I am happy to place before the reader; the Annual Report of the Assam Agricultural University for the year 2016-17. The year is another successful year achieving excellence in its mandated areas of teaching, research and Extension. During the year, 973 students were enrolled and 624 passed out (551 & 372 in Agriculture; 290 &159 in Veterinary; 93 &69 in Community Science and 39 &24 in Fishery Science respectively) which were 14 and 11 per cent higher than those of 2015-16. Besides, number of students qualified for NET (133) and SRF (51) during the year also increased substantially over those of previous year. The implementation of new UG Course curricula as per ICAR 5th Deans’ Committee recommendation in all the constituent colleges of the University (except Veterinary colleges); provision of Brave Fellowship to students (4) under Erasmus Mundus Collaborative Programme of European Commission; continuation of Student Exchange Programme with Cornell University of USA; exposing of large number of faculties (266) to latest training programmes across reputed national institutions; 1237 diverse publications and awards and recognitions to many teachers and students in their respective field of specialization were some of the other significant academic activities of the University during the year.

Striving efforts are being continued in the University to emulate research excellence. A total of 241 externally funded projects; Best Award to Jorhat Centre of (i) ICAR Seed Project (ii) AICRP on Agrometeorology (iii) AICRP on Honey Bees and Pollinators and (iv) AICRP-MSPE in Crop Science; release of a pig variety, HD-K 75 (with 75% genetic material from Hampshire and 25 % from Deshi pig) , registration of ‘Doom pig’ a native breed of Assam, filing of two patents and development of breed descriptors of some indigenous cattle, buffalo, goat, duck and chicken in Veterinary Science and transfer of technology for commercial production of fish feed SUSHAMA to Guwahati based firm in Fishery Science are few significant research achievements during the year. Besides, AAU developed Olitorious Jute Variety (TARUN) has been registered under PPV&FRA Act 2001; capsularies Jute variety NCJ 28-10 (Kkhyati) has been recommended for notification and release for the country and a sugarcane variety ‘Doiyang’ has been already notified by the Central Subcommittee on Crop Standards, Notification and Release of Varieties for Agricultural Crops for its release in NE region. Apart from these, seven rice varieties were accepted for notification by the Central Sub-committee over and above 7 more rice varieties, 1 pulse variety (SGC16) and one jute variety (NCJ-7) have been recommended by the State Subcommittee for notification by the Central Subcommittee. In addition, development of a technology for preparation of rice beer (ready for commercialization), an endophytic bioformulation enhancing rice seedling vigour, pigeon pea lines expressing Cry@Ab gene for Helicoverpa resistance, an in vitro regeneration system in groundnut, transgenic chickpea lines expressing a full length version of Cry 1 Ac gene and reconstructed chloroplast targeted Cry2Aa gene construct are some other frontline biotechnological research programs being carried out by the University during the year.

Farmer centric need based training and capacity building activities along with the advance technical exposure to state department technical personnel as well as SMS of the KVks are being emphatically carried out during the year through a strong extension network of KVks, constituent colleges and regional research stations besides Directorate of Extension Education, Extension Education Institute and ATIC in the headquarter. To be specific, 1434 farmer trainings (on/off farm), 444 FLD & 328 OFTs covering a total of 44618 farmers were carried out by the KVks alone in addition to those undertaken by the constituent colleges, RARS and other agencies of the University’s extension wing. Apart from these, there were a sizeable number of farm publication (33), farmers’ visit to ATIC (5310), Radio & TV Programme (126), Phone in Programme (94), Farmers Fair, Exhibition etc., all of which acted towards bringing excellence in transferring university developed technology and thereby benefit the farming community. Organization of a massive awareness programme on ‘Pradhan Mantri Fasal Bima Yojona’ across 23 KVks for sensitizing the state’s farmers about the Crop Insurance Scheme and Implementation of ICAR ‘Pulse Seed Hub’ programme in 5 KVks of the University for pulse seed production in order to make the state self sufficient in pulses are other major policy intervention during the year.
The aforesaid teaching, research, extension and other associated activities of the University during the year are the results of the determined enthusiasm and commitments of teachers, scientists, students, statutory officers, staff and above all the institutional leadership of the University. I am very much thankful to all of them.

I am also grateful to Govt. of Assam, ICAR, Govt. of India and other agencies for their financial and technical support to the University. I keep on record my sincere thanks to the national, international, non-governmental and private organizations that have been partners in our progress.

I express my appreciation to the in-charge Planning & Monitoring Unit and the editorial team for their efforts in compiling, editing and presenting this report in its present form.

( K. M. Bujarbaruah )
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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 (Fig.1.1). 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 will power and dedication to service of Bharat Ratna Late Gopinath Bordoloi, the first Chief Minister of Assam. Both the Colleges were affiliated to Gauhati University and then to Dibrugarh University before the Assam Agricultural University came into being embracing both the colleges.

**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.**

![Fig. 1.1 New Administrative Building](image-url)
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 per cent + 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
- Provide quality education and training in the areas of agriculture and allied sciences.
- Undertake basic, applied and adaptive research relevant to the needs of the farmers and entrepreneurs of Assam.
- 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
- 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 four Faculties in the fields of Agriculture, Veterinary, Community Science and Fishery 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.
Fig. 1.2 Organizational structure of Assam Agricultural University, Jorhat

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

2.1 Institute Level Award

2.1.1 Best Centre Award for ICAR Seed Project to Assam Agricultural University

The University has been adjudged as the ‘Best Centre’ of the ICAR Seed Project - ‘Seed Production in Agricultural Crops’ for the year 2015-16 among 39 Agricultural Universities associated with the project. Dr. Prasanna Kumar Pathak, Associate Director of Research and also Nodal Officer of the project at AAU received the ‘Best Centre Award’ from Dr. Mangala Rai, Vice-Chancellor, GB Pant University of Agriculture & Technology (GBPUA&T), Pantnagar and Dr. J. S. Sandhu, Deputy Director General (Crop Science), ICAR on August 18, 2016 on the occasion of XI Annual Review Meeting of ICAR Seed Project held at GBPUA&T on August 17-18, 2016 (Fig.2.1). In the recent years, the AAU has demonstrated its capability to produce large quantity of quality seeds of the major crop varieties. The Technology Showcasing Programme conceived by the Honourable Vice-Chancellor, Dr. K. M. Bujarbaruah and launched in 2010 at his instance has led to significant change in the AAU’s seed production scenario which has allowed in one hand to demonstrate to the farmers the worth of improved crop varieties and technologies in very large compact block and on the other produce large quantity of quality seeds in the farmers’ fields with their active participation helping the farmers produce and trade seeds keeping in desired quality standards, learn better crop husbandry and seed production technology, and most importantly facilitating very quick dissemination of new varieties, Dr. Prasanna Pathak stated. Dr. Pathak also added that the works and achievements in relation to quantum of seed production, farmers’ capacity building, technology demonstration, popularization of new varieties with their seed production and dissemination, timely reporting of technical and financial developments have made AAU the ‘Best Centre’ among all the universities involved with the project.

2.1.2 KVK, Jorhat bagged the “Pandit Deendayal Upadhyay Rashtriya Krishi Vigyan Protshahan Puraskar, 2016”

Krishi Vigyan Kendra, Jorhat, Assam Agricultural University, Jorhat bagged the “Pandit Deendayal Upadhyay Rashtriya Krishi Vigyan Protshahan Puraskar, 2016” of Indian Council of Agricultural Research, Ministry of Agriculture & Farmers Welfare, Govt. of India. The award was received by Dr. Rupam Borgohain, Programme Coordinator, Krishi Vigyan Kendra, Jorhat from Honourable Minister of Agriculture & Farmers Welfare, Government of India, Sri Radha Mohan Singh on the occasion of Krishi Unnati Mela held on March 15 at New Delhi (Fig.2.2). The award contains certificate of appreciation and Rs. 2.00 lakh.
2, 25,000.00 for development of Krishi Vigyan Kendra, Jorhat. The works carried out by KVK, Jorhat are instrumental in reaching the unreach farmers and benefit them with technology injected agricultural practices besides placing the KVK as ‘one stop information and technology hub’ for the farmers and agricultural technology seekers.

2.1.3 Best Centre Award to AICRPAM, Jorhat

Jorhat centre of “All India Coordinated Research Project on Agrometeorology (AICRPAM) “was adjudged the Best Centre for dissemination of agromet advisory services for the year 2015-16. Dr. Bondita Goswami, Asst. Professor, Dept. of Agrometeorology and PI of the project received the Award from Dr. Vijay Kumar, Project Coordinator, AICRP on Agrometeorology in the XIV Biennial Workshop of AICRP on Agrometeorology held during December 5-7, 2016 in Punjab Agricultural University, Ludhiana (Fig.2.3).

2.1.4 Best Research Work Award to AICRP on Honey Bees and Pollinators, Assam Agricultural University, Jorhat

The “Best Research Work” award has been conferred to the AICRP on Honey bees and Pollinators, Assam Agricultural University, Jorhat ( amongst the 28 centres of the country) for the years 2014-15 and 2015-16 in the biennial group meeting of the ICAR All India Co-ordinated Research Project on Honey bees and Pollinators held at the Dr. Y.S. Parmar University of Horticulture & Forestry, Solan, Himachal Pradesh, India from October 14-16, 2016. Dr. A. Rahman, PI on behalf of the AICRP on Honey bees and Pollinators, AAU, Jorhat centre, received the award on Oct. 16, 2016 from Dr. H.C. Sharma, Hon’ble Vice Chancellor of the said University (Fig.2.4). The award is recognition to the commendable works done on apiculture in the areas of research as well as extension.

2.1.5 “Doom” Assam’s Native Pig Registered as Breed

‘Doom’, a native variety of pig of Assam, has been registered as a breed with accession number ‘INDIA_PIG_0200_DOOM_09006’ by the Breed Registration Committee of the Indian Council of Agricultural Research (ICAR), New Delhi (Fig.2.5). The ‘Doom’ pig is the first livestock of Assam ever registered as a breed. The registration certificate of the breed of pig was presented to Dr. Galib Uz Zaman and Dr. Subimal Laskar, both professors from the Dept. of Animal Genetics and Breeding, College of Veterinary Science, AAU, Khanapara, by Dr. Trilochan Mohapatra, Secretary of Dept. of Agricultural Research & Education (DARE) and Director General of ICAR, at a function held on Aug. 23, 2016 at Krishi Bhawan, New Delhi (Fig.2.6).

The ‘Doom’ pig is a native variety of pig found in pure form in its breeding tract in Dhubri, Bongaigaon.
and some parts of Kokrajhar district. This breed is adapted to a special management system called migratory scavenging system with minimum input from the economically backward people whose main vocation is pig rearing. They are larger in size as compared to other indigenous pigs of North East region and the meat of ‘Doom’ pig is lean and palatable. The breed has a small population and there is a need to make efforts for its conservation. The data required for registration of this breed was generated from the project “Conservation of Doom Pig” funded by Ministry of Agriculture, Department of Animal Husbandry, Dairying & Fisheries, GoI in operation at Livestock Research Station, AAU, Mandira.

2.1.6 Outstanding Centre Award for AICRP-MSPE Project to AAU

Jorhat Centre under All India Coordinated Research project on “Micro and secondary nutrients and pollutant elements in soils and plants (AICRP-MSPE), AAU was adjudged as the Outstanding AICRP-MSPE Centre at 28th National Workshop & Interface Meeting held on Mar. 21-23, 2017, Bhopal. The award was given to Jorhat Centre for its outstanding contributions in research activities in the field of delineation of micro and secondary nutrients status in soils of Assam, development of technologies for amelioration of micro and secondary nutrients, establishment of critical limit of zinc, boron and sulphur in soils and plants and different activities for improvement of crop production for management of secondary and micronutrients for tribal farmers under Tribal-Sub Plan(Fig.2.6).

2.1.7 AAU bagged Best Centre award at IIT, Guwahati

Assam Agricultural University (AAU) bagged the ‘Best Centre’ award at Research Conclave, IIT, Guwahati (IITG) that was held during March 16-19, 2017. The students of AAU received the award from Dr. Gautam Biswas, Director, IITG on behalf of the University (Fig.2.7). Research Conclave is organized under the banner of Students Academic Board (SAB) of IITG and its main objective is to nurture the young minds towards research, innovation and entrepreneurship. Apart from winning the best centre award, Udit Nandan Mishra, Ranima Mishra, Priyam Sharma, Pompi Deka, Murchana Malakar, Pallavi Devi, Afsana Rehman, Gargee Baruah, Panthoi Changtham and Dr. Rinumoni Buragohain of Assam Agricultural University were adjudged for the best poster awards among 400 participants in the category of Life sciences and Social Sciences. About 500 students from different institutions like JNU, IITG, JB College, Students from Bhutan participated in the Research Conclave. The winners of the ‘Best Poster’ awards received certificates along with cash prizes and trophies. Among many universities of the country, AAU was selected as best centre due to its excellent research activities.

Fig.2.6: Dr Galib Uz Zaman and Dr Subimal Laskar, Dept. of AGB, CVSc., AAU, Khanapara received the registration certificate of the Doom breed of pig.

Fig.2.7: Dr. Anjali Basumatary, PI, received the Outstanding Centre Award for AICRP-MSPE Project to AAU, Jorhat

Fig.2.8: Students of AAU after receiving the ‘Best Centre’ award at Research Conclave, IIT, Guwahati (IITG)
research and scientific quality and structure of the presentations.

2.1.8 GI tag for Joha Rice of Assam

The Trademarks and Geographical Indication (GI) Authority, Govt. of India has awarded the GI tag for Joha rice of Assam under The Geographical Indications of Goods (Registration and Protection) Act, 1999. Assam Agricultural University, Jorhat facilitated this registration process and the application was filed by Seuj Saritha, an NGO of Sivasagar district. This is the first time that the State has received GI registration for rice varieties. The GI registry has approved 43 different varieties of Joha rice.

2.2 Award/Recognition to Teachers/Scientists and Students

2.2.1 Agriculture

- Dr. Sunayana Rathi, Assistant Professor, Dept. of Biochemistry and Agril. Chemistry, CA, Jorhat received Erasmus Mundus BRAVE Fellowship, 2016 for 8 months. Presently she is at Martin Luther University, Leibniz Institute of Plant Biochemistry, Halle (Saale), Germany.
- Dr. Runima Sarmah, Professor, Dept. of Biochemistry and Agril. Chemistry, CA, Jorhat received “Reviewer Excellence Award”, Indian Journal of Agricultural Research, Legume Research- An International Journal
- Dr. Tamizuddin Ahmed, Chief scientist , RARS, Titabor ; Dr Palash Deb Nath, Professor, Dept. of Plant Pathology, College of Agriculture, Jorhat and Dr. Rupam Borgohain, Programme Coordinator, KVK Jorhat were honoured with the ‘Best Research Scientist’; ‘Best Teacher’ and ‘Best Extension Scientist’ Award respectively for the year 2016 from the Faculty of Agriculture respectively in the 48th Foundation Day of AAU held on April 1, 2016. Dr. K. M. Bujarbaruah presented the award (Fig.2.9). The awards are due recognition to their outstanding contribution in their respective fields.
- Dr. P. Dutta , Asst. Professor, Plant Pathology Dept., CA, Jorhat was invited for lead speaker on “ Nanotechnological approaches for plant health management” at a symposium on Plant Health Management in North East India held on Jan. 15-16, 2016 at ICAR Research Complex for NEH Region, Umium, Meghalaya. Dr. Dutta was also invited for a lead paper on “Nanocentric plant health management with special reference to Silver” authored by P. Dutta, P. Kaman, K. C. Puzari and A. Bhattacharyya in ISMPP 38th Annual Conference and National Symposium 2016 held on November 24-26, 2016 at BCKV, Kalyani.
- Dr. M. Borah, Asst. Professor, Dept. of Plant Pathology, College of Agriculture, Jorhat was given “Best Oral Presentation Award” under the theme “Nano and biotechnological approaches for plant disease diagnosis and management” in the NE Zonal meeting of Indian Phytopathological Society held on Nov.4-5,2016 at AAU, Jorhat. Dr. Borah was also nominated for competition in the “Guman Devi Memorial Best Woman Scientist for the year 2016” from the Indian Society of Mycology and Plant Pathology.
- Mr. Sundar Barman, Asst. Professor, Dept. of Extension Education, CA, Jorhat was conferred upon the “Best Extension Professional Award-2017” for outstanding contribution in the discipline of Extension Education by the Society of Extension Education, Agra in its 8th National Extension Education Conference.

Fig.2.9: (A) Best Research Scientist Award to Dr. Tamizuddin Ahmed, Chief Scientist, RARS, Titabor; (B) Best Teacher Award to Dr. Palash Dev Nath, Professor, Dept. of Plant Pathology, CA, Jorhat and (C) Best Extension Scientist Award to Dr. Rupam Borgohai, Programme Coordinator, KVK, Jorhat for the year 2016 from Faculty of Agriculture by Dr. K.M. Bujarbaruah, VC, AAU in the 48th Foundation Day of the University.

- Dr. Kalyan Pathak (Principal Scientist), Dr. Abhijit Sarma (Professor) and Pompy Deka (Student) of the Dept. of Agronomy, College of Agriculture, Jorhat received the “Best Poster Award” in the 1st Asian Conference on ‘Water and Land Management for Food and Livelihood Security’ (WLMFLS-2017) organized by IGKV, Raipur and Soil Conservation Society of India, New Delhi during January 20-22, 2017 at Raipur.

- Dr. R. M. Karmakar, Professor & Head, Department of Soil Science, CA, Jorhat was selected as Editor, Journal of the Indian Society of Soil Science, New Delhi.

- Dr. K. N. Das, Professor, Department of Soil Science, CA, Jorhat was conferred with the Fellow of Indian Society of Agricultural Biochemist (F.I.S.A.B), Kanpur on December 6, 2016 at AAU, Annand, Gujrat.

- Dr. Niloy Borah, Professor, Department of Soil Science, College of Horticulture, Nalbari conferred with the Fellow of Indian Society of Agricultural Biochemist (F.I.S.A.B), Kanpur on December 6, 2016 at AAU, Annand, Gujrat. Dr. Borah was also honoured with the “Leadership Award 2016” by Soil Conservation Society of India, New Delhi.

- Dr. Devajit Bhattacharyya, Professor, Department of Soil Science, CA, Jorhat was nominated as a Member of the Academic Council of Gauhati University for a period of 3 years.

- Dr. S. C. Barua, Prof. & Head, Dept. of Tea Husbandry & Technology, CA, Jorhat was selected as the Member of Board of Management under AICTE-NSQF at HRH the Prince of Wales Institute of Engineering & Technology, Jorhat.

- Dr. P. Das, Professor & Head, Department of Nematology, CA, Jorhat was selected as the member of the Selection Committee for the post of Principal Scientist under ASRB, ICAR, New Delhi.

- Dr. Gitanjali Devi, Junior Scientist, AICRP on Nematodes, Dept. of Nematology, CA, Jorhat received the consolation prize for the “Best Paper Presentation Award”. The paper entitled, ‘Rearing of entomopathogenic nematodes in termite (Odontotermes obsesus, Ramb.)’ was presented in the National Symposium on Climate Smart Agriculture for Nematode Management, held at ICAR-Central Coastal Agricultural Research Institute, Ela, Old Goa, India from Jan.11-13, 2017.

- Best Poster Presentation Award was received by S. Alam, B. Gogoi, P.K. Borthakur, P.Kalita and P.Dutta in the National Conference on Tropical Tuber Crops for the Sustenance and Welfare of Tribal Communities held at CTCTR, Trivandrum on Oct.20-22, 2016. The title of the Poster was “Convenience food from Nal Kachu (Colocasia antiquorum var stolinefera) and locally available fruits.”

