain self confidence.
3. A Coaching camp was organized for the students from 19th February to 9th March, 2018 to prepare them for ARS/NET.
4. A programme on Entrepreneurship Development: IDEATION 2018 was organized on 13th March, 2018 in collaboration with NRL.
5. A JRF coaching camp was organized in the month of March, 2018

• Student's placement

1. Nine students were selected as Agriculture Field Officers and appointed in nationalized banks.
2. Junior Consultant in MIDH, Central Government.: 1 number
3. In Nature Bio Foods: 1 number
4. OSD to the Director in Inland Water Transport: 1 number
5. Appointment in Govt. schools: 22 numbers as vocational teacher.

5. Research

Research is one of the three major mandates of Assam Agricultural University. The research activities of AAU are undertaken in various departments of all the constituent colleges, in the six Regional Agricultural Research Stations in the six different agro-climatic zones of Assam, in the five Commodity Research Stations as well as in the KVKs under the aegis of the University.

AAU follows a Research Management System (Figure 5.1) laid out to systematically conduct the need-based, demand driven, situation specific and problem-oriented research. Under the current management system, the research problems are identified based on the information collected by the scientists from the farmers' fields and also on the basis of the feedback received from line departments of the state government. The system ensures project-based funding and effective monitoring of the programs to make them sharply focused on the relevant problems only. Under the research management system, there

is a provision of several committees with well-defined power and responsibilities.

5.1 Agriculture

The research in the fields of Agriculture and Community Science are generally coordinated by the Director of Research (Agri). The research activities in agriculture and community science are being undertaken in different departments of the concerned (four) constituent colleges as well as in the six Regional Agricultural Research Stations (RARS) and three Commodity Research Stations (CRS). Constant efforts are being made to address the demand-driven issues in all possible areas. In the reporting period, a total of 202 research projects were carried out under the Faculties of Agriculture and Community Science (APPENDIX-I), of which 6 were completed, 196 in operation including 16 projects under DBT-AAU Centre. Some of the significant research findings obtained during the year are presented below.

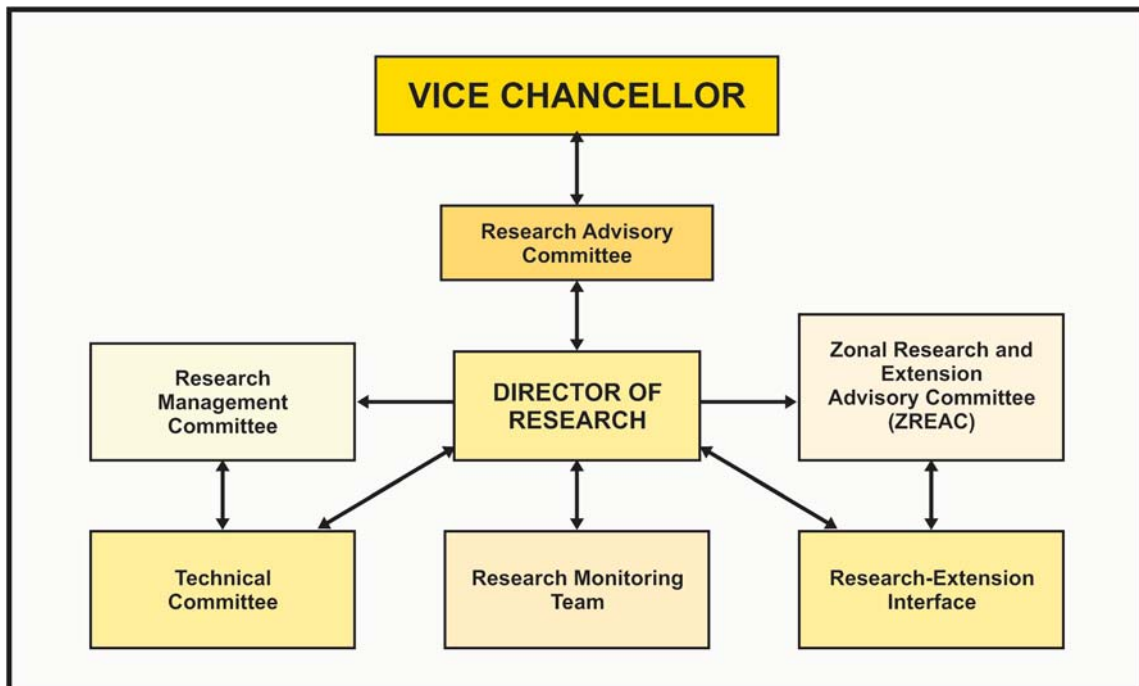


Figure 5.1. Research Management System of the University

5.1.1 Rice

5.1.1.1 Crop Improvement

- Two submergence tolerant varieties, *Ranjit Sub 1* and *Bahadur Sub 1*, developed by the university were notified by the Central Sub Committee on Crop Standards, Notification and Release of Varieties for 66 Agricultural Crops. Further, another line U-86 was tested in IVT-IM during *Kharif* 2017 in the AICRP network. The duration of the line is 130 days and the line is having submergence tolerance.
- A medium duration line, *Numoli*, was proposed for recommendation based on the trial result. The line is of 135 days duration with fine grain quality having the yield level of 5.3 t/ha in farmer's field.
- The F₃ generation of two crosses – *Ranjit Sub 1/Improved Samba Mahsuri // Ranjit Sub 1* and *Bahadur Sub 1/Improved Samba Mahsuri//Bahadur Sub 1* were evaluated during *Sali* 2017 with the help of molecular markers. SNP analysis of the lines indicates the presence of three BLB resistant genes *xa5*, *xa13* & *Xa21* in 13 lines. Further, in about 50 lines two genes are present in different combinations.
- Fifty lines derived from 7 crosses were maintained during *Kharif* 2017. The F₃ lines of HYV Kola Joha x Black kernel Kola Joha was evaluated and 45 plants selected based on grain and phenotypic characters. SNP marker analysis of selected lines indicated the presence of *Badh 2* and *Bph17* in rice *Chakhao* and *Pita* gene in HYV Kola Joha.
- In the Observation Yield Trial (OYT), 38 entries evaluated among 90 test genotypes showed yield of more than 6t/ha. In OYT1-NS, five entries were identified with more than 8t/ha yield. In AYT-SHW, five entries with more than 5t/ha yield were identified. In OYT2 (NS), the best entry IR16D-1048 recorded a yield of 6.2t/ha.
- To select stress tolerant rice for the poor farmers of Africa and S.E. Asia, four trials were conducted for shuttle breeding in 2017 and mother trial was done at farmer's field. The most preferred variety in research stations by farmers were LPR 1103 and *Ranjit sub1*, while the least preferred varieties were *Lasher* and *TTB 619-7-3*. In farmer's field, the most preferred varieties were LPR 1103 and *Dhansiri*, while the least preferred varieties were *Panchanan* and *OR 2435-5*.

- To develop new plant type varieties, 1370 breeding lines from 104 crosses from six different generations were evaluated and 1161 lines were selected for advancement. Further, in the process of developing blast and BLB resistance from these crosses, screening by artificial inoculation was made and 246 lines were identified as blast resistant with score 1 and 284 lines were identified as BLB resistant with score 1.
- To develop and supply rice varieties tolerant to abiotic stresses for the poor farmers in unfavorable rice growing ecosystem, 12 cultivars including five submergence tolerant varieties (*Ranjit Sub-1*, *Bahadur Sub-1*, *BR11 Sub-1*, *Swarna Sub-1*, *Jalashree*, *Ranjit*, *Bahadur*; *Dhanshree*, *TTB939-11-16*, *TTB 938-2-19-3*, *IR 70153-11-TTB1-6*, *IR 69485-10-2-B-1-TTB 86-1-4*), were evaluated as farmer's managed baby trials and researcher's managed mother trials in 17 villages of Jorhat and Golaghat district. It was observed that under submerged condition, the submergence tolerant varieties could survive up to 10 days of submergence. But no varieties could survive when submergence was severe for 16-20 days.



Figure 5.2. Submergence tolerant variety *Ranjit Sub-1*



Figure 5.3. Rice line U-86 also has submergence tolerance

- 103 aromatic germplasm were collected from different institutes and states of North East India like NBPGR, New Delhi; RARS Karimganj; Rice Research Station, NRRI Gerua; RARS Titabar, Arunachal Pradesh, Assam and Manipur. The evaluation of the aromatic germplasm were also carried out for the presence BADH₂, Bacterial Blight, Blast, BPH, Chalkiness and Sub-1 with the help on SNP. The majority of the germplasm have BADH₂ genes besides having some biotic and abiotic tolerance.
- Under the IRRI-AAU collaborative project, the Global Rice Array (GRA) a comprehensive approach shall be made to make use of the latest genetic sequencing technology, high through-put phenotyping methodologies, bioinformatics and computational biology integrated with geographical information system (GIS) data to boost the methods and systems to cope with challenges brought by climate change. Under the project, the drone based high throughput Phenotyping (HTPP) will be provided by IRRI and it will help in transforming the rice breeding.
- The F₂ populations of the cross between Disang, Kolong with IR64 are being maintained. The trial is in progress with few promising lines selected for further advancement.
- Generation advancement with selection in different mutant generations of *Ranjit Sub 1* after treating with 3 different gamma ray doses are in progress.
- Altogether, 3350 rice germplasm including 1727 *Sali*, 1054 *Ahu*, 569 *Asra* and 211 *Boro* entries are being maintained at RARS, Karimganj.
- The entire set of *Ahu* germplasm were characterized for 8 yield and yield attributes and categorized into four flowering groups viz., <80 d, 80-90 d, 90-100 d and >100 d with mean grain yield of 13.30, 8.23, 11.38 and 9.02 g per plant, respectively. 43 *Sali* germplasm evaluated for 8 agronomic traits were classified into three flowering groups viz., <100 d, 100-110 d, 110-120d and >120 d with mean grain yield of 23.05, 36.82, 40.71 and 51.36 g per plant, respectively.
- Seventy-eight *Ahu* germplasm including 48 hill rice and 62 *Sali* rice germplasm were maintained during the year 2017 at RARS, Diphu.
- Twenty promising heterotic hybrids have been identified to standardize the hybrid rice production techniques and to develop rice hybrids with high yield potential for the state of Assam. A total of 106 rice genotypes including both *indica* and *japonica* entries have been involved in 231 crosses with the 5 Wild Abortive Cytoplasm Male Sterile (W/A CMS) lines for development of scented hybrid rice. 39 potential restorers and 8 maintainers for 5 W/A CMS lines were identified. Out of these, one was aromatic restorer and one *japonica* perfect maintainer.
- To identify unique markers for varietal identification and maintenance of genetic purity, rice varieties in seed chain were used for DNA fingerprinting and PCR analysis for identification of polymorphic markers unique for variety utilizing SSR microsatellite markers. Trait linked markers and phenotyping of the grains were used to identify unique diagnostic key markers for individual varieties. Identified markers for respective varieties are Gitesh RM 12 (400 bp), Jalashree RM 25 (1150 bp) Ranjit RM 190 (490bp) Jaymati RM 190 (900 bp) Bhugali RM 190(400 bp) Ranjit sub-1 RM 307 (1090) BP Numali RM 287 (395bp), Piyali RM 287 (990bp).
- Six QTLs for drought tolerance in rice were identified under the DBT-AAU Center

5.1.1.2 Crop Management

- Result of development of package of practices for organic rice, cv. Ketekijoha, conducted at RARS, Titabar during *kharif* season revealed that combined application of green manure (GM) @ 2.5t/ha + vermicompost (VC) @ 2.5 t/ha each, along with rock phosphate @ 17 kg/ha, azolla incorporated @ 20 kg/ha, seedling root dipping in *Pseudomonas fluorescense* produced significantly the highest grain yield (3.26 t/ha), panicle number (309) and panicle weight (2.62 g) coupled with a high C:B ratio of 2.83.
- On study of influence of Silicon induced stress tolerance in rice at RARS, Titabar, application of Silixol as a source of Silicon resulted positive role in improving the total dry matter and grain yield under water stress. Among the tested varieties, PHB-71, KRH-2 and IR64 responded well to Silixol application with reference to total dry matter and grain yield. The harvest indices were more in KRH-4.

- Out of five AICRP trials viz., IHRT–M, IHRT–ME, IHRT–E, IHRT–MS and MLT conducted during Sali 2017, Sahayadri-5, 28P9 and PAC-8744 were found promising in MLT. Among 26 hybrids developed from 12 different private sector organizations, US-337, Arize-diamond and Arize-bold were found promising.
- On study on heat tolerance of rice at RARS, Titabar the varieties IET 26759, IET 26766, IET 26777, Gontra Dhan3 and Shraboni were identified as relatively heat tolerant.
- Soil texture map of Karimganj district showed that most of the soils (55.49%) of the district are sandy clay loam in texture and map on soil pH of the district indicated that majority of the soils (67.33%) are strongly acidic in reaction. Soil organic carbon map of Karimganj district revealed that soils are mostly (85.07%) high in organic carbon status. However, soils of large area (76.88%) of the district exhibited low available (Av) N content and most of the soils (78.40%) are medium fertility status in Av P as per Av P status map of Karimganj district. Areas under medium and low Av K fertility status of the soils of the district are 78.56% and 21.44%, respectively. As per thematic maps, soils are sufficient (99.98%) in DTPA-Zn and deficit (100%) in HWS-B.
- Experiments conducted on root CEC and rice yield conducted at RARS, Karimganj resulted significantly higher grain yield in germplasm having root CEC > 6 cmol(p+) kg^{-1} followed by 4-6 cmol(p+) kg^{-1} and < 4 cmol(p+) kg^{-1} respectively.
- In rainfed *kharif* rice, a bund height of 30 cm is optimum to retain rain water (upto 97.2 %) for higher yield (53.49q/ha) of rice as well as to conserve residual moisture for better yield of succeeding relay crops with net economic benefit Rs 60,824.00/ha.



Figure 5.4. Rice plot with bund for water and moisture conservation

- In evaluating Nanoclay Polymer Composite (NCPC) on resource use efficiency and productivity in diverse rainfed production systems, maximum grain yield (12.45qt/ha) and B:C ratio(1.66) was recorded in the treatment containing 15 kg NCPC+100% RDF in rice (var. *Inglongkiri*). The same treatment also recorded the highest rain water use efficiency (0.99(kg/ha/mm)).
- A long-term experiment under rice-rice sequence at Titabar over 29 years in Alfisol (Typic Endoaqualf) indicated that application of recommended NPK + FYM(S+h) maintained sustainable yield over the years in both *Ahuand Sali* season. The percent change in important soil parameters indicated that there was a maximum declined organic C in control treatment (-38%) and in RDF+FYM recorded maximum buildup of organic-C. In case of P, there was substantial buildup of available P while in case of K, there was an improvement in available K in INM and FYM treated plot.

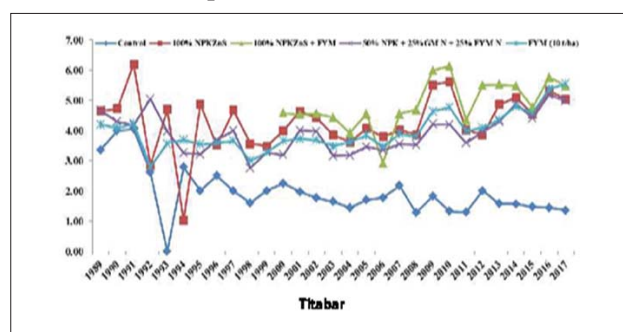


Figure 5.5. Graph showing performance of rice under various fertilizer management regimes

- On screening of rice genotypes for acid soil and related nutritional constraints, application of recommended NPK + lime showed yield increase by 17 % compared to recommend NPK. The genotype producing the highest yields with liming were T1-93, DR Dhan 44, Aghonibora and Prafulla. Genotypes recording superior yield in the treatment without liming were DRR, Dhan 44, DRR Dhan 42, Gitesh, Prafulla, Aghonibora and T 191.
- Leaf colour charts (LCC) were used in winter to improve N use efficiency at North Lakhimpur for need based nitrogenous fertilizer management. When the LCC value of six out of ten leaves fell below the critical level, 15 kg N/ha was top dressed on the same day.

- In a study on the Effect of Zn and B on hybrid rice, the results indicated that application of 7.5Kg Zn/ha+0.25%B as Foliar spray(2 times) along with 80 kg N +40 kg P₂O₅ + 40 kg K₂O recorded highest grain (6.20t/ha) and straw yield(6.48t/ha). However total (rice+straw) B and Zn uptake were highest at 176.70 (g/ha) and 409.17(g/ha) on application of 10Kg Zn/ha+0.25%B as FS(2 times) with 100 kg N +50 kg P₂O₅ + 50 kg K₂O.
- Soil Test based Fertilizer Recommendations for hybrid rice was evaluated and the prescription equations were finalized. Two ready reckoners for target of 60 q/ha and 70 q/ha were also prepared for hybrid rice.
- It was concluded from an experiment on bioremediation of iron toxicity in lowland rice ecosystem of Assam that *Bacillus* sp and *Burkholderia tropica*(PSB_{5w}) can be used as a promising bioremediation tool to ameliorate iron toxicity in lowland rice ecosystem. Standardized and consortia based plant growth promoting *rhizobacteria* bio-fertilizer package for chronically iron toxicity affected rice ecosystem can be developed. This bio-package will be more suitable for organic rice cultivation showing iron toxicity.
- In an experiment on Boron-Zinc Interaction on rice, cv. Bahadur for three consecutive years 2015-16, 2016-17 and 2017-18 at ten farmer's fields in Golaghat district of Assam with three treatments i.e., T1: Farmers practice (control), T2: 100% RDF, T3: 100% RDF + (Zn 5kg/ha) 25 kg ZnSO₄/ha + 1.5 kg B (as borax 13.2 kg)/ha it was concluded as

that FLDs on boron-zinc interaction on rice, cv. Bahadur for 3 years (2015, 2016, 2017) showed 58.7% increase in yield over farmer's practice and 36.7% increase over the state recommended dose of fertilizers.



Figure 5.6. Hybrid rice with recommended fertilizer dose

5.1.1.3 Plant Protection

- Among the nine fungicides tested against false smut of rice, Tilt (Propiconazole 25 EC) was found to be significantly more effective in controlling false smut disease followed by Folicur and Amistar Top with increased yield.
- In a collection of 24 isolates of *Xanthomonas oryzae* pv. *oryzae* from six agro-climatic zone of Assam, six pathotypes could be detected based on phenotypic reaction against Xa single gene and pyramided genes of rice differential (viz. Xa-5, Xa-8, Xa-13 and Xa-21).
- In a study on the status of predators and pest in protected and unprotected conditions it was observed that the spider population attained a peak under unprotected condition (1.17/hill) as compared to protected condition (0.63/hill) at 120 days after sowing (DAS) and both Coccinellid bug

Table 5.1: Pathotyping of *Xanthomonas oryzae* pv. *oryzae* isolates based on phenotypic reaction against Xa gene

| Pathotype | Location of agro climatic Zone | Characterization of the pathotype against Xa gene |
|---------------|---|---|
| Pathotype- I | Goalpara | Isolate shows compatible interaction with all the Xa genes including resistant variety DV-85 |
| Pathotype- II | Bongaigaon and Nalbari | Isolate shows incompatible interaction with Xa5, Xa13 genes, compatible with Xa21 gene |
| Pathotype-III | Kamrup, Jagiroad, Marigaon, Nogaon, Kaliabor | Isolate shows incompatible interaction with Xa5, Xa21 gene and compatible interaction with Xa13 gene |
| Pathotype-IV | Golaghat, Jorhat, Sibsagar, Dibrugarh, Sonitpur, Biswanath Charali, Lakhimpur and Dhemaji | Isolate shows compatible interaction with Xa5 gene and incompatible interaction with Xa13 and Xa21 gene |
| Pathotype-V | Silchar Arunachal, Silchar, RARS Karimganj and Badarpur | Isolate shows incompatible interaction with Xa8, Xa13 and Xa21 genes and compatible interaction with Xa5 gene |
| Pathotpe-VI | Bokajan, Manja, Diphu and Halflong | Isolate shows incompatible interaction with all the Xa genes along with susceptible variety TN1 |

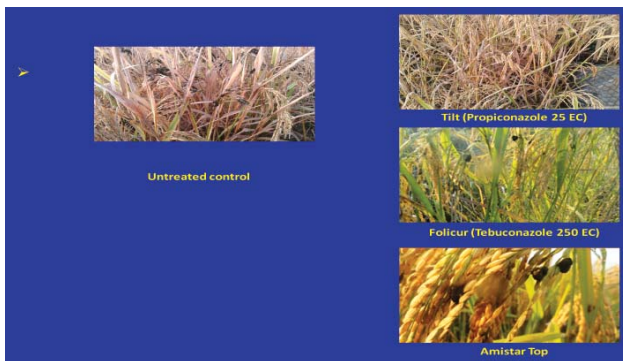


Figure 5.7. Fungicides treatment against false smut of rice

(2.22/hill) and Mirid bug (1.63/hill) were observed

to be the highest at 135 DAS in the unprotected condition. The protected condition showed a marked reduction in pest population thereby enhancing the yield performance with a 25.54 % increased in yield over unprotected condition.

- Different botanicals viz. multineem, pestoneem and neemazal were evaluated against yellow stem borer and leaf folder infestation in rice and the a low infestation of stem borer at 30 days after transplantation (DAT) (4.97) and 50DAT(6.58) was recorded in Neemazal treated plots. It also showed a low infestation of leaf folder (3.49) as well.
- Among different insecticides tested against rice earhead bug, the maximum reduction (84.82% and 73.81) of bug population was recorded with Virtako (Thiomethoxam + Chlorantraniliprole (1.0%w/w+0.5%w/w) both in 1 DAS and 7 DAS, respectively.
- *Pseudomonas fluorescence* enriched FYM @ 500 kg/ha (1.0 kg Pf in 100 kg FYM incubated for 15 days) + soil application of Carbofuran@ 1.0 kg a.i./ha at 45 DAS) was found effective in reducing population of *Meloidogyne graminicola* and increasing yield of direct seeded rice.
- In transplanted rice, maximum grain yield (3.715 t/ha), minimum soil and root population and RKI of *M. graminicola* were recorded when Carbofuran was applied @ 1.0 kg a.i./ha at sowing.
- It was recommended that seed treatment with Rynaxypyr 20 SC @ 2 ppm (0.01 ml/ kg seed) gives effective protection of stored paddy seed against storage insect pest up to nine months without affecting germination.
- The dissipation of pretilachlor in soil followed a *pseudo* first order equation. The pretilachlor residue

level was observed at BDL from 45th day of application of pretilachlor. However, the lowest level of pretilachlor residue was resulted from the combination treatments of minimum tillage with direct seeding rice. The dissipation of pendimethalin in soil followed a pseudo first order equation. The pendimethalin residue level was observed at BDL in case of minimum tillage from 45th days of application of pendimethalin. However, lower level of pendimethalin residue was resulted from the combination treatments of minimum tillage with direct seeding rice.

5.1.2 Wheat, Maize & Millets

- Rice straw mulch application with 3 irrigations recorded the highest grain yield (34.18 q/ha) in wheat, significantly higher than the counterpart without mulch.
- New wheat var. HD 2967 in FLDs recorded av. yield of 26.3q/ha (32.9% increase over check). Biofertilizer and Zero Tillage increased the wheat yield by 13.5% and 12.8%, respectively, over the use of chemical fertilizer alone and Farmers' conventional tillage technique.
- Out of 156 entries screened for Leaf Blight in field conditions, 10 were found resistant and 100 were found medium resistant.
- Research work on maize and black gram intercropping at RARS, Gossaigaon, showed significantly higher maize equivalent yield (83.67 q/ha) and B:C ratio (2.14) from Maize + Black gram paired row (50:70) intercropping system.



Figure 5.8. Maize and black gram intercropping

- Study on planting density and nutrient management practices on the performance of hybrids Maize in *kharif* season at RARS, Gossaigaon revealed significant difference in grain yield and net return due to nutrient management practices. Highest

grain yield and net return was recorded at SSNM followed by STCR and RDF.



Figure 5.9. Planting density and nutrient management on hybrids Maize

- On evaluation of new biofertilizer in maize, the highest maize yield and B:C were recorded at treatment 60 kg P₂O₅ + NPK consortia followed by N & K fertilizers doses.



Figure 5.10. Maize grown on biofertilizer

- On standardization of spacing and fertility management of *rabi* season baby corn at RARS, Gossaigaon, fertilizer dose @ 120-60-60 N-P₂O₅-K₂O kg/ha + 22.5 kg ZnSO₄/ha with spacing of 45 cm x 20 cm was found optimum.



Figure 5.11. Rabi crop of baby corn

- In standardizing the fertility and spacing of *rabi* sweet corn, fertilizer dose @ 120-60-50 : N-P₂O₅-K₂O kg/ha + 22.5-ZnSO₄ kg/ha with spacing 50 cm x 20 cm was found optimum in respect of cob yield

(27.78.t/ha) and B:C (5.75) followed by 120-60-60 : N-P₂O₅-K₂O kg/ha +22.5-ZnSO₄ kg/ha and spacing 50 cm x 20 cm [25.27 t/ha, 5.30].



Figure 5.12. Rabi sweet corn

- Recommendation of the finger millet variety IC-0624917 has been made after submission of the data of DNA fingerprinting and biochemical analysis.
- The yield attributing characteristics like plant population at 25 DAS and at harvesting showed significant different among the treatment due to application of biofertilizers. Also found significant effect on Plant height, 50% flowering and maturity, yield of Maize and net return. The highest maize yield recorded at 60 kg P₂O₅ + NPK consortia followed by N & K fertilizers doses.

5.1.3 Pulses

- Greengram variety SGC 25 and Black gram variety SBC 50 recorded the grain yield of 1365 kg/ha and 1498 kg/ha, respectively.
- Protocols for genetic transformation of two blackgram and pigeonpea were optimised and transgenics with Bt gene are being generated.
- GM chickpea lines developed using Bt Cry genes entered into deregulation process



Figure 5.13. Chickpea early cropping with rice

- Ten FLDs on PU-31/SBC-40 and IPM-02-3/SGC-16 in 10 ha of land in Morigaon district during *kharif*, 2017, exhibited av. yield of 1184 kg/ha (30% over Farmers practice) for blackgram and 1037 kg/ha for Greengram (38% over Farmers practice).
- In MLTs, new blackgram lines SB 43-7 and SB 42-8 showed better performance in seed yield against the best performing check SB 23-5 with 19.4% and 18.1% increase over location, respectively.
- The mutation breeding programme was undertaken to observe the extent of variation induced by different doses of mutagen treatments and to isolate synchronous maturity, short pods, densely clustered pods and other desirable visible mutations in greengram. The desirable mutants were more prominent in 200 Gy + 0.2% EMS treatment.
- On effect of sulphur and boron on green gram and black gram it was observed that application of 1kgB/ha plus 20 kg S/ha found highest crop yield (8.0qt/ha) and found at par with treatment receiving 1.5kgB/ha plus 20 kg S/ha (7.75qt/ha) and 1.5 kg B/ha plus 10 kg S/ha (7.60 qt/ha). Combined application of sulphur and boron improves available sulphur and boron status in soil.
- Ridge method of planting using tractor drawn Bed Planter proved to be better for *Kharif* pulse production. Pendimethalin 1.0 kg/ha as pre-emergence followed by hand weeding at 30 DAS controlled the weeds most effectively in urdbean and resulted in grain yield of 1007 kg/ha. This weed management practice in ridge method of planting gave grain yield of 1067 kg/ha.
- The highest grain yield of *Kharif* mungbean and urdbean was recorded when the crop was sown on 3rd Sep. Therefore, every 10 day delay in sowing accrued in considerable yield loss ranging from 10-47% in urdbean and 16-49% in mungbean (till 3rd Oct).
- Relay cropping (broadcasting Chickpea seed in rice crop, 15 days after 50% flowering) resulted significantly high grain yield (1223 kg/ha) over all tillage treatments except direct seeding in untilled field using manual ploughing + rice straw mulching (1193 kg/ha).
- Quinalphos 25EC @ 0.05% followed by Dimethoate 30EC @ 0.06% at 10 days interval against pod bugs, viz., *Riptortus linearis* & *Nezara viridula* in summer mungbean, exhibited reduction of bug population (91.5%) and pod damage (84.4%).
- Two sprays of Diafenthiuron 50WP @ 312 g ai/ha at 30 & 60 DAS checked the pod damage (4.7 %) due to legume pod borer, *Meruca vitrata* and gave better yield (1163 kg/ha) compared to untreated control (21.7 % pod damage and 843 kg/ha), in urd bean during *kharif* season.
- In partial modification of earlier recommendation of web blight (*Rhizictonia solani*) management in greengram spraying of Tebuconazole 25EC @ 0.1% - 3 times at 15 days interval was effective in controlling the disease.



Figure 5.14. Web Blight diseases of Mungbean

- Three sprayings of Tebuconazole 25EC @ 0.1% at 10 days interval just after disease appearance was effective in reduction of rust disease of lentil (95.1% over the control).

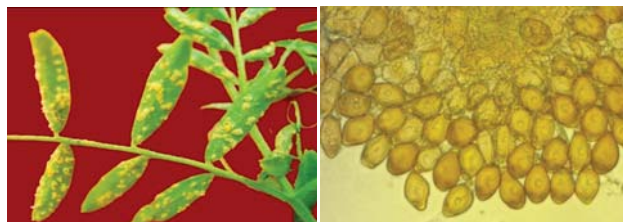


Figure 5.15. Lentil Rust **Figure 5.16.** Teleutospore of *Uromyces fabae*

- Incidence of collar rot in chickpea was reduced (14.7%) with new strains of Trichoderma showing high grain yield (977 kg/ha) in combination with seed treatment with Hexaconazole + Zineb (Avtar) @ 3g/kg seed.
- Out of 79 germplasms of lentil tested against *M. incognita*, three (Shalimar-M-1, IPL 316 and E 348) were found to be resistant.
- In the experiment “Management of *M. incognita* in pulse by crop rotation”, the sequence ‘black gram –potato –maize’ was found effective in reducing nematode population. But, from economic point

of view, black gram – cabbage – okra was found effective.

- Four different species of entomopathogenic nematodes (EPN) *Heterorhabditis bacteriophora*, *Steinernema aciari*, *Oschieus chongmingensis* and *Steinernema* sp.; belonging to three genera were recorded from Jorhat district of Assam around the rhizosphere of rice, okra, mung, arahar, cowpea, Assam lemon, jackfruit, sweet potato and tea.
- Three species of root knot nematode populations were identified from different districts of Assam viz., *Meloidogyne incognita*, *M. graminicola* and *M. javanica*. The *M. incognita* population was identified as Race 2.

5.1.4 Oilseed crops

- On the basis of AICRP trials, two soybean varieties JS97-52 and RKS-18 were suggested for recommendation in Assam.
- Three year pooled data of two white seeded sesame line AAUDT 301-4-2 (883 kg/ha) and AAUDT 302-3-4 (863 kg/ha) exhibited higher yield than Punjab Til 1 (678 kg/ha).
- Agronomic evaluation of Ag-6 exhibited superiority (1350 kg/ha) over 5 other mustard entries at 150% RD of NPK, along with adoption of plant geometry of 30x10 cm.
- Variety Shekhar, sown on 5 Nov., recorded the highest seed yield of 676 kg/ha. Linseed var. Sabour Tisi-1 recorded 985 kg/ha when sown on 28 November.
- A fertilizer dose of 30:20:20 kg N: P₂O₅: K₂O / ha. was found to be optimum for local white sesame varieties of Hill zones of Assam.
- Two new insect spp. viz., *Plusia* sp. and *Euproctis* sp. emerged as new minor pests on mustard crops in the reproductive stage. The population levels per plant were registered as 1.2 and 1.5, respectively.

5.1.5 Jute and allied fibres

- RARS Nagaon developed *olitorius* var. NOJ 27-12 which performed better (35.9 q/ha) against best check JRO-524 (34.7 q/ha) in AVT-II.
- *Capsularis* vars. JRCJ-11 (38.5 q/ha) & JRCJ-10 (37.9 q/ha) performed better against best check JRC-517 (36.1 q/ha) in AVT-I.
- In IPM/IDM in jute, Seed treatment with Carbendazim 50WP @ 2g/kg seed + Spraying of Spiromesifen 240SC @ 0.7ml/l water at 35DAS +

spraying of Tebucanazole @ 0.15% at 45DAS + spraying of Lamda cyhalothrin 5EC @ 0.6 ml/l at 55DAS was superior (28.9 q/ha) in controlling insect pests & diseases than the other organic IPM treatment (28.3 q/ha).

- 150% NPK on ST-TY + lime/ dolomite application on 25% LR + organic manure gave higher yield (37.7 q/ha) as compared to control (25.0 q/ha) under Soil amelioration & INM in jute/mesta.
- Pretilachlor lowered the weed infestation (17.6 g/sqm) compared to unweeded control (71.9 g/sqm) under IWM in jute, wherein 18 weed spp. were found dominant.
- In an experiment on effect of soil amelioration and integrated nutrient management on yield of jute / mesta based cropping system under acidic soil condition highest plant height and basal diameter were recorded in treatment containing 150% NPK on Soil Test-Targeted Yield approach + organic manure (equivalent to 5 t/ha of FYM). Increasing the fertilizer dose to 150% NPK on ST-TY approach along with amelioration of the soil with lime and incorporation of organic manure recorded the highest fibre yield (37.66 q/ha) but at par with those obtained by without liming.
- A study on the Carbon dynamics and hydro-physical characterization of soil in jute and mesta growing areas showed that organic carbon (SOC) content was high in Morigaon district (range: 1.21-1.31 %) as compared to Nagaon district (range: 0.94-1.14 %). Among the locations, Urigaon village, Morigaon district has highest SOC content (1.31 %) against the lowest SOC at Bajiagaon, Nagaon district (0.99 %). The water stable aggregate (WSA) and mean weight diameter (MWD) of all the locations has significantly higher aggregate stability (WSA range: 58.9-86.9 %; MWD range: 0.68-1.05 mm). Saturated hydraulic conductivity (Ks) values of the soil samples varies in between 0.44 and 1.58 X 10⁻³ cm/hr, lowest being at Bajiagaon, Nagaon district. Faster rate of steady infiltration prevails in all locations (ranging in between 11.3 to 15.5 cm/hr, except in Bajiagaon, Nagaon (7.03 cm/hr). The low water transmission pattern at Bajiagaon, Nagaon may be corroborated with lowest SOC content. Available water content in various locations varies from 0.12 to 0.28 m³/m³, lowest being at Dogaon, Nagaon and Gorajan, Morigaon district.

5.1.6 Fruits

- Application of 75% RDF+ VAM (500 g/Plant) + Azospirillum (100g/Plant) + *T. harziarum* (100g/Plant) as INM package resulted highest fruit yield (17.04 t/ha) of Khasi mandarin with B:C of 4.3.
- Stagewise application of nutrients at 0:0:0, 30:40:10, 30:35:10, 20:25:30 and 10:0:25 per cent of RDF during stage I to VI of Khasi mandarin resulted fruit yield of 18.0 t/ha with B:C 3.1
- Method of preparation of candy from peel of citron (*Citrus medica*) have been standardized and on the basis of sensory evolution it is preferred more than Khasi Mandarin (*C. reticulata*) and Pumelo (*C. medica*). Citron candy in food grade jar can be stored for at least three months.
- In Standardization of stage wise water requirement in citrus maximum canopy volume (9.16 m³) was recorded under the treatment with alternate 80% and 90% evaporation replenishment. Relatively higher nutrient status was observed under the treatment with 80% evaporation replenishment while maximum canopy volume (16.73 m³) was observed with the application of 80% RDF and 90% evaporation replenishment.
- Roving survey carried out in Assam, Arunachal Pradesh and Meghalaya. revealed that 4 major fungal diseases viz., *Phytophthora* root rot (*Phytophthora nicotianae*), Twig blight (*Colletotrichum gloeosporioides*), fruit drop due to pre-harvest stem end rot and Scab (*Elsinoefawcetti*) with minor diseases viz., Sooty mould (*Capnodium citri*), and Felt (*Septobasidium pseudopedicellatum*) were recorded in all Khasi mandarin orchard. Among virus and virus like diseases, CTV and Citrus Greening Disease were detected in most of the orchards up to incidence level of 40.0 and 43.33% respectively.
- Application of Dimethomorph (50WP) + mancozeb(75WP) and addition of two bioagents viz., *Trichoderma harzanium* & *Pseudomonas fluorescens* (100g/plant) was found effective for management of *Phytophthora* root rot disease in Khasi mandarin
- The treatment of 50% more than recommended dose of Phosphorus (RDP) + Tetracycline hydrochloride 600ppm + ZnSO₄ @ 200g) was found better in terms of % disease control(40.90%) and yield(61.43 Kg/plant) for management of Citrus Greening disease.
- Alternate sprays of Copper oxychloride 50% WP(0.3%) + Streptomycine (100) ppm in combination with NSKE (5%) have been found to be effective for the management of citrus canker in Assam lemon.
- Foliar application of *Beauveria bassiana* @ 0.1%(4x10⁶ cfu/ml) at the appearance of the larvae is found effective for management of citrus butterfly in nursery and young orchard.
- Foliar application of Novaluron 10 EC @ 0.005% twice at 15 days interval during flushing period have been found effective for management of citrus psylla (*Diaphorina citri*).
- The treatment of *Beauveria bassiana* was found effective for management of citrus butterfly (*Papilio demoleus*). FLD is going on.
- Neem formulation 10000 ppm @ 5ml/L followed by Thiamethoxam (0.025%) was found to be most effective for management of leaf miner (*Phyllocnistis citrella*) incidence which was however at par with Neem formulation 10000 ppm @ 5ml/L followed by Spinosad (0.002%).
- Bio-control of citrus nematode, *Tylenchulus semipenetrans* could be achieved using nematophagous fungus *Paecilomyces lilacinus* infected grain 30g/tree@2x10⁷spores. FLD is going on.
- *Trichoderma viride* @ 20g/m² reduced the population of *Tylenchulus semipenetrans* and increased the yield of Assam Lemon. The ICBR was 1:2.20 in demonstration trial.
- One Manohar group (ABB) identified as 'SimoluMonohar' and has yielded bunch weighing 30.32kg has been planted for further evaluation.
- 100% RDF in respect of nitrogen and potassium at 20:15, 30:25, 30:30, 20:30 at 3rd, 5th, 7th, 9th MAP was recommended for the maximum productivity of (58.46t/ha) against RDF (53.41 t/ha) with the benefit cost ratio of 4.48 and 4.20, respectively.
- The treatment involving Sawdust +BAP(4ml)+ *Bacillus subtilis* (30g) showed better results for most of the characters studied for two commercial varieties 'Jahaji' and 'Barjahaji' recorded the highest number of 22 to 25 plantlets, respectively.
- Performance of Jahaji variety under organic nutrient schedule with a combination of FYM 10kg + Neem cake 1.25kg + vermicompost 5kg+ woodash 1.75kg/plant was proved effective in improving the fruit quality as well as the positive

effects on soil properties and appeared to be an economic practice in banana plantation.

- Drip irrigation + Fertigation+ micronutrient foliar spray+ bunch spray of SOP+ black polyethylene mulching recorded the highest bunch weight (21.68kg) and yield (67 t/ha) with the highest benefit cost ratio of 4.78 against the control 3.06 in Cv. Grand Naine.
- Application of Acephate (0.1125%) spray + Bunch cover reduced the infestation of banana leaf and fruit scarring beetle (10.67) and increased the yield (13.19 t/ha).



Figure 5.17. Biological control of banana stem weevil (*Odoiporus longicollis*)

- Spray of entomopathogenic fungi (EPF) *Beauveria bassiana* @ 1×10^7 spores/ml @ 3ml/litre at 5th, 6th and 7th month after planting + stem trapping (30cm longitudinal split of banana pseudostem) swabbed with *B. bassiana* @ 10 ml/trap (3ml liquid formulation / litre of water) at 5th month after planting could effectively bring down stem weevil (*O. longicollis*) infestation along with simultaneous increase in fruit yield of banana. Alternatively, spray of *Heterorhabditis bacteriophora* @ 1×10^9 IJs/ha at 5th, 6th and 7th month after planting can be used to reduce the stem weevil infestation to achieve better fruit yield of banana.

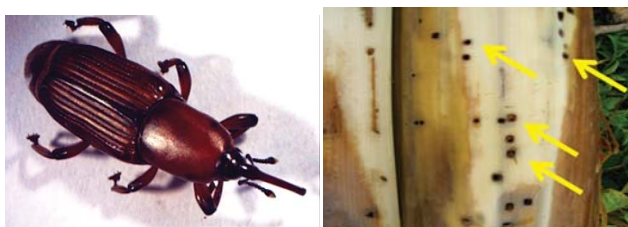


Figure 5.18. Banana stem weevil (*Odoiporus longicollis*)

- Disease (Fusarium wilt) free suckers from disease free field + application of Neem cake @ 250g/plant + dipping in Carbendazim (0.2%) for 30 min. followed by Carbendazim drenching 0.2% solution (2nd, 4th and 6th month after planting) and

Carbendazim injection @ 3 ml of 2% solution (3rd, 5th and 7th month after planting) could check the disease significantly as compared to control as well as other treatments and the cost benefit ratio was found to be 1 :2.34 against 1 :1.98 in the previous technology.

- “Simalu Manohar” selected as a superior clone among the commercial banana cultivars of the region which is tolerant to sigatoka leaf spot, moderately, to scarring beetle and resistant to bunchy top.
- The following locations were recognized as hot spots for root-knot nematode, *Meloidogyne incognita*: Goroimari, Bihdia jajikona, Kamalpur for banana.
- Application of 75 per cent RDF through drip irrigation in coconut in 10 splits from October to March at 18 days interval registered higher growth, nut yield and ensures higher profitability by saving 25% of the recommended fertilizers.



Figure 5.19. Drip irrigation in coconut

- The experiment on collection, conservation and evaluation of local germplasm of coconut was initiated during 2005 with 10 local accessions of coconut in Assam along with two check varieties viz., Kamrupa and W.C.T. Kamrupa recorded the highest growth in respect of height, girth, annual leaf production, number of functional leaves as well as nut yield (72.4 nuts/palm/year) followed by IC 610354 (62.6 nuts/palm/year) till now. Genotype CRP 702 (IC 610354) recorded biggest nut size and nut weight (1460 g/nut) along with highest tender nut water of 380 ml/nut.
- The experiment undertaken during 2009 with 5 cross combinations of coconut i.e., Assam Green Tall (Kamrupa) x Kalpa Prithba, Kamrupa x Kera Chandra, Kamrupa x IND 058, CRP502 x Kamrupa and CRP501 x Kera Chandra in a 3 RBD. The highest plant height (705 cm), girth (142 cm), maximum leaf production per year (12.0), no. of functional leaves/palm (28.0) was recorded in

CRP501 x Kera Chandra. Till now the highest fruit yield (48.6 nuts/palm/year) was recorded in AGT x PHOT closely followed by AGT x MYD (45.0 nuts/palm/year) whereas, the lowest yield of 34.2 nuts/palm/year was found in CRP 501 x PHOT.

The experiment on five Tall x Tall hybrid cross combinations with WCT x TPT, Chandra LCT x ADOT, BGR x ADOT, ADOT x ECT, ECT x LCT and Local Check was started during 2013. The highest plant height (385.0 cm), girth (77.4 cm), no. of leaves (16.8), total leaf length (276.2 cm) were observed LCT x ADOT whereas, the hybrid ADOT x ECT recorded the lowest values for the above characters.

The experiment on development of coconut based integrated cropping system models for different agro-climatic region comprised of five crop components such as Turmeric (var. Prova), Pineapple (var. Kew), Assam lemon and Banana (Chenichampa) and black peppe (Var. Panniyur-1). A compact coconut block covering of 0.4 ha was taken for the model. The whole plot was divided into three blocks and the following three treatments were imposed. T₁ - 75 % Recommended NPK + Vermicompost recycling, T₂ - 50% Recommended NPK + Vermicompost + *In situ* Green manuring + Biofertilizer + Vermiwash, T₃ - Fully organic: Vermicompost + Composted Coir Pith + Biofertilizer + Vermiwash + *In situ* Green manuring + Glyricidia loppings + mulching with coconut leaves. The highest yield/ha for all the intercrops were recorded in T₂ (50% Recommended NPK + Vermicompost + *in situ* Green manuring + Biofertilizer + Vermiwash) followed by T₁ and the lowest yields were recorded in T₃ (Fully organic). Nut yield was also influenced due to the treatment effects. The highest nut yield was found in T₂ while the lowest was recorded in the control (monocropping). With regard to soil nutrient status (NPK) as well as leaf nutrient content, highest nutrient status for both the cases under the treatment T₂ compared to other treatments. However, microbial population (bacteria, fungi, actinomycetes) as well as earthworm population of soil recorded higher values in T₃ followed by T₂ and the lowest was recorded under in T₄. The highest net return (Rs. 473300/ha) with benefit cost (2.01) were recorded in T₂ followed by T₁ (421300/ha and 1.93) and the

lowest net return of Rs. 391350/ha and B: C ratio of 1.82 were obtained in the treatment T₃. Control plot (Coconut monocropping) recorded only a net return of Rs. 65950/ha and benefit cost ratio of 1.24.

Considering the yield, harvest duration (65 days) and Shelf life of fruits, Strawberry varieties Chandler and Festival are recommended for cultivation in Karbi Anglong district. November is the suitable month for planting strawberry in Karbi Anglong district. Highly significant reduction in yield was recorded while planting after this month.

Multilocation trial (MLT) of cocoa clones under palms was conducted during 2015 with 16 nos. of cocoa clones (VTLC series & one hybrid). The highest plant height (188.5 cm), girth (21.0 cm), number secondary branches (15.3) per plant, plant spread (E-W and N-S) were recorded in VTLC-20 followed by VTLC - 18 and the lowest values for the above characters were observed in YET. All the cocoa clones have now started flowering. The highest plant height (153.0 cm), girth (2.8 cm) and number of branches (6.6) per plant were recorded in VTLC-25 followed by VTLC -40 and the lowest values for the above characters were observed in VLTC-28.

5.1.7 Vegetables

Partial root drying i.e. irrigating the furrow in irrigation event and keeping the same furrow unirrigated in the next irrigation and vice versa for the succeeding irrigation is beneficial for potato crop under water scarce situation in terms of its tuber yield (16.45 q/ha), water use (450 mm) and economic returns (Rs 76260.00/ha)



Figure 5.20. Furrow irrigation in Potato

In Participatory Research on Floating Bed Vegetable cultivation in the CBVZ of Assam, alternate layers of Water Hyacinth & other aquatic weeds + (½ kg cowdung + ½ kg vermicompost)

per sqm gave the highest yield and B:C ratio in Okra (52.28 t ha⁻¹ and 6.5, respectively).

- Organic cultivation of Ridge gourd (*Luffa acutangula*) with 'Rock Phosphate + Azotobacter + PSB + Enriched Compost @ 5 t/ha showed the highest values of 19.7 nos. of laterals, 335 cm vine length, 76.5% fruiting, 17.7 fruits/plant, 148 g fruit weight and 13 t/ha of yield.
- The following locations were recognized as hot spots for root-knot nematode *Meloidogyne incognita*: Bezera, Bihdia jajikona, Kamalpur, Septi, Bongaon, Bahjani for papaya; and Goroimari, Samaria, Bezera, Kamalpur, Bongaon, Bihdia jajikona for vegetable crops.
- Out of 50 germplasm of brinjal and okra each, tested against *M. incognita*, 1 germplasm (IC 112315) of brinjal, one of (EC 306700) okra was found resistant.
- Application of *Purpureocillium lilacinum* @ 20g/m² (cfu 2x10⁶) + neem cake @ 100g/m² was found effective against *M. incognita* in cowpea, where the yield was 51 q/ha as against 39 q/ha in untreated control.
- Seed treatment with *Purpureocillium lilacinum* @ 2.5 ml/kg + *Pochonia chlamydosporia* @ 2.5 ml/kg followed by soil application of vermicompost @ 2.5t/ha enriched with *P. chlamydosporia* and *P. lilacinum* each @ 5ml/kg was found effective against *M. incognita* in okra where the yield was 8.81 t/ha as against 6.58 t/ha in untreated control.
- Among the biofumigants, cabbage leaves @ 50 t/ha was found effective in reducing population of *M. incognita* in okra.
- In managing late blight disease in potato, the fungicides Lurit (T2) and Nativo at the recommended concentration was found to be effective. These treatments showed significant reduction in AUDPC (Area Under Disease Progress Curve) value (341.29 and 480.63), apparent rate of infection (0.075 and 0.079) and disease severity at 85 DAS (45.00 and 53.33%) with increased total yield (12166.66 and 9766.66 kg/ha) as compared to rest of the treatments (560.63- 643.77 AUDPC value, 0.112-0.135 rate of infection, 80-85% disease severity. Control showed the highest AUDPC (Area Under Disease Progress Curve) value (860.10), apparent rate of infection (0.179) and disease severity at 85 DAS (100%) with decreased total yield (4433.00kg/ha).

- Use of host varietal diversity and rice straw mulching for management of Late Blight of Potato it was found that the combination of Kufri Jyoti + Holland Bhutan + Mulching was the best in managing late blight disease in potato. These treatment shows significant reduction in AUDPC (Area Under Disease Progress Curve) value (341.71), apparent rate of infection 'r' (0.108) and disease severity at 75 DAS (43.33%) with increased total yield (3966.66 kg/ha) as compared to rest of the treatments (467.74- 1092.14 AUDPC value, 0.112-0.181 rate of infection, 60-96% disease severity).

Integrated Farming System

- Experiment on resource conservation revealed highest REY (380 q/ha), gross return (Rs 6,79,067/ha), net return (Rs 5,58,872/ha), B:C ratio (5.65) and employment generation (445 man-days/ha) with the sequence Green gram + Sesamum (2:1) (Broad-bed)+Rice (Furrow) – Chili (Broad-bed) + Toria (Furrow) – Cowpea (Vegetable +Residue for incorporation).
- Permanent plot experiment on integrated nutrient management in cereal-based cropping systems revealed that the treatment with replacement of 25% N as chemical fertilizer through the incorporation of 16.1 q/ha (dry weight basis) rice straw/crop stubble at the time of puddling of winter rice in Rice (W) – Rice (A) sequence was found to be the best recording highest REY (86.53 q/ha), gross return (Rs 1,35,850./ha), net return (Rs 80,131/ha) and B:C ratio (2.44) along with lowest cost of production (Rs 644/q).
- Development of organic farming package indicated that highest REY of 127.82 q/ha along with a B:C ratio of 3.69 was obtained with fully organic treatment (using one third each of FYM, vermicompost and mustard oil cake) along with intercropping during *rabi* and summer with cropping pattern Winter rice – Toria + Pea – Black gram + French bean; however highest B:C ratio of 5.78 was obtained with fully organic treatment along with biofertilizer and Mussoric rock phosphate.
- Under micro-nutrient analysis, while highest availability of Fe and Mn at the end of crop cycle was observed in treatment Winter rice – Toria + Pea – Black gram + French bean (13.33 and 3.78

ppm respectively), that of, Cu and B were observed in treatment 100% RDF (inorganic) + secondary and micronutrient based on soil test + pumello fruit as bio-pesticide (1.24 and 0.34 ppm, respectively).

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- The consolidated performance of the IFS model over the years from 2010-11 to 2016-17 was found to be on an average REY 26.36 t with Rs. 2,08,398 of net income, 1.97 B:C ratio and 429 man-days of employment generation.
- On-farm evaluation of farming system modules for improving profitability and livelihood of small and marginal farmers, there exist mainly four types of farming system, the most pre-dominant being the Crop+cow+pig+fishery with the average net income of Rs. 69,550.00. After two year of experimentation, it was found that Crop+Cow+Pig+Fishery gave highest net return of Rs.99550.00 after 1st year and Rs. 112432.00 after 2nd year.