- Dr. Nandita Baruah, Assist. Professor, Dept. of Soil Science, B.N. College of Agriculture, Biswanath Chariali was awarded the “Student Incentive Award, 2016” by Soil Conservation Society of India, New Delhi for her Ph.D work which was carried out under the guidance of Dr. Binoy Kr. Medhi, Professor, Department of Soil Science, AAU, Jorhat.

- Dr. R N Barman, Professor, Dept. of Agril Economics and Farm Management, Biswanath College of Agriculture was awarded the ‘Dr. N. A. Mujumdar Prize Award’ for ‘Best Paper Presentation’ in the 76th Annual Conference of Indian Society of Agricultural Economics.

- Dr. B.K. Sharmah, National Professor and Director, DBT-AAU Centre was selected as the Member in (i) Screening Committee for NER Twining R&D programme, DBT, Govt of India, since January 2016 (ii) Expert Committee for NER Twining R&D programme, DBT, Govt of India since Feb., 2016 (ii) Screening Committee DBT-UExcell programme since Sept., 2016 (iv) Task Force (DBT-Agricultural Biotechnology), since Dec., 2016 (v) Expert Committee, DBT-Banana (NER) since Jan., 2017 (vi) Scientific Advisory Committee of the Tea Research Association for the term 2016-2019 (vii) Board of Post Graduate Studies in Life Science & Bioinformatics, Assam University, Silchar for the period 2017 – 2020. Dr. Sharmah also received recognition from the Dept. of Science and Technology, Govt of Assam in Biotech Conclave, 2017 organized by Biotech Park, Assam for preparing draft Biotech Policy of Assam besides getting selection as DBT nominee for IIT, Guwahati for the 2nd time since Jan., 2017

- Dr. B.K. Sarmah, Director, DBT-AAU Centre was invited to deliver a talk on “Transgenic chickpeas”
in the annual meeting for the Chickpea Innovation Laboratory held in the campus of Ege University, Izmir, Turkey during May 30 to June 2, 2016. Dr. Sarmah was also invited to participate in the workshop ‘GM Crops in India- Way Forward’ organized by the ICAR, New Delhi on May 17, 2016.

- Dr. Priyadarshini Bhorali, Assistant Professor, Dept. of Agricultural Biotechnology, AAU, has bagged the ‘Norman E. Borlaug International Agricultural Science and Technology Fellowship (Borlaug Fellowship) 2016’. She is currently pursuing her research under the mentorship of Dr. Sorina C. Popescu, faculty at the Department of Biochemistry, Molecular Biology, Plant Pathology and Entomology at Mississippi State University, USA.

- Four students viz., Geetimollika Hazarika, Ananya Barua, Ricky Raj Paswan and Mausumi Hazarika from the Dept. of Agril. Biotechnology have bagged the prestigious BRAVE fellowship under the Erasmus Mundus programme for their Masters’ research work at various universities of Europe in the current semester.

- Afrina Ara Ahmed, Pranab Dutta and others received Prof K S Bilgrami Paper Presentation Award (3rd) for the paper entitled “Efficacy of Metarhizium anisopliae against termite in tea ecosystem” at 38th Annual conference and national symposium organized by Indian Society of Mycology and Plant Pathology, Udaipur and Bidhan Chandra Krishi Viswavidyalaya (BCKV) at BCKV, Mohanpur (Nadia), West Bengal on Nov.24-26, 2016.

- Pranjal Kaman was nominated for “Prof M J Narashimham Award” to contest at national level for the paper on “Biosynthesis of silver nano particle and its effect against soil borne pathogens” authored by Pranjal Kaman, Pranab Dutta, S. Rahman and M. R. Das during North East Zonal meeting, Indian Phytopathological Society, and National Seminar on “Facilitating a shift from chemocentric to organic mode of plant health management in the North East, held on Nov. 04-06, 2016 at AAU, Jorhat.

- Himadri Kaushik was nominated for American Phytopathological Society Travel Grant from North East Zone to contest at national level for the paper on “Chemical approach of synthesizing ZnO nanopowder and studies on its antifungal activity and plant growth promotion” authored by Himadri Kaushik and Pranab Dutta, during North East Zonal meeting, Indian Phytopathological Society, and National Seminar on “Facilitating a shift from chemocentric to organic mode of plant health management in the North East, held on Nov. 04-06, 2016 at AAU, Jorhat.

2.2.2 Veterinary

- ‘Best Teacher’ to Dr. Probodh Borah, Professor & Head, Dept. of Vety. Biotechnology, CVSc., Khanapara and ‘Best Research Scientist’ to Dr. Niranjan Kalita, Professor and Head, Dept. of Poultry Science, CVSc., Khanapara for the year 2016 from Veterinary Faculty were awarded for their outstanding contribution in teaching and research by Dr. K.M. Bujabarauha, VC, AAU in the 48th Foundation Day of the University held on April. 1, 2016 in Jorhat Campus (Fig.2.10)

- Dr. Probodh Borah, Professor & Head, Dept. of Vety. Biotechnology, CVSc., Khanapara was appointed as a (i) Member of the Task Force for ‘Research Resources, Service Facilities and Platforms’ and DBT-BUILDER Programme’ (2017-19) of DBT, Govt. of India and (ii) Member of the Core Committee and Chairman of the Animal Biotechnology Subcommittee constituted by DBT, Govt. of India for ‘Course Curriculum Revision Exercise of Post-graduate Programmes in Biotechnology.

**Fig.2.10:** Dr. Probodh Borah, Prof. & Head, Vety. Biotechnology and Dr. Niranjan Kalita, Prof. and Head, Dept. of Poultry Science, both from CVSc., Khanapara received the ‘Best Teacher” and ‘ Best Research Scientist’ Award in the Faculty of Veterinary Science for the year 2016 in the 48th Foundation Day of the University held on April. 1, 2016 in Jorhat Campus.
Dr. Borah, also acted as a (i) member of the Committee constituted by Department of Science & Technology (DST), Govt. of India to review the progress of the projects entitled “Socio-economic upliftment of farmers through Mithun based farming” implemented at NRC, Mithun, Medziphema, Dimapur and Nagaland State S & T Council, Kohima, Nagaland in September, 2016. (ii) Member of the Expert Committee constituted by DBT, Govt. of India for the 2nd Review cum Mentoring Meeting of Coordinators of the BLiSS programme of DBT held on November 3-4, 2016 at GP Women’s College, Imphal, Manipur (iii). Chairman of the Site Visit Committee constituted by DBT, Govt. of India for evaluation of implementation of DBT-BUILDER grant at Barkatulla University, Bhopal (visited on March 10, 2017) (iv) Chairman of two Technical Sessions during the 57th Annual Conference of Association of Microbiologists of India held at Gauhati University, Guwahati from 24-27 November, 2016. Dr. Bora was also invited to deliver the Key Note Address on ‘Application of Bioinformatics in Epidemiology and Control of Infectious Diseases’ in the National Workshop on Bioinformatics and Computational Biology held at Chittagong, Bangladesh from December 18-21, 2016. Dr. Borah has also been nominated as a Member of the Core Committee and Chairman of the Animal Biotechnology Subcommittee constituted by DBT, Govt. of India for ‘Course Curriculum Revision Exercise of Post-graduate Programmes in Biotechnology” in July, 2016. He also attended the WHO Workshop on animal biotechnology held at Thammasat University, Rangsit Campus, Thailand from April 4-8, 2016.

- Dr. Anil Deka, Assistant Professor, Dept. of Anatomy, CVSc, Khanapara received the Young Scientist Award of Indian Association of Veterinary Anatomist (IAVA) in its XXXI Annual Convention and National Symposium. Besides, Dr. Deka was also honoured with the Best Assistant Professor Award in Veterinary Science for the year 2016 from Pearl Foundation – A Foundation for educational Excellence.

- Dr. Snehangsu Sinha, Teaching Associate, Department of Anatomy, CVSc, Khanapara received “Excellent Professional Achievement Award”, 2016 in Professional Awards and Honors’ organized by Society of Professional Engineers (SPE) in Association with Indian Society of Medical Science, Madras. Dr. Sinha was also enlisted in “Marquis Who’s Who in the World”, 2016 (33rd Edition). Besides, Bharat Gaurav Award” was also conferred upon Dr. Sinha by India International Friendship Society, Delhi.

- Dr. Dulal Chandra Roy, Professor cum PI, Dept. of Pharmacology & Toxicology, CVSc, AAU, Khanapara was conferred Bharat Jyoti Award-2016 on Aug. 13, 2016 at India International Centre, New Delhi for meritorious services, outstanding performance and remarkable role in advancement of Science at a Seminar cum Award function organized by India International Friendship Society (IIFS). Dr. Roy was also conferred the Award for ‘Research Excellence-2016’ on Sept. 13, 2016 at the Indo-American Education Summit 2016 organized by the Indus Foundation, New Jersey, USA at Taj Vivanta Ambassador, New Delhi for his creative expression and outstanding contribution to the knowledge in advancement of scientific research.

- Dr. Sarojini Mahanta Tamuli, Professor, Dept. of Pathology, CVSc, Khanapara had been conferred upon “ICVP –DIPLOMAT” award of certificate in the XXXIII Annual Conference of Indian Association of Veterinary Pathologists and National Symposium held on Nov.9-11, 2016 at Durgh, Chattichgarh.

- Dr. B.N. Saikia, Professor & Head, Dept. of Animal Nutrition was honoured with “Fellow of Animal Nutrition Association (FANA)” in the IX Biennial Animal Nutrition Association Conference. Dr. Saikia also got the “Best Poster Award” in the said conference.

- Dr. L C. Lahon, Professor & Head, Dept. of Pharmacology & Toxicology was selected as the “Fellow of Indian Society of Veterinary Pharmacology & Toxicology (ISVPT)”.

- The “Fellow of Indian Society of Veterinary Pharmacology & Toxicology (ISVPT)” was conferred upon Dr Chandana Choudhury Barua, Professor, Dept. of Pharmacology & Toxicology. Dr Barua was also awarded the Best local chapter of Society for Ethno pharmacology (SFE), India as local coordinator.

- Dr. B. C. Deka, Professor & Head, Dept. of ARGO was honoured with “Dr. A.S. Kaikini Award of ISSAR-2016” by the Indian Society for the “Study of Animal Reproduction (ISSAR)”.
2.2.3 Community Science

- Dr. Satvinder Kaur, Dean, Faculty of Community Science was invited by Dibrugarh University to visit Digboi Mahila Mahavidyalaya for inspection of the College for possibility of opening P.G. programme. Besides, she was also invited to attend (i) Executive Committee Meeting of Community Science Association of India at M.S. University of Baroda, Vadodara, Gujarat (ii) Board of Studies Meeting at the College of Community Science, Tura as member (iii) a meeting at New Delhi to modify score card and guidelines of CAS of CAU, Imphal; (iv) a meeting at Lakhimpur Girls College, North Lakhimpur as member of P.G. Advisory Board.

- Ms. Asfeeka Islam, Ph.D student of the Department of Food Science and Nutrition, College of Community Science, AAU was awarded “Student of the Year Award 2016” for outstanding contribution on Empowerment of youth in Agriculture on all India nomination basis by ICAR, UASR, and AIASA.

- Dr. Mridula Saikia Baruah, Associate Professor, Dept. of Food Science and Nutrition, received the “Best Poster Presentation” Award under the Plant Genetic Resources session in the 1st International Agro-biodiversity Congress (IAC2016) held on November 6-9, 2016 at NAAS Complex, New Delhi. Besides, Dr. Baruah is also nominated as Fellow of the Indian Society of Agricultural Biochemists (FISAB) in a meeting held at Anand Agricultural University, Gujrat during December 6-8, 2016.

- Dr. Sayanika Borah, Assistant professor, Dept. of Extension and Communication Management, Faculty of Community Science received the ‘Best Participant Award’ in the Summer School on “New age extension strategy for communication proficiency and managerial skill for extension professionals: Concept, Approach, Methodology and Application” at the Department of Agricultural Extension, BCKV, West Bengal, (2016).

- Dr Juri Baruah, Professor, Dept. of Human Development & Family Studies delivered lectures on “Teaching beyond books” and “Know your Learners” in the Teachers workshop in Oil Shikshya Ratna Award ceremony organized by ILFS in Oil India Limited, Duliajan on March 21 and September 22, 2016 respectively. She also delivered another lecture on “Identification and Early Intervention of Disability” in the occasion of 59th International day of Deaf organized at Jorhat on Sep. 24, 2016.

2.2.4 Fisheries.

- Dr. Bibha Chetia Borah, Principal Scientist, Fishery Research Centre, AAU, Jorhat was recognized as Ph.D. guide under (i) West Bengal university of Fisheries and Animal Science (ii) ICAR-Central Institute of Fisheries Education, Mumbai.
3. Important Events

3.1 20th Convocation of AAU held

20th convocation of AAU was held at Dr. M. C. Das Memorial Auditorium on Feb. 28, 2017 (Fig.3.1). Altogether 676 graduates and postgraduates received their degrees and as many as 30 students received gold medals and cash prizes for their academic proficiencies. Dr. K. M. Bujarbaruah, Hon’ble Vice-Chancellor of AAU, in his welcome address said, “Convocation is a very special occasion for a university, more so for a premier university like AAU which has been producing quality human resources in the field of agriculture and allied sciences not only for the service of the north-eastern region but also for the nation as a whole. Addressing the students, teachers, researchers and other staff of the University, HE the Governor of Assam and the Chancellor of the University Sjt. Banwarilal Purohit and the Director General of ICAR, Dr. Trilochan Mahapatra said that this esteemed institution of the north-eastern region had already set outstanding records in agricultural research and education for larger benefits of the farming community of the country. Eminent space scientist, Dr. J. N. Goswami; Director General of the New Delhi-based Borlaug Institute for South Asia Dr. H. S. Gupta; eminent veterinary scientist and former Professor of College of Veterinary Science Dr. C. K. Rajkonwar were conferred with DSc degrees (Honoris Causa). Gold medals and cash prizes were awarded to 30 students for their proficiency in different academic programmes including B. Sc. (Agriculture), B Sc in Veterinary Science and animal husbandry, BFSc, BSc (Horticulture) and in subjects like Entomology, Food Science and Nutrition. The coveted AAU gold medals were received by Pratiksha Baishya and Bandana Saikia in BSc (Agri) course for the academic year 2015 and 2016 respectively while Vishal Rai was conferred with the University gold medal for his proficiency in BVSc and Animal Husbandry programme (Fig.3.2).

3.2 48th Foundation Day of AAU, Jorhat Observed

The 48th Foundation Day of Assam Agricultural University was observed on April 1, 2016. In a graceful function presided over by the Hon’ble Vice-Chancellor Dr. K. M. Bujarbaruah, the Foundation Day Lecture was delivered by Dr. Sunil Roy, Hon’ble Vice-Chancellor, Kaziranga University, Jorhat. Speaking on agricultural development of the state, Dr. Roy stated that besides producing human resource, the AAU plays a very important role in contributing towards technology generation and dissemination for the farming community of the state as well as the region. Dr. Bujarbaruah, in his address, thanked the University community for their support and efforts in bringing about the positive changes in the University and giving it a respectable status among the agricultural universities of the country (Fig.3.3). Special importance would be given to pulses production in the
state through the KVKs under AAU, and awareness among farmers would be created on Pradhan Mantri Fasal Bima Yojana and Soil Health Card, he added. As a part of the ceremony, the best teachers of the year Dr. Polash Debnath and Dr. Probodh Borah; the best research scientists Dr. Tamizuddin Ahmed and Dr. Niranjan Kalita from the Faculties of Agriculture and Veterinary Science respectively and the best extension scientist Dr. Rupam Borgohain were awarded. The Dharmananda Das Memorial Award for best graduate in the Department of Tea Husbandry & Technology was given away to Ms. Tusi Chakma (Fig.3.4). The other programmes of the Day included a friendly volleyball match and a colorful cultural evening.

3.3 Awareness Programme on Pradhan Mantri Fasal Bima Yojana

Awareness programmes on Pradhan Mantri Fasal Bima Yojana (PMFBY) were organized by 23 KVKs under Assam Agricultural University during May-June, 2016 to sensitize the farmers of the state about the crop insurance scheme. The programmes were organized following the directive of ICAR, with the cooperation of line Departments of Govt. of Assam. Honourable Members of Parliament of the respective Lok Sabha Constituencies and MLAs of the local Legislative Constituencies attended the programmes as Chief Guests and Guests of Honour respectively (Fig.3.5, Fig.3.6 & Fig.3.7). The hon’ble Vice-Chancellor of AAU, Dr. K.M. Bujarbaruah attended the programmes at KVKs of the districts of Jorhat, Sivasagar, Kamrup, Dibrugarh and Golaghat. Dr.B.C. Deka, Director, ATARI, Zone-III, Umiam and Dr. H. C. Bhattacharyya, Director of Extension Education, AAU, other statutory officers of the University, officials from line departments, bank and insurance sectors were present in these programmes. In his address, the Hon’ble Vice-Chancellor highlighted the merits of the Yojana and emphasized on involvement of every farmer for its effective adoption. Soil Health Cards were also distributed among farmers (Fig.3.6).
Farmers’ Fair and Farmer-Scientist Interaction Programmes were also held as part of the programme.

3.4 **Hon’ble Chief Minister of Assam visited AAU, Jorhat**

The Hon’ble Chief Minister of Assam, Sri Sarbananda Sonowal was felicitated in a gorgeous function organized in the Dr. M.C. Das Memorial Auditorium of AAU, Jorhat on Sep. 6, 2016 (Fig.3.8). The other dignitaries present in the function were the Hon’ble Agriculture Minister of Assam Sri Atul Bora; Satradhikar of Auniati Satra of Majuli, Sjt. Pitambar Dev Goswami; Sri Bhabendra Nath Bharali, MLA, Dergaon Constituency; Sri Tapan Goswami, MLA, Sonari Mahmara Constituency; Sri Jogen Gogoi, MLA, Mahmara Constituency and Sri Hrishikesh Goswami, Press Adviser to the Chief Minister, Assam. Addressing the faculty and students of the University, the Hon’ble Chief Minister lauded the University for its achievements and appealed to the University community to lead the state towards development in the agriculture sector. He also urged that the University should put all out effort to materialize the dream of Hon’ble Prime Minister Narendra Modi of transforming the entire North East to a hub of organic agriculture. Earlier, in the welcome address, the Hon’ble Vice Chancellor of AAU, Dr. K.M. Bujarbaruah briefly presented the contribution of the University towards the development of agriculture and allied sectors in the state. Sri Atul Bora, Agriculture Minister, Assam, in his address, assured that the Department of Agriculture will work hand in hand with AAU in the endeavor of agricultural upliftment of the state.

3.5 **Union Minister for Agriculture and Farmers’ Welfare at AAU, Khanapara**

Union Minister for Agriculture and Farmers’ Welfare Sjt. Radha Mohan Singh along with Sjt. Atul Bora, Minister of Agriculture, Veterinary etc., Govt. of Assam visited College of Veterinary Science, AAU, Khanapara campus along with Dr. T. Mohapatra, Secretary DARE and DG, ICAR for a state level review meeting on agricultural progress on June 17, 2016 at the conference room of CVSc, Khanapara, Guwahati (Fig.3.9). The Meeting was also attended by Hon’ble V.C., CAU, Dr. M. P. Singh; Agriculture Production Commissioner, Govt. of Assam and dignitaries of ICAR and AAU. Later in the evening both the ministers addressed the faculty and students of the College of Veterinary Science, AAU, Khanapara in its Auditorium.