5.1.8 Flowers:

- Mutants of Marigold, AAUM1, AAUM2, AAUM3 and AAUM4 were selected for OFT in different locations. The varieties AAUM1 and AAUM3 are orange in colour with an average yield of 16.51 t/ha and 19.2t/ha, respectively. Whereas, AAUM2 and AUM4 are yellow in colour with a yield of 17.61t/ha and 18.42t/ha, respectively.
- 50% recommended dose of fertilizers along with 1 kg of FYM and 300g of vermicompost /m²/y is recommended for better plant growth, quality and thereby to increase spike and bulb yield of tuberose Cv. Vaibhav(double) and Prajwal(single).
- Considering the market acceptability and gardeners choice Red heliconia, Shrimp heliconia, Bihai Yellow Dancer and Bihai Orange Dancer are recommended for cut flower production and for border planting and shrubberies.
- Post harvest dipping in 5% boric acid solution for 30 seconds enhances shelf life of loose flower of tuberose.

- Media depth of 30 cm along with media composition of sand + coco peat + vermi-compost + vermiculite + perlite in the ratio of 1:2:2:0.25:0.25 by volume is best for roof top gardening of flowers like Gerbera (Red Gem) & Chrysanthemum (Prof. Hariss) and Vegetables like Lettuce (Iceberg) and Broccoli (Centauro).



Figure 5.21. Roof Top Gardening

- 50 ppm Biological AgNP2 + 4% sucrose synthesized from *Zanthophyllum oxyphyllum* Edgew is recommended as the best nano formulation for enhancing the vase life of cut flowers viz. Anthurium cv. 'Fire'(19.67 days), Rose cv. 'First Red'(19.50 days) and Gerbera cv. 'Antibes'(15.80 days).



Figure 5.22. Nano formulation for enhancing the vase life

- The Marigold variety Seracole was found to be the best among all the varieties showing significantly highest mean values for most of the growth and flower characters. Varieties Seracole, Pusa Narangi Gainda and Pusa Basanti Gainda exhibited average stability for flower yield /ha. The basal diet supplemented with 12 mg carotenoid/kg diet recorded highest carotenoid content and colour score of egg yolk.
- Tuberose Vaibhav variety performed well in NFT (nutrient film technique) system of hydroponics than waterculture and drip system of hydroponics. And among three different concentrations of modified hogland nutrient solution viz EC 1, EC 1.5 AND EC 2, growth and flower characters were

found to be superior in EC2 nutrient concentration.

- Standardization of packing techniques for flower strings of marigold: Among the three packing treatments, flowers packed in Bamboo basket with paper lining and ice pack in the centre (two baskets upside down of about 1.5 feet diameter with 1 foot depth) recorded highest Physiological Loss in Weight (PLW) (7.48% and 8.81%, 13.56% and 13.55%, 22.01% and 23.05%) of flowers at 1, 2 and 3 days, respectively, compared to the other two types of packing containers.
- Standardization of packing techniques for flower strings of tuberose: Among the packing materials used, highest PLW (35.89 % and 31.18%) was recorded in tuberose strings packed in Bamboo basket, followed by Thermocol box and CFB Box, which were at par.
- Standardization of postharvest treatment using boric acid and sodium benzoate for improving post harvest life of loose flowers of tuberose: Boric acid 5% (21.47% in 24hrs and 43.67% in 48hrs) and sodium benzoate 25 ppm (21.52% in 24hrs and 42.93% in 48hrs) significantly retained the moisture level over control (31.06 % in 24hrs and 53.31 % in 48hrs) and improved the storage period up to 50 hrs over water spray control (38.67 hrs) and recorded least rotting percentage (57.57%) after 48 hours of storage over control (84.05%).
- Use of food dyes for tinting in tuberose stems: Dipping in Kesor Yellow (4% dye) for 2 hrs recorded highest retention of colour upto 4 days with maximum floret opening (86.33%).
- Effect of holding solutions on keeping quality of orchid spikes: A holding solution containing 50% coconut water, 4% sucrose and 0.2% sodium hypochlorite (NaOCl) significantly increased economic vase life (24.92 days) and total vase life (34.50 days) over control (17.52 days, 22.25 days, respectively).

5.1.9 Spices

- October month can be considered as the most suitable month for planting of garlic (*Allium sativum* L.) in Assam. The elite germplasms, Assam Local and Ekfutia Assam and the National variety Bhima Omkar were found to be suitable for future cultivation under changing climatic condition.
- Five pepper varieties viz., IISR Thevam, IISR Shakti, IISR Malabar Excel, Sreekara and

Panniyur-1 were selected for the trial. The highest vine length and vine girth were recorded in Panniyur-1 whereas lowest vine length and vine girth was observed in IISR Shakti. With regard to number of branches/vine among the varieties, the highest number of lateral (29.8 at one m column) was recorded in Sreekara and the lowest of 23.7 numbers was found in IISR Malabar Excel. Among the varieties/hybrids, Panniyur-1 recorded significantly higher number of spikes (109.1 in one meter column height), spike length (14.4 cm), number of berries per spike (64.1) and yield (1.25 kg/vine) compared to other varieties/hybrid.

- Among 12 black pepper varieties/hybrids (7 yrs old) evaluated, Panniyur-5, Karimunda and Panniyur-1 recorded maximum dry berry yield of 2.35, 1.95 and 1.86 kg/vine, respectively. In second set of black pepper evaluation, a total of 26 genotypes were collected from IISR, Calicut, PRS, Panniyur, AICRP (Sirsi), APPL (Teok) and Local Collection and maintained.
- For raising bush pepper, black pepper (Var. Panniyur-1 and Karimunda) cuttings taken in the month of May was found best (82.00 and 84.00% success, respectively). Successful grafting combination of Panniyur-1, Karimunda (90.00%) and betel vine (95.00%) with Brassilian pepper (Resistant to *Phytophthora*, nematode and water stagnation) has been recorded.

5.1.10 Medicinal, Ornamental & Aromatic Plants

- Three prominent lines of *Piper longum* (Pipali) identified and characterized for release as a variety are JPL-1, JPL-12 and JPL-19.
- Leaf size, leaf length, leaf breadth and internodal length in *Piper longum* was found to be significantly higher under 90 x 60 cm while minimum (28.51 cm) and (3.87 cm) respectively was recorded in 40 x 40 cm. minimum leaf breadth (3.93 cm) was observed in 60 x 40 cm which is at par with 40 x 40 cm (4.03 cm). Highest internodal length of 5.37 cm was also recorded in 90 x 60 cm.
- The experiment was conducted during 2016-17 to 2017-18 to study the effect of organic manure as a supplement for nitrogen requirement of *Piper longum*. FYM and Vermicompost were taken as organic manure substitute. Three years pooled data indicates that there was no significant variation in leaf length and leaf breadth among the treatments.

- Maximizing productivity of Lucky Bamboo (*Dracaena sanderiana*) with the use of different types of plastic mulch and shade net.
- Raising mother plants of *Dracaena sanderiana* under 50 % black and Green agro-shade net with 25 micron reflective mulching was found to be economically beneficial with higher benefit cost ratio 3.6 and 3.4.

5.1.11 Agro-forestry

- Tree improvement of *Gmelina arborea*, 16 year old: Out of 95 germplasm of *Gmelina arborea* collected, AAU 15 & AAU 16 (Seed source Byrnihat) and AAU 17 & AAU 18 (Seed source Silchar) registered tree height of 16.93, 17.00, 14.67, 16.18 m and dbh of 35.40, 36.28, 40.42, 41.95 cm, respectively. AAU 18 (Silchar), recorded the highest timber volume of 0.8614 m³/tree, biomass of 943.18 Mg/ha and above ground C stock of 471.59 Mg/ha.

· *Acacia mangium* based Agroforestry system

13 year old *Acacia mangium* based agroforestry system recorded the maximum plant height (13.81 m) and dbh (29.92 cm) in 5 m x 6 m spacing and 5 m x 5 m with intercrops, respectively. However, the maximum canopy diameter (8.75 m), timber volume (207.12 m³/ha), tree biomass (334.5 Mg/ha) and above ground carbon stock (167.25 Mg/ha) was recorded in sole tree at 5 m x 4 m spacing. The maximum fodder yield of Hybrid napier (48.20 t/ha) was obtained in sole fodder followed by tree spaced at 5 m x 6 m (45.19 t/ha), 5 m x 5 m (40.16 t/ha) and 5 m x 4 m (38.50 t/ha), respectively. Continuous build up of OM and major nutrients was also observed in the system. Litter fall production (5.16 Mg/ha) and N (38.80 Kg/ha) & P (2.51 Kg/ha) return to soil was found maximum in sole tree spaced at 5 mx4 m.

· **Coconut based agri-horti system**

Interspaces of 35 year old coconut garden were utilized by growing *Moringa oleifera*, turmeric, pineapple and fodder crops. Coconut yield in intercropped plot was 11.79 to 16.04 per cent higher than the sole coconut plot (7,299 nuts/ha). Green fodder yield of Setaria was only 16.66 per cent less in intercrop plot than in open conditions (45.00 t/ha). Turmeric (cv. Megha turmeric 1) recorded

7.14% less yield in intercrop plot than in open conditions (30.00 t/ha). Pineapple (cv. Queen) recorded 9.83 % less yield in intercrop plot than in open conditions (61.00 t/ha) during 2017-18. Maximum build up of OM (18.75 %) and N P K kg/ha were recorded where Setaria was grown as intercrop.

· **Jackfruit based agri-horti system**

Thirteen year old Jackfruit based system recorded higher tree height (7.79 m), dbh (27.93 cm), Canopy diameter (3.80 m), timber volume (28.125 m³/ha), tree biomass (86.249 Mg/ha) and above ground C stock (43.12 Mg/ha) in intercropped plots compared to sole plantation. Build up of OM and major nutrients were also observed in intercropped plots.

· ***Bambusa tulda* based agroforestry system**

Mean plant height (22.60 m), spread (2.98 m), total culms (73.49 nos.), canopy diameter (14.49 m), biomass (164.92 Mg/ha) and harvestable yield (621 no./ha) of *Bambusa balcooa* was recorded in 9 years after plantation. On the other hand, mean plant height (19.68 m), spread (3.22 m), total culms (61.97 nos.), canopy diameter (10.92 m), biomass (200.32 Mg/ha) and harvestable yield (1248 no./ha) was found in *Bambusa tulda*. Build up of OM, available N, and available P₂O₅ over initial status of soil after 9 years of plantation under *Bambusa balcooa* is 43.35%, 13.96%, 13.94% respectively; while for *Bambusa tulda* the increase percentage was 40.70%, 13.20%, 9.72% respectively over.

· ***Acacia mangium* for timber, 16 year old**

75 superior trees attained 22.97 m plant height and 38.08 cm dbh in 16 year old plantation. Timber volume calculated on the basis of mean data has been recorded as 1.1902 m³/tree. Mean tree biomass of the standing tree was 341.8 Mg/ha. Built up of organic matter (1.29 to 1.80 %), available N (207.0 to 262.6 kg/ha), available P₂O₅ (18.6 to 22.2 kg/ha) and available K₂O (148.9 to 160.1 kg/ha) in the soil has been recorded.

5.1.12 Soil Biodiversity-Biofertilizers

- A study on Metagenomics of 'Rhizosphere Microbiome' in rice as influenced by 12 years long term 'Integrated Nutrient Management' clearly exhibited the impact of enriched compost amid

reduction in nitrogenous and phosphatic chemical fertilizer even upto 75% . The treatment consisted of 25% RD of NP with 100% K along with enriched compost (2 t/ ha) could sustain the rice production at 4.20 t/ ha which was comparable with total inorganic fertilizer (4.07t/ ha). The metagenomics study of rhizosphere microbiome illustrated significant differences in the microbial diversity in long term INM. Significantly highest abundances of microbes were recorded in the treatments that received quality enriched compost (@2.0t/ha). The Shannon Diversity Index (H') of Phylum and Species were also recorded at 1.703 and 4.656 respectively in the treatment received enriched compost @ 2t/ha. The geometric mean of soil enzymes established strong relation with Shannon Diversity Index (H') at phylum($R^2=0.64$) and species ($R^2=0.68$) level. Similarly, the carbon management index and sustainable yield index also established strong positive relations with Shannon Diversity Index (H') at $R^2=0.59$ and $R^2=0.73$.

- A six year study on metagenomics of 'rhizosphere microbiome' in rice as influenced by organic nutrient management revealed that the application of enriched compost @5t/ha could yield 3.38t/ha of scented rice. The application of enriched compost @ 5.0t/ha clearly demonstrated the significant increase in microbial diversity of species in terms of Shannon Diversity Index (4.717). The dissolved organic carbon (DOC) and total organic carbon (TOC) explained strong correlations with Shannon Diversity Index at $R^2=0.55$ and $R^2=0.72$.
- In studying the diversity of culturable endophytic Actinobacteria from different varieties of rice plants the 16SrDNA sequences of the nine culturable endophytic actinobacterial isolates were compared to those of known 16SrDNA sequences using BLAST and the Gen Bank data base. Following the sequence analysis the endophytic Actinobacteria were identified as *Streptomyces longispororuber*, *Streptomyces rochei*, *Streptomyces parvulus*, *Streptomyces warraensis* and *Nocardiopsis alba* (Figure 5.23). Research will be carried out to formulate consortia of PGPR with Actinobacteria.
- To confirm the diversity of the potassium solubilizing bacteria (KSB), the 16SrDNA sequences of the five KSB isolates were compared

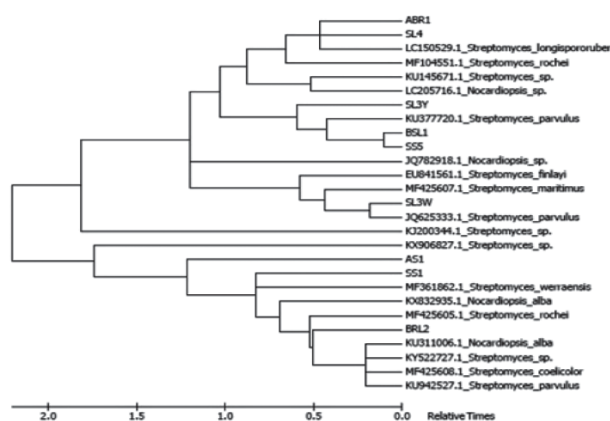


Figure 5.23. Phylogenetic tree of culturable endophytic actinobacteria from rice plants based on 16S rDNA sequences

to those of known 16SrDNA sequences using BLAST and the Gen Bank data base. The results showed that the KSBB3 possessed 100% similarity with its close species strain BRL02-31. Four isolates (KSBB8, KSBB9, KSBC5 and KSBC6) were found to be closely phylogenetically related to *klebsiella*, showing with 96-100% similarity in their 16SrDNA sequences. The isolate KSBB9 closely related to *Klebsiella variicola* strain kms0422, isolate KSBC5 was similar to *klebsiella* sp.2009I10. The phylogenetic tree was constructed using BLAST analysis in NCBI in order to make sure the above results (Figure 5.24). Two years of experiment resulted statistically comparable yield of rice(3.85-4.00t/ha) on application of potash solubilizing bacteria(KSB) with reduced potassic fertilizers which were at par with full dose of potassic fertilizer(@20kg/ha) (4.20t/ha). However, on the basis of cumulative release of NH_4OAc-K in soil, the microbial consortia of KSB performed better compared to single inoculation of KSB. On the basis of the performance of KSB consortia in

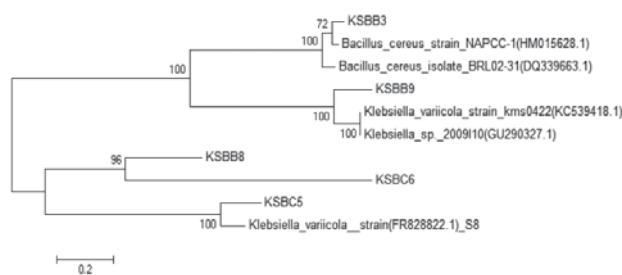


Figure 5.24. Phylogenetic tree of K- solubilizing bacteria from chilli and banana rhizosphere soil based on 16S rDNA sequences

reducing potassic fertilizers in rice cultivation, the treatment consisting of “NPK@40:20:10+ KSB consortia” recommended for OFT at KVK.

5.1.13 Rodent Control

- Among the different cropping system studied (rice-toria/rice-pulse/rice-rice/rice-vegetables) the cropping system ‘rice-vegetables’ was found to be more susceptible in respect of rodent incidence and damage. The recorded rodent species were *Bandicota bengalensis*, *B. indica*, *Rattus sikkimensis*, *Rattus rattus*, *Mus musculus* and *Dremomys lokriahunder* UBZV of Assam. Rice was found to be one of the most preferred crops for rodents with 36.86 LBC/ha, trapping index of 8.82 and 9.92 per cent tiller damage. Among the vegetables grown after rice, the highest incidence in terms of LBC/ha was recorded in pumpkin (42.76), potato (32.41), pea (26.86), brinjal (30.82), carrot (24.81), tomato (18.44) and beet (14.82). Among the vegetables the highest damage was recorded in pea (8.81 %), potato (8.71 %), pumpkin (6.62 %) and beet (6.61 %).



Figure 5.24. Rodent incidence in rice-vegetables cropping system

- In terms of pre- and post-count LBC revealed a control success rate of 67.02%, 48.12%, 41.75% and 31.13% in vegetables, wheat, rice and mustard respectively due to installation of barn owl nest boxes. The control success in respect of TI was 56.36% in vegetables, 55.81% in rice, 47.82% in mustard and 47.16% in wheat.
- The local bamboo traps (*maat chitap*) have showed promising results in trapping rodents (TI: 4-11%) over Sherman traps (TI: 3-10%). The pre and post count LBC due to placement of local bamboo traps

revealed a control success of 63.1%, 57.4% and 55.7% in rice, mustard, and vegetables, respectively.



Figure 5.26. Field placement of local bamboo traps (*maat chitap*)

5.1.14 Honey bees

- Apis mellifera*, an exotic honey bee species introduced in North East India at AAU, Jorhat centre and as the species is prone to inbreeding depression attempts have been made for selective breeding of *Apis mellifera* through Artificial insemination technique to maintain the vigour and vitality of the species. The comparative performance of Naturally Inseminated (NI) Queen versus Artificially Inseminated (AI) Queen showed that the performance of brood rearing activities in AI is superior to NI having average brood area development 3554.95 sq. cm against 2741.5 sq. cm with the increase in brood area of 124.5%.



Figure 5.27. Grafting needle



Figure 5.28. Sealed queen cells obtained from mass queen rearing by grafting

- In view of the prediction on increase of temperature and CO₂ concentration due to climate change a study on the impact of elevated temperature and CO₂ concentration on foraging behaviour of honey bee, *Apis cerana* irapeseed and mustard under

Carbon dioxide and Temperature Gradient Tunnel revealed that bee mortality of 7.49 per cent with 2^o C rise in temperature and 550 ppm of CO₂ and 12.40 per cent with 4^o rise of temperature and 650 ppm of CO₂ concentration. Similarly, pollen load per trip has been decreased from 7.06 to 5.89 in earlier case and 3.76 in the later.



Figure 5.29. Open pollination, Pollination in CTGT Structure



Figure 5.30. *Apis cerana* foraging on rapeseed plant

5.1.15 Soil Arthropod Pests

- Species wise profiling of 1263 numbers of scarab beetles collected from ICR farm, AAU, was done.
- Pheromonal compounds of *L. mansueta* were investigated in collaboration with NBAIR, Bangalore. GC-MS analysis revealed the presence of 4 compounds in the PTG extracts of males and another 4 compounds in the female abdominal extracts.
- The amino acid profiling of *Lepidiota albistigma* and field cricket, *Brachytrupes portentosus* were carried out at CSIR-CFTRI, Mysore. All together 17 amino acids have been recorded in case of *L. albistigma* whereas 19 amino acids have been detected in *B. portentosus*. Among all the amino acids, 8 essential amino acids viz. Histidine, threonine, valine, methionine, isoleucine, leucine, phenylalanine and lysine have been recorded in the above species.
- The HPLC analysis of sugar and fat soluble vitamins of two *Lepidiota* sp. viz. *L. mansueta* and *L. albistigma* has been conducted. The glucose

content of *L. mansueta* and *L. albistigma* has been found to be 7.860 and 13.993 mg/ 100 g, respectively. Sucrose content was found to be higher in *L. albistigma* (3.760mg/100g) than *L. mansueta* (0.615 mg/100g). The HPLC analysis of water soluble vitamins of both *L. mansueta* and *L. albistigma* was found to be 4.294 mg/100g and 4.440 mg/100g, respectively.

- Eight species of termites viz., *Odontotermes obesus*, *O. feae*, *O. parvidens*, *O. kapuri*, *Microtermes mycophagous*, *Trinervitermes biformis*, *Speculitermes chadaensis* and *Neotermes buxensis* were identified in collaboration with University of Agricultural and Horticultural Sciences, Shivamogga, Karnataka.
- A potential strain of EPN was isolated and identified as *Heterorhabditis bacteriophora* from the host cadavers of 3rd instar grubs of *L. mansueta*. Efforts have been made to prepare the formulation for further field testing.
- Field evaluation of seven different insecticides against the grubs of *L. mansueta* in potato revealed that the soil application of fipronil 40 % + imidacloprid 40 % recorded lowest infestation of tubers (2.44 %) and highest yield (125 q/ ha).

5.1.16 Acarology

- From the screening trial of chilli, the lines PC/2602, CCH-65 (d), 27/10 and 4/09 A (Black) were found to be moderately resistant and the local collection Memjolokia, Krishna, Konjolokia and Moni were found to be resistant against *Polyphagotarsonemus latus*.
- Predatory mite, *Neoseiulus longispinosus* was released @10, 20, 30, 40 predators/plant against *Tetranychus urticae* in rose and *Brevipalpus californicus* in gerbera. 100 percent mite control was achieved after 10 days of releasing the predator @ 20/plant.
- IPM package have been developed against *Aceria litchi*. Cultural control followed by two sprays of propargite 57 EC @ 0.057% at 15 days interval was considered to be the best option against the pest.
- Mass production technique of the predatory mite, *Neoseiulus longispinosus* has been developed in *Amaranthus hybridus* as host crop on *Tetranychus urticae* as prey mites.

- Several plant extracts have been evaluated against *Polypahgotarsonemus latus* and *Tetranychus urticae*. Among the botanicals *Polygonum hydropiper* leaf extracts was found effective in controlling 90 per cent of the pests after 7 days of application.
- Several newer acaricides have been evaluated against *Oligonychus coffeae* in tea. Rebufenpyrad 20% WP @ 100 g a.i./ha was found to be the best in controlling 100 per cent mites after 3 days of application.
- Biodiversity of mites has been studied throughout the year. February-March and October were found to be the congenial season for most of the mite pests. During the year, 25 phytophagous and 10 predatory mites have been recorded from different ecosystem.

5.1.17 Sugarcane

- Planting of setts after overnight soaking in 100 ppm ethrel solution followed by spraying of GA₃ (35ppm) at 90, 120 and 150 DAP recorded significantly the highest cane yield (57.8 t/ha) than conventional 3 budded sett planting in plant crop of Sugarcane.
- Paired row trench planting (30:120 cm row spacing with organic mulching @ 6 t/ha) recorded significantly higher cane yield (54.72 t/ha) than other planting method of sugarcane.
- The new production technology of sugarcane (SSI) recorded 23.6% higher cane yield (91.5 t/ha) than conventional production technology (74 t/ha).



Figure 5.31. SSI – New production technology



Figure 5.32. Experiment on plant growth regulators

- Organic amendment in sugarcane grown under organic condition by green manuring with dhaincha along with application of azotobacter and PSB @ 10 kg culture per hectare, FYM and sugarcane trash compost @ 5 t/ha each and rock phosphate @ 30 kg/ha with or without liming @ 750 kg/ha resulted equivalent cane yield (93.23 – 111.98 t/ha) and sucrose (17.3 – 17.88%) and glucose (3.57 –

4.46%) content of cane juice to that of fertilized crop (Cane yield: 104.95 t/ha, Sucrose:17.67%, Glucose: 4.41%).

- The variety CoBln 7501 showed resistance (R) reaction to both the isolates of *Colletotrichum falcatum* in plug as well as cotton swab method.
- In case of survey of sugarcane diseases, incidence of red rot was found upto 7.69%. Wilt was observed



Figure 5.33. Red rot infected cane

Figure 5.34. Wilt infected cane

in the genotype CoBln 9104, CoBln 9103, Co 997, Co740 upto percent disease incidence of 19.23%. YLD was observed in the genotype CoBln 9104, CoBln 9103, Co 997, Co740 upto percent disease incidence of 8.57.



Figure 5.35. YLD infected sugarcane leaf

Foliar disease like ring spot was observed upto 53.33% in the genotype CoBln 9104 in grand growth stage. Pokkahboeng was observed up to 11.42% in the cultivar CoBln 09103 in grand growth stage followed by 8.20 in the cultivar BO 155 at the tillering stage.

- The insecticide Chlorpyrephos 20 EC @2.5 kg a.i/ha has given highest percentage of germination (58.56) of sugarcane in termite infested field and a new insecticide Spinosad 45 SC recorded lowest



Figure 5.35. Plasley borer infestation



Figure 5.37. Top borer infestation

infestation (3.52%) with highest yield 49.0 t/ha against sugarcane borer.

Organic amendment in sugarcane grown under organic condition by green manuring with dhaincha along with application of Azotobacter and PSB @ 10 kg culture per hectare, FYM and sugarcane trash compost @ 5 t/ha each and rock phosphate @ 30 kg/ha with or without liming @ 750 kg/ha resulted equivalent cane yield (93.23 – 111.98 t/ha) and sucrose (17.3- 17.88%) and glucose (3.57 -4.46%) content of cane juice to that of fertilized crop (Cane yield: 104.95 t/ha, Sucrose:17.67%, Glucose: 4.41%).



Figure 5.38. Organically grown sugarcane performs as good as fertilized crop

5.1.18 Forage crops

Package of practices for rye grass (*Lolium multiflorum*) varieties Makhan and PRG-1 as productive annual rabi forage crop for Assam has been developed. This forage crop is having high flexibility of sowing time like oat from October last to mid December. Yield potential ranged from 350-400q/ha and dry matter yield of 60-70 q/ha from 3-4 cuts. The quality parameters include 9.0-10.0 % crude protein, 30.0 – 35.0% crude fibre and ash content of 3.9%. It remains green throughout the growing period, provides 3-4 cuttings Green herbage is available in lean period (Viz December - April) when Oat crop is only fodder for winter season. It is a cold tolerant grass resistant to rust and blight.