3.6 **Agriculture Minister of Assam visited AAU, Jorhat**

Hon’ble Agriculture Minister, Govt. of Assam Sjt. Atul Bora visited Assam Agricultural University, Jorhat.
for the first time on June 17, 2016. Addressing scientists of the University after inaugurating the state-of-the-art Plant Pathology department-cum-administration building in the University campus (Fig.3.10), Bora said making the state self-sufficient in seeds would help make them available to farmers on time and that the state would help in the University’s efforts to do so. Hon’ble Vice Chancellor of AAU, Dr. K. M. Bujarbaruaah said that the University would make the state self sufficient in seed production within three years if the state government provided adequate help. “The government has to ensure convergence of different departments like agriculture, soil conservation, irrigation and PWD for the development of agriculture here,” he said. “Moreover, the government must form an agriculture cabinet and a farmers’ commission for development of farmers,” he further added. Smti. Renupoma Rajkhowa, MLA, Teok and Sri Bhaben Bharali, MLA, Dergaon also visited the University along with Sjt. Bora. Later, Sjt. Bora laid the foundation of a boys’ hostel in the University campus.

3.7 Governor of Assam and Nagaland visited KVK, Karimganj

His Excellency the Governor of Assam and Nagaland, Shri P. B. Acharya visited KVK, Karimganj under AAU on July 2, 2016 (Fig.3.11). The Governor took part in a tree plantation programme in the KVK campus as a part of Vana Mahotsav week. Thereafter, he had an interaction with the Programme Coordinator and scientists of the KVK and released the fourth edition of the KVK Karimganj Newsletter. Towards the end of the programme, the Governor visited the Demonstration Units and lauded the success of Vanaraja poultry in the KVK as well as in farmers’ fields of Karimganj district.

3.8 DBT’s Task Force Meeting on Aquaculture & Marine Biotechnology

The 5th Meeting of the Task Force on Aquaculture and Marine Biotechnology, Department of Biotechnology, Ministry of Science & Technology, Govt. of India, was organized at Fisheries Research Centre (FRC), Assam Agricultural University (AAU), Jorhat on July14-15, 2016 (Fig.3.12). The meeting was chaired by Dr. Dilip Kumar, former Director, CIFE, Mumbai and co-chaired by Dr. Iddya Karuna Sagar.
former FAO Fellow. Prominent personalities like Dr. A.S. Ninawe, Advisor, DBT; Dr. W.S. Lakra, former Director, CIFE, Mumbai; Dr. Sudhir Raizada, ADG (Inland Fishery), ICAR, New Delhi and others participated. A total of 36 projects were discussed in the meeting. On the closing day, a plantation programme was organized in the premises of the new building of FRC, AAU, wherein all the members of the DBT’s task force took part.

3.9 MOU Signing Ceremony for Commercial Production of Fish Feed 'Sushama' & NEC Funded project ‘Pig Farming through Promotion of Farmer Producer Organization’

Two MoU’s were signed on August 30, 2016 at Faculty of Veterinary Science, Assam Agricultural University, Khanapara, in a ceremony presided over by Dr K M Bujarbaruah, Hon’ble VC, AAU, in presence of Sjt. C. K. Das (IAS, Retd) Member, NEC, GOI cum Director, Department of Fisheries, Govt of Assam and hosts of other dignitaries of AAU, Jorhat and Khanapara campus, members of Mothonga Agro Producer Company Ltd and M/S SDB Agrochem, Guwahati (Fig.3.13, Fig.3.14 & Fig.3.15). One MoU signed was for commercial production of a fish feed SUSHAMA developed by Fisheries Research Centre, AAU, Jorhat. Sushama- the AAU fish feed is an outcome of a research project conducted at Fisheries Research Centre, Assam Agricultural University & funded by World Bank under ARIASP during 1997-2003. The feed has been popular among the fish farmers of the state of Assam and some neighbouring state. M/S SDB Agrochem Sikaria Complex, Christian Basti, G.S. Road, Guwahati had taken up the venture for commercial production of this popular fish feed. The other MoU was for a NEC funded project ‘Pig Farming through Promotion of Farmer Producer Organization at Tamulpur subdivision of Baksa District implemented by AAU & Mothonga Agro Producer Company Ltd, NCL Complex, Bareigaon, Tamulpur, Baksa (BTAD), Assam under PPP mode. Dr Apurba Chakraborty, Director of Research (Vety) signed both the MoU on behalf of AAU. Dr K M Bujarbaruah, Hon’ble Vice Chancellor, Assam Agricultural University in his illuminating speech highlighted the achievements of AAU and requested the Government agencies to help the entrepreneur so that the youth and farmers of the State get benefited by the technologies available in the University and the same is percolated down to the farmers. Sjt C K Das, (IAS, Retd) Member, NEC, GOI highlighted the food production scenario of the country especially in NER region and urged upon the scientists to take measures for producing more food including meat and fish. He assured the required support from NEC in this sector. Dr Bibha Chetia Bora briefed about the development of the fish feed. Sri Anil Baro, Chairman, Mothonga
Agro Producer Company Ltd thanked the AAU and NEC for the support.

3.10 Foundation Stone Laying Ceremony for the NEC funded project

The foundation stone laying Ceremony for the NEC funded project ‘Pig Farming through Promotion of Farmer Producer Organization (FPO)’ was held on Sep. 27, 2016 at Khandikar, Baska. Dr. K.M. Bujarbaruah, Hon’ble Vice Chancellor, AAU was the Chief Guest of the ceremony. The foundation stone for the base breeding farm & office complex was laid in presence of Shri Ram Muivah, IAS, Secretary, North Eastern Council Secretariat, Nogrim Hills, Shillong, Meghalaya; Sjt. S. N. Brahma Choudhury, Economic Advisor (Retd), Ministry of DoNER; Dr Apurba Chakra borty, Director of Research (Vety); PC, officers and staff of KVK Baska; District Veterinary officers and bank officials. More than 200 beneficiaries and farmers attended the ceremony. In his illuminating speech Dr K M Bujarbaruah, Hon’ble Vice Chancellor, Assam Agricultural University has urged upon all stakeholders to work sincerely to make this project success (Fig.3.16). It is worth mentioning that this is the first project supported by NEC under PPP mode. Shri Ram Muivah, IAS, Secretary, NEC assured more support in this sector especially to AAU.

3.11 Brain Storm on “Innovative Interventions and Effective Disease Management in Duck”

A Brain Storm Session on “Innovative Interventions and Effective Disease Management in Duck” under DBT’s Programme for the NE was organized jointly by the Department of Biotechnology, Govt. of India and Directorate of Research (Vety) at AAU, Khanapara campus w.e.f. July 26-27, 2016. Dr. K.M. Bujarbaruah, Hon’ble Vice-Chancellor, AAU chaired the session. Dr. T Madan Mohan, Adviser DBT; Dr. Lalkrishna ADG (Retd) ICAR, now advisor DBT; Dr Pabawn Sharma, Advisor DBT; Dr. J. M. Kataria, Director, CARI, Izatnagar and hosts of experts from reputed and renowned institutes from all over India attended the sessions (Fig.3.17). The faculties from FVSc, AAU, Khanapara also took part in the deliberation. All issues pertaining to duck, that covered management, health, nutrition and biotechnological tool to improve the duckery sector of entire country were discussed in detail. Based on the outcome of the session the DBT invited proposals for developing the duckery sector of the country with special emphasis to North Eastern Region.

3.12 4th Certificate Course on Tea Completed

The Department of Tea Husbandry & Technology has successfully conducted the 4th Certificate Course on ‘Tea Production Technology & Management’ of six months duration starting from Nov. 1, 2015 to April 30, 2016 (Fig. 3.18). The objective of this course is to help the unemployed youth to develop skill on various aspects of tea cultivation with hands on training both
at the tea garden and factory of the University. A total of 23 students successfully completed the course and were awarded certificates from the University at a valedictory function held on May 30, 2016 in the august presence of Dr. G.N. Hazarika, DR (Agri); Dr. C. Hazarika, Director of Post Graduate Studies; Dr. R. K. Saud, Associate Director of Extension Education (P&I), AAU, Jorhat and the faculty members of the department.

3.13 Brain Storm Session on ‘Problems and Prospects of Banana in North East India’

A brain storm session on ‘Problems and Prospects of Banana in North East India’ was organized at AAU, Jorhat under the sponsorship of Dept. of Biotechnology, Govt. of India during June 2-3, 2016. Dr. Ashok Bhattacharyya, the Organizing Secretary of the session welcomed the house. Dr. G. N. Hazarika, DR (Agri.), AAU, Jorhat, in his introductory remarks requested the house to work in a collaborative mode to address need based issues of the region. In a video conference, Dr. T. Madhan Mohan, Advisor to DBT, Govt. of India offered vote of thanks and urged the house to work on development of some varieties of banana that are rich in Vitamin A and other nutrients.

3.14 Veterinary Council of India Inspected C.V.Sc., AAU, Khanapara

Expert team of Veterinary Council of India inspected CVSc., AAU Khanapara from June 23-25, 2016. The team comprised of Dr. A.K. Ishwar, Chairman, Dr. J. D. Ghosh and Dr. P.K. Pati as members. On June 23, 2016, they were briefed by the Dean FVSc. in presence of officers and HoDs about teaching, research and extension activities of the College (Fig.3.20). Later on they visited all the departments and other establishments to assess CVSc. as per VCI norms.

3.15 Training on “Advanced Methods for Molecular Typing of Microbes”

A short-term hands-on training programme on “Advanced Methods for Molecular Typing of Microbes” was conducted by the DBT-funded State Level Biotech Hub of College of Veterinary Science,
Assam Agricultural University, Khanapara, Guwahati from May 9-13, 2016. A total of 10 selected research scholars and faculty members from different parts of the North-Eastern Region participated in the training programme. Dr. N. Senthil Kumar, Prof. & Head, Dept. of Biotechnology, Mizoram University and Dr. Pranab Goswami, Professor, Dept. of Bioscience & Bioengineering, IIT, Guwahati acted as the resource persons for the training programme. Dr. Probodh Borah, Coordinator, State Biotech Hub and Prof. & Head, Dept. of Animal Biotechnology, conducted the training programme as the Course Director (Fig.3.21).

3.16 69th Foundation Day of College of Agriculture, Jorhat Celebrated

College of Agriculture, Jorhat celebrated its 69th Foundation Day on August 16, 2016 with a colourful cultural procession by the students which was flagged off by Hon’ble Vice Chancellor Dr. K. M. Bujarbaruah (Fig.3.22). This was followed by flag hoisting by Dr. D. K. Bora, Dean, College of Agriculture and Swahid Tarpan by the faculties present. Thereafter, Hon’ble Vice Chancellor delivered a short and impressive speech to the students, teachers and employees. An exhibition and a cultural function were also organized to commemorate the Foundation Day.

3.17 14th Group Meeting of AINP on Agricultural Acarology

The Fourteenth Biennial Group Meeting of All India Network Project on Agricultural Acarology was held in the Department of Entomology, Assam Agricultural University, Jorhat during April 21-23, 2016. In the meeting the Hon’ble Vice-Chancellor of the University Dr. K.M. Bujarbaruah addressed the gathering as chief guest. About twenty five acarologists from different institutions throughout the country attended and discussed the progress report of last two years and formulated technical programme for next two years. Dr. N. Srinivasa, the Project Coordinator presented the research activities of the project carried out throughout the country. Dr. G.N. Hazarika, Director of Research (Agri) highlighted the research achievements of AAU, Jorhat centre. The participating scientists appreciated the organizers for holding the meet in a befitting manner. Dr. Sahidur Rahman, Principal Scientist and Principal Investigator of the project was the Organizing Secretary of the meeting (Fig.3.23).

3.18 Orientation Workshop on Teaching Technology

An Orientation Workshop on Teaching Technology was held at AAU, Jorhat campus on July 7-9, 2016 (Fig.3.24). The workshop organized by the Dean,
Faculty of Agriculture was attended by 50 newly recruited faculties from Colleges of Agriculture, Community Science, Sericulture and Horticulture of Jorhat campus. The programme was inaugurated by Dr. D. K. Borah, Dean, Faculty of Agriculture in presence of Dr. (Mrs.) S. Kaur, Dean , Faculty of Community Science; Dr. C. Hazarika, Director of Post Graduate Studies and Dr. B. K. Sarmah, National Professor and Director, AAU-DBT Centre. The inaugural function was attended by the HoDs of the colleges of AAU, Jorhat Campus. In his inaugural speech, Dr. D. K. Borah emphasized on adopting a student centric teaching style to prepare 21st century ready students so that they can be able to cope up with the real challenges. On the second day of the workshop, Hon’ble Vice Chancellor, Dr. K.M. Bujarbaruah addressed the participants throwing lights on various aspects of teaching and learning. While discussing with the participants, the Hon’ble Vice Chancellor urged the participants to well-equip themselves to develop different kinds of graduates for fulfilling the various needs of the society. He too stressed on maintaining the teaching quality by every teacher and making the teaching more interesting for students by using various techniques. The three day workshop was attended by several senior faculty members of AAU, Jorhat as resource persons.

“Agricultural Development in Eastern India & Integrated Farming System for Resource Conservation” for the students and faculty of the College of Agriculture, Assam Agricultural University(AAU), Jorhat (Fig. 3.25). The lecture was the second in a series of lectures in which Dr. Bhatta made an exposition on problems and prospects of Agriculture in Eastern India, emphasizing more particularly the North East.

Earlier in June 2016, the first of the series of lectures on the topic “Relevance of Community Science Education to Address Socio-Economic Issues” was delivered by Dr. Minaxi Pathak, Retd. Dean, Faculty of Community Science, AAU, Jorhat. She highlighted the important socio-economic issues confronting Assam as well as other north eastern states of India which could be effectively addressed by the home scientists of the region. The lecture immensely benefitted the students and teachers of the College (Fig.3.26).

3.19 NAAS Lectures Organized at AAU, Jorhat

On Sep. 2, 2016, Dr. B.P. Bhatt, Director, ICAR Research Complex for Eastern Region (ICAR-RCER), Patna delivered an invited lecture on the topic

3.20 AAU Signed MoU with Bayer Crop Science Ltd

Bayer Crop Science Ltd, Thane, Maharashtra, and Assam Agricultural University, Jorhat signed an MoU
on July 12, 2016 to initiate Bayer Fellowship programme at AAU. Bayer has donated the fellowship funds to AAU for the years 2015 to 2018, as a part of its corporate social responsibility initiatives. Dr. C. Hazarika, Director of Post Graduate Studies, AAU, and Mr. Rajshekhar Sakalkar, Head, Development & Regulatory Affairs, Bayer Crop Science were the signatories of the MoU. Four fellowships, each of Rs. 6,000.00/month for M.Sc. (Agri), and 2 fellowships, each of Rs. 10,000.00/month for Ph.D. degree programme for the academic session 2015-16 were awarded to the students (Fig.3.27).

3.21 Inauguration of Family Counseling Centre

A family counseling centre was established by AICRPCD in collaboration with Sansad Adharsha Gram Yojna (SAGY) on May 8, 2016 in Balijan Shyam Gaon, Mariani. A large crowd from nearby villages attended the inaugural programme. The need of the counselling was explained to the people present there. Dignitaries present were, Dr. G.N. Hazarika, DR (Agri), Assam Agricultural University; Ms. Raushni Aparanjee Karate A.D.C, Jorhat, and Mr. Amit Kumar Khuswaha, Prime Minister Rural Development Fellow.

3.22 ZREAC Meetings Held for Kharif, 2016

The Zonal Research and Extension Advisory Committee meetings of different Agro-climatic Zones of Assam for the Kharif, 2016 season were held during April 21, 2016 to April 30, 2016 as per the schedule given below:

<table>
<thead>
<tr>
<th>Zone Venue</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Brahmaputra Valley Zone</td>
<td>21.04.16</td>
</tr>
<tr>
<td>RARS, Titabar</td>
<td>21.04.16</td>
</tr>
<tr>
<td>Hill Zone RARS, Diphu</td>
<td>22.04.16</td>
</tr>
<tr>
<td>Lower Brahmaputra Valley Zone</td>
<td>23.04.16</td>
</tr>
<tr>
<td>RARS, Gossaigaon</td>
<td>28.04.16</td>
</tr>
<tr>
<td>Central Brahmaputra Valley Zone</td>
<td>29.04.16</td>
</tr>
<tr>
<td>RARS, Shillongani</td>
<td>29.04.16</td>
</tr>
<tr>
<td>Barak Valley Zone RARS, Karimganj</td>
<td>29.04.16</td>
</tr>
<tr>
<td>North Bank Plain Zone RARS, Lakhimpur</td>
<td>30.04.16</td>
</tr>
</tbody>
</table>

3.23 ZREAC Meetings Held for Rabi 2016

The Zonal Research and Extension Advisory Committee meetings of different Agro-climatic Zone of Assam for the Rabi, 2016 season were held during Sept. 20, 2016 to Oct. 6, 2016 as per the schedule given below:

<table>
<thead>
<tr>
<th>Zone Venue</th>
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</tr>
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<tr>
<td>North Bank Plain Zone RARS, Lakhimpur</td>
<td>20.09.16</td>
</tr>
<tr>
<td>Barak Valley Zone RARS, Karimganj</td>
<td>20.09.16</td>
</tr>
<tr>
<td>Hill Zone RARS, Diphu</td>
<td>21.09.16</td>
</tr>
<tr>
<td>Central Brahmaputra Valley Zone</td>
<td>22.09.16</td>
</tr>
<tr>
<td>RARS, Shillongani</td>
<td>23.09.16</td>
</tr>
<tr>
<td>Upper Brahmaputra Valley Zone</td>
<td>27.09.16</td>
</tr>
<tr>
<td>RARS, Titabar</td>
<td>28.09.16</td>
</tr>
<tr>
<td>Lower Brahmaputra Valley Zone</td>
<td>06.10.16</td>
</tr>
<tr>
<td>RARS, Gossaigaon</td>
<td>06.10.16</td>
</tr>
</tbody>
</table>

3.24 Training on Organic Tea Production for Small Tea Growers

Considering the growing demand for organic tea in recent time, the Dept. of Tea Husbandry & Technology organised an institutional training programme on ‘Husbandry Practices and Processing of Organic Tea’ for small tea growers from May 23-28, 2016 (Fig.3.28). During the course of the training

Fig.3.27: Executives of Bayer Crop Science Ltd, Maharashtra, statutory officers and fellowship recipient students of AAU in the MoU signing ceremony

Fig.3.28: A trainee receiving Certificate from Dr. G.N. Hazarika, DR(Agri.), AAU, Jorhat for undergoing training on Organic Tea Production for Small Tea Growers
programme, emphasis was given on establishing market linkage for selling the hand-made organic teas of the trainees in national and international markets. Altogether 28 numbers of small tea growers from different parts of Assam attended the training and were awarded certificates.

3.25 Indoor Stadium at C.VSc. Khanapara Inaugurated

Sjt Atul Bora, Hon’ble Cabinet Minister for Agriculture and Veterinary etc., Govt. of Assam inaugurated the indoor stadium of College of Veterinary Science, Khanapara in presence of Hon’ble Vice Chancellor, AAU, Dr K. M. Bujarbaruah on July 15, 2016 (Fig.3.29). Sjt. Atul Bora, MLA of Dispur Constituency was the guest of honour of the inauguration ceremony. The Agriculture Minister also played badminton with VC and other dignitaries on that occasion.