Figure 5.39. Rye grass variety “Makhan”



Figure 5.40. Rye grass variety PRG-1

Package of practices for Congosignal grass (*Brachiaria ruziziensis*) has been developed and recommended for Assam. It is a highly productive perennial grass suitable for growing in a g r o c l i m a t i c condition of Assam. It remains productive upto 6-7 years. Its tillering ability is very high (250-300 tillers / tussock). The only variety recommended for this grass is DRSB-7. The green forage yield of the variety ranges from 1150-1200 q/ha/year (3-4 cuts) and dry matter yield ranges from 260-270q/ha. The plant height ranges from 70-80cm and crude protein content varies from 10-12 %.



Figure 5.41. Congosigna Grass: DRSB-7

5.1.19 Lac Insect Genetic Resources

Eleven districts of Assam were surveyed during January to December, 2017 out of which, lac insect was recorded in four districts, viz., Kamrup, Dhemaji, Sonitpur and West Karbi Anglong. In the Lower Lumpi region of Kamrup district, naturally occurring lac was found in large quantities on peepal tree. In Sonitpur district also naturally occurring lac was found on Litchi Plant. Whereas, in Dhemaji district, lac was cultivated on Ber plant by some farmers under supervision of a local NGO.

Study on settlement behavior of lac insect, *Kerria lacca* crawlers was carried out in the Lac Park, AAU, Jorhat. The study revealed highest initial settlement density towards north direction and lower side of the branches.

Life cycle study of the Aghani (winter) crop of the race, AAUK-03 (Jhalda, Purulia, WB) recorded 192 days from emergence to adult stage, whereas, the Jethwi (summer) crop of the same race completed its life cycle within 170 days. The indigenous race of lac insect, AAUK-06 (Langerdang, W. Karbi Anglong, Assam) showed a different crop cycle. We collected the race AAU-06 on November 15th, 2016 and inoculated in our lac park on host *F. semialata* on 17th November, 2016 and it was harvested on 4th May, 2017. The race took 168 days under *in-situ* condition. When harvested broodlac was reinoculated on 5th, May,

2017, it was ready for harvest on 7th October, 2017 which took a shorter duration of life cycle *i.e.* 155 days.

- Productivity linkage study of AAUK-03 (Jhalda, WB) on *F. semialata*, *F. macrophylla*, *F. strobilifera*, *F. religiosa*, *C. cajan* and *Ziziphus* sp. revealed that *F. semialata* was superior to the other host plants in terms of brood lac production. AAUK-06 also revealed that *F. semialata* was much better host as compared to *F. macrophylla* in respect of brood lac, phunki lac and scrapped lac yield.
- One new ITK on medicinal use of lac insect was recorded during interaction with tribal people in the district of Karbi Anglong. They use the fresh lac encrustation as curative medicine against body pain. According to them, fresh lac encrustation is boiled in hot water till the colour of the water turn red. Then they allow it to cool and take one or two teaspoon during the time of body pain.
- Gene Bank Conservation of lac insect consisted of 3 races (AAUK-01 (Umkhirmi, West Karbi Anglong, Assam), AAUK-03 (Jhalda, Purulia, West Bengal) and AAUK-06 (Langardang, West Karbi Anglong).



Figure 5.42. Lac production and training on scientific lac cultivation in collaboration with NBSSLUP at Jorhat

5.1.20 Agrometeorology

- Trend analysis of rainfall was carried out for different districts of Assam for the period 1981-2015. There was found a significant decreasing trend of annual rainfall at different probability levels in Tinsukia, Golaghat and NC Hills. Analysis

of rainy-days over the period showed a significant decreasing trend in respect of Barpeta, Dhubri, Goalpara and Nalbari districts. However, a significantly increasing trend in annual rainfall associated with a decreasing trend in rainy-days was also observed for districts like Karimganj, Goalpara and Dhubri indicating occurrence of high intensity rainfall resulting in flash flood, erosion, etc. It is clearly an evidence of climate change scenario having some significant impact on agriculture in the region.

- Correlation between projected maximum and minimum temperatures and tuber yield in three different cultivars of potato, viz. Kufri Jyoti, Kufri Pukhraj and Kufri Himalini was studied considering planting and projection periods together. This was done in respect of emergence to tuber initiation and tuber initiation to maturity growth stages. Maximum temperature was found to exert higher negative influence on tuber yield than the minimum temperature irrespective of the growth phases. At RCP8.5, higher levels of minimum temperature did not exhibit any statistically significant influence on yield in any of the cultivars, and the probable reason may be that the cultivars attained highest levels of yield reduction due to temperature stress and showed some sort of genetic resistance to further reduction.

5.1.21 Agricultural Engineering

- A bamboo shoot grating machine was designed and fabricated. The developed machine runs on 0.25 hp motor. Capacity: one peeled shoot in 2-3 minutes. Cost of the prototype: Rs.25, 500.00. Issue of hygiene and drudgery well addressed.
- A bamboo stalk cooked rice (chunga chawal) making machine conceptualized, designed and fabricated. Capacity: 4 kg/batch of 8 bamboo stalks. Fuel (LPG) consumption: 0.5 kg/batch. Cost of prototype: Rs.24, 700.00. For same overall acceptability level traditional method needs 25 min whereas machine cooking needs 18 min. Texture of cooked rice was at par with traditionally done product. Issue of hygiene, drudgery, safety and environmental pollution well addressed. Waste heat utilization facility provided for water boiling.
- Designed and developed a storage structure for green gram and glutinous paddy for high moisture environment. Capacity: 15 kg. Cost of the

prototype: Rs. 1100.00. The designed storage structure showed less infestation (7.67%) of *Callosobruchus chinensis* over other storage devices in 12 months of study.

- Management of Coleopteran storage grain insect-pests by plant leaf extracts was carried out. Methanol extract of *Jatropha* leaf @ 2ml/kg of grain was found to be effective against *Sitophilus oryzae*. Hexane extract of Tulsi @ 2ml/kg of grain was found to be effective against *Tribolium castaneum* in the storage of wheat. Weight loss due to infestation by *Sitophilus oryzae* was found to be minimum in Methanol extract of *Jatropha*. Weight loss due to infestation by *Tribolium castaneum* was found to be minimum in Hexane extract of Tulsi.
- Testing the technology for value addition to jaggery with aonla (Indian gooseberry) blending was carried out. Aonla jaggery prepared by mixing of aonla grates with concentrated cane juice during jaggery making. Vitamin C content of aonla jaggery was higher (63.495 mg/100g) as compared to common jaggery (6.57 mg/100 g). Product characteristics: Sucrose=71.50%; Glucose=10.25%; Aonla flavored. Thus product is of improved food value while being a sweetener.
- Increased height of cut by 6 cm for the Self propelled Vertical Conveyer Reaper is gaining popularity for harvesting of paddy (Previously due to long size of the cut straw it was difficult to be carried manually in shoulders). The average value of field capacity was 0.21 ha/h thereby requiring around 4.76 hour to harvest 1 hectare of crop. . There is a 68% man-hour saving while using the VCR compared to traditional practice of manual harvesting.

5.1.22 Miscellaneous

- Groundwater prospect mapping using Remote sensing and Geographic Information System (GIS) as tool for demarcating the potential ground water resource during pre-monsoon season for the entire Jorhat district covering 2852 sq.km was completed highlighting with area-wise groundwater potential information in the form of map. Maximum area (739.50 sq. km) was observed in groundwater table depth of 6.16 – 6.82 m bgl and minimum (78.34 sq. km) in groundwater table depth of 4.20-4.95 m bgl. Based on the depth of groundwater resource,

selection of pump suitable for lifting water and possibility of using such pump to irrigate unit area were prepared in the form of map. Out of the total geographic area of Jorhat district, 510.23 sq.m was demarcated with groundwater table within 5.0 m depth while the rest showed a depth of more than 5.0 m and hence helps in selecting suitable pump-sets accordingly. Regarding groundwater table depth during post monsoon season, highest area of 1156.32 sq. km was observed in 3.44 – 4.11 m bgl category, while minimum area of 198.78 sq. km was noticed in the category of 4.11 – 8.78 m bgl. It is estimated that if 50 per cent of water resource available from the difference of ground water table depths recorded in pre and post monsoonal period is utilized, the potential water resource available for instant water use for different purposes across the entire district would be around 9219.26 cubic metres.

- GIS-aided mapping with non-spatial data generated through laboratory analysis of certain groundwater quality parameters (pH, As & F) provided a useful format in visualizing these information in comprehensive and presentable form for need based site-specific decision making process. The groundwater vulnerability for contamination of arsenic was medium to high in the whole study area of Nagaon district giving an indication of a good warning for the wise use of the groundwater resource especially for this parameter. An *in-situ* low cost technology using biochars as strong adsorbent was developed from locally available bio-wastes from rice straw and toria stover with the aim to reduce arsenic entry in irrigated summer rice. A low cost farmers' friendly easy to use kiln has been fabricated with success in field situation. Application of biochars at 1 to 2 percent levels, irrespective of sources, reduced the root, straw and grain arsenic content and thus the technology would be helpful in reducing arsenic entry into food chain through rice.
- Cultivation of *Azolla* by providing net protection with bamboo frame structure and providing shade by growing pigeon pea along the two sides of the tank can reduce the doubling time (DT) and improve relative growth rate (RGR) of *Azolla pinnata* and *Azolla caroliniana* by reducing insect-pests and providing sufficient shade to the crop.

- On standardization of agronomic practices of broom grass in terms of fertilizer dose and spacing, fertilizer dose @ 60-45-30 : N-P₂O₅-K₂O kg/ha with spacing : 1.5 m x 1.5 m was found optimum in terms of yield and economic return.



Figure 5.43. Azolla cultivation

- A fertilizer dose - Urea 150 g, SSP 200 g and MOP 60 g / Tussock with a spacing of 2 m x 2 m was optimum for better performance of broom grass under hill condition of Assam.



Figure 5.43. Standardization of agronomic practices of broom grass

5.2 Community Science Research

5.2.1 Human Development and Family Studies

- A study on the area of parent adolescence attachment and peer pressure on adolescents' mental health revealed that possible cases of mental health disorder is prevalent among adolescents and boys are more prone to mental disorders than girls. Adolescents are more attached to their mothers than fathers and girls are more securely attached to their parents than boys. Parent adolescent attachment has significant impact on mental health status of adolescents. Peer pressure during adolescence showed significant impact on mental health status.
- A research conducted on family dynamic and personality traits of only child revealed that cohesive family environment has positive significant correlation with personality trait of extraversion in only child. Similarly "organization" component of family dynamic shows significant positive correlation with personality trait of 'openness' in only child.

- In assessing the maternal and child health it was found that majority (83.69%) of respondents has good knowledge regarding maternal health but still they lack in practicing their knowledge in certain aspects. A large number of respondents 33.23 percent of respondents still believe that a child who suffers from diarrhoea should not be given good amount of liquid. 45.85 percent of respondents still believe that a child should not be breastfed during his or her illness. Only 64 percent of respondents believe that a child should be given variety of foods to supplement the balance diet.

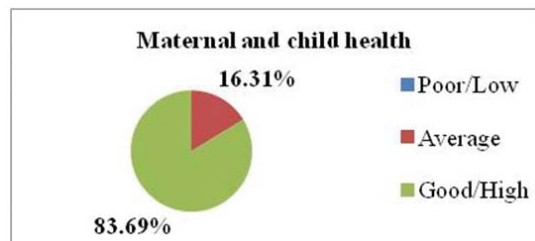


Figure 5.45. The maternal and child health knowledge

- A study on gut feeling in business decision revealed that 68.33 per cent of respondents principally used their gut feeling while making business decision. Experience is the first and foremost influencing factor for making business decision based on gut feeling and knowledge is the second influencing factor which help in making gut decision in business. Experience and knowledge had positive correlation with gut feeling.
- While assessing the reproductive health, the data revealed that majority (76.92%) of the respondents had good knowledge on reproductive health. All the respondents (100%) had knowledge on minimum legal age of marriage for girls. Only 45.54 per cent of respondents had knowledge about reproductive organs. It is also noteworthy that a large number of respondents (38.46%) are still unaware of the fact are still unaware of the facts which increases the risk for STD or HIV or Hepatitis B.
- Respondents were assessed on their psychological wellbeing, in five different areas namely, Physical Health, Social Health, Emotional Health, Spiritual Health and Intellectual Health. With regards to social health and spiritual health a large portion of respondents, i.e., 48 percent and 43.69 percent respectively fall in the very good category.

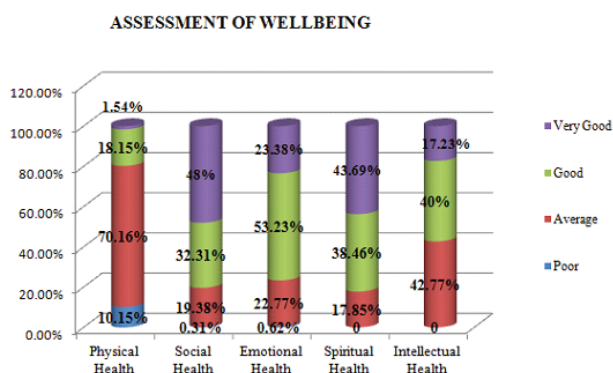


Figure 5.46. Assessment of psychological wellbeing

5.2.2 Family Resource Management

- Technology intervention for reducing drudgery in uprooting of seedlings showed that cent percent of the farm women experienced reduction of drudgery in all the parameters in mat nursery over conventional method of uprooting of seedlings. Ten numbers of households of different operational villages adopted mat nursery (modified at AAU, Jorhat) for reduction of drudgery during uprooting of seedlings.
- Ergonomic evaluation was carried out for ring cutter and the results showed that the output of using improved technology was more (3 kg/min) than the conventional method (2.5kg/min) of vegetable harvesting and also recorded a reduced heart rate while operating with the ring cutter.
- Sapling transplanter is a tool used for transplanting saplings in vegetable and tuber crops. Performance evaluation of sapling transplanter with seedling basket, a significant difference in Physiological work load among different Heart Rate parameters was observed between sapling transplanter methods over conventional method.
- The assessment of thermal efficiency of briquettes made from a few green waste available in Assam such as saw dust, areca palm sheath waste, rice husk, was conducted in the laboratory of CSIR, North Eastern Institute of Science and Technology (NEIST), Jorhat. The gross calorific value (kcal/kg) of briquettes made from areca nut sheath was highest and was found to be 4115 kcal/kg followed by rice husk briquettes 4080 kcal/kg. Among the three samples briquettes made from sawdust showed comparatively lesser calorific value which was 3965 kcal/kg. Thus it can be said that the briquettes produced from these green waste

materials can be very efficient fuel and can be utilised as alternative fuel which is environment friendly and that there is high viability of commercial production of briquettes from some of the green waste in Assam.

- Areca palm leaf based disposable plates and bowls were being prepared by collecting the raw materials from nearby villages and products were being liked by the people and opined that there is high commercial value of the products.



Figure 5.47. Briquettes from green waste



Figure 5.48. Disposable Plate/bowl from palm leaf sheath

- For workers engaged in tea garden exposed to static and dynamic loads on different parts of the body a worker friendly basket was designed which is like a back-pack. This is light in weight and very comfortable to carry than the existing one which they use to hang from their head that cause more stress on their body. The capacity of improved basket is more i.e. 7kg whereas the capacity of existing basket is 3.5 kg only.
- A protective dress was also designed because they often work under extreme weather conditions; one is for summer season and another one is for winter season. This dress is designed with waterproof material and cotton fabric. The dress is well appreciated by the workers.

5.2.3 Extension Communication and Management

- In promoting farm women knowledge groups (FWKGs) for enhanced use of ICT in agriculture and allied sectors it was revealed that 65% of the respondents had ownership of mobile phones while 72% of the respondents could use them even though some of the respondents did not own a mobile phone. The major problem, associated with the use of ICTs is that unaffordable ICT services followed by poor network connectivity (82 percent). More than half of the respondents (60 Percent) had the favourable attitude towards use of ICT.

- While a very high percentage (93 percent) perceived that ICTs were helpful in enhance timely feedback followed by helpful in time saving (81 percent) as well as increase the information flow (80 Percent).

5.2.4 Textile and Apparel Designing

- Six locally available plants for extraction of underutilized fibres were identified namely, Cotton rose (*Hibiscus mutabilis*), Cotton plant (*Gossypium herbaceum*), Marolia (*Mallotue barbatus*), Sualoo (*Listea monopetala*) and Pumpkin (*Cucurbita pepo*) for fibre extraction. Based on pre- testing, yield of fibre and quality of fibre cotton rose was selected for fibre extraction and fibre extraction was carried out by water retting which was optimized. Different physico-chemical properties of extracted fibre were evaluated for further processing.
- In developing functional finishes 5 different plants were selected namely Tulsi (*Ocimum basilicum*), Neem (*Azadirachta indica*), Dhatura (*Datura fastuosa*), Kharpat (*Cassia alata*) and Guphool (*Lantana camera*) based on their various properties like anti-microbial, anti-itching, anti-allergic, anti-septic UV protection, mosquito repellency etc. On analyzing the green extract from the selected plants it was found that kharpat showed maximum phenolic content in both ethanol (51.98) and distilled water (50.97) followed by neem, guphool, dhatura and tulsi.
- A survey was conducted to collect the information regarding the various traditional handicrafts and folk design of Assam. The collected traditional motifs were documented. By combining different tribal woven art forms with non tribal forms, a total of 24 new designs were developed and the designs were prepared through hand weaving craft with extra weft and dobby attachment. The final woven designs were evaluated by 30 respondents for assessing the acceptability of the developed designs for different diversified woven products.

5.2.5 Food Science and Nutrition

- A total of 48 food items from different food groups having low Glycemic Index (GI) or hypoglycemic properties were documented and the database will provide data on the nutritional composition and

glycemic index of some commonly available foods of the region. The modification of traditional recipes with low glycemic index foods will serve the diabetic and pre-diabetic population in controlling the blood glucose level.

- A high fibre multigrain Ready To Use (RTU) mix and one energy dense multigrain RTU mix were developed for the management of over nutrition (mix 1) and under nutrition (mix 2), respectively.
- Among the three widely grown indigenous jackfruit genotypes of Assam i.e. Dhol kothal, Pat kothal and Mridongia Kothal were analyzed for their quality characteristics and Dhol Kothal was found to be superior among all the three varieties.
- Total of four products were developed from jackfruit (Dhol kothal variety) at various stages namely dehydrated tender jackfruit - ready to cook, jackfruit chips (mature, unripe) jackfruit leather (mature, ripe) and osmotically dehydrated jackfruit bulb (mature, ripe). Nutrient analysis of the developed product revealed that products were rich source of macro nutrients. Developed products were irradiated using different radiation doses i.e. 1, 2 and 5 KGy at Bhabha Atomic Research Centre (BARC), Trombay, Mumbai, and Maharashtra to increase the shelf-life of the products. The irradiated products stored in high density polyethylene (HDPE) pouch were found to be safe for consumption.

5.3 Veterinary Science

5.3.1 Breed Registration

Lakhimi Cattle

Indigenous cattle of Assam have been registered as a breed. They are named as **Lakhimi cattle** and **the accession number** is: INDIA_CATTLE_0200_LAKHIMI_03041. The certificate for registration was awarded by the Hon'ble Minister for Agriculture Sri Radha Mohan Singh at a function held at ICAR New Delhi on 10th January, 2018. The team of scientists who worked on this project are Dr G. C. Das, Dr. G. Zaman and Dr. M.S. Tantia.

Pati duck

Local duck of Assam have been registered as a new breed of duck by the ICAR National Bureau of Animal



Figure 5.49. Lakhimi Female and Male cattle and the Technology transfer

Genetics Resource, Karnal, Haryana. They are named as **Pati duck and the Accession number is: INDIA_DUCK_0200_PATI_11001. This is the only registered duck breed in the entire India.** The certificate for registration was awarded by the Hon'ble Minister for Agriculture Sri Radha Mohan Singh at a function held at ICAR New Delhi on 10th January, 2018. The team of scientists who worked on this project are Dr N. Nahardeka, Dr J.D. Mahanta and Dr M.S.Tantia.



Figure 5.50. Pati duck and the technology transfer

Some significant achievements of ongoing projects are furnished below

5.3.2 Pig

- Under AICRP on Pig the herd strength at the beginning of the year and at the end of the year under report was 90 and 336 HD- K75 (75% H) genetic group.
- 476 piglets were obtained from the two Crops during 2017- 18. The average litter size at birth, litter weight at birth, litter size at weaning and litter weight at weaning of 1st crop were found to be 6.42 ± 0.21 , 6.51 ± 0.22 kg, 5.87 ± 0.23 and 61.06 ± 1.53 kg respectively. The average body weight at birth, at 6th week and at 7 month of age were found to be 1.01 ± 0.71 kg , 9.90 ± 3.10 kg and 61.95 ± 0.94 kg respectively.
- 189 (22+167) piglets of different categories were sold to the farmers during the year under report. 195 farmers were benefited from the piglets and consultancy service of ICAR-AICRP and ICAR-MSP on Pig respectively.
- The department of Animal Husbandry & Veterinary, Govt. of Assam and Sikkim purchased of HD-K75 piglets for breeding stocks.
- The Artificial insemination programme in Pig was practiced in collaboration with the Department of ARGO, C.V.Sc.,AAU, Khanapara.. 13 Sows are inseminated at the farmer's houses of Sonapur, Kamalpur and Rangia.
- Several extension training program, visit by farmers etc were also conducted during the period.



Figure 5.51. Sow with piglets of HD- K75



Figure 5.52. 50% H.50% I, under MSP on ICAR-AICRP on Pig, AAU. Khanapara

Mega Seed Production (MSP)

- The herd strength under ICAR- Mega Seed Project on Pig was 584 and 490 at the beginning and at the end of the year respectively, irrespective of age and sex
- A total of **1321** piglets were obtained from **166** farrowing against production target of 1500 piglets

.The average litter size at birth and litter size at weaning were found as 7.96 ± 0.11 and 6.66 ± 0.13 respectively.

• A total of **1256** weaned piglets were sold to the farmers, ICAR-NRC on Pig and KVKs of the University. This generated an income of **Rs.42,03,200**

NEC funded PPP project “Pig Farming through promotion of Farmer Producer Organisation”, under Tamulpur Sub-Divisional area, District Baksa,(B.T.A.D), Assam

Project Executed by: Mothonga Agro Producer Company Ltd., Khandikar, Baksa.

Pig Breeding Unit

- i. **Pig Sty:** Construction of 13 units (One unit contains 10 chambers) of pig sty completed and for seven remaining units construction is going on.
 - ii. **Piglet:** 129 nos of piglets of various breeds like Hampshire, Hampshire Cross and Ghungru are being reared at breeding unit at Khandikar, Baksa which are procured from AAU, Khanapara and Hekra.
1. **Feed Mill:**Construction of feed mill is already completed. Plant and machinery installed on the month of Feb, 2018. . Transformers of 33 kw was installed on the month of March, 2018. The processed feed for the piglets and pigs are given from its own feed production unit
 2. **Office Building:** Construction of office building is completed.
 3. **Pig Rearing Units:**Out of 200 units of pig rearing units, construction of 190 units are already completed. The remaining 10 units’ construction is going on and it will be completed within a short period of time.
 - i. Piglet: Total 450 piglets have been distributed to the farmers.
 - ii. Feed: Total 750kgs feed has been distributed to the farmers.
 - iii. Vaccine, medication and Insurance are provided to all beneficiaries.
 - iv. Training: Hands on Master training have been imparted to 11 nos of farmer and another 50 farmers were trained on “scientific management of pig”.



Figure 5.53. Pig Sty



Figure 5.54. Piglet distribution ceremony

DBT project: “Capacity building and awareness generation for enhanced productivity of pig through assisted reproductive biotechnology in North Eastern Region through community participation”

- Semen collection facilities were created at Pig breeding farm in Karbi Anglong.
- Semen processing and preservation facilities have been created in the department of ARGO.
- Awareness cum training programs were conducted in various places of Assam.
- A portable dummy made up of iron and wood was developed to collect semen from boar at boar pen as an alternative to fixed dummy. This movable dummy is very useful, less laborious and effective to collect semen from boar and can be moved from one boar pan to another.
- Semen samples were successfully collected, evaluated and preserved in Modena and TRIXcell+ extenders in BOD incubator at 15°C.
- AI doses of semen samples were made in plastic sachets procured from IMV.
- Semen samples up to 96 hours of preservation showed more than 50 per cent sperm motility and live sperm.
- The semen doses were transported to different farms located in different districts of Assam and artificial insemination was done at farmer’s doorstep.

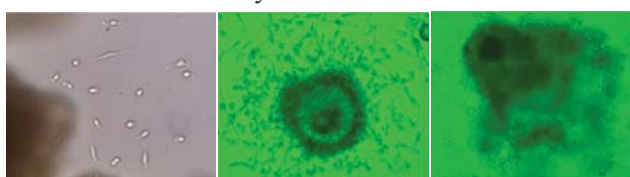


Figure 5.55. A.I. at Farmer’s piggery

- A total of 812 pigs were inseminated with semen preserved for different hours. A total of 539 pigs furrowed with the highest litter size of 16.
- Upgraded piglets with improved average litter size of 9.42 (range 5 to 16) were obtained by inseminating with preserved semen.

DBT twining project: Conservation of Indigenous Pig of Assam through Handmade Cloning Technique

- Initial standardization of collection of slaughterhouse sample- ovary, gravid uterus, tissue samples are undertaken.
- Aspiration of oocyte and collection of follicular fluid from slaughter house ovaries are standardized.
- Standardization for establishment of fibroblast from adult/fetus and cumulus cells is carried out.
- Characterization and quality assessment have been initiated and in progress.
- Standardization of different techniques of cloning like IVM, denudation, enucleation, oocyte-somatic cell fusion followed by incubation to produce reconstructed oocytes etc. are initiated.



Adult Fibroblast- Tissue Explant (10X10) Cumulus Cell Culture- Primary (10X10) Cumulus Cell Culture- Primary (10X10)

Figure 5.56. Development of pig foetal fibroblast cells

DBT Twining Project: Enhancing pig productivity by optimizing bio-molecular expression through nutritional intervention in the existing system of pig farming” Location: LCVsc, AAU, Joyhing, North Lakhimpur

- Procurements of equipment viz Thermal Cycler, Gel electrophoresis apparatus, Gel documentation System, ELISA reader, Deep freeze -20 °C completed.
- Temperature humidity index (THI) of Lakhimpur and Dhemaji district is determined
- Feed samples from areas of study were collected and analyzed for proximate principles.
- Collections of records on productive and reproductive performances are continuing by personal interaction with the pig farmers using questionnaires.

- Collection of blood and serum samples (Figure C) to study the different bio-molecules is continuing and analysis of samples are going on.
- The extraction of RNA from whole blood and cDNA preservation is continuing for gene expression study. The prepared cDNA and already collected serum samples were stored for further analysis of rest of parameters.
- Experimental pigs were selected by an exclusive survey to conduct the study in the farmer’s field.

5.3.3 Goat

- Under AICRP on Goat Improvement five field units, viz., (a) Batabari, District Darrang, (b) Tetelia Gandhinagar, District Kamrup (Metro), (c) Nahira, District Kamrup (Rural) (d) Tepesia, District Kamrup (Metro) and (e) Digholbori, District Morigaon has been established. Digholbori, under Morigaon district was adopted in the reported period.
- The opening and closing balance of goats were 2321 and 2785 animals, respectively for the year 2017-18
- Population growth was 97.47% in the adopted field units where 524 adult does have given birth to 829 kids. The initial growth rate at the time of implementation of the project in the year 2009-10 was 14.22%.
- A total of 578 healthy animals and 101 culled animals were sold by the registered farmers with a total income of Rs.11, 93,408.00 indicating an annual income of Rs. 3,938.00 per house hold.



Figure 5.57. Goat with their young ones

5.3.4 Poultry

- The new variety of dual purpose chicken “KAMRUPA” developed in AICRP on Poultry Breeding which was released on February 11, 2015 is performing well both in farm and field condition.
- 1320 numbers of hatching eggs and 26737 nos. of day old chicks of Kamrupa have been supplied to the rural farmers of Assam and NE region.

- The indigenous flock had been regenerated and replacement stock for all the flock had been procured in desired population strength and their performance had been studied
- A brooder house is constructed and procured different equipments under infrastructure development is in progress.



Figure 5.58. Kamrupa chicken

ICAR National Agricultural Research Funded project: A flaoxin-Tolerant Duck Production through Genetic and Epigenetic Approaches

- Construction of Duck Shed: Completed
- Procurement of the instruments and appliances: Completed
- Blood collection for normal haematological examination like Hb, PCV, DLC etc.: Completed
- Morphometric study of several vital organs like liver, spleen, pancreas and intestines are carried out and histological study is going on.

5.3.5 Animal diseases and management

ICAR-AICRP on FMD “Epidemiological Studies on Foot and Mouth Disease”

The objective of the project is to provide base line epidemiological data of Foot and Mouth Disease for planning the strategy of disease control programme.

1. During the year under report, a total of 12 outbreaks of FMD were confirmed in Assam. All the outbreaks were due to FMD virus serotype ‘O’. A total of 111 clinical samples were collected and subjected to sandwich ELISA and mRT-PCR for typing of the virus at the Regional Research Centre, CVSc, AAU, Khanapara. From 101 (90.99 %) clinical samples FMD virus serotype ‘O’ was recovered. None of the samples was positive for FMD virus serotype ‘A’, ‘Asia-1’ or ‘C’. Thirty four isolates of FMD virus serotype ‘O’ could be

isolated in BHK-21 cell line and each sample was passaged for at least 3 passages.

2. The direct economic loss in the confirmed FMD outbreaks were calculated taking into account of milk loss, mortality, and cost of treatment. The total direct economic loss due to investigated FMD outbreaks was estimated as Rs. 72,72,800.00.

AICRP on Disease Monitoring and Surveillance (PD-ADMAS)

- There was a decreased tendency of infectious disease outbreaks in the state of Assam which may be due to increased vaccination coverage or poor disease reporting.
- Among the bacterial diseases of ruminants BQ, HS and a single outbreak of Anthrax and Leptospirosis were recorded. In case of small ruminants disease like enterotoxaemia and Listeriosis have been encountered.
- Spatial distribution of bacterial diseases of ruminants reveals that the major killer disease has been recorded in 5 different districts of Assam viz. Kamrup, Dhemaji, Lakhimpur, Dibrugarh and Baksa. Similarly, outbreak of HS was recorded in 3 districts only viz. Karbi Anglong, Dhemaji and Kamrup.
- A single outbreak of Anthrax has been reported from Lakhimpur district attacking 13 animals out of which 10 died.
- In case of small ruminants, the major killer bacterial disease was found to be Enterotoxaemia which was recorded in 10 districts of Assam viz. Nalbari, Goalpara, Sonitpur, Darrang, Golaghat, Morigaon, Dhemaji, Sivasagar, Kamrup and Karbi Anglong.
- Among the viral diseases of ruminants only two outbreaks of Rabies were recorded. PPR and Goatpox were recorded in small ruminants. Goatpox continued to be a major killer disease of small ruminants in 4 districts (Sonitpur, Nalbari, Kamrup and Lakhimpur). PPR was recorded in two districts only viz. Morigaon and Sivasagar. A single outbreak of Orf was also reported from Karbi Anglong district, affecting 25 animals out of which 12 animals died.
- Newcastle Disease (Ranikhet) and Duck Plague continues to be the major killer disease of poultry and ducks. Outbreak of Ranikhet was recorded in 3 districts of Assam, although unofficial

information reveals that the number of districts will be much more. Duck plague was recorded from 5 districts of Assam (Karimganj, Nalbari, Sivasagar, Bongaigaon and Golaghat).

DBT-NER Centre for Advanced Animal Disease Diagnosis and Management Consortium (ADMaC)

- Infrastructure and diagnostic facilities at Core Lab I and Core Lab III is complete. Peripheral labs at Assam, Meghalaya, Mizoram, Tripura, and Manipur were renovated and all approved instruments were procured. In other three states (Arunachal Pradesh, Sikkim, Nagaland), process is continuing. Consumables and other diagnostic facilities are created in all field labs.
- Laboratory technicians, Veterinary officers associated with disease diagnosis works were trained in core labs as well as in their respective laboratories. Common disease investigation formats, diagnostic protocols were provided to each lab. Routine diagnosis of field outbreaks is done with kits provided by 3 core Labs and national labs. Feed back on test performance was satisfactory. All formats and SDPs are also uploaded in the ADMaC website (www.neradslab.res.in).
- NER core labs are well equipped to handle various endemic as well as emerging infectious diseases. Various indigenous molecular and proteomic based diagnostic reagents are optimized. Batteries of diagnostics (CSFV, JE, PPR, DPV, NDV, Mastitis, Haemoprotezoa, endoparasites) are developed and distributed to all peripheral labs for their use. User-friendly kits are being developed by national labs (PCR array for swine diseases, multiplex RT-PCR for AI, RT-LAMP PCR, LFT-Brucella) and the process of validation is continuing.
- Five monoclonal antibodies against Brucella abortus S99 were produced by ICAR-NIVEDI and characterized. One Brucella specific monoclonal antibody 1E3 was selected for diagnostic development.
- OIE recommended test for the diagnosis of Brucellosis- Fluorescence polarization Assay was standardized and validated.
- Multiplex diagnostic PCR array with uniform reaction conditions capable of screening samples for 12 swine pathogens simultaneously has been successfully developed and validated with available

reference samples/materials by ICAR-NIHSAD. The targets include African Swine Fever (ASF), Aujeszky's disease, Classical Swine Fever (CSF), Ebola (Reston) virus, Japanese Encephalitis (JE), Nipah Virus Encephalitis (NVE), Porcine Circovirus 2 (PCV 2), Porcine Reproductive and Respiratory Syndrome (PRRS), Swine Influenza, Swine Vesicular Disease (SVD), Transmissible Gastroenteritis (TGE) and Vesicular Stomatitis (VS). The primers and positive controls coated PCR plates/strips are compatible for transport and storage at room temperature.

- Quantitative multiplex real-time RT-qPCR has been optimized for the simultaneous typing and subtyping of Influenza H5N1 viruses.
- A LAMP assay for rapid detection of Porcine Reproductive and Respiratory Syndrome Virus infection in pigs is developed by ICAR-NIHSAD.
- A molecular epidemiological picture on MRSA, MR- CoNS, ESBL, and Carbapenemase producing bacteria in farm animals and the animal handlers in North East Region in India is created with the help of ICAR-NIVEDI, Core Lab-II, III). Important pathogenic resistant bacteria and antibiotics are identified.
- Under this project two important cell culture adapted vaccines (CSFV & DPV) are developed by Core Lab I and are in field use. Vaccination with cell culture adapted vaccines protects DPV and CSFV infected hosts in the phase of outbreaks. Besides, Goat pox, ORF vaccines and RK-13 adapted CSFV vaccines are in pipeline.
- Detection of CSFV in bovine serum of Meghalaya and BVDV in pig sera is first report from NER.
- Confirmed the greasy pig disease in pig population in Mizoram, Assam, Meghalaya.
- In wild animals, Elephant Endotheliotropic Herpes Virus (EEHV) is first time confirmed in this lab. The disease has emerged as new threat for wild and domestic elephants in this part of India. Besides wild goats are suffering from pox.

Veterinary Type Culture

- A total of 206 number of bacterial isolates were made
- Out of the isolates the cultures of *Pasteurella multocida*, *Salmonella*, *Klebsiella pneumoniae*, *E. coli*, and *Staphylococcus aureus*, *Brucella abortus*,

Staphylococcus and *Streptococcus* and two isolates Swine Pox virus was sent to the Central Repository, NCVTCC, Hissar.

Development of physical facilities

- A diagnostic laboratory has been converted into a “Veterinary Type Culture”. Laboratory with a Biosafety cabinet, refrigerator, gas burner, incubator and other facilities for bacterial and fungal culture.
- Facilities have been created for detection of virulence genes of *E. coli*, *Pasteurella multocida*, *Lactobacillus* and *Clostridium perfringens* by molecular methods (PCR).

DBT Network Project on Brucellosis: Brucellosis-epidemiology

- A total of **1826** serum samples were collected from cattle (1459), goat (262) and pig (105) from different districts of Assam. The samples were tested for Brucella antibody by Rose Bengal Plate Test (RBPT) and IELISA.
- Seroprevalence of brucellosis in cattle was 8.43% and 2.86% in pig. None of the samples from goat was found positive for Brucella antibody.
- District wise, highest prevalence of brucellosis in cattle was recorded in Kamrup-M (14.77%) followed by Morigaon (14.22%) district.
- The prevalence was more in cows from 4.1-6 years (11.04%) followed by 2.1- 4 years (9.22%) and animals with problem of ROP (45.74%) and history of abortion (40.51%).

DBT Twinning Programme For The NE “Sero-surveillance, isolation and molecular characterization of blue tongue virus in sheep and goats of Tripura and Assam states”

A total of 581 serum samples, 505 blood samples and 44 tissue samples were collected from different districts of Assam. Out of 580 serum samples 256 (44.06%) was found to be positive for BTV antibody.

DBT Twinning: Development and Evaluation of DIVA-based Vaccine Utilizing an Indian Isolate of Classical Swine Fever Virus

- The PK-15 cell line obtained from ATCC (# Cat. No.: CCT- 33, USA) is at 37 passage level. The 24 hr grown PK-15 cells showing uniform morphology

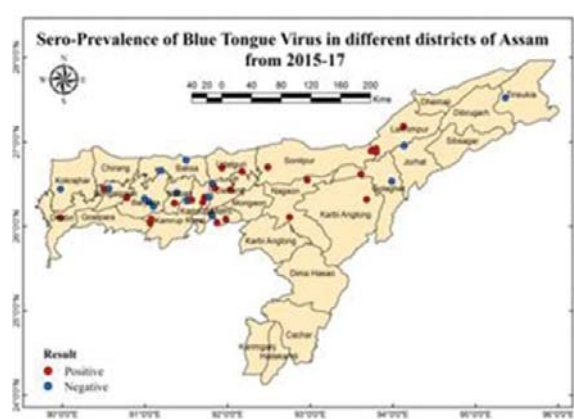


Figure 5.59. Map showing seroprevalence of blue tongue across different districts of Assam for the period from 2015 to 2017

and retained healthy configuration at subsequent passages. Preservation of cells in LN₂ conserves viability and cellular integrity after reviving. Screening of cells, FBS at different passage levels showed free from Pestivirus, Circovirus and Mycoplasma. No BVDV antibody could be demonstrated in FBS.

- Determination of TCID₅₀ of isolated CSF viruses.

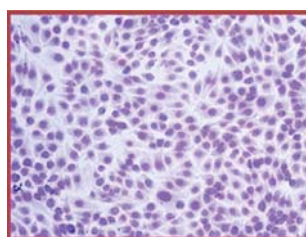


Figure 5.60. Confluent monolayer of PK-15 cell after 24 hours of sub culture, May-grunwald & Giemsa stain, X400

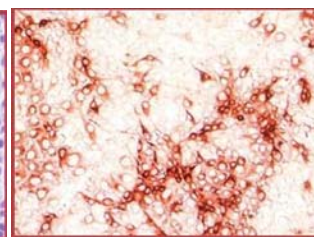


Figure 5.61. CSFV propagated PK-15 cells showing brown stained cytoplasm in IPT after 72 hrs of infection. x400

- A total of 25 isolates along with the vaccine virus were grown in PK-15 cells and 8 isolates were subjected for TCID₅₀ using immuno peroxidase technique (IPT). Indirect immunoperoxidase linked assay (IPA) was employed to detect cell culture propagated CSF virus. Uninfected cell monolayer exhibited no colour (Fig 1). CSF virus infected cells allowed to react with polyclonal serum specific to CSFV and showed various degree of reddish brown stain in cytoplasm of the infected cells (Fig.2).
- The test was performed as per the recommendation of European Union Diagnostic manual (2007) and TCID₅₀ calculation was done following the method

of Karber (1931). Virus Infectivity titres were expressed as log value of tissue culture infectious dose (logTCID₅₀) per volume (0.1ml) of virus suspension. Infectivity titre at 5th passage level varied in the range of 4.25 to 5.23 among the field isolates. Highest logTCID₅₀ was recorded in AADSMC/AS/WH/0025. The dilution factors for representative isolates were determined to make the final concentration of 100 TCID₅₀ per 50µl volume required for neutralization test.

Phylogenetic analysis of E2 gene

It was observed that the E2 gene of the CSFV field strains viz. PH-AS-2016, WH-AS-2013, DP-AS-2017, DP-Mg-2012, DP-TR-2017 were phylogenetically closely related to the CSFV sequences as reported from China and India at nucleotide level. Field isolates from domestic pig of Tripura and Meghalaya remained in same cluster, belong to Genotype 2.2. Samples from domestic pig of Assam were under 1.2 genogroup. Similarly, samples from Wild hog and pygmy hog of Assam belonged to 1.1 genogroup.

Cloning of CSFV E2 and E^{rns} Gene for Expression of Heterologous Protein

Primer was designed for E2 and E^{rns} cloning in pET 302 NT-His vector as described in methodology. cDNA was synthesized and gradient PCR was performed to optimize the annealing temperature. The optimum annealing temperature was found to be 47°C. (FIG: 10) and using the annealing temperature PCR to obtain the gene was done (FIG:11). Further work of ligating the PCR product into the Vector is going on and all the following steps for cloning is pending.

DBT Twinning project: Epidemiological studies on emerging infectious diseases of elephants (*Elephas maximus*) with special reference to tuberculosis (TB) and elephant endotheliotropic herpes virus (EEHV)

- Elephant Endotheliotropic herpes virus (EEHV) has been detected in two wild Asian elephant calves (rescued) in Centre for wildlife Rehabilitation and conservation, Kaziranga National Park.
- The two elephant calves affected with EEHV were successfully treated. This is the first success case of treatment in EEHV affected calves in the NE region of India. The follow up of the recovered

calves has been made and it is confirmed that the recovered calves do not remain as carrier.

DBT Twinning Project: Sero-surveillance of Leptospira infections in animals of Northeastern region of India

- The present project has been undertaken with broad objectives to make an active Sero surveillance of *Leptospira* infections in animals of North eastern region of India.
- For this, the serum samples were collected through an active surveillance covering entire states of NER India from different animals including cattle, goat/sheep and pigs in the field and were transferred to the laboratory and were further processed for detection of *Leptospira*.
- A total of 1200 samples were collected from animals from various States of NER (Assam, Meghalaya, Mizoram). Out of these 670 samples were collected from Cattle, 330 from goat and from 200 pigs.
- A total 554 serum samples were sent to collaborating centre Bharatidasan University Tiruchirapali Tamil Nadu. The samples were screened for *Leptospira* infection by performing microscopic agglutination test (MAT) for sero prevalence study.

ICAR project : Outreach Project on Zoonotic Diseases

(Targeted disease: Tuberculosis, Cysticercosis and Trichinellosis)

Tuberculosis

- A total of 2153 cattle and 624 buffalo carcass were examined in different unorganized slaughter houses of Assam and Meghalaya and out of 339 suspected carcasses only 177 carcasses was found ZN stain positive.
- Suspected 329 tissue samples with visible lesions were collected from 339 suspected carcasses and ZN microscopy confirmed only 85.71%. Highest positive preculture ZN stain recorded in lymph nodes (45.39%) followed by lungs (37.94%) and liver (10.99%).

Cysticercosis

- Based on carcass examination overall prevalence of porcine Cysticercosis in Six (6) states of NE

India (Assam, Arunachal Pradesh, Meghalaya, Tripura, Mizoram and Sikkim) was recorded 0.84%.

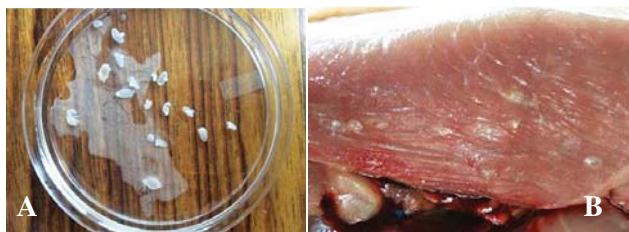


Figure 5.62. A) Immature and B) Cyst in skeletal muscle

Trichinellosis

- Till now a total of 856 pigs and 98 rats samples (tongue and diaphragm) were inspected for Trichinellosis, but no larva were detected by acid-pepsin digestion.
- A total of 1613 pig serum samples were analysed by ELISA for Trichinella. Overall seroprevalence was 0.25% (Meghalaya: 0.41 %, Assam: 0.27 % and found negative for other four states).
- Human blood samples (37 nos) were collected from Assam and Meghalaya with consent. Seven (7) samples were found positive for Trichinellosis by ELISA which were again revalidated in Mumbai Veterinary College.



Figure 5.63. Rat and pork sold in Kumarikata weekly market, Baksa Distric (Largest pig market in Lower Assam), which is the main source of transmission of Trichinella in Human

ICAR funded AINP on “Gastrointestinal Parasitism”

- As part of the epidemiological study of gastrointestinal parasitism, a total of 193 faecal samples were collected from small ruminants (goat and sheep) for 3 months (January to March, 2018).
- Several species of gastrointestinal parasites were recorded on microscopic examination of faecal samples and culture viz. nematodes *Haemonchus contortus*, *Oesophagostomum sp.*, *Strongyloides*

papillosus, *Trichostrongylus sp.*, *Bunostomum sp.*, *Cooperia sp.*, *Trichuris sp.*, trematodes as Amphistomes, cestode as *Moniezia expansa* and protozoa as oocysts of coccidia. *Haemonchus contortus* was found to be the predominant nematode species.

5.3.6 Animal Nutrition

AICRP on Nutritional and Physiological Approaches for Enhancing Reproductive Performance in Animal

- Administration of 5 ml (20 µg) GnRH intravenously along with feeding of mineral mixture and bypass fat in delayed pubertal indigenous heifers resulted in higher rate of estrus induction and conception rate as compared to feeding the supplements alone.
- The mean periods required for uterine involution and exhibition of postpartum estrus were shorter after parturition in cows fed with supplements as compared to control cows.
- Ovsynch plus synchronization protocol was efficacious in setting up fertile estrus in postpartum anoestrous cows.
- In developing egg yolk-free extender for freezing of goat semen, 1.5% soy-lecithin in Tris had post thaw sperm motility comparable with that in 20 % egg yolk in Tris.

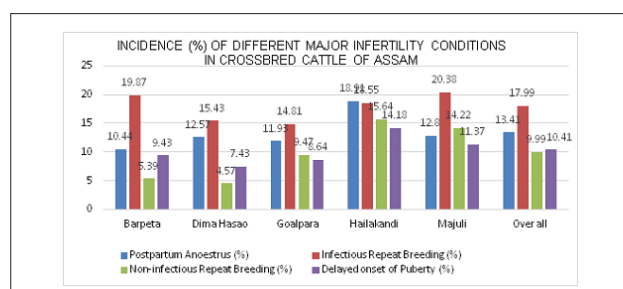


Figure 5.64. Infertility in crossbred cattle

DBT twinning project: Exploring Selected Natural Plant Sources Of North-East Parts Of India As Potential Therapeutic Agents For The Treatment Of Cancer.

- SOP has been prepared.
- The selected plants (*Entada phaseoloides*, *Diospyros lancaefolia*, *Zanthoxylum armatum*) for anticancer activity were further screened for analgesic property.

- Their results are in the order: *Diospyros lancaefolia* > *Entada phaseoloides* > *Zanthoxylum armamatum*.
- Two reviews of the plants *Zanthoxylum armamatum* and *Diospyros lancaefolia* are prepared and communicated.

Life Science Research Board Project: “Modulation of lipopolysaccharide-induced depressive behaviour by few indigenous plants of North East India and their molecular mechanism”

- Initially 3 plants viz. *Zanthoxylum alatum*, *Dysphania ambrosioides* and *Erigeron linifolius* were selected. Bioassay guided fractionation was done using various solvents depending on polarity basis.
- Out of the seven extracts, only n-hexane, hydroalcohol extracts of *Zalatum* and hydroalcohol extract of *E.linifolius* were found to show promising antidepressant activity in preliminary screening. *Dysphania ambrosioides* was not active in the above models.

ICAR OUTREACH PROJECT ON “ETHNOVETERINARY MEDICINE”

- On the basis of consistent findings of AAU-EVM-NW-3 for its effect on reversal of Scopolamine induced Cognitive Dysfunction in Elevated Plus Maze model in mice. Barne Maze model in rats model.
- **AAU-EVM-NW-3 @200mg/kg** showed good potency as memory enhancer as based on gene expression (Nrf2. Nfk B. caspase 3. BDNF. TrkB. time PCR.
- **AAU-EVM-NW-3** was found to be a good candidate plant which showed satisfactory result in almost all the parameters under study thus cognitive dysfunction.

5.3.7 Post Harvest

AICRP on Post Harvest Engineering & Technology, Khanapara Centre:

- **Solar Dryer (Improved version):** The solar dryer is equipped with wooden solar collector containing glass cover and blackened aluminum sheet.

Collector is connected with drying chamber containing drying shelves. A backup system is provided by using solar panel, solar battery, digital solar UPS and solar charge controller. Backup heating is provided by using a bulb and a solar heater. An exhaust fan is attached at the top of the drying chamber to control humidity of drying chamber. The internal temperature of drying chamber varies between 60-65°C under good sunshine. Solar heater gives backup for 2-3 hrs.

- **Liquid Smoke production plant:** Liquid smoke can be produced easily with some technical expertise. Here moist hard wood chips or saw dust is allowed to smolder over a hot surface and the resultant smoke is condensed in a condenser pipe. The condenser pipe is cooled by circulating cooling water pipes. Smoke while passing through the condenser gets condensed and is collected through the nozzles fitted on the bottom side of the condenser pipe. The collected liquid smoke is filtered through activated charcoal or may be allowed to stand undisturbed for 24 to 48 hrs to settle down the tar and the other gross solid matters. Thereafter, the clean filtrate/ supernatant can be used for preparation of various meat products.
- **Solar dried pork product:**Meat is thoroughly washed with clean potable water to minimize the surface contamination. Then the meat is cured overnight at room temperature. Thereafter the meat is minced and mixed with spices and other antioxidant rich agricultural and fruit based ingredients and marinated for 5-6 hrs at refrigeration temperature. The meat balls are then placed in a solar dryer and dried for a period of 36-40 hours for meat balls. The products are packed in food grade packaging materials anaerobically. The dried meat balls can be consumed in the form of curry/soup etc. after rehydration.
- **Chicken Jalebi:**Salty snacks *Chicken Jalebi* is prepared from fresh deboned chicken along with non meat ingredients including black gram flour (urad dal), semolina (suji), rice flour, corn flour, Bengal gram flour (besan) and plain dahi are mixed together with water and a batter is prepared. The batter is allowed to ferment by normal fermentation process for 24 hours at room temperature. The meat portion, non-meat ingredients (batter), vegetable oil, salt, baking powder and all other spices are added and then mixed properly to form an



A. Solar Dryer
(Improved version)

B. Liquid Smoke
production plant



C. Solar dried pork product



D. Chicken Jalebi

Figure 5.65. Various post-harvest technologies developed emulsion. *Jalebi* shape is given from the emulsion and deep fried in vegetable oil in a frying pan and dipped in readymade sauce for 1 to 2 minutes. This is a ready to serve meat product.

- The centre has also conducted two training programmes. The lab was visited by students of foreign university, entrepreneurs and farmers. The centre also took part in Technology and Machinery Demonstration Mela at AAU, Jorhat.



Figure 5.66. Training and demonstration on post harvest technology

5.3.8 Research at Mondira

(Livestock Research Station, Assam Agricultural University, Mondira, Kamrup-781127)

Livestock sector

- 50nos of Murrah Buffaloes procured from the CIRB and breeding tract of Haryana were scientifically reared at LRS AAU, Mondira. They

are well adapted to the local Agro –Climatic – Condition of Lower Assam.