3.26 Training on Crop Simulation Models

A training programme on Crop Simulation Modelling for Yield Forecasting was organized by the Dept. of Agrometeorology, AAU, Jorhat during June 20-25, 2016. The training was inaugurated by Dr D. K. Borah, Dean, Faculty of Agriculture, AAU, Jorhat (Fig.3.30) and a total of 20 scientists and researcher from various Agricultural Universities and ICAR Research stations of the North Eastern Region of India participated in the training programme. Resource persons from India Meteorological Department, New Delhi, Regional Meteorological Centre, Guwahati and AAU gave extensive hands-on training on crop models. The training was sponsored by the IMD, Ministry of Earth Sciences, Govt. of India, New Delhi.

3.27 Veterinary Faculty Team Visited Flood Affected Areas

Under the aegis of Assam Agricultural University, a team headed by Dr. Apurba Chakraborty, Director Research (Vety) rushed to different flood affected areas of Majuli on August 3, 2016 for animal health relief activities and investigation of the media reported large scale death cases of livestock due to ‘mysterious disease’. The team comprised of Dr. S. K Das, Prof. and Head, Dept. of Microbiology; Dr. S. Islam, Prof., Dept. of Parasitology; Dr. Ditul Barman, Asstt. Prof., Dept. of Veterinary Preventive Medicine and Dr. Pankaj Deka, Asstt. Prof., Dept. of Microbiology. The team visited some river islands (chaporis) and took stock of the situation. Amongst the chaporis, Majuchapori was found worst affected with flood. The team encountered a large number of moribund cattle in this chapori. The team also came to know the acute plant toxicity as the cause of death of livestock from the report of the investigating officers from the North Eastern Regional Disease Diagnostic Laboratory, Guwahati, under the Ministry of Agriculture and Farmer’s Welfare, Govt. of India. Hence, CVSc team along with the scientific staffs from KVK, Titabor, Jorhat, visited the areas and located several distributed patches of Lantana camera, an invasive weed species known for its notoriety as the cause of toxic jaundice, photosensitization, dry gangrene leading to death of animals during the lean period and time of disaster. The team also diagnosed the cause of death of livestock due to consumption of toxic plant Lantana camera by flood affected animals. The team alerted the famers and inhabitants about the ill effects of the plant and advised to exterminate the species from the vicinity of animal. Medicines, anthelmintics and
vitamins were provided to the needy owners for treatment of around 1000 affected animals (Fig.3.31). On August 5, the team visited the periphery of the Kaziranga National Park, Centre for Wildlife Rehabilitation and Conservation (CWRC) at Borjuri, Panbari and supported with veterinary medicines for the rescued orphaned baby rhinos, elephant calves and deer calves. On August 6, the team visited the Rangagora Ghat of Namtemera Village, Golaghat district. A free health camp for the flood affected animals was organized under the aegis of the State Veterinary Hospital located at Badulipara by the visiting scientist of CVSc., Khanapara and Krishi Vigyan Kendra (KV) , Golaghat. A large number of farmers attended the camp. They were distributed with veterinary medicines, health rejuvenators for the flood affected 1000 head of cattle, goat and pigs . Later in a public meeting, the DR (Vety.) addressed the farmers regarding the improved breed programme, local breed conservation, cultivation of flood and disease resistant crop varieties, animal insurance, health management and scientific animal farming etc. The technical staff from the KVK and the state District Veterinary Officer, Golaghat also addressed the villagers on the occasion.

3.28 Release of the Pig Variety Hd- K75

A ceremony was organized on October 14, 2016 at AAU Khanapara to release a synthetic variety of pig developed under All India Co-ordinated Research Project on Pig, Assam Agricultural University, Khanapara. The variety was named as HD-K 75 (Fig.3.32), where “H” signifies 75% Hampshire, “D” signifies Desi (Indigenous) pig of Assam and “K” represents the place of its development ie. Khanapara. Hon’ble Vice-Chancellor, AAU, Dr. K.M.Bujarbaruah presided over the release ceremony. Dr. Habibur Rahman, Deputy Director General (AS), ICAR released the variety (Fig.3.33). Dr. R.S. Gandhi, ADG (AP&B), ICAR; Dr. D. K. Sarma, Director, ICAR-NRC on Pig, Rani; officials from the Department of Animal Husbandry & Veterinary, Govt. of Assam; Dr Apurba Chakraborty, Director of Research (Vety), AAU, Khanapara and hosts of other dignitaries from AAU attended the ceremony. The pig variety with 75% Hampshire and 25% indigenous inheritance (75%H: 25% I) had been stabilized through 16 generations of inter-se mating. Already this pig variety has gained popularity among the farmers of Assam as well as the entire North Eastern Region of India because of its high production potential, consistency in performance and adaptability to the local environment.

3.29 XXXIII Annual Conference of Indian Poultry Science Association (IPSACON 2016) & National Symposium

The Indian Poultry Science Association and the Department of Poultry Science, College of Veterinary Science, AAU, Khanapara organized XXXIII Annual Conference of Indian Poultry Science Association (IPSACON 2016) & National Symposium on November 3-5, 2016 at College of Veterinary Science, Assam Agricultural University, Khanapara. The focal theme of the conference was “Rural poultry for livelihood, Nutritional and Economic Security” which is of utmost importance in the present scenario. This conference was held for the first time in entire N.E region (Fig.3.34), which was attended by 305 numbers
of delegates, 50 numbers of entrepreneurs and more the 150 numbers of non registered students, employees and farmers. His Excellency, the Governor of Assam, Sri Banwarilal Purohit inaugurated the event. Sri Atul Bora, the Minister for Agriculture, Horticulture & Food Processing, Animal Husbandry & Veterinary addressed the gathering on this occasion. Dr. K.M. Bujarbaruah, VC, AAU in his welcome address gave a brief poultry scenario of the country with special emphasis on economic security in rural areas through poultry rearing.

3.30 National Conference on Farmers First for Conserving Soil and Water Resources in North-easter Region (FFCSWR-2017)

The national conference on Farmers First for Conserving Soil and Water Resources in North-easter Region was held from February 9-11, 2017. The open session was inaugurated by Chief Guest Sri Sarbananda Sonowal, Hon’ble Chief Minister, Govt. of Assam in presence of Guest of Honour, Shri Atul Bora, Hon’ble Minister of Agriculture, Govt. of Assam; Shri Naba Kumar Doley, Hon’ble Minister of State for Cultural Affairs, Govt. of Assam. The other dignitaries present were Dr. K.M. Bujarbaruah, Hon’ble Vice Chancellor, Assam Agricultural University, Jorhat and Dr. A.K Singh, Deputy Director General (Agricultural Extension), ICAR, New Delhi. The Conference was organized by Indian Association of Soil and Water Conservationists, Dehradun, Uttarakhand in Collaboration with Assam Agricultural University, Jorhat; ICAR-Indian Institute of Soil and Water Conservation, Dehradun, Uttarakhand; Indian Association of Hill Farming, Umroi Road, Umiam, Meghalaya and Soil Conservation Department, Govt. of Assam.

In his inaugural address, the Hon’ble Chief Minister said that soil is our soul and water is the life. Without Krishi, it is not possible to create Rishi. He emphasised on enhancing productivity and farmers’ income particularly rural youths without adverse impact on natural resources. Researchers should guide the farmers and policy makers for developing right policies. He initiated the Chief Minister Gram Samratri Yojana and Village Tourism. Organic hubs will bring a momentum in sustainable agriculture. He stated that creating and maintaining clean and fresh environment is utmost important. Attracting the youths in agriculture was also one of the concerns of the chief guest (Fig.3.35 & Fig.3.36).
Farmers should be respected at every step. Dr. A.K Singh, DDG (Agrl Extension), ICAR, New Delhi highlighted the philosophy and approach of Farmer FIRST Program. He said that it is farmer centric and they have key role at every step of the developmental programme. Based on agro-system analysis, involving farmers as partners, enhancing interface among different stakeholders, technology integration and content mobilisation components are being addressed. In this program, a mechanism of enhanced farmers-scientists contact, technology adaptation and feedback is to be created. Focus on creating partnership, institution building, models of linkages, technology absorption, marketing, etc. is being given. All the farmers including landless, interventions are to be developed. Major attention is FIRST (farmers’ fields, innovations, resources, science and technology) considering farmers view point. Dr. K.M. Bujarbaruah, Vice Chancellor, Assam Agricultural University, Jorhat delivered Dr K.G. Tejwani Memorial Lecture on ‘Towards Meeting Soil-Man-Soil Expectation’. He said that soil is a primary concern for our farmers and the mankind as a whole. His emphasized was on input use efficiency, realising per soil unit gain, enhancing soil productivity, etc. Earlier, Dr. P.K. Mishra, Director, ICAR-IISWC, Dehradun and President (IASWC) in his welcome address said that the conference was unique where farmers speak and scientists and professionals listen. On this occasion, IASWC Lifetime Achievement Award was presented. A total of more than 80 farmers participated from the NEH states to share their experience with the researcher and extension workers.

3.31 Annual Conference of Indian Society of Agricultural Economics

76th Annual Conference of Indian Society of Agricultural Economics (ISAE) was held during Nov. 21-23, 2016 at the Jorhat Campus of AAU. Participating in the conference, Dr. Ramesh Chand, member of the National Institution for Transforming India (NITI) Ayog, said that the country requires an annual growth rate of 10.4 percent in agriculture to double the income of farmers by the year 2022, as per the directive of Prime Minister, Narendra Modi.

Stressing on the importance of proper implementation of Government policies for effective growth in agriculture and farmers’ welfare, he said that if well coordinated efforts are made effective by the Centre and the States, then the country would be able to achieve the goal of doubling farmers’ income within 7 to 10 years. “Some recent development initiatives of the Central Government aims at raising output, reducing cost and insuring crop lost compensation are Pradhan Mantri Krishi Sinchai Yojana, Soil Health Card Scheme, Paramparagat Krishi Vikas Yojana and Pradhan Mantri Fasal Bima Yojana,” he said (Fig.3.37).

Expressing optimism about achieving the targeted growth rate through effective implementation of the Government schemes and innovative measures, the Hon’ble Vice Chancellor, AAU, Dr. K. M. Bujarbaruah said that he was confident of making various positive changes in agriculture.

A galaxy of agricultural economists from India and aboard including Dr. Abhijit Sen, ex-member, Planning Commission and President of the Executive Committee, ISAE; Dr. R. B. Barman, Chairman, National Statistical Commission; senior officials from NABARD, RBI, Gokhale Institute of Politics and Economics, Pune; Indian Institute of Management, Ahmedabad participated in the Conference.

3.32 Conference on “Linking Food Entrepreneurs with Govt. Schemes & Markets”

A Conference on “Linking Prospective Food Entrepreneurs with Government Schemes & Markets” was organized on Feb. 16, 2017 by The Associated Chambers of Commerce and Industries of India (ASSOCHAM) in collaboration with Ministry of Food & Processing Industries (MoFPI), Govt. of India and Assam Agricultural University, Jorhat for providing a platform to aspiring food entrepreneurs, existing SMEs in food, agriculture professionals & students,
progressive farmers, Self Help Groups, etc. (Fig. 3.38).

Inaugurating the Conference Shri Kamakhya Prasad Tasa, Hon’ble Member of Parliament, Jorhat appreciated ASSOCHAM and MoFPI, Govt. of India for addressing the issue of linking farmer with market. He asked the government, industries and scientists to formulate policies to attract youth of Assam toward agriculture and make agriculture a career objective.

Dr. Om S Tyagi, Senior Director, ASSOCHAM, in his welcome address said that the food processing industry had made some significant progress in North Eastern region of India.

Dr. K. M. Bujarbaruah, Hon’ble Vice Chancellor, AAU, in his address said that the government is optimizing farming system for doubling farmers’ income. Assam Agricultural University through its different programs encourages entrepreneurship among farmers of the state. He also informed about the different scheme of the central and state governments for development of agriculture in the state.

Dr. D. Ramaiah, Director, CSIR-NEIST, discussed various financial schemes funded by government agency to help farmers and rural youths to develop into successful Agri-entrepreneur. Dr. D. K. Bora, Director of Extension Education, AAU proposed the vote of thanks.

3.33 PCRA-AAU joined Hand to save Fuel in Agricultural Sector

Petroleum Conservation Research Association (PCRA), Ministry of Petroleum and Natural Gas, Govt. of India and Assam Agricultural University signed an MoU on Oct. 28, 2016 to work collaboratively to spread awareness on efficient use of energy and conservation of petroleum product among the farmers of Assam. The MoU was signed by Shri Prabir Kr. Raychaudhuri, Director & Chief Regional Coordinator, PCRA (Eastern Region) and Dr. Dipak Kumar Bora, Director, Extension Education, AAU in presence of Dr. M. Neog, Associate Director of Extension Education (T), AAU and Shri Indrajit Kaman, Dy. Director, PCRA, Guwahati. During the signing ceremony other AAU Senior officials were also present (Fig.3.39).

3.34 Workshop on Conservation of Lac Insect Genetic Resources

To review the activities of the Network project on Conservation of Lac Insect Genetic Resources, a workshop was held during Dec. 6-7, 2016 at AAU, Jorhat with active participation of sixteen eminent lac scientists and researchers from across the country along with scientists of AAU. Dr. L.K. Hazarika, Organizing Secretary and Head, Dept. of Entomology, AAU welcomed the delegates with a brief account about lac insects.

Dr. K.M. Bujarbaruah, Hon’ble Vice Chancellor, AAU inaugurated the workshop. In the Chairman’s remarks, he urged the scientists to develop scientific technologies needed to improve traditional lac cultivation to a scientifically advanced commercial venture so as to attract youth. Expansion of traditional lac growing areas might be possible through inter-state collaboration. Dr. Bujarbaruah also emphasised on possible replacement of harmful plastics with products made of natural resins and gums. He also accentuated initiation of collaborative works with State Biodiversity Board and Forest Research Institutes to know more about the insect as well as to bring commerce into lac production in the future.

Dr. K.K. Sharma, Director, ICAR-Indian Institute of Natural Resins and Gums (IINRG), Ranchi; Dr. D.K. Borah, Dean, FA, AAU; Dr. C. Hazarika, DPGS, AAU;
Dr. G.N. Hazarika, Former DR (Agri), AAU and many other dignitaries graced the occasion (Fig. 3.40).

During the workshop, with the financial assistance from the ICAR-IINRG, Ranchi, a newly established “Lac Park” at AAU, Jorhat was inaugurated by Dr. K.K. Sharma, Director, IINRG.

The centre will propel citrus production, particularly Khasi mandarin in the region, with scientific eco-friendly technologies and also engage in transfer of technology programmes.

3.36 XXII Biennial Workshop of AICRP on Community Science

The XXII Biennial Workshop of AICRP on Community Science was organised by College of Community Science, AAU, Jorhat, Assam on Feb. 10-11, 2017. In the inaugural function, Dr. G. N. Hazarika, DR (Agri) and Dr. S. Kaur, Dean, College of Community Science, welcomed all the dignitaries and participants from SAUs. The workshop was inaugurated by Dr. Narendra Singh Rathore, Deputy Director General (Education Division), ICAR, New Delhi as chief guest(Fig. 3.42). In his inaugural speech, Dr. Rathore urged upon the scientists to enhance the visibility of AICRP on Community Science. Dr. K. M. Bujarbaruah, Hon’ble Vice Chancellor, AAU, in his presidential address emphasized the importance of Community Science education and urged to bring up the visibility of AICRP- Community Science. Dr. Jatinder Kishtwaria, Director and Project Coordinator ICAR-CIWA, Bhubaneswar, in her keynote address expressed that this Workshop is a momentous occasion offering opportunities to deliberate future goals and strategies in attaining the objectives of medium term plan commencing from 2017-2020. Ms. Zerifa Wahid, Ambassador, Assam Autism Foundation and Special Olympics Bharat (Assam Chapter) as the special guest on the occasion appreciated the role of Community Science in empowering womenfolk of the nation. Dr. Ruplekha Borah, Principal Scientist and Organizing Secretary of the workshop said that the...
workshop was attended by scientists from ten coordinating centres from SAUs across the country and eminent experts were invited for each component to bring out strategic action programme models. An exhibition was put up for showcasing the technologies and publications of the scientists under AICRP-Community Science during the 12th five years plan.

3.37 Regional Crop Planning Workshop

A Policy Advocacy Dissemination workshop, “Regional Crop Planning for Improving Resource Use Efficiency and Sustainability” was organized by the Dept. of Agricultural Economics & Farm Management, AAU, Jorhat under the ICAR- NIAP SSN project on Jan. 28, 2017. Dr. K. M. Bujarbaruah, Hon’ble Vice Chancellor, AAU presided over the inaugural session. Dr. Rajni Jain, Principal Scientist, NIAP and PI of the project attended the workshop along with Dr. S.K. Srivastava Scientist, NIAP (Fig. 3.43).

3.38 National Symposium on Molecular Insect Science

The National Symposium on Molecular Insect Science organized by the Assam Agricultural University, Jorhat was inaugurated by Dr. K.M. Bujarbaruah, Hon’ble Vice Chancellor, AAU, Jorhat and Dr. M.K. Bhattacharyya, Pr ofessor, Io wa Stat e Unive rsity, USA and Dr. P. K. Talukdar, Regis t rar (i/c), AA U, Jorhat attended the inaugural session as special guests (Fig.3.44). Altogether 120 numbers of scientists, teachers, researchers and students across the country participated in the symposium. Dr. Bujarbaruah in his address stated that insect pests had always been reported as threat to the national food security. Agricultural biotechnology had revolutionized the agriculture worldwide. He urged upon the scientists to explore the fields of molecular science and biotechnology for addressing the pest problems and generating viable technologies for overall progress in agriculture. In connection with the symposium a publication “Souvenir and Abstracts” was released by the Hon’ble Vice Chancellor. Dr. Bhattacharyya delivered the key-note talk on ‘Soybean-Phythopthpora interaction; GmDS1 enhanced SDS resistance in particular’.

3.39 Horticultural Show & Competition

29th Horticultural Show & Competition was organized by the Dept. of Horticulture, Assam Agricultural University, Jorhat on Feb. 17, 2017. More than 400 farmers from different places of Assam participated in the various sections (fruit, vegetable, mushroom, cut flower, potted plant, flower arrangement, nursery, jam, jelly, marmalade, pickle, salad, juice, etc.) of the competition. The event was inaugurated by Hon’ble Vice Chancellor, Dr K.M. Bujarbaruah (Fig.3. 45). The best exhibit prize of the show given in memory of Late Jyotis Chandra Sarma was bagged by Mr. Bhobesh Bezbaruah.

3.40 NE Zonal Meeting of IPS-2016

The Annual North East Zone Meeting of Indian Phytopathological Society (IPS) was held at the Dept. of Plant Pathology, AAU, Jorhat during Nov. 4-5, 2016 (Fig.3.46). A National Seminar on “Facilitating a shift from Chemo Centric to organic mode of Plant health Management in the North East” was held with
participation of 100 research workers from various institutes of the NE who presented their research findings through oral and poster presentations in 3 technical sessions.

The Zonal President, Dr. K C Puzari welcomed the delegates. Inaugurating the meeting, the Hon’ble Vice Chancellor, AAU, Dr. K. M. Bujarbaruah stressed on a multidisciplinary approach for successful organic agriculture. A Souvenir cum Abstract of Research Papers was released by the Hon’ble VC in the inaugural session. Besides the technical sessions, a competition was also held for nomination to the M. J. Narasimhan Merit Academic award contest which was bagged by two Ph.D Scholars of the Dept. of Plant Pathology, AAU. Another competition was held for the American Phytopathological Society’s travel grant, in which another Ph. D scholar of the Dept. of Plant Pathology got selected for the final contest to be organized by IPS, New Delhi. The vote of thanks was proposed by the Zonal Councillor Dr. A. Bhattacharyya.