- 6467nos of improved variety day old chicks for backyard rearing were hatched out at Poultry Seed Production Unit. The varieties of chickens hatched were Vanaraja-2847nos, Gramapriya-2750nos and Srinidhi-870nos. The Hatching eggs were brought from Directorate of Poultry research, Hyderabad. The Chicks were procured by the KVKs, NGOs and progressive farmers.
- The cattle unit is having Lakhimi & cross bred cows numbering 20.
- The piggery unit is having 93 nos of pigs. They are being distributed / sold to farmers, FPO & KVKs. & TSP programs.
- Goat & Sheep unit is having 55 nos of animals. Pure Beetal goat 10 nos.
- Geese & duck 15 + 15 nos under IFS.
- One TSP having components of piggery, chick, agro- horti, fish was in operation during report period.

Fishery

- Carp seed like common carp, grass carp, and Rahu and silver carp fishes were produced at Chinese Circular Hatchery, LRS, Mondira.
- About 1,000 thousand fry of each carp seed were distributed amongst farmers for rearing in the farmer's Pond. Their growth was found satisfactory.
- Under NPFR program of AAU a project on Ornamental fish breeding cum rearing unit have been established. Breeding of various indigenous & exotic fish species are going on.

Agriculture

- Boro paddy Seeds (cv: Joimoti) were distributed @2.5 kg to 20 nos of Farmers. The yield was recorded as 75qt l/ha under the AAU Technology as against the Farmer's Practice yield of 55qtl /ha.
- Cashew nut (140) & Assam lemon (500) have been planted under agro horti division.
- The Institute of Horticulture Technology established under a MOU with AAU is functioning.

Extension

- Training on Modern Techniques of Boro Paddy cultivation with special reference to Climate Change Effects" jointly by KVK, Kamrup and LRS, Mondira.

- A vaccination cum Treatment camp.
- Three months RFWET program for students of CFSc, AAU, Raha.
- Training on preparation of fish pickle to 60 entrepreneurs.
- Students from various schools and colleges visited the station for exposure.

Revenue earned: Rs 41, 20,550



Figure 5.67. ILF of AAU, Mandira

5.4 Fisheries

- A low cost aquaponics model has been developed for incorporation in polyhouse system. Nutrient rich water from brood fish raising pond under polyhouse is recycled through a sand gravel media for filtration & recycled back to the pond. Horticultural crops including tomato, ladies finger, leafy vegetables, etc. were grown in sand gravel media by using the nutrient from recycled pond water. The system paves the way for maximum utilization of the polyhouse area for higher return and economic viability *vis a vis* maintaining the water quality of the pond.



Figure 5.68. Low cost aquaponics in integration with a) Poultry-fish farming & b) Polyhouse fish farming

- Study on impact of enhanced temperature by using polyhouse on breeding and seed production efficiency of Common carp (*Cyprinus carpio*) revealed that under the artificially enhanced temperature, the embryonic development was faster and hatching took place after an incubation period of 37 ± 0.7 hours in the polyhouse pond, whereas in control, the incubation period was 125 ± 10 hour which was 85-90 hours higher than the experimental. These findings pave the way for using polyhouse for intensive breeding of the species under controlled environment.



Figure 5.69. Study on impact of enhance temperature on breeding performance of *Cyprinus carpio*

- A model for fish seed grader cum counter with provision for grading and counting fish fry/fingerling upto 4 size groups have been designed in collaboration with DIC- IIT Guwahati under the project Development of Automatic Fish Seed Grader cum Counter. The CAD Model design is Complete and physical model preparation is under progress.
- The regeneration of testes was observed under the study on Refinement of breeding technology of magur by using self-healing and regeneration capacity of the fish. Fully matured testes were observed on 2nd year of rearing after dissection. The findings were presented in the International Symposium held during 11th Indian Fisheries & Aquaculture Forum at Kochi, Kerala.
- Induced Breeding and seed raising for indigenous *Anabas testudineus* (Kawoi) by using brooders raised under captive condition has been done successfully.



Figure 5.70. Maturation of regenerated testes of Magur

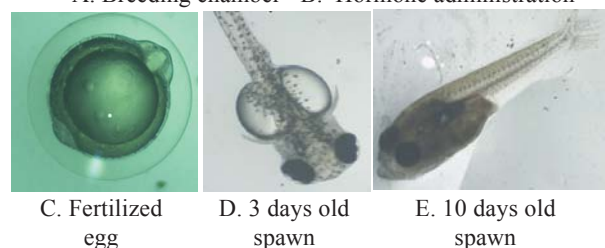


Figure 5.71. (A to E) Different stages of induced breeding of *Anabas testudineus*

6. Extension Education

Assam Agricultural University caters the needs of the farming community of the North-Eastern region and has been playing a vital role for socio-economic development of the people of Assam. The extension service of the University is led by the Directorate of Extension Education with its headquarters at Jorhat. This Directorate not only maintains liaisons with the State Department of Agriculture but also it maintains linkages with other line departments of the NE states like Fishery, Veterinary & Animal Husbandry and Sericulture. The Directorate extends necessary scopes for adoption and dissemination of technologies evolved locally at AAU. Extension services to the farmers' fields have been warmly accepted by the farmers of the region, which is evident from the boosting up of the crop production potentialities remarkably. The area under HYV has increased and the farmers of the region were committed to adopt the recommended package of practices for both *Rabi* & *Kharif* crops. The Directorate of Extension Education provides ample opportunity for convincing and motivating the resource poor farmers of the region towards low cost technologies through its different production related training programmes, different demonstrations, Krishi Vigyan Kendras (KVKs), farmers' visits to AAU farms and Agricultural Technology Information Centre (ATIC) and through other farm related programmes. Apart from this, the Publication and Information wing of the Directorate regularly publishes Annual Reports, Newsletters, Farm Newspaper, Extension Bulletins etc. The technologies generated in the University along with timely advisory are being disseminated by means of push messages through KisanMobile Advisory Services (KMAS) and also through electronic and print media.

The Directorate of Extension Education functions with the following mandates:

- Developing linkages between various govt. and non govt. organizations concerned with agricultural and allied extension programmes
- Organizing need-based training for extension functionaries, farmers, farm women, rural youth and SHG members

- Providing advisory services to farmers
- Functioning as a centre for collecting, storing and disseminating information to farmers and extension functionaries
- Conducting demonstration for transfer of technology
- Entrepreneurship development in agriculture and allied areas
- Publications

Organizational structure

The organogram of the Directorate depicting the organization structure is presented below:

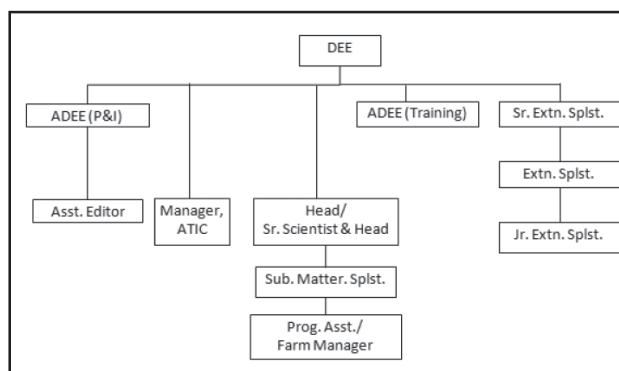


Figure 6.1. The organization of the Directorate of Extension Education

The network of different units/programmes under the Directorate comprises of:

- Krishi Vigyan Kendras (KVKs): There are 23 KVKs, one each in the districts of Baksa, Barpeta, Bongaigaon, Cachar, Chirang, Darrang, Dhemaji, Dhubri, Dibrugarh, Golaghat, Jorhat, Kamrup, Karbi Anglong, Karimganj, Kokrajhar, Lakhimpur, Morigaon, Nagaon, Nalbari, Sivasagar, Sonitpur, Tinsukia and Udalguri
- Agricultural Technology Information Centre (ATIC)
- Agri-clinics and Agri-business Training Cell
- Facilitation Centre for Medicinal Plants
- Publication and Information

6. 1 AGRICULTURAL TECHNOLOGY INFORMATION CENTRE (ATIC)

6.1.1 Introduction

The role of appropriate information on technology and its dissemination to the farmers or other end users are very much vital. A generated technology will be of use only when delivery of the required information to the farmers with least dissemination loss is ensured.

In the course of agricultural revolution, the availability of improved varieties of cereals, oilseeds, pulses and other crops, breeds of livestock including poultry and fisheries, horticultural plant materials and improved management practices have been largely possible for attaining food self-sufficiency despite population explosion. For this purpose, the farmers need quality seeds, planting materials and other inputs, diagnostic services, information through printed, audio, video and electronic media and consultancy services.

The establishment of ATIC is intended to provide such facilities of information dissemination of technology to the farmers as a single window delivery system. This service includes both providing solution of location specific problems and making available all the technological information along with technology inputs and products.

6.1.2 Need

The needs for establishment of such ATIC are:

- Providing diagnostic services for soil testing, plant and livestock health.
- Supplying research products such as seeds and other planting materials, poultry strains, etc. emerging from the institution for testing and adopting by various clientele.
- Disseminating information through published literature and communication materials as well as audio-visual aids.
- Providing an opportunity to the institution to have resource generation through the sale of their technologies.

6.1.3 Objectives

The objectives for establishment of such a centre as single window system are:

- To provide a single window delivery system for the products and species available from the university to the farmers and other interested groups as a process of innovativeness in technology dissemination.

- To facilitate direct access to the farmers to the resources available at the university in terms of technology, advice, technology products etc. for reducing technology dissemination losses.
- To provide mechanism for feedback from the users to the university.

6.1.4 Facilities provided at the ATIC:

Technological products:

- Seeds of field crops, vegetable and other horticultural crops.
- Nursery plants of vegetables, fruits and ornamental plants.
- Bio-fertilizer
- IPM-organic and bio-pesticides including NPV
- Small Farm Implements
- Tissue cultured plant materials
- Processed products and by-products of cereals, oilseeds, pulses, vegetables, fruits, mushrooms including spawn, honey, milk, meat & fish etc.
- Poultry strains, livestock breeds, semen, fish seed etc.
- Agricultural equipments and drawing of designs.
- Vermiculture and vermicompost.
- Vaccine/diagnostic kit.
- Microbial culture for milk and milk products.

Services :

- Soil testing
- Seed quality testing
- Plants health clinic
- Veterinary/animal clinics for small and large animals
- Testing and calibration of agricultural equipments and implements
- Project profile and consultancy
- On-farm consultancy for farmers/orchardists

Information :

- Farm literature-leaflets, pamphlets, journals/magazines, booklets, manuals.
- Audio and Video cassettes of crops and other agri-related enterprises.
- Exhibits including dioramas, transparencies
- Specimen etc.

6.1.5 Functional Components of ATIC

The functional components of ATIC have been indicated in the following figure:

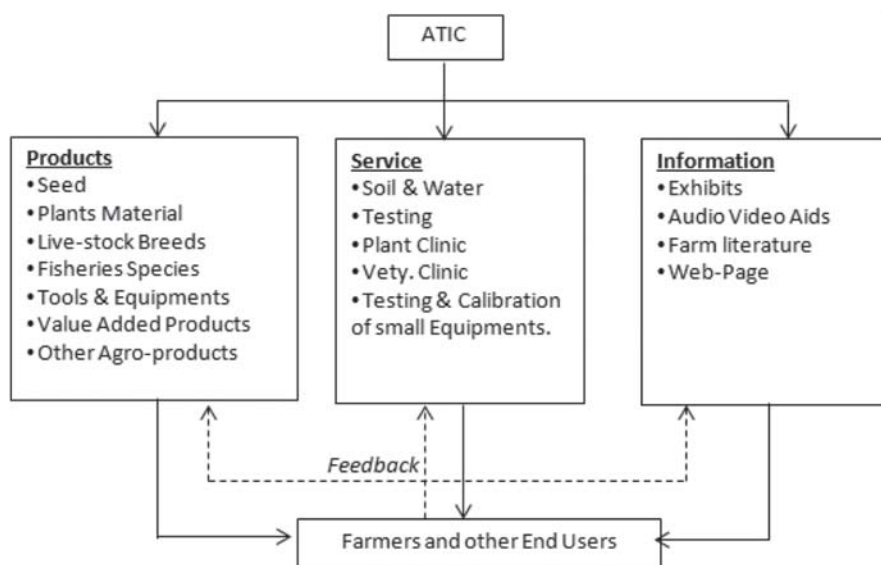


Figure 6.2. The functional components of ATIC

No. of farmers who visited ATIC: A total of 8,174 (4,808 male and 3,366 female) farmers visited the ATIC during the year 2017-18.

6.1.6. Technological inputs sold

ATIC has sold rice seeds of different varieties, vegetables seeds, planting materials, processed products like tea, black pepper, honey etc. Besides, the fresh vegetables like cabbage, tomato, brinjal, lemon, capsicum, beans, cucumber etc. are being sold in the daily sale counter of ATIC.

6.1.7. Farm Advisory Services

Scientists involved in ATIC activities and other staff of the university provides technical guidance to the farmers through farm and home visit, personal contact and correspondences through mobile and social networks. Similarly, farmers including farm women regularly visit to us for seeking guidance in agricultural technology, animal production, livestock management, sericulture, home science and other farm problems and they are well attended by scientists/staff of the university. Queries on agricultural technology from the Department of Agriculture, Veterinary, Fishery and Sericulture etc. are also met immediately by the scientists. A well-knit liaison also exists with different funding agencies such as NABARD, Nationalized Bank, DRDA etc.

6.1.8. Development of website “*Briddhi*”

Constant developmental works in designing of the website ‘*briddhi.aau.ac.in*’ as well as updating of

available data and inclusion of additional contents are in progress. Meteorological information alongwith the crop advisories have been included for the benefit of the farming community.

6.1.9. Publication and Information

The Directorate of Extension has published several bulletins, newsletters, farm newspaper, booklets, folders, magazines, laboratory/training manuals etc. during 2017-18, as detailed below. All these publications have been printed at AAU Printing Press, Jorhat.

| Publications | Nos. |
|---------------------|------|
| AAU Newsletter | 4 |
| <i>GharePathare</i> | 24 |
| Bulletins | 9 |
| Training Manuals | 2 |

6.1.9.1 Radio talk: During the period from April 1, 2017 to March 31, 2018, altogether 99 and 28 programmes were broadcasted through AIR, Jorhat and AIR, Dibrugarh, respectively.

6.1.9.2 Phone in Programme: Altogether 93 questions on various aspects relating to Agriculture, Veterinary, Horticulture, Animal Husbandry and Fisheries were received from 93 farmers, which were replied by the scientists of the University.

6.1.9.3 Exhibitions: The Directorate participated in the following exhibitions during 2017-18 :

| Sl. No. | Date | Name |
|---------|------------------|---|
| 1. | Jan. 4-8, 2018 | 5 th Assam International Agri-Horticultural Show-2018 at Chowkidingee Field, Dibrugarh organized by AAU & KVK, Dibrugarh |
| 2. | Jan. 20-21, 2018 | 26 th Conference of KASS and NASS at Gurmow, Baksa, Assam organized by KVK Baksa& AAU |
| 3. | Nov. 9-11, 2017 | 8 th National Seminar on “Doubling Farmers’ Income: Multi Stakeholders convergence” organized by Society for Community Mobilization (MOBILIZATION), New Delhi organized by ICAR, ATARI & AAU |

6.1.9.4 Workshops/Group Meetings/Trainings under Directorate of Extension Education

The Directorate of Extension Education also organized the following programmes at its Conference

room. These trainings are mainly aimed at updating the knowledge and skill of the SMS and Programme Assistants serving in the various KVKs of Assam.

a. Training Programmes

| Sl. No. | Date organized | Title of the training programme | No. of Participants | No. of KVKs involved |
|---------|---------------------|---|---------------------|----------------------|
| 1 | 3-5 April, 2017 | HRD training programme on Recent Advances in Horticulture for SMS(Horticulture) of KVKs | 31 | 22 |
| 2 | 19 & 20 April, 2017 | HRD training programme on Recent Advances in ICT Application for PA(C) of KVKs under AAU | 35 | 22 |
| 3 | 24-27 April, 2017 | HRD training programme on Recent Advance in Assessment of Nutritional Assessment for SMS/PA (H.Sc.) | 20 | 20 |
| 4 | 29 April, 2017 | Training on Scientific cultivation of field and Horticultural crops for prisoners of M.N. Open Jail | 34 | |
| 5 | 4-6 May, 2017 | HRD training programme on Recent Advances for SMS/PAs(Fishery Science) of KVKs | 17 | 9 |
| 6 | 22-24 May, 2017 | HRD training programme on Entrepreneurship Development in Agriculture at KVK, Nagaon | 19 | 12 |
| 7 | 29-31 May, 2017 | HRD training programme on Farm Management for Farm Manager of KVKs under AAU | 35 | 23 |
| 8 | 1-3 June, 2017 | HRD training programme on Recent Advances in Plant Protection for SMS and PA of KVKs | 22 | 22 |
| 9 | 5-6 June, 2017 | HRD training on Photography and Videography for SMS under KVKs, AAU | 23 | 23 |
| 10 | 8-9 June, 2017 | HRD training on Financial & Administrative Management | 25 | 23 |
| 11 | 15-17 June, 2017 | HRD training programme on Recent Advances in Agronomy for SMS & Prog. Asstt. of KVKs under AAU | 18 | 18 |
| 12 | 18-20 June, 2017 | HRD training programme of SMS(Soil Science) of KVKs under AAU | 16 | 16 |
| 13 | 20-22 June, 2017 | HRD Training on New Era of Extension Management for Head, KVKs | 34 | 23 |

b. Workshops/ Seminar

| Sl. No. | Date organized | Title of the programme | Organised by | Training For | No. of Participants | No. of KVKs involved |
|---------|--------------------------|--|-------------------|------------------|---------------------|----------------------|
| 1 | 20/02/2018 | Seminar on 'Creating awareness on Petroleum Product Conservation & Impact on Environment due to excessive use of fuel' | PCRA & AAU | Scientists | 50 | 23 |
| 2 | 09/11/2017 to 11/11/2017 | 8 th National Seminar on "Doubling Farmers' Income: Multi Stakeholders convergence" organized by Society for Mobilization Community (MOBILIZATION), New Delhi | ICAR, ATARI & AAU | Scientists & SMS | 1000 | 23 |

6.2. AAU Certificate Courses

The directorate offers Vocational Certificate courses in a regular manner. Last year the following Certificate courses were offered.

6.3. Interaction on Extension of AAU with Commodity Boards

The Directorate collaborated with various organizations to bring awareness among the farming community. The salient ones are detailed below:

| Sl.No. | Date organized | Title of the programme | No. of Participants |
|--------|-------------------------|--|---------------------|
| 1 | 1.11.2017 to 30.4.2018 | Tea Production Technology & Management | 25 |
| 2 | 1.12.2017 to 30.12.2017 | Bakery | 20 |

Sl.No. Name of Organisation

Achievement / Activities

| | | |
|---|---|--|
| 1 | Petroleum Conservation Research Association (PCRA) | Organised 46 seminars on 'Creating awareness on Petroleum Product Conservation & Impact on Environment due to excessive use of fuel' through 23 KVKs in which 650 no. of participants took part during 2017-18 |
| 2 | National Agricultural Bank for Rural Development (NABARD) | <ul style="list-style-type: none"> Organised 1(one) workshop on Govt. Sponsored Schemes with special focus on Agriclinic and Agribusiness Centre (ACABC), organized by District Development Manager, NABARD in which 70 no. of students participated, during 2017-18 Vocational training programme on Food Processing and Preservation with 20 nos. of participants in 2018. |
| 3 | Fertilizer Association of India | Organised Fertilizer Orientation Course for students in 2017 with 137 nos. of participants including students and faculty members of AAU |
| 4 | Agriculture Innovation Project (AIP) under USAID | <ul style="list-style-type: none"> Technology Dissemination and Income Improvement Activities (TDIIA): A total of 19 different income improvement activity programmes were conducted through KVKs with 2149 nos. of participants AIP mobile solution: Introduced mAIP mobile solution programme on real time basis through 20 KVKs for rapid dissemination of information to farmers for maximum optimization of technology and natural resources and help increase the livelihood of the farming community. A total of 16602 numbers of farmers were registered and solutions for 2073 numbers of problems were provided. |

Sl.No. Name of Organisation

Achievement / Activities

- Seven (7) nos. Certificate courses (Skill Development), viz. Apparel Designing & Construction, Tea Production Technology & Management, Aquaculture Production and Management, Poultry Production Technology and Management, Master Goat Production, Cut Flower Production, Dyeing & printing of Textiles in which there were 192 nos. of participants
- 5 Bayer Bioscience Pvt. Ltd. Conducted demonstration on paddy hybrids and celebration of Field Days in 6(six) districts of Assam through KVKs during 2017-18
- 6 The Associated Chambers of Commerce of India (ASSOCHAM) Organised conference on Linking Prospective Food Entrepreneurs with Government Schemes and Markets with 156 nos. of participants
- 7 Centre for Microfinance and Livelihood (CML), NGO Two (2) skill development training programmes on “Livestock and Poultry Production”
- 8 The Energy and Resources Institute (TERI) formerly known as Tata Energy and Resource Institute Project proposals have been submitted by two (2) KVKs as partnering institute to Biotech-KISAN through TERI who will play the role of project hub. The objectives of the project is to disseminate the production technology of biofertilizers, seed, integrated disease and pest management and year round production of mushroom
- 9 Centre for Agriculture Rural Development (CARD) Organised ‘Rongali Destination-culture-harmony’ exhibition during 2017-18 with 11200 nos. of participants

6.4 Krishi Vigyan Kendra

For efficient dissemination of technology to the farmers of various districts, 23 number of KrishiVigyanKendrasare presently functioning directly under the Directorate of Extension Education of the University. To achieve the set mandates, the KVKs are conducting On Farm Trials (OFT), Front Line Demonstration (FLD) besides imparting training to the farmers, farm women, rural youths, extension

functionaries, conducting and. The KVKs also organize Field Day, KishanMela, Agri Expo, Exposure Visit, Farmers-Scientists Interaction, Awareness camp, PRA exercise. During 2017-18, 953 numbers of scheduled training programme (on/off campus) were conducted by all these KVKs where more than 25,060 trainees participated. Technology dissemination is a major aspect of KVK and it was carried out through a number of FLDs and OFTs during 2017-18.



Figure 6.3. Pea Garden by KVK, Dhemaji



Figure 6.4. Training on Improved method of Vermicompost production by KVK, Darrang

6.4.1 OFT & FLD (2017-18)

| Name of KVK | OFT | | FLD | |
|---------------|---------------|------------------------|---------------|------------------------|
| | No. conducted | No. of farmers covered | No. conducted | No. of farmers covered |
| Baksa | 8 | 26 | 16 | 73 |
| Barpeta | 9 | 23 | 12 | 49 |
| Bongaigaon | 15 | 52 | 19 | 546 |
| Cachar | 11 | 27 | 10 | 53 |
| Chirang | 12 | 38 | 20 | 123 |
| Darrang | 14 | 37 | 25 | 153 |
| Dhemaji | 13 | 38 | 35 | 907 |
| Dhubri | 16 | 53 | 18 | 150 |
| Dibrugarh | 12 | 37 | 17 | 136 |
| Golaghat | 24 | 76 | 21 | 366 |
| Jorhat | 25 | 123 | 25 | 104 |
| Kamrup | 12 | 30 | 22 | 646 |
| | | | | +2 schools |
| Karbi Anglong | 12 | 37 | 24 | 461 |
| Karimganj | 12 | 46 | 14 | 66 |
| Kokrajhar | 11 | 43 | 20 | 205 |
| Lakhimpur | 10 | 57 | 17 | 143 |
| Morigaon | 8 | 49 | 24 | 443 |
| Nagaon | 11 | 27 | 12 | 80 |
| Nalbari | 13 | 33 | 11 | 43 |
| Sivasagar | 13 | 68 | 16 | 122 |
| Sonitpur | 6 | 17 | 16 | 59 |
| Tinsukia | 15 | 45 | 22 | 208 |
| Udalguri | 19 | 164 | 27 | 626 |
| Total | 301 | 1146 | 443 | 5762 |
| | | | | +2 schools |

6.4.2. Training Particulars during 2017-18

| Sl. No. | Name of KVK | No. of Training | Participants | | Total |
|---------|---------------|-----------------|--------------|-------------|--------------|
| | | | Male | Female | |
| 1. | Baksa | 37 | 780 | 199 | 979 |
| 2. | Barpeta | 25 | 487 | 207 | 694 |
| 3. | Bongaigaon | 80 | 1202 | 542 | 1744 |
| 4. | Cachar | 26 | 435 | 256 | 691 |
| 5. | Chirang | 31 | 660 | 326 | 986 |
| 6. | Darrang | 24 | 374 | 216 | 590 |
| 7. | Dhemaji | 64 | 912 | 622 | 1534 |
| 8. | Dhubri | 51 | 823 | 422 | 1245 |
| 9. | Dibrugarh | 56 | 1225 | 610 | 1835 |
| 10. | Golaghat | 57 | 937 | 697 | 1634 |
| 11. | Jorhat | 51 | 536 | 625 | 1161 |
| 12. | Kamrup | 62 | 1231 | 682 | 1913 |
| 13. | Karbi Anglong | 35 | 643 | 254 | 897 |
| 14. | Karimganj | 26 | 402 | 227 | 629 |
| 15. | Kokrajhar | 46 | 744 | 442 | 1186 |
| 16. | Lakhimpur | 41 | 495 | 176 | 671 |
| 17. | Morigaon | 27 | 286 | 500 | 786 |
| 18. | Nagaon | 36 | 489 | 330 | 819 |
| 19. | Nalbari | 34 | 716 | 219 | 935 |
| 20. | Sivasagar | 23 | 417 | 272 | 689 |
| 21. | Sonitpur | 42 | 588 | 694 | 1282 |
| 22. | Tinsukia | 43 | 754 | 483 | 1237 |
| 23. | Udalguri | 36 | 515 | 408 | 923 |
| | Total | 953 | 15651 | 9409 | 25060 |

6.4.3. Award/Honour/Recognition to the faculties for the year 2017-18

The Head, KVK Bongaigaon was awarded the Best Extension Scientist Award of the University for the year 2017-18

6.5 Extension Activities by the Constituent College of Agriculture

Apart from Directorate of Extension Education, the Teacher and scientists of different constituent colleges of Agriculture, community science and veterinary science were also involved in extension activities, during the year.