3.41 AAU accredited by ICAR for next five years

Based on the Self Study Report submitted by the University and subsequent report of Peer Review Team and observations of the Sectoral Committee, the National Agricultural Accreditation Board of ICAR in its meeting held on 26th October, 2016 has granted accreditation to Assam Agricultural University, Jorhat for a period of five years (2016-17 to 2020-21).
4. Education

4.1 Faculties

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 with its headquarters at Raha, Nagaon.

4.2 Degree Programme

The 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 Master’s and Ph. D. Degrees are offered only 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 current academic session 2016-17 (in all the Faculties except Veterinary), the 4 year Bachelor’s Degree is broken into two parts i.e. course work for first three consecutive years and the final year for the ‘Student READY (Rural Entrepreneurship Awareness Development Yojana)’ Programme of 40 credits in 7th and 8th semesters, each with 20 credits. The duration of the BVSc Degree has also been increased in the current academic session from 5 years to 5 ½ years comprising course work of 4 ½ years and internship of 1 year. Besides, the nomenclatures of the degrees have also been changed in accordance with the recommendations of the ICAR in the areas of Agriculture, Community Science, Horticulture and Sericulture.

Besides degree courses, the University also offered 4 Certificate courses during the year through its Directorate of Extension Education, Jorhat. These courses include (i) Dairy farming and fodder production (ii) Bakery (iii) Tea Production Technology and (iv) Pig farming.

4.3 Course Curricula

The UG Course Curricula prescribed by the 5th Deans Committee of ICAR are being implemented in the constituent colleges of the Faculty of Agriculture, Community Science and Fishery Science. However, the colleges under the Faculty of Veterinary Science 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 included 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 current academic Session 2016-17.

4.4 Intake and Output

During 2016-17, 973 students were admitted in the University of which 514 in Bachelor’s, 331 in Master’s and 128 in Ph.D. degree programmes. In regards to output, 624 students obtained degrees during the year, of which 347 were Bachelor’s Degree, 227 Master’s Degree and 50 Ph.D. Degree holders. The constituent college wise student enrollment and output under different degree programmes is shown in Table 4.1 and Fig. 4.1 & Fig.4.2

4.5 Total Students on Roll

Altogether 2660 students were on roll in the University during 2016-17 academic year of which slightly more than 52 per cent were girl students (1383). Out of the total students on roll, 1885, 546 and 229 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 Fig.4.3

4.6 Fellowships Awarded to Students and National Tests Qualified

During the year, 572 students of the University were either awarded fellowships or qualified for national test of which 53 were awarded Junior Research Fellowship, 51 Senior Research Fellowship, 10 DBT Fellowship and 133 were qualified for NET. In addition, 325 students (UG & PG) enjoyed merit and other fellowships during the year.
4.7 Publication

The teachers and scientists of the University have published altogether 1237 publications during the year. Out of these 424 were research papers in journals, 48 research abstracts in journals and 160 research abstracts in proceedings, 14 books, 64 book chapters, 155 practical manuals, 106 popular articles, 45 technical bulletins, 2 extension bulletin, 177 paper presented in seminar/Symposia and 42 other publications. College of Agriculture has the maximum
number of publications (421). The College wise breakup of the publications is shown in Table 4.4 and Fig.4.4.

4.8 Human Resource Development

Altogether 266 teachers/scientists of the University were deputed for attending regional/national/international level training/workshop/seminar etc during 2016-17. The College of Veterinary Science deputed the maximum number of teachers (110). The college wise and event wise breakup of the number of teachers deputed from the University is given in Table 4.5 and Fig.4.5.

4.9 Training/Seminar/Workshop Organized

The University organized 84 regional/national level trainings/ workshops/ seminars etc. during the year. The College of Vet. Science (30) is 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 4.6 and Fig.4.6.

Table 4.4: Publications of different constituent colleges of the University during 2016-17

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<th>Particulars of Publication</th>
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<td>C.V.Sc</td>
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<tr>
<td>Research paper in journal</td>
<td>141</td>
</tr>
<tr>
<td>Research abstracts in journal</td>
<td>18</td>
</tr>
<tr>
<td>Research abstracts in proceeding</td>
<td>61</td>
</tr>
<tr>
<td>Books</td>
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<tr>
<td>Book chapter</td>
<td>4</td>
</tr>
<tr>
<td>Practical manual</td>
<td>62</td>
</tr>
<tr>
<td>Popular articles</td>
<td>19</td>
</tr>
<tr>
<td>Technical bulletin</td>
<td>4</td>
</tr>
<tr>
<td>Extension bulletin</td>
<td>-</td>
</tr>
<tr>
<td>Paper presented in seminar/symposia</td>
<td>66</td>
</tr>
<tr>
<td>Others</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>389</td>
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</table>

Table 4.5: Teachers deputed for attending training, seminar, workshop etc. during 2016-17

<table>
<thead>
<tr>
<th>Training, seminar, conference attended</th>
<th>CAJ</th>
<th>BNCA</th>
<th>SCS CA</th>
<th>CVSc</th>
<th>LCVSc</th>
<th>CCSc</th>
<th>*CFSc</th>
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<tr>
<td>International level training</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>-</td>
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<tr>
<td>National level training</td>
<td>9</td>
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<td>9</td>
<td>22</td>
<td>16</td>
<td>4</td>
<td>2</td>
<td>63</td>
</tr>
<tr>
<td>Regional level training</td>
<td>8</td>
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<td>-</td>
<td>9</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td>International level seminar</td>
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<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>-</td>
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<tr>
<td>National level seminar</td>
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<td>-</td>
<td>23</td>
<td>-</td>
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<td>46</td>
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<tr>
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<tr>
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<td>-</td>
<td>5</td>
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<td>02</td>
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<tr>
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<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>International level workshop</td>
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<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
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<td>Regional level Workshop</td>
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<td>-</td>
<td>9</td>
<td>-</td>
<td>5</td>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>Others</td>
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<td>-</td>
<td>2</td>
<td>-</td>
<td>11</td>
<td>-</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>66</td>
<td>17</td>
<td>9</td>
<td>110</td>
<td>19</td>
<td>35</td>
<td>10</td>
<td>266</td>
</tr>
</tbody>
</table>

*Including Fishery Research Centre, Jorhat
4.10 Library

The Rev. B M Pugh Library (RBMLP) is serving as the knowledge resource centre on Agriculture and 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 Vety. Science, Khanapara, Guwahati; College of Fisheries Science, Raha; Biswanath College of Agriculture, Biswanath Chariali; Lakhimpur College of Vety. Science, Joying, Lakhimpur and SCS College of Agriculture, Dhubri.

4.10.1 Library Holdings

The total library holdings in the University during 2016-17 were 337869 which include 197056 text books and reference books; 10445 journals /periodicals; 27377 back volume of periodicals and 102991 other miscellaneous publications. The Rev. B. M. Pugh Library, Jorhat accounted for the maximum (77 per cent) of the total holdings of the University and the SCSCA, Dhubri the minimum. College wise details of the types of printed collection during the year is given in Table 4.7.

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

Some of the facilities/services of “Rev. B M Pugh Library” (RBMLP) 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://krishikosh.egranth.ac.in/handle/1/466

Krishikosh Repository
http://krishikosh.egranth.ac.in/

CAB Abstract available online at www.cabdirect.org and From 1972 to 2013 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 Agri Stat Database
http://www.indiaagristat.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), Facultyscientist (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 (Fig.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

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 depend 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 were 600 and 12,936 respectively.

- **Services to Visitors:** An average of 40 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 2016-17 was 70 which was around 17 per cent higher than that of 2015-16.

- **Internet Services:** The internet browsing facility is available in the library premises on the basis of an 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 3861 internet users during the year which is about 54 per cent higher than the previous year (Fig.4.8).

- **User Education Programme Provided:** The RBMPL, apart from providing dedicated user service, is also extending quality user education programmes. This include:
  - **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 2016-17

During 2016-17, RBMP library received Rs 205,00,00,00 (Rupees Two Crore Five Lakh only) 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.
- In regards to print book collection, the Rev. B M pugh Library collected 5000 books during the year besides collection of books by other constituent colleges with CAR fund.

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.

4.11.1 Games and Sports Activities

- The Annual College Meet, the yearly sport event was organized by the students of all the constituent colleges of the University (Fig.4.9).
- The AAU students also celebrated the XXVIII Inter College Meet in the CVSc, Campus, Khanapara w.e.f March 3-6, 2017 (Fig.4.10). In the inaugural function, Dr. K.M. Bujarbaruah, Hon’ble Vice-Chancellor declared the meet open and Shri Hiren Ch. Nath, IPS Commissioner of Police, Guwahati, Assam addressed the participants as the Chief Guest. The Meet began with a colourful march past competition amongst the constituent colleges in

Fig.4.9: Few snapshots of Annual College Meet (LCVSc.) during 2016-17
which College of Horticulture bagged the 1st prize. The overall best college award was bagged by College of Veterinary Science, Khanapara. College of Horticulture was adjudged the best disciplined team. The meet was concluded with, a colourful cultural function.

- The students of the University participated in the XVII All India Inter Agricultural Universities Games and Sports Meet held at CCS Haryana Agricultural University, Hisar (Haryana) from March 25-29, 2017.
- The University participated in the 17th All India Inter Agricultural University Youth Festival (Agriunifest) held in Rajasthan University of Veterinary & Animal Sciences (RAJUVAS), Bikaner w.e.f February 22-25, 2017. A group of 27 students participated in the event and bagged several prizes which include 1st prize in Spot Painting, 2nd prize in Poster Making, 3rd prize in Cultural Procession and 4th prize in Light Vocal.
- The Assam Agricultural University swimming pool started its regular swimming sessions from May, 2016. More than 300 persons including students, employees and their family members and others enrolled themselves for the swimming sessions.
- Biswanath College of Agriculture organized a 15 days football coaching camp for the students w.e.f February 10 to 24, 2017 by engaging an experienced coach Mr. Purna Piso who represented the state football team.
- Inter Hostel Volleyball Competition amongst the boy’s as well as amongst the girl’s hostels was held this year also in the College of Veterinary Science, Khanapara. Main Hostel (W/W) and A. T. Hostel became the champion and runner’s up respectively amongst the boy’s hostels while the New Girl’s Hostel and the Girl’s Hostel No. 1 were the champion and runner’s up amongst the girls’ hostels.
- Late Achyut Kr. Tamuli Memorial 6 A-side Day and Night Cricket Tournament was held from March 11-12, 2017 in the Assam Type Hostel playground of the CVSc., Khanapara. KBR Hostel & Assam Type Hostel were declared as the Best and Runners up team respectively amongst the boy’s hostels and New Girl’s Hostel & Girls’ Hostel No. 1 as the Best and Runners up team respectively amongst girl’s hostels.

4.11.2 National Service Scheme

- World Environmental Day was observed on June 5, 2016 by the NSS volunteers, other students and faculties of all the constituent colleges of the University (Fig.4.11).
- NSS volunteers of all the constituent colleges observed the Foundation day of National Service Scheme during the year.
- A workshop on Digital India was conducted at AAU, Jorhat on Oct. 31, 2016 where more than...
250 NSS volunteers from 8 constituent colleges of the University participated and gained knowledge and skill on Digital applications (Fig.4.12).

- Four NSS volunteers of College of Agriculture, College of Community Science and College of Horticulture participated in the NE Youth Festival, Guwahati organized by the NSS, Ministry of Youth Affairs & Sports, Govt. of India, from January 5-9, 2017.

- National Service Scheme Cell of Assam Agricultural University, Jorhat organized the NSS Special Camp from Nov 28 – Dec 4, 2016 at Kachukhat Model Village (under Sansad Adarsha Gram Yojana), Titabor where emphasis was put on solid waste disposal for environmental protection besides observing World AIDS Day on Dec.1 and First Agricultural Education Day on Dec.3, 2016. Medicinal plants and dustbins were distributed in the programme. NSS Camp was also organized by the NSS Unit of CFSc, Raha.

- The NSS Unit of Assam Agricultural University, Jorhat organized some important days during the year viz., Constitutional day on Dec., 10, 2016; International Women’s Day on March 8, 2017; World Consumer Right Day on March 15, 2017; World Water Day on March 22, 2017. Besides, Independence Day of the Nation, Foundation Day of the College s and Teachers Day are other important days which were also observed during the year by the NSS volunteers along with faculties and students of all the constituent colleges of the University.

- The NSS Unit of CFSc., Raha, BNCA and LCVSc., observed the National Constitutional Day of Indian Union on Nov., 26, 2016. As a part of the Programme, Quiz, Essay Writing and Poster Making Competition etc. were organized among the students.

- International Yoga Day was observed by the NSS Unit of CFSc., Raha on June, 21, 2016 through holding of a Yoga Demonstration Camp and a Seminar on Yoga which were attended by the NSS volunteers, teachers and employees of the College. The Day was also observed by the NSS volunteers and faculties of LCVSc., Joyhing, SCSC College of Agriculture, Dhubri and BNCA, Biswanath Chariali (Fig.4.13).

- An Awareness Camp on Vittiya Saksharata Abhiyan (VISAKA) was undertaken by the NSS Volunteers of LCVSc., in the nearby area of Joyhing Market (Dec. 24, 2016) and CFSc., Raha (Dec.22, 2016) to spread awareness regarding digital economy and cashless transaction. The programme received overwhelming response from faculties & students of the College and shop owners & vendors (Fig.4.14).

- The cleanliness programme “Swachh Bharat Abhiyan was organized by the NSS Unit of AAU, Jorhat (March 19,2017); LCVSc., Joyhing (Nov.6, 2016); SCSCA, Dhubri ( Sept. 24, 2016); BNCA (Aug. 20,2016) (Fig.4.15)

- On 24th August, 2016, NSS Unit of BNCA organized a Motivational Lecture on stress management among the teachers, students and employees of BNCA. In this occasion, B.K. EV. Swaminathan Bhai Ji, Professor, Engineering College, Mumbai, invited as the lecturer.
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• NSS Unit of BNCA organized an awareness programme on management of army worm at Gingia on September 19, 2016. NSS volunteers, teachers and employees of BNCA inspected the army worm infested rice fields and applied the recommended insecticides for control of the worm besides distributing leaflets on army worm among the farmers present.

• NSS Unit of BNCA, as per direction of ASDMA, Dispur, Guwahati and proposal from DDMA, Sonitpur, organized a programme on Earthquake and Fire Mock Drill on October 5, 2016 at BNCA campus. NSS volunteers, teachers and employees of BNCA participated in the programme. Sri Ranvijay Singh, Team Commander, 1st Battalion, NDRF assisted in conducting the Mock Drill.

• Armed Forces Flag Day on December 7, 2016 was observed by NSS Unit BNCA through a fund collection move. For widest publicity of the occasion, the NSS Unit of BNCA distributed Car flag and Token flag among the teachers, employees and NSS volunteers of the College. The fund so collected were sent to Zila Sainik Welfare Office, Sonitpur, Tezpur.

• On 10th December 2016, NSS Unit of BNCA organized a health check up camp at BNCA campus among the NSS volunteers, teachers and employees of the College.

4.11.3 Other Student Welfare Activities

• There is a provision for medical care and health service in each of the Colleges of the University. Since 2015-16 academic year, Group Health Insurance Policy for all the students of the University has been introduced. However, the said Medical Insurance Scheme for the students was discontinued from the first semester of 2016 and in place, a new scheme called Students Medical Assistant Scheme was introduced with a lower premium of Rs. 360/- as against Rs. 770/- per year per student earlier.

• The Educational Tour of the 3rd year Under Graduate students of College of Agriculture, College of Horticulture and College of Sericulture to South India was organized during the month of January, 2017. In the tour, the students visited Educational Research Institutes, Departments, Regional Centre and many other places and benefitted themselves a lot from the exposure. The 3rd Year BNCA students had also undergone the educational excursion w.e.f. Jan.5-24, 2017.

• Students of BNCA organized (i) a programme on candel wood tree planting on the boundary of the College on March 22, 2017 which was inaugurated by the Hon’ble Minister, Mr. Ranjit Dutta, Honourable Minister of Irrigation, Handloom & Textiles and Sericulture in presence of Dr. K. M. Bujarbaruah, VC, AAU; Padmashree Jadav Payeng and all the teachers, employees and students of the College (ii) one day workshop on Dance and (iii) a 3 days training programme on Mushroom production and marketing for the students.

• The students of the College of Veterinary Science, Khanapara organized “All Assam Debating Competition” on September 25, 2016 in the College Auditorium, in memory of Late Lt. Col Dipjyoti Gogoi, an alumnus of College of Veterinary Science, AAU, Khanapara. Mr. Kaushik Pran Bardoloi, LCVSc, AAU, North Lakhimpur; Ms. Himakshi Thakuria, Cotton College State University, Guwahati and Mr. Bijit Kalita, Assam Academy of Media Sciences, Guwahati were adjudged as the Best Debator, 2nd Best Debator and 3rd Best Debator respectively. The team comprised of Himangshu Chakraborty & Chintu Moni Saikia from NEI Media Studies, Guwahati were declared as the best debating team in the competition.

• Adya Shraddha Ceremony in memory of 8 students victims of Gas Tanker Blast accident was also organized this year near the Swahid Bedi on November 1, 2016 by the CVSc., students. Eight students did the Shraddha in the name of each departed soul. A Naam Prasanga was organized to mark the occasion where all the students participated.
• The 47 R & V Squadron NCC unit of the College of Veterinary Science participated in the Republic Day Parade held at New Delhi. This time 2 girls, Ms. Divya Vashishishtha (15-VK-113) and Ms. Prachi Singh (15-VK-123) and 2 Boys, Mr. Utpal Boro (14-VK-96) and Mr. Paresht Taye (14-VK-69) from the CVSc., Khanapara participated in the RDC Camp during the month of January, 2017 to represent North Eastern Region.
• Ms. Nirmali Sarma (2012-VK-56) of CVSc., Khanapara participated in the Elocution Contest organized by UAS, GKVKK, Bangaluru from February 21-24, 2017 and bagged the 2nd Prize.
• Mr. Dhiman Patgiri (15-VK-18) & Ms. Mandakranta Bhuyan (16-VK-43) of College of Veterinary Science, Khanapara participated in the Debate competitions viz., (i) “Cotton Fest-2017” organized by Cotton College State University from April 9 – 11, 2017 and (ii) Assam Debate Competition organized by Guwhati Institute of Media Studies (GIMS) and Prag News. Mr. Dhiman Patgiri bagged 1st Prize as Best Debator in both the competitions. Both the Debators also participated in the Debate Competition organized by Asian Institute of Nursing in District Library.
• Mr. Rajkishore Sapcota (2nd Year) & Ms. Mandakranta Bhuyan (16-VK-43) of CVSc., Khanapara participated in the Rebati Mohan Dutta Memorial Debate Competition (National Level) organized by Assam Engineering College.
5. Research

The research activities were undertaken in the different departments of the constituent colleges as well as in the six Regional Agricultural Research Stations in the six different agro-climatic zones of Assam and 5 Commodity Research Stations to take care of the situation-specific issues.

The University follows a Research Management System laid out to systematically conduct the need based, demand driven, situation specific and problem oriented research. Under the current management system (Fig 5.1), the research problems are being 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 to the relevant problems only. Under the research management system, there is provision of several committees with well defined power and responsibilities.

5.1 Agriculture

The Director of Research (Agri) coordinates the research activities in the field of Agriculture and Community Science. The research activities in agriculture and Community Science are being undertaken in different departments of the concerned (three) 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 163 research projects were carried out in the Faculty of Agriculture (APPENDIX-I), of which 6 were completed, 157 in operation including 14 projects under DBT-AAU Centre. Some of the significant research findings obtained during the year are presented below:
5.1.1 Rice

5.1.1.1 Crop Improvement

- Rice varieties - Gitesh, Kanaklata, Jalashree, Jalkuwari, Rongkhang, Dehangi and Inglongkiri were accepted for notification by the Central Sub Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops.

- Rice varieties - Ranjit Sub 1, Bahadur Sub 1, Shraboni, Mulagabhoru, Dhansiri, Dipholu and Chakra lahi have been recommended by the State Sub Committee for notification by the Central Sub Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops.

- The rice varieties – Numoli and Bokul Joha are in the pipeline of recommendation (Fig. 5.2).

- Two breeding lines - LPR 1103 and LPR 1130 were found to be promising in semi-deep water situation of NBPZ, UBVZ, CBZ, BVZ.

- Three AAU developed hybrids are in the final stage of testing.

- Several advanced breeding lines with different grain quality attributes have been found promising and three of them (TTBDR 201-1-1, TTBDR 103-5-1 and TTBDR 106-2-5) have been sent for testing under AICRP network (Fig. 5.3).

- Six entries out of fifteen aromatic rice lines out-yielded local check Kalijira (2222 kg/ha), while one entry LPR 119-18-4 (3104 kg/ha) out yielded both the checks Kalijira and Keteki Joha (2810 kg ha⁻¹). Three other varieties viz., Kon Joha (2766 kg ha⁻¹), Baigon Bichi (2550 kg ha⁻¹) and Barai Sail (2518 kg ha⁻¹) recorded yield of more than 2.5 t/ha.

- Breeding lines for development of aromatic rice varieties with grain quality attributes similar to kola Joha are in the final stage of testing (Fig. 5.4).

- Altogether 72 red kernelled bao rice varieties (Deepwater rice) were characterized with respect to 16 physicochemical parameters. Kekowa Bao, Negheri Bao, Amona Bao, Dal Bao, Badam Bao, Ahina Bao, Baola Bao were found to be promising among the varieties evaluated.

- Altogether 569 asra germplasm accessions maintained at RARS, Karimganj were characterised for yield and yield related traits and eighteen morpho-physiological traits. Similarly, 300 sali germplasm accessions were also characterised for yield and yield related traits. The entire stocks of boro germplasm were evaluated for root characters and yield and yield attributing traits.

- Nutritional profile of rice varieties of Assam was studied. In the study, iron content of two chakua rice varieties “kagoli chakua” and “saru (haru) chakua” were found to be remarkably high at 643 mg per 100 g and 44.97 mg per 100g, respectively. The sodium, potassium, phosphorus and iron content of brown rice was found from 14.82 mg to 21.60 mg, 84.71 mg to 276.73 mg, 173.95 mg to 328.78 mg and 1.54 mg to 643.50 mg, respectively.

- Under organic management practices, performance of the rice variety TTB-404 was the best with yield of 4.5 ton/ha followed by Ranjit, Gitesh and Prafulla.
5.1.1.2 Crop Management

- Adoption of fertilizer dose (118 kg N, 37 kg P₂O₅ and 59 kg K₂O/ha) based on site specific nutrient management (SSNM) using rice nutrient expert (a software model based tool) in conjunction with leaf colour chart (LCC) recorded the highest grain yields of 5.78 t/ha in kharif rice (Ranjit) and 6.53 t/ha in boro rice (Kanaklata) were statistically superior to that under recommended dose of 60-20-40.

- Retention of 30 per cet crop residue at surface @ 2 t/ha followed by root dipping of seedlings with Azospirillum and PSB @ 3.5 kg each, green manuring with Dhaincha along with 75% RDF recorded the highest grain yield of rice variety Shraboni (4.56 t/ha) indicating that 25% of inorganic fertilizer can be reduced following such integration. Seed yield of Linseed (6.6 q/ha) and rice equivalent yield of rice – linseed system were also highest under this treatment.

- Application of 10 ton FYM/ha showed highest build up of alkaline phosphatase activity as well as dehydrogenase activity. Further integration of recommended dose of NPK along with 5 t FYM / ha registered highest FDA and glucosidase activities in soil at the end of kharif rice harvest of 2016.

- Application of enriched compost @ 5 t/ha + Biofertilizer and/or Azolla @ 0.5t/ha + biofertilizers was recommended as organic nutrient management in rice.

- The genotypes namely Gitesh, Prafulla, DRR Dhan 42 and 27P37 responded to liming under lowland situation. Increase in grain yield with lime over no-lime application was 30 per cent.

- A study on the role of silicon in plant nutrition and increasing rice productivity for the last two years showed that Immidazole (a carrier molecule) and Silixol (a commercial formulation containing silicon) application increased grain yield to the tune of 11-15 per cent and 8-9 per cent, respectively in comparison to control. Application of Immidazole resulted in marginal improvement (3-5%) of HI over control. Application of Immidazole increased the silica content in the leaves in all the genotypes except PA 6129 besides increasing photosynthetic rate by 20-25 per cent over control. There was less incidence of BLB infestation due to immidazole treatment in comparison to control.

- Application of boron @ 0.4 ppm at the time of anthesis of rice reduced the spikelet sterility significantly.

- A total of 110 rice germplasm accessions were evaluated for root CEC at maximum tillering stage and flowering stage during sali season of 2016. The root CEC was found to be higher at maximum tillering stage than in flowering stage.

- Fertilizer Prescription Equations (FPE) and ready reckoner equations were developed for hybrid rice (var. US 382). The FPE equations are as follows:
  - Without IPNS
    - FN = 3.69 × T - 0.70 × STVN
    - FP = 1.23 × T - 2.49 × STVP
    - FK = 3.52 × T - 1.02 × STVK
  - With IPNS
    - FN = 3.69 × T - 0.70 × STVN - 0.75 × M
    - FP = 1.23 × T - 2.49 × STVP - 0.61 × M
    - FK = 3.52 × T - 1.02 × STVK - 0.64 × M
  - Where,
    - FN, FP, FK are Fertilizer N, P, K;
    - STVN, STVP, STVK are soil test values for N, P, K;
    - T is targeted yield;
    - In case of P and K, soil test values should be converted to P₂O₅ and K₂O by multiplying P and values with 2.29 and 1.2, respectively.

- Combined application of 1.5 kg B/ha and 5 kg Zn/ha along with recommended dose of NPK resulted the highest crop yield and B: C ratio (2.45) in rice-rapeseed sequence. Results of On-Farm-Trial at twenty five different locations of five districts of Assam showed highest average yield for both rice and rapeseed over state recommendation.

- In late planted condition, double planting of long duration photoperiod sensitive rice variety Manoharsali with 60 days or older seedlings (30 + 30 days) gave better result in all the dates of transplanting starting from 16th August to the end of Kharif season (i.e. 25 September). The grain yield declined gradually with the advancement of planting dates from 16th August (42.68 q/ha).

- Threshold level of Binoy-bon (Echinochloa crusgalli) under its pure stand competition with winter rice var. Ranjit was found to be 65 number/ m².

- Experiment indicated that there were different options for the farmers under delayed planting condition with varying performances as given below:
  - Double planting of 60 days (30 + 30) old seedlings of long duration photoperiod-insensitive variety Ranjit gave higher yield (41.22q/ha) than normal planting of Basundhara
Normal planting of medium duration variety Basundhara (34.22 q/ha) performed better as compared to double planting of Ranjit (30.69 q/ha), staggered planting of Manoharsali (30.62 q/ha) and normal planting of Manoharsali (29.09 q/ha) if planting is to be delayed up to 26 August.

− If planting is to be delayed up to 5 September or beyond, staggered as well as normal planting of Manoharsali remains as an alternative option against double planting of Manoharsali.

− Beyond 5 September i.e. on 15 or 25 September, normal seedlings of Manoharsali also failed to give remunerative yield. In that condition, staggered planting of Manoharsali with aged seedlings is the only other alternative option.

− In none of the dates, the short duration variety Luit performed better than any other options on a particular date under delayed condition. However, this variety could be grown up to 26 August if no other alternatives are available.

5.1.1.3 Plant Protection

- In a study, 6 pathotypes out of 24 isolates of Xanthomonas oryzae pv. oryzae of Assam were 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).

- Seed treatment (cv-Mahsuri) with T. harzianum along with Cow urine (20%) significantly reduced the blast disease incidence in nursery as well as under field condition. However, MOC amended with T. harzianum along with cow urine showed significantly better inhibitory effect.

- The fungicides Tricyclazole + Tebuconazole (36 % SC) @ 2.25 ml/l significantly suppressed incidence and spread of sheath rot of rice and disease as compared to other fungicides with increased yield followed by Tricyclazole + Tebuconazole (36 % SC) @ 2 ml/l and Carbendazim.

- Altogether 75 actinobacteria strains were isolated from different locations of Golaghat, Jorhat, Lakhimpur and Dhemaji districts and screened against major rice pathogens, Rhizoctonia solani and Xanthomonas oryzae pv oryzae (Xoo). The isolate ‘Act 116’ from the rhizosphere of deep water rice variety, ‘Padmanath’ at RARS, North Lakhimpur recorded the maximum 66.67 per cent inhibition of Rhizoctonia solani in dual culture assay (Fig. 5.5). The strain showed phosphorus solubulization and strong cellulolytic activity in laboratory tests. The strain Act 116 is identified as Streptomyces cochorusii at MTCC, Chandigarh. Two other strains Act 119 and Act 122 showed antagonism against Xoo.

![Fig. 5.5: Antagonism of Actinobacteria ‘Act116’ against Rhizoctonia](image)

- Two new insecticide molecules namely, Flubendiamide 480 SC (g/L) and Rynaxypyr (Coragen 20 SC) were found to be effective against stem borer in the last three years consecutively in rice ecosystem with grain yield recorded at 4.7 ton/ha against the grain yield recorded at 2.5 ton/ha in untreated control.

- In management of coleopteran storage grain insect pests by plant leaf extracts, Hexane (5% concentration) extract of leaf of Ocimum sanctum was found to be effective against Tribolium castaneum causing mortality of 73.33 % within 24 hours of exposure. Hexane (5% concentration) extract of leaf of Jatropha curcas was found to be effective against Tribolium castaneum causing mortality of 67.33 % but the exposure period required was 72 hours.

- Root knot nematode Meloidogyne graminicola in direct seeded ahu rice can be effectively managed by application of Biofor- Pf enriched FYM @ 500 kg/ha (1.0 kg Pf in 100 kg FYM incubated for 15 days) plus soil application of carbofuran@ 1.0 kg a.i./ha at 45 DAS). In this treatment, there was 23.62 per cent increase in yield and 39 per cent reduction of rice root-knot nematode the nematode population. However, application of carbofuran 3G @ 1.0kg a.i/ha at sowing in nursery bed was also
found effective for management of this nematode. In this treatment, the yield of rice (var. Luit) was 3.49 ton/ha with an increase of 15.50% over untreated control.

- A defense related gene expression study was conducted on rice (variety-Mahsuri) and qRT-PCR analyses confirmed application of Pf-As1 + Zn (50 ppm) up regulated rice defense genes - \textit{PR 1a, PR 1b, PR 10a} and \textit{R genes- Xa1, Xa26}.

5.1.2 Wheat & Maize

- Six pre-harvest sprouting tolerant wheat advanced breeding lines developed at RARS, Shillongani did not sprout even when exposed to long spell of rainfall (14 days) while the other accessions in different screening nurseries sprouted just when exposed to 3-4 days of wetting.
- In wheat, basal application of Zinc Sulphate @15 kg/ha in addition to RDF produced the highest grain yield of 54.75 q/ha followed by its application @ 10 kg/ha (47.27 q/ha).
- Rice straw mulching @ 4 t/ha with 3 irrigations under conservation tillage produced the highest grain yield of wheat (45.62 q/ha) followed by the same treatment under Zero tillage (40 q/ha).
- Maize intercropped with blackgram recorded the highest MEY of 43.56 q/ha whereas maize intercropped with soybean showed the lowest MEY of 20.73 q/ha. Among the crops intercropped, the highest B:C ratio was observed in maize + blackgram and the lowest (1.33) in maize + soybean. Similarly, maize + Blackgram as intercrops showed highest Relative Water Use Efficiency.

5.1.3 Pulses

- Greengram variety Rupohi (SGC 16) was recommended by the State Sub Committee for notification by the Central Sub Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops (Fig. 5.6).
- Spraying of Tebuconazole 25 EC @ 0.1% three times at 10 days interval just after the appearance of web blight disease in mungbean is proposed for recommendation.
- Infection of more than ten per cent foliage by web blight disease in mungbean results in the economic yield loss and hence this threshold is proposed for recommendation.

![Fig. 5.6: Greengram variety Rupohi](image)

- Fertilizer Prescription Equations (FPE) were developed for summer greengram. The equations are as follows:
  
  \begin{align*}
  \text{Without IPNS} & \\
  FN = 11.37 \times T - 0.62 \times STVN \\
  FP = 3.82 \times T - 0.22 \times STVP \\
  FK = 12.81 \times T - 1.29 \times STVK
  \\
  \text{With IPNS} & \\
  FN = 11.37 \times T - 0.62 \times STVN - 0.13 \times M \\
  FP = 3.82 \times T - 0.22 \times STVP - 0.17 \times M \\
  FK = 12.81 \times T - 1.29 \times STVK - 0.2 \times M
  \end{align*}

  \text{Where,}

  \begin{itemize}
  \item FN, FP, FK are Fertilizer N, P, K; STVN, STVP, STVK are soil test values for N, P, K; T is targeted yield; In case of P and K, soil test values should be converted to P\textsubscript{2O5} and K\textsubscript{2O} by multiplying P and values with 2.29 and 1.2, respectively.
  \end{itemize}

- Ready reckoner equations for summer greengram were developed for targeted yield of 10 q/ha and 12 q/ha with FYM = 5 t/ha. The equations can be applied for all the agro-ecological zones of Assam. Highest B: C ratio (>4.0) and net return per rupees invested was recorded with FPEs under IPNS over RDF.

- Blackgram variety Shyamal (SBC 40) has been recommended by the State Sub Committee for notification by the Central Sub Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops (Fig. 5.7).

- Results of three year experiments on response of blackgram to sulphur revealed that application of 20 kg sulphur along with recommended dose of NPK recorded the highest grain yield (10.35 q/ha) and B: C ratio (3.02). On-Farm-Trials at different location of seven districts of Assam exhibited an average yield of 8.5 to 12.0 q/ha under application
of 20 kg S/ha and proposed for recommendation in package and practices.

- In summer urdbean, ½ RDF + 2% urea spray at 35-40 DAS resulted in the highest grain yield (902.32 kg/ha) which was significantly superior to all other levels except the recommended dose of 15:35:15 kg N, P₂O₅, K₂O/ha.

- The grain yields of *kharif* blackgram (11.10 q/ha) and green gram (10.43 q/ha) reached plateau when the crop was sown on 3rd September. Early as well as delayed sowing resulted in considerable yield reduction. Optimum range of sowing time might be from August 24 to September 13.

- For efficient weed management in blackgram and greengram, pre-emergence application of Pendimethalin @ 750 g/ha or Oxyfluorfen 100 g/ha followed by hand weeding at 25 DAS was found to be the best.

- A ricebean variety, Shyamalima has been accepted for notification by the Central Sub Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops during 2016-2017.

- Recommended dose of nitrogen (15 kg/ha) and seed inoculation with *Rhizobium* @ 50 g/kg and Sodium Molybdate (1g/kg) accrued in the highest grain yield of lentil (8.82 q/ha).

- Under rice-*utera* conditions, grass pea variety ‘Prateek’ with 60 kg seed rate recorded the highest yield (9.56 q/ha).

- Conventional tillage recorded highest grain yield in chickpea (11.08 q/ha) over zero tillage (10.47 q/ha) and reduced tillage (10.42 q/ha).

- Combined application of *Purpureocillium lilacinum* @ 20 g/m²(cfu 2x10⁶) + neem cake @ 100 g/m² was found effective against *M. incognita* in cowpea where the yield was 48.67 q/ha as against 37.83 q/ha in untreated control.

- Exploration to find out effective biocontrol agents against economically important nematode pests of the state revealed that the culture filtrates of the bacteria *Pseudomonas* sp. and *Bacillus* sp reduced hatching of juveniles from *M. incognita* eggs. The per cent hatch ranged from 8 to 25 due to *Pseudomonas* sp where as 4 to 15 due to *Bacillus* sp in 24 hour exposure. *Bacillus* sp. proved more effective in delaying and reducing egg hatch. The per cent hatching of juveniles of *M. incognita* declined as the concentration increased. When juveniles were exposed to the culture filtrates of *Pseudomonas* sp. and *Bacillus* sp., 10 to 26% and 18 to 32% mortality occurs within 24 hours exposure with more than 50% juvenile mortality during 72 hours incubation. Comparatively, *Bacillus* sp. proved more effective in juvenile mortality.

### 5.1.4 Oilseed crops

- The average yield of the improved mustard variety NRCHB 101 was recorded at 19.30 q in 105 days in FLD conducted in 3 villages of Nagaon district. The variety did well in other districts also.

- Fertilizer Prescription Equations have been developed for targeted yield of rapeseed variety TS 38 [normal and late sown condition] (Fig. 5.8). Fertilizer Prescription Equations without IPNS

  - FN = 10.37 × T - 0.39 × STVN
  - FP = 1.86 × T - 1.07 × STVP
  - FK = 4.47 × T - 0.74 × STVK

- Fertilizer Prescription Equations with IPNS

  - FN = 10.37 × T - 0.39 - STVN - 0.58 × M
  - FP = 1.86 × T - 1.07 × STVP - 0.10 × M
  - FK = 4.47 × T - 0.74 × STVK - 0.21 × M

Where,

- T is the targeted yield; STVN, STVP, STVK are the soil test values for N, P & K, respectively and FN, FP and FK are fertilizers for N, P and K. and M is IPNS component (FYM/vermicompost/compost). In case of P and K, Soil test values should be converted to P₂O₅ and K₂O by multiplying P and values with 2.29 and 1.2 respectively.

- Ready reckoner equations for normal sown rapeseed were developed for targeted yield of 10 q/ha and 12 q/ha with FYM = 5 t/ha. The equations can be applied for all the agro-ecological zones of Assam. Highest B:C ratio (>2.8) and net return per
rupees invested was recorded with FPEs under IPNS over RDF.

- Fertilizer Prescription Equations (FPE) have been developed for late sown toria (Var. JT-90-1) also. The equations are as follows:

  **Fertilizer Prescription Equations without IPNS**
  
  \[
  \begin{align*}
  FN & = 8.71 \times T - 0.27 \times STVN \\
  FP & = 5.90 \times T - 3.13 \times STVP \\
  FK & = 9.42 \times T - 0.78 \times STVK
  \end{align*}
  \]

  **Fertilizer Prescription Equations with IPNS**
  
  \[
  \begin{align*}
  FN & = 8.71 \times T - 0.27 \times STVN - 0.22 \times M \\
  FP & = 5.90 \times T - 3.13 \times STVP - 0.08 \times M \\
  FK & = 9.42 \times T - 0.78 \times STVK - 0.18 \times M
  \end{align*}
  \]

  Where,
  
  T is the targeted yield; STVN, STVP, STVK are the soil test values for N, P & K, respectively and FN, FP and FK are fertilizers for N, P and K. and M is IPNS component (FYM/vermicompost/compost). In case of P and K, Soil test values should be converted to P₂O₅ and K₂O by multiplying P and values with 2.29 and 1.2 respectively.

- Ready reckoner equations for late sown toria (var. JT-90-1) were developed for targeted yield of 10 q/ha and 12 q/ha with FYM = 5 t/ha. The equations can be applied for all the agro-ecological zones of Assam. Highest B:C ratio (>2.5) and net return per rupees invested was recorded with FPEs under IPNS over RDF.