6.5.1 College of Agriculture

6.5.1.1. Department of Extension Education

An awareness programme on use of ICT in Agriculture was organised for farmer in Dangdhara and Paninara villages of Titabar area on 15/02/ 18. All total 60 farmers were participated in the awareness programme. In the programme, farmers were taught about various uses of mobile phones for accessing



Figure 6.5. Training on value-added product making for economic upliftment by KVK, Jorhat



Figure 6.6. Exhibition Stalls organized by KVK, Udalguri



Figure 6.10. OFT on Strawberry by KVK, Udalguri



Figure 6.7. Ground Nut field of KVK, Darrang



Figure 6.11. Vocational Training on Fruits and Vegetables Preservation by KVK, Sonitpur



Figure 6.8. FLD on popularization of pumpkin variety 'F1 Arjuna' by KVK, Dibrugarh



Figure 6.12. OFT on organic cultivation of Cabbage by KVK, Golaghat



Figure 6.9. FLD on Ranjit Sub-1 in flood affected area by KVK, Sivasagar

agricultural information and how to access agricultural web sites. Demonstration on sending SMS to *mkisanportal* and making call to KCC for getting farm advisory service have been shown to farmer.



Figure 6.13. Demonstration on Low cost Solar Tent Dryer by KVK, Udalguri



Figure 6.14. Visit of ICAR Team lead by ADG (Extn.) at KVK, Jorhat



Figure 6.15. World Honey Bee day celebration by KVK, Sivasagar



Figure 6.16. Scenes from the awareness programme on use of ICT in Agriculture

6.5.1.2 Department of Agricultural Engineering

- Participated in the farmers' fairs organized by RARS Titabor and Sugarcane Research Station, Buralikson.

- Demonstrated use of Direct seeded rice seed drill in AAU farm and NeoulGaon covering an area of 3.5ha.

6.5.1.3 Department of Animal Husbandry & Dairy

Faculty from the department delivered 60 lectures in various training programmes conducted by the directorate and also participated in various exhibitions and organized trainings etc. Some of which are detailed below:

- Participation and display of Technology in the farmers' exhibition at RARS, Titabar on 07.10.2017
 - Participation and display of Technology in the farmers' exhibition at RARS Buralickson on 23.11.2017
 - Participated and display of technology in the International Horticultural Show on 6-9 January, 2018 at Dibrugarh
 - Organized 3 days duration skill development training programme on Animal Husbandry, management of pig, dairy, goat on 24th July to 26th July, 2017
 - Attended 25 phone-in Programme organized by All India radio, Dibrugarh
 - Provide technical support to farmers for establishment of Dairy, Piggery, Goat and Poultry farming along with supply of quality germplasm
 - Organized vaccination camp with collaboration with Directorate of Extension Education on 09.05.2017
 - Conducted Experimental Learning Programme on Poultry Production Technology
- In addition, the department helped in various activities like

- Handle exposure visits of farmers and students from various parts of Assam and the North-East India.
- Maintenance of parent line of Vanraja
- Maintenance of Srinidhi, Rainbow rooster and Kalinga Brown parent stock
- Maintenance of Turkey and Quail
- Introduction of Duck breeds (Breed-CharaChembalii and Khaki Campbell)
- Supply of Quality Vanaraja chicks to more than 150 farmers
- Supply of quality quail bird to more than 150 farmers
- Supply of quality turkey poultry to more than 50 farmers



A. Vanaraja parent line



B. Khaki Campbell



C. Quail Bird



D. Turkey (Beltsville Small White)



E. Turkey (Spanish Black)

Figure 6.17. Picture of different poultry birds

6.1.5.4 Department of Sericulture

The faculties of the department have participated with exhibition stall in the Farmers' Day at RARS, Titabar and act as resource person in the training programmes at STI, Titabar, Govt. of Assam.

6.5.1.5 Department of Entomology

AINP on Soil Arthropod Pests

A massive mass campaigning programme was organized under the aegis of AINP on Soil Arthropod Pests, AAU, Jorhat for the mass collection and



Figure 6.18. Setting of eggs in the incubator (Hatchery unit, Poultry farm, AHD)



Figure 6.19. Participation in Different exhibitions



Farmers Scientist Interaction at poultry farm

ELP Programme

Figure 6.20. Extension activities of AHD

destruction of *L. mansueta* beetles in Majuli river island by involving 400 farmers from 40 endemic villages, mostly from flood and erosion affected areas. The mass campaigning programme was conducted by following the concept of “Social Engineering” by sending SMS, erecting banners and flexes at different strategic locations, use of public address system, distribution of awareness cap and awareness stickers among farmers, conducting drawing competition among primary and secondary students, use of electronic media, Social networking site like Facebook and WhatsApp, farmers awareness camp/training, exposure visit, exhibition, documentary show, distribution of photographs /leaflets, publishing leaflets in both Assamese and Mishing language, method demonstration etc. This mass campaigning programme received overwhelming response and was exceedingly successful leading to massive collection and killing of about 2.3 Lakhs beetles during March-April, 2017. More than 60 per cent of the beetles collected were explored as human food/ animal feed.

Entomophagy

Concerted efforts have been initiated from 2010 onwards to convert some soil dwelling insects into cuisine/delicacy, especially among the tribal populace of Assam. Nutritional profiling of those species have been initiated and summarized below:

- Proximate and elemental compositions of five soil-dwelling scarabs, *Lepidiota mansueta*, *L. albistigma*, *Xylotrupes gideon*, *Catharsius molossus* and *Sophropsiri dipennis* were assessed. Nutrient content varied widely and the ranges of proximate contents were as follows: moisture (2.04–2.55%), crude protein (68.54–79.33%), crude fat (4.00–5.50 %), crude fibre (5.16–8.28 %), total mineral (0.80–4.98 %), and carbohydrate (5.28–11.84 %). Caloric content was greater in *L. mansueta* (379.29 kcal) compared to the other four species. Sodium content ranged 23.16–35.91 mg/100 g; potassium 14.20–44.33 mg/100 g; calcium

23.33–33.37 mg/100 g; iron 1.41–37.05 mg/100 g; copper 2.01–16.13 mg/100 g; zinc 2.38–15.86 mg/100 g; and manganese 1.09–19.66 mg/100 g. Out of aforementioned five beetles, two species viz., *L. mansueta* and *L. albistigma* exhibited highest levels of endemism and were extremely popular among the tribal populace as a culinary delight and alternate source of protein. Further nutritional profiling of these two species was carried out.

- The phenol, flavonoid and antioxidant activities of *L. mansueta* and *L. albistigma* were 4.00 and 6.42 mg catechol equivalent/ g, 1.59 and 3.71 mg quercetin equivalent/ g, 22.60, and 28.20 % (DPPH activity), respectively. Tannin content was higher in *L. albistigma* (13.30 mg/g) than in *L. mansueta* (3.24 mg/g).
- Fatty acid profiling of the aforementioned beetles has been carried out in collaboration with Guwahati Biotech Park, IIT Guwahati. GC-MS analysis indicates that *L. mansueta* beetles contained 4 fatty acids viz. lauric acid, stearic acid, linoleic acid, palmitoleate and *L. albistigma* contained another 4 different types of fatty acids viz. nonanoic acid, linoleic acid, myristic acid and stearic acid.
- The amino acid profiling of two scarab beetles viz., *L. mansueta* and *L. albistigma* and field cricket, *Brachytrupes portentosus* were carried out at CSIR-CFTRI, Mysore. All together 17 amino acids have been recorded in case of both the scarab beetles whereas 19 amino acids have been detected in *B. portentosus*. Among all the amino acids, 8 essential amino acids viz. histidine, threonine, valine, methionine, isoleucine, leucine, phenylalanine and lysine have been recorded in all the above three species.
- The HPLC analysis of sugar and fat soluble vitamins of *L. mansueta* and *L. albistigma* has been conducted. The glucose content of *L. mansueta* and *L. albistigma* has been found to be 7.860 and 13.993 mg/ 100 g, respectively. Sucrose content was found to be higher in *L. albistigma* (3.760mg/100g) than *L. mansueta* (0.615 mg/100g). A considerable amounts of water soluble vitamins viz., thiamine hydrochloride, ascorbic acid, nicotinic acid, pyridoxal phosphate, pyridoxine hydrochloride, folic acid and riboflavin were also recorded in both the species through HPLC analysis.

VPM (Rodent Control)

- Training on integrated rodent pest management in rice-rice cropping system at Bohikhuwa on 30th June, 2017
- Training on rodent pest management in rice- oilseed cropping system at UporTemare on 18th July, 2017
- Interactive programme on rodent and their management in Kharif rice at Dhanjan on 27th July, 2017
- Field training on different rodent control measures in rice- pulse cropping system at Bekajan on 31st August, 2017
- Participated and exhibited at Farmers Day at RARS Titabor on 7th November, 2017
- Exhibited at Farmers' fair at SRS,Buralikson on 23rd November, 2017
- Farmers training in integrated rodent pest management at Ekorajan on 8th December, 2017
- Field demonstrations on different rodent control measures in rice-vegetables cropping system at UporTemara on 22nd December, 2017
- Method demonstrations on rodent pest and their field management at Bohikhuwa on 25th January, 2018
- Interactive programme on Monkey damage in Agricultural ecosystem at Rongamati-Badulipara on 22nd February, 2018

6.5.1.6 Department of Agrometeorology

- Farmers' Awareness Programme on 12th January, 2018 at Thengalgaon, Golaghat.
- Technology Demonstration on Irrigation Water Management at Thengalgaon, Golaghat on 13th January, 2018.

6.5.1.7 Department of Tea Husbandry & Technology

- The Small Tea Growers Advisory Cell of the Dept. of Tea Husbandry & Technology (THT) implemented the project 'Advisory Services to the Small Tea Growers of Tuensang, Nagaland' sponsored by North East Rural Livelihood Promotion Society, Ministry of DONER, Govt. of India.
- Method Demonstration on Tipping and Plucking of Tea at Longkhim,Chare Block on 8th and 9th June, 2017 among 164 participants.

- Exposure visit to Commercial tea plantation and small tea grower sector in Assam to study ‘Organic tea cultivation & processing, Contour planting and Nursery management, at Golaghat on 16th June, 6th July and 7th July; at Sonitpur on 17th June; at Sivasagar on 6th June and 18th August and at Jorhat on the 17th August, 2017
- A group of 35 small tea growers visited Experimental Garden for Plantation Crops of the department on 7th November, 2017. The visit was organized by National Cooperative Union of India (NCUI), Jorhat.
- Conducted a Summer Course on Tea Production entitled ‘Farm to Cup’ for students of Rutgers University, New Jersey, US for a period of 21 days.

6.5.2 College of Community Science

6.5.2.1 AICRP-CD Component

- Organized four Awareness camps on Reproductive Health at four different villages for the mothers having children below 6 years.



A. Awareness camp on 07.03.18 at Peerakota village

B. Awareness camp on 14.03.18 at Napam Bharaluwa village



C. Awareness camp on 28.03.18 at Mudoijan

D. Awareness camp on 25.04.18 at Mudoijan Bharaluwa village

Figure 6.21. Awareness camps on Reproductive Health

- World Literacy Day on 8th September, 2017:** AICRP Child Development component in collaboration with AICRP Extension & Communication Management component celebrated the “World Literacy Day” in Peerakota Bharaluwa Gaon on 8th September, 2017. The programme was attended by total number of 55 rural women.



Figure 6.22. Observing World Literacy Day

- Swaccha Bharat Abhiyanon 25th September, 2017:** All the components of AICRP (Home Science) organized Swaccha Bharat Abhiyan on 25th September, 2017 at two villages of Teok; namely, Peerakota and Badulipukhuri Majgaon.



Figure 6.23. Swaccha Bharat

- World Disability Day on 3rd December, 2017:** AICRP Child Development Component celebrated the World Disability Day by organizing a day long awareness camp on “Early Identification of Disability of Children” in Peerakota, Bharaluwa Gaon. The programme was attended by total number of 90 rural women and children. Sayera Rahman, Principal of Prerona was invited as a chief guest in this programme. She deliberated a lecture on early identification of disability. They also organized some special games among children for



Figure 6.24. Observation of World Disability Day

identification of disability. Prizes were distributed to the winners and all the participants were given a gift as a token.

- **Workshops organized by the department of Human Development & Family Studies:** The Department of Human Development & Family Studies (HDFS), College of Community Science, AAU organized a workshop on “Role of leadership and competencies in innovation” for 4th year students of Community Science who are undergoing Experiential Learning Programme. The workshop was held on 17th August, 2017 with an objective to develop leadership qualities and enhance innovative skills among students which is further expected to help in promoting entrepreneurial mindset among the students. Ms. Chandrani Borkotoky, PhD scholar of the department of HDFS, College of Community Science and Mr. Parash Goswami, District programme officer, SSA, Jorhat acted as resource persons for the workshop.



Figure 6.25. Workshops organized by the department of HDFS, CCSc

- A workshop on “Life skills: key to future success” was organized by the department of Human Development & Family Studies, College of Community Science in collaboration with NSS and Directorate of Student’s Welfare on 30th August, 2017. Final year students of colleges of Community Science, Agriculture, Horticulture & Sericulture participated in the workshop. The participants were actively engaged in the learning process, had the opportunity to practice and enhance new skills and gain self-confidence. This workshop was facilitated by Mr. Indrajit Sinha Director Way foundation, Guwahati.

6.5.2.2 Dept. of Extension and Community Management

- A skill development training on “Crochet work” was organized in the department of ECM, Faculty



Figure 6.26. Workshop on “Life skills: key to future success” organized by the department of HDFS in collaboration with NSS and Directorate of Student’s Welfare

of Community Science on 16-18 Nov 2017 for the housewives from the neighboring households of AAU campus. The 3 days training programme started with motivational training followed by skill development training Dr. Daisy Hazarika, Professor of the department. A total of 10 members actively participated in the training. The training module was made in such a way that the participants were asked to prepare few learnt items on their own and display on the day of certificate distribution. The trainees have prepared different crochet items which clearly indicated that the training was successful.



Motivational Training



Crochet items prepared by the Trainees

Skill Development

Figure 6.27. Training organised by dept. of ECM

- Considering the importance of dairy farming for sustainable economic development, one day training programme on “Empowerment of rural



Figure 6.28. Training on “Empowerment of rural women through Dairy farming”

women through Dairy farming” was conducted on 24th November, 2017 in the department of ECM under the leadership of Dr. Manju Dutta Das, Professor, Department of Extension and communication management for skill up gradation of farm women. All total twenty numbers of SHG members from Urongial village, Titabor block were participated. Dr. Dipak Borah, Professor, Animal Husbandry, AAU explained the care & maintenance of cows. To make the training more effective a demonstration cum training programme was organized on preparation of milk product such as Paneer and Rashgulla for commercial purpose.

For economic empowerment of women, one day training programme was organized on “Poultry Farming” on 23rd November, 2017 in the department of ECM under the leadership of Dr. Sayanika Borah, Assitt. Professor and Dr. Manju Dutta Das, Professor, Department of Extension and communication management. All total twenty numbers of SHG members from Urongial village, Borhula, Titabor block were participated. Dr. Himanjali Hazarika, Assitt. Professor, Animal Husbandry, AAU explained the care & maintenance of chicks (Vannroja variety). To provide firsthand experiences the AAU poultry farm was visited by the group.



Figure 6.29. Training on poultry farming

AICRP ECM Exposure visit of 18 Farm women of Pirakota Bharalua and Dewan Bharalua to different departments of University was done on 31-10-17.



Figure 6.30. Exposure visit of farm women to different Dept. of AAU

Demonstration on Mushroom Cultivation was conducted by AICRP Extension component on 15th April, 2017 with 15 women farmers in the department and mushroom cultivation center of AAU.



Figure 6.31. Training on mushroom cultivation

Conducting “Swachhta hi Seva” in Pirakota Bharalua and Badulipukhuri Mazgaon on 25-9-18. A total of 50 women and student were participated alongwith the Research team of AICRP Home Science.



Figure 6.32. “Swachhta hi Seva”

Celebrated International Literacy Day (Use of Mobile phone by farm women) in Pirakota Bharalua on 8-8-17. A total no. of 54 women were attended the programme.



Figure 6.33. Literacy Day training on use of mobile phone by farm women

- Conducted Training on Agripreneurship development on 4-12-17 in the department with 18 no. of participants.



Figure 6.34. Agripreneurship development training

- Organised Training on Extraction of Banana fibre and preparation of products in Dewan Bharalu on 21-3-18 with 17 no. of participants.



Figure 6.35. Training on Extraction of Banana fibre and preparation of products

- One Day awareness camp was organised on “Handmade Paper and Fibre Industries” in the department of Extension and Communication Management in collaboration with KVIC, Assam and NGO(SNEHPAD) on 18.5.17. Total 100 nos of participants form entire North-Eastern Region participated in the camp.

6.5.2.3 Dept. of Food Science and Nutrition

- Department of Food Science and Nutrition organized a two days workshop cum training on bakery skills for the benefits of the students of the department on 11th to 12th September, 2017. Mrs.



Figure 6.36. Two days workshop cum training on bakery skills organised in Department of Food Science & Nutrition on 11th & 12th September, 2017

Monmi Das, a renowned skill trainer on baked products from Guwahati was the resource person. Mr. Anjan Choudhury another skill trainer also acted as a resource person on Entrepreneurship development.

- Organized one month training on ‘Bakery’ in collaboration with NABARD for training rural youths in self-employment from 5th March to 5th April 2018. A total of 25 participants from different parts of Assam participated in the hands-on training programme.



Products developed under one month certificate course on bakery

Exhibition cum sale organised by the trainees of one month certificate course on bakery

Figure 6.37. Training on ‘Bakery’ for rural youths

- Collaborative HRD training programme on “Recent Advancement in Assessment of Nutritional Status” for SMSs and PAs (Home Science) under KVKs of AAU organized by Directorate of Extension Education 24th April to 27th April, 2017.
- Dr. Ruma Bhattacharyya, Professor, Dept. of FSN, delivered a talk as appointed speaker at Urangial village, Borholaon 8th March 2018 on the occasion of celebration of International Women Day.
- Mrs. Moloya Gogoi, Assistant Professor, Dept. of FSN, participated in KisanMela at Rice Research Station, Titabor organized on 7th November 2017, Sugarcane Research Station, Buralikson on 23rd November 2017. She also participated in 5th Agri-Horticultural Fair held from 5th- 8th January 2018 at Dibrugarh and Live phone-in programme “*amar ahar otramdhenu rongor xomahar*” on 7th September 2017 on AIR Dibrugarh on the occasion of National Nutrition Week.

6.5.2.4 Dept. of Textile and Apparel Designing

- Mrs. M. Konwar, Assistant Professor, Dept. of TAD, participated in KisanMela at Rice Research

Station, Titabor organized on 7th November 2017 and 5th Agri-Horticultural Fair held from 5th- 8th January 2018 at Dibrugarh.

- Dr. Bulbul Baruah, Prof. Dept. of TAD, acted as resource person to faculty development programme at Kaziranga University Sponsored by Dept. of Science & Technology, Govt. of India, New Delhi. She also delivered a talk on “Entrepreneurship Development” on 4th January 2018.
- Delivered a talk on, “*Bivinna Kaushal Byaharkori Saj-pochakar rupankan kora aru pastut karan*” on 19th March, 2018 at JDSA Ground No 2. 3rd SARAS Fair 2018 organised by Assam State Rural Livelihoods Mission Society (ASRLM).

6.5.2.5 Dept. of Family Resource Management

- Department of FRMCS under the DBT funded project on “Management of Green Waste for Economic Benefit and Women Empowerment” conducted a seventeen-days long training programme from 21st Nov to 7th Dec, 2017. Skill development training was imparted on preparation of products from green waste namely water hyacinth; areca palm leaf based disposable plates and bowls and compressed biomass briquette making. A total of fifteen unemployed women and youth actively participated in the training.
- A skill development training programme of ten day duration on preparation of products from green waste namely water hyacinth, areca palm leaf based disposable plates and bowls was conducted by the Dept of FRMCS under the DBT funded project on “Management of Green Waste for Economic Benefit and Women Empowerment” from 22nd to 28th February, 2018. Ten unemployed women and youth from nearby areas of AAU-Jorhat campus participated actively in the training.
- Department of FRMCS under the DBT funded project on “Management of Green Waste for Economic Benefit and Women Empowerment”



Figure 6.38. Hands on training on plate making from areca palm leaf sheath

conducted fifteen days training programme from 27th March to 10th April, 2018. Training for skill development was imparted on preparation of products from green waste namely water hyacinth, areca palm leaf based disposable plates and bowls to ten unemployed rural women participants from different parts of Jorhat District.



Products prepared from green waste by the trainees

Hands on training on utility product making from water hyacinth

Figure 6.39. Training on “Management of Green Waste for Economic Benefit and Women Empowerment”

- An awareness-cum-demonstration Programme on Consumer Education was organized by the department of Family Resource Management and Consumer Science, Faculty of community Science, Assam Agricultural University, Jorhat on 10th Nov. 2017. The main objective of the programme was to make the people aware about importance of consumer education in day to day life. Consumer exploitation, food adulteration and its detection, consumer rights and responsibilities, and three tier redressal system was clearly explained and demonstrated in the programme.



Figure 6.40. Detection of food adulteration

AICRP FRM

- A three days training programme on “Drudgery reducing tools and technologies for farm women” was organized on 9th, 17th & 21st November, 2017 at PirakotaBhorolua, MudoijaanBhorolua, Na-pam Bhorolua, Dewan Bhoroluagaon by the Department of Family Resource Management, College of Community Science, AAU, Jorhat. Fifty numbers

of farm women from adopted villages of AICRP participated in the training programme. Drudgery reducing tools and technologies for household, farm and allied activities were demonstrated followed by interactions with farm women for intervention .

- Awareness camp as well as cleaning programme under *Swachata Hi Sewa* was conducted on 18th September, 20th September, 24th September and 25th September 2017 at Pirakata village, M. E. School of Modoijan village, Rangamancha cum Namghar of Nopam Bhorolua village, Modoijan Bhorolua village, Jorhat. The school teachers, students, anganwadi workers actively participated in this sanitation drive.



Figure 6.41. “Swachata Hi Sewa” campaign at M. E. School of Jorhat

6.5.3 College of Veterinary Science, Khanapara

The Directorate of Extension Education at Khanapara campus of Assam Agricultural University, since its inception in the year 1978, has been contributing to the socio-economic development of the state through its various extension programmes viz. training, demonstration, exhibition, animal health care, vaccination camp, various transfer of technology programmes including frontline demonstration, farm advisory service and awareness programmes etc. The directorate offers continuous knowledge and skill development/up-gradation trainings to a considerable number of farmers, farm women, educated unemployed youths, members of self-help groups, progressive farmers and entrepreneurs with the latest scientific knowledge on various animal husbandry practices. Moreover, emphasis is being given to impart refresher trainings to technical personnel and field veterinary officers of Animal Husbandry and Veterinary Department of Assam and other N.E. states to disseminate latest scientific knowhow on improved managemental practices for increasing livestock and poultry production.

Extension activities:

Training and skill development are considered to be vital and very important in livestock development. Various short term training programmes were continuously organized by the Directorate for the upliftment of rural economy and to provide avenue for self-employment to the unemployed educated youths, farmers and farm women through scientific livestock and poultry farming.

H.R.D. training programme organized

To update the professional knowledge and also to focus towards the implementation of appropriate technologies in the field of Animal Science, a short term HRD Training Programme on ‘Recent Advances in Livestock and Poultry Farming’ has been organized by the Directorate of Extension Education, Assam Agricultural University, Jorhat-13 in collaboration with Directorate of Extension Education AAU, Khanapara, Guwahati-22 from the 16th to 18th May, 2017. A total of 17 SMS/ PA (Animal Science) under AAU, KVK attended the training programme.

Collaborative training programmes

To develop entrepreneur skill and also for creation of the self-employment of the rural woman & educated girls through Livestock farming, the Directorate of Extension Education, AAU, Khanapara has organized two nos. of five days training programmes entitled ‘Skill Development Training on Poultry Farming’ from 3rd to 7th April, 2017 and ‘Skill Development Training on Pig Farming’ from 24th to 28th April, 2017. The training programme were organized in collaboration with Assam State Rural Livelihood Mission Society



Figure 6.42. Skill Development Training on Poultry Farming’ organized by DoEE, AAU, Khanapara

(ASRLMS), Demoria Development Block, Kamrup Metro (Assam). All together 51 educated girls and members of women SHGs of Demoria Block attended the training programme.

Refresher Training Programme of Veterinary Officers on Artificial Insemination

Two Refresher Training programme of Veterinary Officers from various Districts of Arunachal Pradesh on Artificial Insemination (A.I.) in Cattle and Buffalo were organized by the Directorate of Extension Education, Assam Agricultural University, Khanapara in collaboration with Department of Animal Reproduction, Gynaecology and Obstetrics (ARGO), College of Veterinary Science, AAU, Khanapara. These programmes were sponsored by District A.H. & Vety. Officer, East Siang District, Pasighat, Arunachal Pradesh, under NPBB from 4th - 8th September, 2017 and 13th to 22nd November 2017 respectively. A total of 20 (Twenty) Officers from Arunachal Pradesh actively participated in the programme to get the latest technological advancement in the field of A.I.



Figure 6.43. Training Programme of Veterinary Officers on A.I



Figure 6.44. A Group photograph of Dr. R. K. Bora, SES (LPM), DoEE, AAU, Khanapara & Course Director along with trainees of 'Refreshers Training of veterinary officers on A.I. in cattle and Buffalo' organized by DoEE, AAU, Khanapara sponsored by Department of A.H. & Vety. Govt. of Arunachal Pradesh under NPBB on 13th-22nd November, 2017

Training cum Exposure tour of Field Functionaries (Paravets)

For update of professional knowledge and to enhance the skill towards implementation of appropriate technology in Livestock and Poultry sector for the sustainable economic up-liftmen of the rural farmers a series of Training cum Exposure Tour of Field Functionaries (Paravets) were organized by the Directorate of Extension Education, AAU, Khanapara, in collaboration with Department of Animal Husbandry, Livestock, Fisheries and Veterinary Services, Government of Sikkim .