- Lysimeter study showed that actual ET of rapeseed was 152 mm during the crop growing period. The crop coefficient (Kc) increased from 0.71 in early period to 1.29 during 41-50 DAS, thereafter it came down gradually to 0.82 at crop harvest.

- After harvest of transplanted *kharif* rice under medium land situation, sowing of toria variety Jeuti (at a row distance of 25 cm) can be delayed up to 22nd December with an average seed yield of more than 5 q/ha and B:C ratio of 1.89 (Fig. 5.9).

- *Alternaria* blight and collar rot were the major diseases of toria (var. TS 67) in both the ecosystems viz., rice-fallow and arable ecosystems, whereas
Fusarium wilt was the major disease observed in linseed (var. T 397) under both the conditions. The disease severity and incidence of Alternaria blight and collar rot was considerably higher in arable crop than in rice-fallow.

- The cabbage butterfly (Pieris brassica), has become major pest during rabi.
- Linseed varieties viz, Shekhar, Padmini and T-397 were recommended for relay cropping with rice (Fig. 5.10).
- Promising soybean genotypes possessing high yielding ability have been identified (RSC 10-712, JS 21-05, AMS-MB 5-18, KDS 980, JS 20-116, JS 20-94, KDS 753 & RSC 10-46).
- Soybean genotypes (JS 97-52, Hardee 1425 & Kalitur 1403) have been identified which performed well under soil saturated condition.
- 1st week of August was found to be optimum sowing time of soybean under late sown conditions of Assam.

The AAU developed olitorius jute variety “TARUN” has been registered under PPV & FRA Act 2001 in 2016 which is the first variety of AAU registered under this act.

- AAU developed capsularis jute variety NCJ 28-10 (Kkhyati) has been recommended for notification and release for the country.
- NPK @15:13:25 (kg/ha) + Biofertilizer (Azospirillum + PSB @ 3.5 kg each) as seed coating was recommended for INM in Jute.
- Increasing the fertilizer dose to 150 % NPK of the recommended dose on ST-TY approach, ameliorating the soil with lime and incorporation of organic manure resulted in the highest fibre yield (39.28 q/ha) and rice yield of 2.78 q/ha.
- Application of Pretilachlor 50 EC either @ 450 or 900 ml/ha or Butachlor @ 1.5 kg/ha with one hand weeding effectively reduced the weed biomass and recorded about 6-9 q/ha higher fibre yield (31.80 q/ha) compared to unweeded control (22.68 q/ha).
- Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS and 50 DAS reduces yellow mite infestation and recorded highest fibre yield (30.86 q/ha).
- Highest fibre yield of 30.19 q/ha was obtained and comparatively less infestation of Macrophomina phaseolina (0.63%, 0.13 PDI & 1.93% seeding blight, stem rot & root rot respectively) was also recorded when seeds are treated with Azoxystrobin + difenoconazole @ 1.0 ml/kg seed and crop is sprayed @ 0.075 % at 40-45 days of age.
- Lowest PDI for stem rot infestation was in OIN 651 (5.11). However, highest root rot was recorded in OIN 125 (18.35 %) and lowest in JRO 524 (6.87 %).
- Application of microbial consortium CRIJAF SONA @ 30 kg/ha at the time of retting reduces the period of retting by 7-10 days with upgradation of fibre grades resulted in getting more price of fibres.

5.1.6 Sugarcane

- A sugarcane variety CoBln 02173 (22/94) (Doiyang) has been notified by the Central Sub Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops for its release in the NE region (Fig. 5.11).
- A large volume of sugarcane breeding lines are in different stage of advancement.
- Planting of setts after overnight soaking in 100 ppm ethrel solution followed by spraying of GA, (35ppm) at 90, 120 and 150 DAP recorded
significantly higher cane yield (57.8 t/ha) than in conventional 3 budded sett planting in plant crop of sugarcane.

- In case of integrated application of organic and inorganic fertilizer in sugarcane, application of FYM @ 10 t/ha along with bio-fertilizer (AZO+PSB) and inorganic fertilizer based on soil test recorded highest cane yield (44.8 t/ha) in 2nd year ratoon crop.
- 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.
- Different organic treatments produced significantly higher cane yield as compared to control and sustained the production level in successive ratoon crop. However, cane yield declined in the second ratoon crop where no organic matter was added.
- Various organic additions individually influenced the cane yield and the contributions of different organic components were additive. Addition of sugarcane trash compost and FYM along with green manuring resulted in highest contribution to cane yield.
- Post-harvest spray of the harvested cane with lauryl sulphate @ 12 mM, Na-metasilicate (1%) and formaldehyde (100 ppm) and covering with trash resulted in little or no change in the quality of juice and jaggery with regard to sucrose and reducing sugar content from their initial values when cane crushing delayed up to 4 and 5 days.
- Altogether 24 entries including one check variety and 5 standard varieties were evaluated against red rot by plug and nodal cotton swab methods of inoculation using CF 07 and CF 08 pathotypes. Genotype CoLk 12207 and CoLk 12209 showed resistance reaction to CF 07 but moderately resistance to CF 08 isolate in plug method. Other genotypes showed moderate resistance to both the isolates.

- In a survey on sugarcane diseases, pokkah boeng was observed in CoSe 11454, CoLk 09204, CoP 13436, BO 130, Co 997. Top Rot was observed in genotype CoSe 11451. Ring spot was recorded in BO 130, CoSe 12453, CoBln 09104, CoBln 09605. Red rot incidence varied from trace to 6.82%. Wilt was observed from trace to 18.51% in plant and ratoon crops. YLD incidence was noticed up to 5.88%. Banded sclerotial disease was also observed in BO 155 in trace.

### 5.1.7 Forage crops

- Intercropping of oat + pea at 3:3 ratio of rows produced Green Fodder Equivalent Yield (GFEY) of 123.4 t/ha which was followed by intercropping of oat + pea at 3:2 ratio (104.4 t/ha) while sole oat produced GFEY of 55.2 t/ha only (Fig. 5.12).

- In an experiment on establishment of oat crop by rice stubble management and INM in rice – oat cropping system, the highest GFY (233.7q/ha) and DMY (53.7 q/ha) were recorded with INM treatment - 25% N through FYM + 50 % NPK of RDF + Biofertilizer (Azotobacter + PSB) + green manure. Further, cutting rice stubble at 30 cm height could produce 94.66% of green forage (244.7q/ha) from oats as compared to normal cultivation (269.6q/ha).

### 5.1.8 Fruits

- In an evaluation of local germplasms of coconut, Kamrupa recorded the highest plant height, collar girth, number of functional leaf, annual leaf production and produced the highest yield of 68.50 nuts/palm/year.
- In an experiment on development of coconut based integrated cropping system models for different agro-climatic regions conducted with five intercrop components, viz., Turmeric (var. Megha Turmeric), Pineapple (var. Kew), Banana (var. Chenichampa), Black pepper (var. Panniyur 1) and Assam lemon,
the treatment with 50% recommended NPK + vermicompost + in situ green manuring + biofertilizer + vermiwash produced the highest yield/ha in the base crop as well as all the intercrops resulting in the highest net return (Rs. 3,74,834 per ha) and benefit cost ratio (2.26) with collateral improvement in the soil nutrient status (NPK) as well as leaf nutrient content.

- The non-woven poly-propylene 17 GSM bunch bag was found to be the best for controlling the damage by fruit scarring beetle in the banana variety Jahaji followed by the muslin cloth bag with a benefit cost ratio of 2.71 and 2.18, respectively.

- Split application of N and K, 20% N and 15% K₂O at 3rd month, 30% N and 25% K₂O at 5th month, 30% N and 30% K₂O at 7th month and 20% N and 30% K₂O at 9th month stages along with recommended dose of phosphorus at 3rd month of planting showed the best result under prevailing agro climatic conditions giving a bunch weight of 19 kg and a B:C ratio of 4.48.

- Subsurface drainage in the form of perforated PVC pipe in upper half overlain by mineral filter in form of rough sand oriented in the middle of two rows of Assam lemon plant at a depth 45 cm and with a gradient of 1:100 could lower water table below root zone for Assam Lemon plants during rainy season. The same pipes have been used for providing subsurface irrigation at 0.8 ER by supplying water by gravity. Benefit Cost ratio of the technology is 2.62.

- The suitable planting time of strawberry was found to be mid November for the Hill Zone of Assam. The variety Chandler produced berry yield of 9.63 q/ha followed by the variety Festival (9.37 q/ha). For both the varieties, the first harvest could be done after 70 days of planting (Fig. 5.13).

### 5.1.9 Vegetable

- Two chilli varieties namely Bireek-1 (semi dwarf, spreading type, fruit length 3-5 cm, bold green when unripe with capsaicin content -0.5 mg/g of fruit) and Bireek-2 (semi dwarf, spreading type, fruit length 3-5 cm, bold black when unripe with capsaicin content -0.42 mg/g of fruit) selected from landraces were found promising with mean green chilli yield of 95.87 and 106.21 q/ha, respectively and are now under AICRP testing (Fig. 5.14).

- Split application of N and K, 20% N and 15% K₂O at 3rd month, 30% N and 25% K₂O at 5th month, 30% N and 30% K₂O at 7th month and 20% N and 30% K₂O at 9th month stages along with recommended dose of phosphorus at 3rd month of planting showed the best result under prevailing agro climatic conditions giving a bunch weight of 19 kg and a B:C ratio of 4.48.

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- Application of 3.0 kg zinc/ha (equivalent to 14.5 kg Zinc Sulphate) along with recommended dose of fertilizer (RDF) was economic and profitable for potato which resulted in yield of 19.78 t/ha with B:C ratio of 1.73 which was significantly higher than the RDF (15.28 t/ha).

- Response of graded doses of nitrogen in potato under irrigated conditions was observed up to 150 kg N/ha which produced tuber yield of 17.40 t/ha with B:C ratio of 1.46 which was 17.2 and 26.9 %, respectively higher than the recommended dose of N.

- Spray of Potato Specific Formulation, developed by ICAR-CPRI, recorded the highest potato yield of 19.62 t/ha with B:C ratio of 1.88 which was 50.8% higher than the RDF (13.01 t/ha).

- Seed potato of variety Kufri Himalini, stored (for 174 days) in bamboo made conventional storage, had the lowest weight loss (due to rottage and shrinkage) of 29.6% while Kufri Jyoti, Kufri Pukhraj and Kufri Girdhari had a total loss of 32.1, 53.7 and 46.9%, respectively (Plate 2, 3 and 4).

- In water saving irrigation trial on potato, tuber yield recorded under full irrigation was significantly higher than partial root drying and deficit irrigation. However, deficit irrigation and partial root drying were statistically at par.

- In cucumber, 100% coverage of beds with polyfilm mulch produced highest number of fruits per plant.
(14.84), fruit yield per plant(3.48 kg), weight of fruit (257.02g), total yield (23.06 t/ha) and highest B:C ratio (2.44) as compared to the control, where number of fruits per plant(7.48), fruit yield per plant (1.20 kg), weight of fruit (139.96 g), total yield (7.96 t/ha) were recorded respectively, with a B:C ratio of (1.27) during early kharif season.

- For Roof Top Gardening, media depth of 30 cm along with media composition of sand + coco peat + vermicompost + vermiculite + perlite in the ratio of 1:2:0.25:0.25 by volume was best amongst all treatments for vegetables viz., Broccoli, Lettuce, Okra & Cucumber and flowers viz., gerbera, Chrysanthemum, Summer Marigold and Tuberose. The maximum B:C ratio (3.42) was obtained from this treatment (Media & depth) (Fig. 5.15).
- Feasibility study of using Panchagavya in drip fertigation on broccoli showed that drip irrigation recorded higher head yield than flood irrigation. Integration of FYM (5 t/ha) and Panchagavya (50 lit/ha) with 75% fertilizer recorded the highest head yield followed by recommended dose of fertilizer.
- Three spraying of Imidacloprid @ 20 g ai/ha could significantly reduce the population of *Aphis gossypii*
In tomato, BIPM package was found to be superior in reducing the Helicoverpa armigera larval population (2.32/plant) and fruit damage (9.87%) and Scirtothrips dorsalis (2.08/3 leaves) with higher yield of 242.83 q/ha compared to chemical control (2.90/plant, 12.47% and 3.87/3 leaves with 234.7 q/ha).

In brinjal, the per cent damage of shoot (9.03) and fruit (16.43) by Leucinodes orbanalis was lower in BIPM package as compared to chemical control with 11.50 and 19.71, respectively. The yield under BIPM package was 263.78 q/ha as against 260.09 q/ha under chemical control, whereas both the treatments were found to be on par.

Minimum larval population of Plutella xylostella (1.03/plant) and Brevicoryne brassicae (3.41/plant) was observed when cabbage was intercropped with mustard and cowpea with highest yield of 175.52 q/ha. Moreover, higher number of coccinellids (3.34/plant) and syrphid (3.01/plant) was also recorded from the same treatment.

Potential bioagents identified & characterized for vegetable ecosystem through in vitro and in vivo and field studies for organic cultivation.

Seed treatment with Purpureocillium lilacinum @ 2.5 ml/kg + Pochonia chalymydospora @ 2.5 ml/kg followed by soil application of vermicompost @ 2.5t/ha enriched with P. chalymydospora and P. lilacinum each @ 5ml/kg was found effective against M. incognita in okra where the yield was 8.66 t/ha as against 6.50 t/ha in untreated control.

Biofumigants are effective as well as emerging strategy for the management of plant parasitic nematodes in different cropping system. Chopped cabbage leaves @ 50 t/ha, that was incorporated in the soil 15 days prior to sowing of seeds was found effective in reducing population of phytonematodes, including root-knot nematode, Meloidogyne incognita in okra and finally increasing the yield of okra to 9.86 ton/ha as against 7.17 ton/ha in untreated control.

Plant parasitic nematode, Meloidogyne incognita is responsible to cause an avoidable loss of 16.65%, 12.86% and 17.78 in brinjal, tomato and cowpea, respectively.

The protocol for chitosan nano particle (5.615 to 91.28 nm) from 4 fungus characterized by UV-Vis Spectroscopy and Zetasizer, DLS and Transmission electron microscopy (TEM) has been standardized which has been found to be compatible with T. asperallum up to 0.02 ppm. Combined application of T. asperallum and Chitosan nanoparticle showed higher efficacy against Fusarium sp., Sclerotium rolfsii and Rhizoctonia solani causing diseases in pea, cabbage, tomato.

5.1.10 Flower

In tropical orchids, 19 species of epiphytic and 3 species of ground (Terrestrial) orchids were collected from various forest locations of Assam and maintained. In field grown gerbers, 11 varieties were collected and raised in open field using black polythene mulch. Protected cultivation and evaluation of 6 exotic gerbers indicated that the var. Tecta, Reene and Loreto were superior to others in terms of days to first flowering, flower diameter and stalk length. In the underexploited ornamentals, Pink Heliconia, Bihai Yellow Dancer and Bihai Orange Dancer were promising in Heliconias group in terms of market acceptability as cut flower, and accession HRS-BOP-1 was found promising in terms of number of inflorescence (7.20) and suckers (6.20) in the Bird of paradise group. In fillers group, a total of 22 species of ferns (both exotic and indigenous) and 5 species of Asparagus were collected and their performances were evaluated based on morphological traits, vegetative growth and vase life studies to find out their uses as indoor potted plant, ground cover, and cut fillers.

Bidhan Ranjan H-2 out of three new genotypes of tuberose recorded highest number of florats (48-53) and rachis length (51.50 cm) when compared with 4 check varieties.

In Dendrobium orchids, Var. Morning Glory recorded maximum number of pseudo bulbs per stem (3.27 no), minimal days to first flowering (358.33 days), longest flowering duration (52.33 days), maximum flower yield (1.40 no/pot), longest days to first floret withering and maximum shelf life in field condition (63.67 days) were recorded when plants were treated with a common basal application of organics along with 10 g of bone meal per pot.
Incidence of *Phoma tuberosa* causing leaf tip burn/blight in tuberose, both Local Single and Double (Prajwali), was confirmed. In addition, three fungal pathogens *viz.*, *Aschochyta gerberae*, *Phoma glomarata* and *Botryodiplodia theobromae* causing leaf spot/blight in field grown gerbera (Var. Red Gem and Red Monarch) were also identified. Besides, *Colletotrichum falcatum*, *Phoma medicaginis* and *Phoma exigua* causing leaf blight in Day Lily (*Hamerocalis* spp), leaf spot/blight in Calathea (*Calathea* spp) and leaf spot in Wart Fern (*Polypodium scolopendrium, P.diversypolium*), respectively were also identified.

Pre-storage and pre-planting treatment of corm with captan 0.2% + carbendazim 0.2% for 30 min followed by soil application of *T. harzianum* (10 g in 1 kg FYM for 10 m²) was found to register less disease incidence of 14.89 per cent with the highest per cent disease control (67.14%) of Fusarium (*Fusarium oxysporum* f.sp. *gladioli*) wilt in gladiolus. Spraying of azoxystrobin 23 SC @ 0.1% or difenoconazole 25EC @ 0.1% were found effective in managing the leaf spot/blight disease of tuberose.

Among the three packing treatments for flower strings of marigold, 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 PLW of flowers at 1, 2 and 3 days, respectively, compared to the other two types of packing containers.

Among the packing materials used for flower strings of tuberose, highest PLW (49.57%) was recorded in tuberose strings packed in Bamboo basket, followed by Thermocol box and CFB Box, which were at par.

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 in the loose flowers of tuberose 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%).

Dipping in Kesor Yellow (4% dye) for 2 hrs for tinting in tuberose stems recorded highest retention of colour up to 4 days with maximum floret opening (86.33%).

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) of orchid spikes over control (17.52 days 22.25 days, respectively).

5.1.11 Spices

Performance of five pepper varieties, *viz.*, IISR Thevam, IISR Shakti, IISR Malabar Excel, Sreekara and Panniyur1 was evaluated. The highest number of branches (28.60) was recorded in Sreekara and the lowest of 21.60 numbers were found in IISR Malabar Excel. Among the varieties/hybrids, Panniyur1 recorded the highest number of spikes (103.40 in one meter column height), spike length (14.2 cm), number of berries per spike (55.6) and yield (0.82 kg/vine) which were significantly higher than all other varieties/hybrid.

Among 12 black pepper varieties (6 yrs old) evaluated, Subhakara, Karimunda and Panniyur-1 recorded maximum green berry yield per plant (6.17, 5.32 and 4.82 kg/plant, respectively). In second set of black pepper evaluation, a total of 19 genotypes were collected and maintained (Fig. 5.16).

For raising bush pepper, black pepper cuttings taken in the month of May was found the best (80.00% success).

5.1.12 Agro-forestry

12 year old *Acacia mangium* based agroforestry system recorded the maximum tree height (12.60 m) in 5 m × 4 m spacing and dbh (29.05 cm) in 5 m × 5 m spacing. Timber volume was the maximum (187.50 m³/ha) in 5 m × 4 m spacing while the canopy diameter was the maximum (10.33 m) in 5 m × 5 m spacing. Tree biomass and above ground carbon stock were maximum (238.0 Mg/ha and 119 Mg/ha, respectively) in 5 m × 5 m spacing.
Intercropping with sesamum and niger was possible up to 4th year while, fodder crops, viz., hyb. Napier could be raised as intercrop even in the later stages. Continuous upsurge of organic matter and nutrients was also observed in the system.

- Intercropping with sesamum and niger was possible up to 4th year while, fodder crops, viz., hyb. Napier could be raised as intercrop even in the later stages. Continuous upsurge of organic matter and nutrients was also observed in the system.