The Directorate of Extension Education, AAU, Khanapara, organized 4 (four) nos. of Training cum Exposure Tour of Field Functionaries (Paravets) of 5 (five) days duration. The first batch training commenced from 08th January to 12th January, 2018. The fourth and final training programme was commenced from 06th to 10th February, 2018. 20 (twenty) Nos. of Paravets participated in each training programme. Thus a total of 80 (eighty) Paravets working under Govt. of Sikkim completed the Training cum Exposure Tour Programme.



Figure 6.45. Training cum Exposure tour of Paravets working under Govt. of Sikkim

Exposure Trip for Progressive Farmers of the State of Sikkim

With an objective of introducing the progressive farmers to the latest techniques, modern package of practices being adopted by scientific modern farmers and other organizations directly engaged in this field of Animal Husbandry & Veterinary., thereby motivating them to implement it, the Directorate of Extension Education, AAU, Khanapara in collaboration with Department of Animal Husbandry,

Livestock, Fisheries and Veterinary Services, Government of Sikkim organized 4 (four) Nos. of Exposure Programmes for the Progressive farmers of the state of Sikkim.

The 5 (five) days Exposure trip of Progressive Farmers commenced w.e.f. 13th to 18th March, 2018, 20 (twenty) Progressive Farmers participated in the first programme. The 2nd Exposure Programme commenced w.e.f. 20th to 24th March, 2018. A total of 40 (forty) Progressive Farmers of which 23 (twenty three) were women participated in the two already completed Exposure Trip programmes. Another 2 (two) Nos of such programme were held on April, 2018. They also visited WAMUL (Purabi Diary), Suimile, Punjabari, Guwahati under this program.



Figure 6.46. Practical class of trainees in 'Exposure Tour of Field Progressive Farmers' at GRS, AAU, Burnihat organized by DoEE, AAU, Khanapara in collaboration with Department of A.H., Livestock, Fisheries, & Vety. Services, Govt. of Sikkim on 13th -17th March, 2018

Goatery Training Programme

The Directorate of Extension Education, AAU, Khanapara, organized a 'training programme on Goatery' in collaboration with Goat Research Station, AAU, Burnihat and sponsored by Srimanta Foundation, Guwahati, Assam at Dergaon and Majuli under Golaghat and Majuli district respectively. The programme was organized from 1st to 2nd February, 2018.



Figure 6.47. Goatery training program

Participation in World Soil Day

The Associate Director of Extension Education, Assam Agricultural University, Khanapara has participated in the farmers meeting on the occasion of 'World Soil Day' organized by KVK, Kamrup at Pubtala Village, Rangia on 5th December, 2017 where in his speech as Guest of honour emphasized on the importance of Soil on human and animal life as well as environment and urged upon the farmers to do everything to protect the soil. The other dignitaries in the dais were the Local MLA, Sri Bhabesh Kalita, Head KVK, Kamrup, Dr. D.N. Kalita, DRDA project Engineer, Ex Principal of local college who also spoke on the occasion.

Exhibitions

The Directorate of Extension Education, Assam Agricultural University, Khanapara, under the banner of Faculty of Veterinary Science, participated in the Exhibition of 'VIBRANT NORTH- EAST- 2017' held at College of Vety. Science playground from 4th to 6th May, 2017. The Exhibition was organized by the Centre for Agricultural and Rural Development (CARD), New Delhi. Attempts were made to highlight and showcase the technologies developed by the University for adoption by the farmers to increase the productivity of Livestock & Poultry based farming. Large number of educated youths & farmers of N.E. States visited the AAU, Exhibition stall.

The 5th Assam International Agri- Horti Show 2018 was held w.e.f. 5th to 7th January, 2018 at Chowkidingi H.S. School playground, Dibrugarh. The Directorate of Extension Education, AAU, Khanapara participated in the exhibition by providing exhibition materials in the AAU Stall. The exhibition was later extended upto 12th January, 2018.

Extension Activities Done by other Departments

6.5.3.1. Department Public Health

- Organized a one-day Small Holder Peri-Urban Dairy Farmers' Meet on Safe Milk Production on 30th October, 2017.

6.5.3.2 Department of Extension Education

- Three Participatory extension activity (PRA) at Domoria Development Block on 18th March, 2018 at Budabasti, at Alenga Village on 25th March, 2018 and at Domora Pathar on 29th March, 2018

- Annual Village Extension Camp on 30th March, 2018
- Capacity building of the farmers of model adopted village of Pyranga cluster villages Collaborative Programme with IIE Guwahati .Inputs were also distributed among the farmers of culster villages.5 skill development training organized. 22 nos. of cross bred piglets and 250 nos. of dual purpose poultry were distributed among the beneficiaries.
- 21 Capacity building training were organized under “Assam Project on Forest and Biodiversity Conservation(APFBC)” with IIE Guwahati and input distribution to the farmers of different EDC and JFMC of Dima-Hasao,Tinsukia and Kokrajhar. 600 nos. of quality piglets were distributed among the beneficiaries.
- Farmers’ awareness programme on “Balanced Nutrition for Optimizing Reproduction in Dairy cattle” at Pathali Pahar, North Lakhimpur on the 25th November, 2017
- A discussion programme on “*Gai Gorur Krittim Projonanaru Gorbhadharonar Samasya*”, broadcast through All India Radio Centre, Nagaon on the 15th September, 2017.
- Pregnancy diagnosis on mare, 4th Assam Police Battalion, Kahilipara on the 30th July, 2017
- Use of Homeopathic medicine for addressing reproductive disorders at T.V.C.C., CVSc., A.A.U., Khanapara under ISSAR Knowledge sharing Plateform(Assam Chapter) on the 18th July, 2017
- Phone-in Live programme, telecast on “*Krishi Darshan*” through Doordarshan Kendra, Guwahati on the 13th July, 2017
- SSB Para-vet Training on “Artificial Insemination in cattle” at ALDA, Khanapara on the 26th June, 3rd and 15th July, 2017
- Phone-in Live programme, broadcast on “*Khetir Diha*” through All India Radio, Nagaon on the 29th June, 2017
- Farmers’ awareness programme on “Scientific rearing of farm animals” at Siajuli, North Lakhimpur on the 26th June, 2017
- Farmers’ training on “Scientific rearing of dairy cattle” at DVO, Morigaon on 31st May, 2017
- Phone-in Live telecast programme through Doordarshan Kendra, Guwahati on “*Krishi Darshan*” on the 19th April, 2017
- Investigation and therapeutic management of infertility problems in Dairy cattle at Lattakujan, Golaghat District from the 5th to the 7th May, 2017

6.5.3.3 Department of Veterinary Physiology

The faculty members of the Department of Veterinary Physiology, C.V.Sc., AAU, Khanapara organized day long practical training on hematology of fish to the students of College of Fishery Science, AAU, Raha on 8th to 9th May, 2017.

6.5.3.4 Department of Animal Reproduction, Gynecology and Obstetrics

- A total of 35 artificial Insemination was done in different rural area using crossbred Hampshire boar semen preserved at 15^oC
- Treatment cum vaccination camp at Alenga, Borkuchi and Domorapathar Villages of Dimoria Development Block, Kamrup Distric Assam on the 30th march, 2018
- Application of Colour Doppler in Veterinary Diagnostic with special reference to Animal Reproduction under ISSAR Knowledge sharing Plateform (Assam Chapter) on the 26th February, 2018

6.5.3.5 Department Preventive Medicine

Extension events organized by the Department of Preventive Medicine, College of Veterinary Sciences, Khanapara are detailed in the table below:

| Particulars of Event/ Type of extension work | Date, Venue | Organizer | Salient points of the extension event |
|---|---|---|---|
| Elephant health camp. | 01.04.2017. to 02.04.2017. Nameri National Park | DBT- Project, Dept. of Preventive Medicine, CVSc., A.A.U., Khanapara. | Health check up has been done in 20 nos elephants of forest department and treated against various diseases. |
| Elephant health camp. | 22.04.2017. to 23.04.2017. Manas National Park | DBT- Project, Dept. of Preventive Medicine, CVSc., A.A.U., Khanapara. | Health check up has been done in 27 nos elephants of forest department and treated against various diseases. |
| Elephant health camp. | 28.04.2017. to 30.04.2017. Kaziranga National Park | DBT- Project, Dept. of Preventive Medicine, CVSc., A.A.U., Khanapara. | Health check up has been done in 30 nos elephants of forest department and treated against various diseases. |
| As Resource Person in the Extension Training Programme for farmers. | 20.07.2017. NIRD PR, Govt. of India, Guwahati. | NIRD PR, Govt. of India, Guwahati. | About 35 farmers from Garo Hills district of Meghalaya were participated in the training Programme. |
| Animal treatment camp. | 23.08.2017. to 26.08.2017. Pathsala | Dept. of Clinical Medicine, CVSc., A.A.U., Khanapara. | About 600 livestock and poultry from Pathsala area under Barpeta district were treated against various diseases. Vitamins and mineral mixtures were provided to all the animals in the affected areas. |
| As Resource Person in the VERU Block Course Training Programme for 5 th Year students. | 26.08.2017. Dept. of Vety. Medicine | Dept. of Vety. Clinical Medicine, CVSc., AAU, Khanapara. | 5 th Year students of B.V.Sc. & A. H. From CVSc., Khanapara were participated in the training Programme. |
| Animal treatment camp. | 27.08.2017. | VERU, CVSc., A.A.U., Khanapara. | About 700 livestock and poultry from flood affected areas of Morigaon district were treated against various diseases. Vitamins and mineral mixtures were provided to all the animals in the affected areas. |
| As Resource Person in the Extension Training Programme for farmers. | 07.09.2017. NIRD PR, Govt. of India, Guwahati. | NIRD PR, Govt. of India, Guwahati. | About 35 farmers from East Khasi Hills district of Meghalaya were participated in the training Programme. |
| Elephant health camp. | 28.10.2017. to 29.10.2017. Kaziranga National Park | Dept. of Preventive Medicine, CVSc., A.A.U., Khanapara. | Health check up has been done in 22 nos of elephants of CWRC Bokakhat, and treated against various diseases. |

| Particulars of Event/ Type of extension work | Date, Venue | Organizer | Salient points of the extension event |
|---|---|---|---|
| Elephant health camp. | 06.11.2017. to 07.11.2017. Kaziranga National Park | DBT- Project, Dept. of Preventive Medicine, CVSc., A.A.U., Khanapara. | Treatment of two nos of elephant calves rescued from flood affected areas by CWRC, Bokakhat suffering from EEHV and both the calves recovered from the disease. These are the 1 st two cases completely recovered after treatment. |
| Elephant health camp. | 12.12.2017. Kaziranga National Park | DBT- Project, Dept. of Preventive Medicine, CVSc., A.A.U., Khanapara. | Treatment of a sub adult elephant of forest dept suffering from EEHV. |
| As Judge in Goat Rally cum Exhibition. | 20.02.2018. Nahira, Kamrup. | Goat Research Station, Byrnihat, AAU. | About 200 goats were judged for evaluation of best animal in the rally. |
| Animal treatment cum vaccination camp. | 20.03.2018. | Dept. of Extension Education, CVSc., A.A.U., Khanapara. | About 800 livestock and poultry from Sonapur area under Kamrup district were treated against various diseases. Vitamins and mineral mixtures were provided to all the animals in the affected areas. |
| Animal treatment cum vaccination camp. | 30.03.2018. | Dept. of Extension Education, CVSc., A.A.U., Khanapara. | About 800 livestock and poultry from Dimoria block under Kamrup district were treated against various diseases. Vitamins and mineral mixtures were provided to all the animals in the affected areas. |

7. Developmental Activities

The Developmental Activities continued in the University during 2017-18 with the support from ICAR and other agencies. Some of the important activities carried out during the year with the support mostly from ICAR are as follows:

1. College of Agriculture/ Community Science, Jorhat

➤ Rupees 20 Lakhs & above

- Construction of Farm Office Building of Animal Husbandry and Dairy.
- Construction of Poultry Shed for 3000 Layers at Poultry Farm.
- Construction of Duckery Unit for Adult Duck at Poultry Farm.
- Construction of Golden Jubilee gate of AAU, cost Rupees above 28 lakhs.
- Construction of Girls Hostel (No. 14) at Jorhat

➤ Rupees 5 Lakhs & above

- Providing Irrigation Facility to the AHD Farm.
- Renovation of old Pig Sty at Dairy Farm.
- Construction of Duckery unit for Duckling at Poultry farm.
- Repair and Renovation of Burn No-3 at Cattle Farm.
- Repairing and renovation of calving shed.
- Providing Water Supply to the Calving shed at AHD Farm.

2. Biswanath College of Agriculture, Biswanath Chariali

➤ Rupees 50 Lakhs & above

- Construction of Canteen cum Indoor Stadium (ongoing).
- Development of Administrative building with class rooms.
- Development of Library building,
- Strengthening and Renovation of old Boundary wall (ongoing).

5. College of Fisheries, Raha

➤ Rupees 50 Lakh & above

- Installation of Solar Panel for Power generations.
- Installation of Central Water Filtration Unit.
- Construction of Experimental Cemented Cistern.
- Partial construction of Hostel and Academic buildings of the college.

6. SCS College of Agriculture, Dhuburi

- Construction of Badminton Court for girls.
- Construction of Volley ball Court for girls.
- Construction of Badminton Court for boys.
- Construction of Volley ball Court for boys.
- Construction of a Dairy Unit.
- Construction of a Poultry Unit.
- Construction of Recreation Facilities for students.
- Construction of First Floor of Boy's Hostel.
- Construction of Guest House.
- Construction of Boys and Girls Hostel.

7. College of Horticulture, Nalbari

- Construction of Administrative building
- Construction of Academic building
- Construction of two hostels (Boys' and Girls') (ongoing).

8. College of Veterinary Science Khanapara, Guwahati

➤ Rupees 50 Lakhs & above

- Construction of Guest House cum Agri-Business Centre
- Construction of ADMaC-DBT building
- Grade IV Staff quarters
- Construction of EEI Building

9. Lakhimpur College of Veterinary Science, Joyhing

➤ Rupees 50 Lakhs and above

- Construction of Girls Hostel
- Construction of 3Storied Staff Quarter
- Construction of Teaching Veterinary Clinic Complex



Figure 7.1. The new Girls Hostel (Hostel Number 14) in Jorhat



Figure 7.2. The new Animal Husbandry Office in Jorhat



Figure 7.3. Guest House at SCS College of Agriculture



Figure 7.4. Ongoing construction work of Girls Hostel at SCS College of Agriculture



Figure 7.5. Boys Hostel at SCS College of Agriculture



Figure 7.6. ADMaC-DBT Building at AAU, Khanapara



Figure 7.7. Grade IV Staff Quarter at AAU, Khanapara



Figure 7.8. Construction of 3 Storied Staff Quarter at LCVSC, Joyhing

Figure 7.9. Academic Building of College of Fisharies, Raha

8. Visit of Dignitaries

Altogether, 66 dignitaries visited different Colleges and Research Centres, both inside and outside of the headquarters of Assam Agricultural University in 2017-18. The details of their visits are given below:

College of Agriculture, Jorhat

- Dr. D. Subrahmaniam, Principal Scientist, IIRR, Hyderabad, visited Department of Crop Physiology,
- Dr. M.B. Chetti, ADG, HRD, ICAR, Delhi, visited the Departments of Agricultural Biotechnology and Crop Physiology on the 3rd March, 2018
- Dr. S. Jhambulkar, SO/G, BRNS, BARC, visited the Department of Crop Physiology on 28th March, 2018.
- Dr. P.K. Chakrabarty, ADG (PP & Biosafety) visited the Department of Entomology.
- Chief Scientist, LRS, Mandira, Gauhati; Dean, CVSc, AAU visited the Department of Animal Husbandry & Dairying.
- Ms. Bismita Gogoi, Ex-minister, Govt. of Assam, visited the Animal Husbandry & Dairying, Khanapara.
- Dr. Guruprasad, Scientist, Entomology and Mr. Umashankar H.G., Jr. Entomologist, University of Agricultural Sciences, Bangalore visited the College of Sericulture, on 11th April, 2017
- Mr. Saidul Islam along with three teachers and a team of 85 students of Springdale High School, Jorhat visited the College of Sericulture, on 8th May, 2017.
- Sophie Noone, R. EmnotBremov, Debbie Calderon and Nelson Marques of USA visited the College of Sericulture on 8th August, 2017.
- Dr. A. Paul and Prof. J. K. Tamuly along with B.Sc. VI semester students of Biswanath College, Biswanath Chariali visited the College of Sericulture on 19th February, 2018.
- Dr. Satyanshu Kumar, Professor, ICAR-Directorate of Medicinal and Aromatic plants Research, Boriavi, Anand, Gujrat visited the Department of Horticulture.
- Dr. Vijay Kumar Kuvundlika, Assistant Professor (SST), visited the Department of Plant Breeding & Genetics.
- Dr. Vinod J. Dhole, visited the Department of Plant Breeding & Genetics.
- Dr. B. K. Das, Scientific Officer (G), visited the Department of Plant Breeding & Genetics.
- The Research Group Leader of Mutation Breeding Section, NABID, BARC, Mumbai-85, visited Plant Breeding & Genetics, on 30th November, 2017.
- Dr. S.J. Jambhulkar, Scientist, BARC, Trombay, Mumbai, visited Plant Breeding & Genetics on 22nd December, 2017.
- Dr. Suman Bakshi, Scientist, BARC, Trombay, Mumbai, visited Plant Breeding & Genetics, on 22nd December, 2017.
- Professor Jagdish Mukhi, Hon'ble Governor of Assam, visited the Assam Agricultural University, on 14th November, 2017.
- Ms. Nidhi Satija, Deputy Director, DAC & FW, DES, MOA & FW, GOI, visited the Department of Tea Husbandry & Technology, on 28th October, 2017.
- Mr. Joginder Rathe, Assistant Director, DAC, FW, DES, MOA & FW, GOI, visited the Department of Tea Husbandry & Technology.
- Mr. Vijay Kumar, Senior Statistical Officer, DAC & FW, DES, MOA & FW, GOI, visited the Department of Tea Husbandry & Technology.



Figure 8.1. The Hon'ble Governor, Assam, Prof J.Mukhi visited AAU on 14th November, 2017

- Mr. D.C.Joshi, DEO, DAC & FW,DES,MOA& FW, GOI, visited the Department of Tea Husbandry & Technology.
- Dr. Sanjib Bhuyan, Associate Professor, Institutional Programme, Rutgers University, New Jersey, United States acted as a Prof. in charge of Summer Study Abroad Course on Tea Production entitled 'Farm to Cup' for students of Rutgers University, New Jersey, US for a period of 21 days organized by the Dept. of Tea Husbandry & Technology, AAU, June, 2017.
- Professor Ratan Kumar Saha, School of Computing Science, Kaziranga University, Jorhat visited the Department of Tea Husbandry & Technology, on 14th December, 2017.
- Anjulo P Fernandes, Assistant Project Office, DRDA, Margaon, Goa, visited the Department of Tea Husbandry & Technology on 22nd March, 2018.
- Dr.BhanuProvaSaikia, Associate Professor, leading his team of students from Moran College visited the Department of Tea Husbandry & Technology, on 29th March, 2018.
- Dr. Sorina S. Popescu, visiting scientist from Mississippi State University, USA, delivered a talk on the topic, "Signal transduction in plant stress – perception and response to pathogens and environmental stress in model and crop systems", and visited the Department of Agricultural Biotechnology, on 13th December, 2017.
- Dr Ranjan Tamuli from IIT, Guwahati, delivered a talk on the topic "Life and Works of Late Prof Lalji Singh" and visited the Department of Agricultural Biotechnology, on 3rd February, 2018.

RARS, Diphu

- Hon'ble EM(Agriculture) Sri Amar Sing Tisso, KAAC, KAAC, Diphu, visited RARS, Diphu on 4th August, 2017.
- Dr Numal Momin, Hon'ble MLA Bokajan, visited RARS, Diphu on 10th August, 2017.

College of Veterinary Science, Khanapara

- Dr. G. K. Pundir, ICAR, NBAGR, Karnal, visited the Department of Animal Genetics & Breeding on 07-04-2017.
- Dr. J. S. Arora, School of Animal Biotechnology, GODVASU, Ludhiana visited the Department of Animal Genetics & Breeding on 01st November, 2017.



Figure 8.2. Hon'ble EM (Agriculture) Sri Amar Sing Tisso, KAAC, KAAC, Diphu, visiting the direct seeded rice field of RARS, Diphu



Figure 8.3. Hon'ble MLA Bokajan, Dr. Numal Momin visiting the Campus of RARS, Diphu

- Dr. Uday Kumar Mahanta, Associate Professor & Chairman, Department of Microbiology & Parasitology, Sher-e-Bangla Agricultural University, Dhaka-1207 visited the Department of Animal Genetics & Breeding on 12th December, 2017.
- Dr. Candido Pomar, Swine Nutritionist, Agriculture and Agri. Food, Canada visited the Department of Animal Nutrition on 2nd August, 2017.
- Dr. Nomal Chandra Bora, CMD, GNRC Guwahati, visited the Department of Animal Nutrition, on 17th February, 2018.
- Dr. S. D. Kharche, Principal scientist, APR Division, ICAR, CIRG, Makhdoom, Mathura-281122 (UP) visited the Department of Animal Genetics & Breeding on 02nd January, 2018.
- Dr. P. K. Senapati, Professor, Department of Animal Genetics & Breeding, WBUAFS, Kolkata-37 visited the Department of Animal Genetics & Breeding on 15th February, 2018.
- Dr. Arjava Sharma, Director, NBAGR, Karnal-132001 (Haryana) visited the Department of Animal Genetics & Breeding on 28th February, 2018
- Dr. G. K. Gaur, Principal scientist & I/C LPM, IVRI, Izatnagar visited the Department of Animal Genetics & Breeding on 15th March, 2018.
- Dr. H. Rahman, Regional Representative for South Asia, ILRI, New Delhi visited the Department of Animal Genetics & Breeding on 16th March, 2018.

College of Community Science, AAU, Jorhat

- Dr. T. Mahapatra Secretary, DARE & Director General, ICAR, visited Faculty of Community Science on 25th April, 2017.

- Dr. P.S. Pandey, Assistant Director General (EP & HS), ICAR, New Delhi, visited Faculty of Community Science on 25th April, 2017.
- Dr. C. D. Mayee, ASRB, Ex-Chairman, visited Faculty of Community Science on 16th Feb, 2018.
- Dr. A. N. Mukhopadhyay, Ex-vice chancellor, AAU, Jorhat, visited Faculty of Community Science on 18th Feb, 2018.



Figure 8.4. Mr. Ram Muivah, IAS, Secretary of North Eastern Council graced the inaugural ceremony of the annual meeting of the Nutritional Society of India, held in AAU

College of Fisheries, Roha, Nagaon

- Prof. Kandarpa K Deka, Hon'ble Vice-Chancellor, Mahapurush Srimanta Sankardeva University, Nagaon, Assam visited the CFSc on 30th November, 2017.



Figure 8.5. Hon'ble Governor of Assam, Prof J Mukhi visiting the facilities in the Fishery Research Centre, Jorhat

- Dr. Abani Bhagawati, Professor, Dept. of Geography, Gauhati University, Assam visited the CFSc on 27th October, 2017.

Fishery Research Centre, Jorhat

- His Excellency, The Hon'ble Governor of Assam, Prof. Jagdish Mukhi along with Hon'ble Vice Chancellor, AAU & other dignitaries visited the Fishery Research Centre, Jorhat on 14th November, 2017.

SCS College of Agriculture, Dhubri

- Dr. D.K. Bora, Dean, FA, AAU, Jorhat and Dr. Chandan Hazarika, DPGS, AAU, Jorhat visited SCSCA on the occasion of Foundation day.
- Dr. D. N. Dutta, Ex. Dean, FA, AAU Jorhat, and Dr. M. K. Mohan, Ex. Chief Scientist, HRS, Kahikuchi also visited SCSCA, Dhubri on its foundation day.
- Dr. R. N. Goswami, Dean, Faculty of Veterinary, AAU, Khanapara, visited SCSCA, Dhubri on the occasion of Freshman Social
- Dr. H.C. Bhattacharya, DEE, AAU, Jorhat, and Dr. A.K. Chakraborty, DR (Vety.) AAU, Khanapara visited in SCSCA, Dhubri on 24th March, 2018 on the occasion of a state level seminar.
- Dr. H. C. Bhattacharya, DEE, AAU, Jorhat, Dr. G. N. Hazarika, DR (Agri), AAU, Jorhat, Dr. S. K. Paul, Chief Scientist, RARS, Gossaigaon, Kokrajhar and Dr. R. Bordoloi, Principal Scientist, ICAR, ATARI, Guwahati visited SCSCS, Dhubri on 11th January, 2018 for the workshop on DACP.

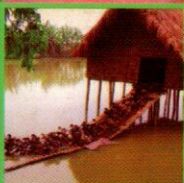


9. Finance

The University received its financial resources from various sources like State Government, ICAR, GOI and internal source of the University. During 2017-18 financial year, the University received an amount of Rs. **46910.09 lacs** from these sources of which around 56 per cent was received under Plan head and the rest under Non-plan head. State Government contributed the maximum (around 70 per cent) to this fund followed by ICAR and others (Table 9.1).

Table 9.1. Receipt of fund (in Lacs) by Assam Agricultural University during 2017-18.

| Receipt | State | ICAR | GOI | Internal Receipt | Total (Rupees in Lacs) |
|-------------------------|--------------|-------------|------------|-------------------------|-------------------------------|
| Non-Plan | 26400.00 | - | - | - | 26400.00 |
| Plan | 6200.00 | 9625.18 | 3359.91 | - | 19185.09 |
| Internal Receipt | - | - | - | 1325.00 | 1325.00 |
| Total | 32600.00 | 9625.18 | 3359.91 | 1325.00 | 46910.09 |



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