- Interspaces of 34 year old coconut garden were utilized for growing vegetables, turmeric, pineapple and fodder crops. Coconut yield in intercropped plot was 10.75 to 14.78 per cent higher than the sole coconut plot (7340 nuts/ha). Economic analyses revealed that coconut-pineapple (ratoon) intercropping was the most profitable venture followed by coconut-turmeric. Building up of soil organic matter and nutrients was observed to be more under coconut-vegetable intercropping.

- A 12- year Jackfruit based agri-horti system recorded higher tree biomass (76.83 Mg/ha), above ground carbon stock (38.4 Mg/ ha), dbh (26.93 cm) and fruit production (480.0 q/ha) in intercropped plot compared to sole plantation. Increase of organic matter and nutrients were also observed in soil of the intercropped plots.

- In Bambusa tulda based agroforestry system, plant height (16.33 m), spread (3.09 m) and no. of culms (87.1 nos.) of 8 yrs old Bambusa tulda. The yield of intercrop was higher during early period and gradually decreased due to increased competition from bamboo. Gradual build up of organic matter, N and P₂O₅ was noted in all the intercropped plots; the maximum being with banana.

- Out of 95 germplasm of Gmelina arborea collected, the results showed the highest tree height of 16.77 m and 16.45 m in AAU 15 and AAU 16 (Byrnihat), highest dbh of 40.43 cm in AAU 17 (Silchar) and highest timber volume of 0.897m³/tree, highest biomass of 924.37 Mg/ha and highest above ground carbon stock of 462.16 Mg/ha in 15 years after plantation in AAU 18 (Silchar).

5.1.13 Agricultural Biotechnology

- Seven QTLs associated with drought tolerance, yield and yield attributing characters have been identified from a mapping population of Ranjit × Banglami. Three drought tolerant advanced breeding lines have also been developed.

- An endophytic bioformulation has been developed that enhances rice seedling vigour.

- Influence of indigenous microbial communities in the conversion of the different forms of arsenic has been deciphered using metagenomics approach.

- Generated pigeon pea lines expressing Cry2Ab gene for resistance to Helicoverpa armigera.

- Generated transgenic hairy roots of Withania somnifera using Agrobacterium rhizogenes (Published in Plant cell tissue and organ culture) and pharmaceutical active recombinant globular protein adiponectin has been produced as a secretory protein in Withania somnifera hairy root culture.

- Developed an in vitro regeneration system in groundnut.

- Transgenic chickpea lines expressing a full length version of Cry1Ac gene have been generated.

- Chloroplast targeted Cry2Aa gene construct has been reconstructed.

- Molecular mechanism of Bruchid-black gram interaction has been elucidated.

- Potential candidate-biomass for lignocellulosic alcohol production have been identified that includes Ipomea (Ipomoea carnea), Nal (Phragmites karka) & Uridal (Oriza rufipogon) all having >50% cellulose.

- Fungal isolate CFAAU29 (accession id: KY910258) that has higher cellulase (FPase) as well as á-Glucosidase activity is being used in alcohol production (Fig. 5.17).

- Rice transgenic lines harbouring PDH47 transcription factor have been developed in IR64 and ASD16 to impart drought tolerance.

Fig. 5.17: Fungal isolates showing cellulase activity
Mutants of rice small subunit (S2b) and large subunit (L2) were developed through site directed and random mutagenesis to impart heat stability of ADP glucose pyrophosphorylase (AGPase) enzyme during grain development in rice.

Local rice germplasms were screened against the proven anaerobic tolerant lines KHO, MZ Red and Khaiyan from IRRI for anaerobic germination. Phenotypic characterization based on morphophysiological parameters led to identification of several genotypes that showed germination percentage ranging from 60-80 percent (Fig. 5.18). The most promising lines are currently being used for marker assisted mapping and introgression of tolerance trait into HYV.

Insertion of QTCL motif in the N-terminus of the small subunit gene of rice AGPase along with replacement of Phenylalanine with leucine at position 379 (L379F) in the wild type small subunit of rice (S2b) gene enhances heat stability of the rice AGPase.

Secondary metabolic pathway in Citronella was elucidated using high-throughput RNA-Seq technology.

Comparative genetic studies of Tulsi ( Ocimum sp) accessions from Assam and mainland India did not show any significant difference in genetic makeup.

Rice cultivars were screened for cold tolerance and the cultivars PSB RC-2, Aagnaisail, PSB RC62, EC-268239 were identified as the most promising variety.

DNA barcodes were developed for the bioagents like Bacillus thuringiensis strain BTJ-S-1, Trichoderma parareesei strain TPJ-S-1, Trichoderma viride strain TVJ-S-1, Aspergillus tamarii strain AFJ-S-1, Paecilomyces fumosoroseus, Trichoderma viride Isolate-1, Pseudomonas fluorescens isolate Pd2 isolate TVJ-S-2, Ralstonia solanacearum isolate RSJ-T, Bacillus subtilis isolate BSJ-S-1, Azotobacter chroococcum isolate AAU/J-1.

5.1.14 Agrometeorology

More than 95 Agromet Advisory Bulletins (AABs) were prepared and disseminated to the farmers through different media under the GKMS project. The bulletins were prepared based on medium range weather forecasts provided by IMD and disseminated in 5 districts of Upper Brahmaputra Valley Zone (UBVZ) of Assam.

Under the FASAL project, crop yield forecasting for different crops (Rice and Jute) at different stages are given using statistical and simulation models. During the year 2016-17, the district wise yield forecasts for jute was given at F3 stage for 13 selected districts of Assam. For rice (kharif), district wise yield forecast at F1 and F2 stages were given for 26 districts of the state using statistical models.

Trend analysis of weather parameters at Jorhat was undertaken for the period 1990-2016 using daily weather data. annual maximum temperature, mean temperature and daily morning Relative Humidity showed highly significant increasing trend while daily Bright Sunshine Hours was found to be showing highly significant decreasing trend.

Monitoring of crop stress was undertaken in potato at Jorhat centre using canopy-air temperature difference (CATD). Three cultivars viz., Kufri-Jyoti, Kufri-Pokhraj and local variety were exposed to three growing environments (sown on 19th Nov, 7th Dec and 23rd Dec, 2016 respectively) and periodic observations on canopy and air temperature were taken using infrared thermometer. Early and normal sown crop suffered from Water Stress during early vegetative growth, compared to late sown crops as revealed by positive CATD values.

5.1.15 Ornithology

Erection of Reflective Ribbon and seed treatment with Copper oxy chloride @ 3 g/kg seed could provide protection to maize in the field during sprouting stage.
- Partial covering of cobs at vulnerable grain maturity stage of maize by wrapping adjacent green leaves of the same plant around the cobs at random on outer 3 rows and fixing of reflective ribbon 3-5 m apart in north south directions showed effectiveness in controlling bird pest problem in maize.
- A detailed checklist of birds of Rambalia wetland of Majuli River Island has been published. In all, 133 species belonging to 47 families were enlisted. Of these, 3 bird species were recorded as near threatened, 3 species as vulnerable and one as endangered (Fig. 5.19).

![Image of birds](image1.png)

5.1.16 White Grub and Other Soil Arthropods

- Considerable level of antioxidant activity of two white grub beetles viz., *L. mansueta* (22.60 %) and *L. albistigma* (28.20 %) was revealed by DPPH free radical scavenging assay. The mean phenol and flavonoid content of *L. mansueta* and *L. albistigma* were found to be 4.00 and 6.42 mg catechol equivalent/g and 1.59 and 3.71 mg quercetin equivalent/g, respectively. Tannin content was found in low amount and varied from 3.24 to 13.30 mg/g in both the beetles.
- Fatty acid profile analysis of two scarab beetles belonging to the genus ‘Lepidiota’ through GC-MS indicated that *L. mansueta* beetles contained 5 fatty acids (Methyl 9,10-Methylene-Hexadecanoate, Methyl 11-Methyl-Dodecanoate, Methyl 11, 14-Octadecadienoate, Methyl 13-Octadecenoate, Methyl 12-Methyl-Tridecanoate) and *L. albistigma* contained 4 fatty acids (Methyl 8-Methyl-Nonanoate, Methyl 9, 10-Octadecadienoate, Methyl 13-Octadecenoate, Methyl 8-Methyl-Nonanoate).
- Amino acid profiling of *L. mansueta* beetle was investigated in collaboration with CSIR- CFTRI, Mysore. Seventeen amino acids have been quantified of which Leucine (5.97 %), Valine (4.45 %), Isoleucine (4.0 %), Phenylalanine (2.89 %), Lysine (2.22 %), Threonine (2.22 %) and Methionine (0.93 %) were essential one.
- A low cost modified battery operated LED light trap was designed especially for trapping *L. mansueta* adults and its effectiveness was assessed in terms of beetle catches and found significant differences with solar LED light trap (paired ‘t’ value: 17.39) and light trap operated with CFL bulb 15 watt (paired ‘t’ value: 15.15).
- A decorative “Diya” has been prepared from the empty shells of Giant African Snail.
- Furrow application of chlorpyriphos 20 EC @ 0.06% (or chlorpyriphos 300 g a.i./ ha) has been recommended against red ants (*Dorylusorientalis*) in potato.
- Five bacterial strains have been isolated from the gut of *L. mansueta* which have cellulose and lignin degrading properties. Nucleotide sequences of the isolates have been submitted to GenBank, NCBI, USA. The cultures were further examined by incorporating them in compost pits to examine their role in degradation of rice straw (Fig. 5.20).

5.1.17 Honey Bee

- Rearing technology of *Xylocopa fenestrata* has been standardized (Fig. 5.21). Portable wooden frame had been designed in which five *X. fenestrata* nested bamboo top had been inserted. Four such portable frames had been introduced in polyhouse for pollination of cucumber. There was a yield increase in cucumber of 43.64% (73.06 q/ha) in *Xylocopa* pollination over without *Xylocopa* pollination (22.32 q/ha).
- Attempts have been made for selective breeding of *A. mellifera* through artificial insemination technique and 10 per cent success has been achieved (Fig. 5.22).
**Apis cerana** pollination on sesame (*Sesamum indicum* L.) contributed significantly to the yield of 9.06 q/ha against 5.60 q/ha in pollinator exclusion. Oil content was also substantially higher i.e. 26.3% in *Apis cerana* pollination against 22.44% in pollinator exclusion.

### 5.1.18 Rodent Control

- The highest antifeedant index of 80.91% in male and 84.71% in females of *B. bengalensis* were recorded with the botanical herbs, *Solanum khasianum* followed by *Moringa oleifera* (73.97% in male and 75.18% in female).
- The pre- and post-treatment count of LBC in case of summer rice revealed a control success of 41.7% whereas the control success in respect of trap index was 55.8% due to installation of artificial barn owl nest boxes in controlling field rodents.
- The comparative trapping efficacy of local bamboo traps revealed the highest trap index of (8.04±0.37) with *maat chitap* in comparison to *neul chitika* (6.61±1.11) at maturity stage of *kharif* rice.
- The baiting with bromadiolone (0.005%) at panicle initiation stage + local bamboo traps (*maat chitap*) at milky stage of *sali* rice gave the highest reduction in rodent population (77.46% LBC/ha and 65.86% TI).
- The application of castor oil in and around the rural poultry farm reduced rodent activity from 52.4-60.8% whereas the application of bromadiolone + castor oil reduced the rodent activity from 54.4-75.1%. The castor oil may be a good alternative to rodenticides in poultry sector.

### 5.1.19 Acarology

- Efficacy of predatory mite, *Neoseiulus longispinosus* in control of the false spider mite, *Brevipalpus californicus* in gerbera was evaluated. After seven days of releasing 10 predators/plant, 98.38 per cent reduction of false spider mite was observed. Whereas releasing 10 or 20 numbers of predatory mites, *N. longispinosus* per plant against two spotted spider mite pest, *Tetranychus urticae* resulted 100 per cent control of the pest after seven days of application which is recommended in lieu of chemical acaricide.
- Management practice against eriophyid mites (*Aceria litchi*) of litchi in Assam has been developed.
and ready for MLT. The best practice was destruction of highly infested leaves + spraying propargite 57 EC @ 0.057 %(1 ml/litre) at 10 days interval which resulted in 80.29 per cent reduction of mite population.

- Mass production technology of phytoseiid predatory mite, *Neoseiulus longispinosus* was standardized. Releasing 40 predators per plant was considered to be the standard for mass multiplication of *N. longispinosus* using wild amaranth, *Amaranthus hybridus* as host crop on *T. urticae* as prey mite.

- Out of 50 varieties including several local collections of chilli screened against the yellow mite (*Polyphagotarsonemus latus*), only four local collections viz. Memjolokia, Krishna, Konjolokia and Moni have, so far, been found to be highly resistant to *P. latus*.

- One new acaricide, Rebufenpyrad 20 per cent WP was evaluated against *Oligonychus coffeae* in tea. Mite control to the tune of 100 per cent was achieved after 5 days of spraying when applied @ 200 g a.i./ha which was at par with the existing acaricide Propargite 57 EC @ 570 g a.i./ha.

### 5.1.20 Soil Biodiversity and Biofertilizer

- Two isolates of Zn solubilizing bacteria (ZSB, Sonitpur and ZSBT, Titabor) were tested for Zn nutrition in Bahadur, Ranjit and aromatic joha and it was observed that the isolates could increase the Zn concentration (39.19 and 38.38 mg kg⁻¹ respectively) in rice grain which was comparable with the application of ZnSO₄ (41.71 mg kg⁻¹) (Fig. 5.23).

- Addition of shed net and Arahar shed with Integrated Nutrient Management significantly increased yield and doubling time of *Azolla caroliniana* and *Azolla pinnata* compared to open homestead method. Azolla produced in this organic mode could be fed to poultry and cattle without any health risk.

- DTPA Fe, Mn and Cu were found to be sufficient in all the blocks of Chirang and Dhubri districts. In Chirang district, boron showed highest deficiency followed by zinc. Soils from all blocks recorded calcium deficiency ranging from 25 to 29 % and magnesium deficiency ranging from 15 to 21%.

- Liquid biofertilizer formulation with 1.0 % additive (PVP), 0.1 % adjuvant and 0.025 % surfactant extended and stabilized the shelf life of *Rhizobium* (10.11 Log cfu/mL), Azospirillum (9.56 Log cfu/mL) and phosphate solubilizing bacteria (9.76 Log cfu/mL) except Azotobacter (7.23 Log cfu/mL) up to 10 months (Fig. 5.24).

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**Fig. 5.23:** Seedling root dip treatments with Zn solubilizing bacteria (ZSB) and ZSBS₁, & ZSBT₁

**Fig. 5.24:** Shelf life of *Rhizobium*, Azospirillum and phosphate solubilizing bacteria

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**Fig. 5.24:** Shelf life of *Rhizobium*, Azospirillum and phosphate solubilizing bacteria
of the isolated DNA using the bacterial primers. Identity of the bacterial isolates was done by sequencing of 16SrRNA and phylogenetic tree for all the 26 bacterial isolates were also prepared. The identified bacterial isolates has been enriched in compost and used as bioremediation in polluted soils.

- Altogether 3533 soil health cards (SHC) were developed and printed and out of this 1407 were distributed to farmers (Fig. 5.25).

- Associations of arbuscular mycorrhizal fungi (AMF) in the rhizospheres of seven rice varieties widely grown in Assam were assessed and the occurrence of AMF spores in the rhizosphere of wet land rice varieties in between 209.00 and 397.00 100g⁻¹ soil of which highest value was observed in Joha rhizosphere (397.00 100g⁻¹).

- The 16S rRNA gene of the highly promising strains of rhizobium was sequenced for identification with an aim of developing biofertilizers for specific crops with potential benefit to improve the crop productivity. The sequences for the other biofertilizer organisms were also sequenced for 16s rRNA gene and the sequences recovered were deposited in the GenBank and NCBI database under different accession numbers.

- A total of 16 Methanotrophic bacterial isolates were isolated in NMS medium using standard protocol from the rice rhizosphere of Jorhat and Golaghat district of Assam. Naphthalene oxidation assay revealed that out of 16 isolates, 11 bacterial isolates indicated the presence of soluble methane monooxygenase enzyme. For molecular characterization of the methanotrophs, 6 efficient isolates were chosen for 16s and the result of 16s sequences obtained from sequencing for rRNA sequencing and gene amplification were submitted in Gene Bank (NCBI) with accession numbers ranging from KY078785- KY078791.

- Soil Fertility Status has been determined at block level for eight parameters viz. pH, OC, N, P, K, S, Zn and B and also for lime requirement (LR) of the soils of Golaghat (7 blocks), Sonitpur ( blocks 14) and Lakhimpur (9) districts.

- Geo-referenced soil fertility maps have been developed at block level using TNT mips, 2014 for Jorhat district (6 blocks: Kaliapn, Selenghut, Sipahikhula, and Dhekargorah), Majuli district (2 blocks: Majuli and Ujoni Majuli), Golaghat district (7 blocks): Kakodonga, Morongi, Golaghat Central, Golaghat West, Golaghat South, Golaghat East and Golaghat North) and Dibrugarh district (3 blocks: Borboruah, Lahowal and Tengakha).

- Several biofertilizing agents isolated and characterized from different crop rhizospheres of Jorhat and Golaghat district of Assam. A total of 15 phosphate solubilizing bacteria, 19 azotobacter cultures, 15 azospirillum cultures, 10 plant growth promoters, 11 methanotrophs and 30 crop specific Rhizobium cultures were isolated. The efficient cultures were identified and submitted to NCBI GenBank with accession numbers. An MoU has been signed between AAU & three private companies viz. Monsut Chem, Panikheth, Gauhati; Priyo Scientific, Jorhat and VRS Agritech Pvt. Ltd., Gauhati for commercialization of these efficient biofertilizer organisms.
5.1.21 Quality seed production

- The University has been producing and supplying breeder, foundation, certified and truthfully labelled seeds of different field and horticultural crops with the intent of at least partially meeting the seed demands of the state. The University began to accord greater attention to producing and trading seeds since the 1990s and then in the beginning of 2000s, the University made renewed efforts to systematize the seed production programme with closer coordination among the constituent colleges, research stations and KVKs for need based production of quality seeds and taking the seeds to the door steps of the farmers across the state. The support received from ICAR under the ICAR Seed Project gave impetus to the seed production programme, particularly for production of the field crops.

- Since 2010, the AAU has been producing quality seeds of the major field crops in very large scale with participation of the farmers under Technology Showcasing/Participatory Seed Production Programme under RKVY. In this programme, farmers are grouped and mobilized to grow together in a large compact block (field) of 100 ha or more and they are supported with quality seeds (breeder and foundation seeds) and need based inputs including fertilizers and pesticides. They are also imparted with theoretical as well as hands-on trainings by scientists of the KVKs on different aspects related to quality seed production of different crops, particularly, rice, greengram, blackgram, lentil and toria. This programme has allowed to effectively showcasing the worth of the modern crop varieties and production technologies while at the same time producing large quantity of quality seeds.

- In 2016-17, the ICAR launched a Pulses Seed Hub Programme and included RARS, Shillongani and five KVKs viz., Jorhat, Lakhimpur, Kamrup, Karimganj and Nalbari with the objective of adequately locally producing the pulse seed. This programme will give further impetus to the seed production programme of the University.

- During 2016-17, altogether 15567 q quality seeds of different crops were produced including 1606 q pulses seed produced under Pulses Seed Hub programme (Fig. 5.26).

Besides, the university also produced huge quantity of sugarcane sets, forage slips and planting materials of different horticultural crops.

5.2 Community Science

- Research activities in Community Science are also coordinated by the Directorate of research (Agri) besides those in Agriculture Faculty. Altogether 11 research projects were in operation under different departments of the Faculty of Community Science during the year. Salient findings of these projects are given below.

5.2.1 Human Development and Family Studies

- In a study, none of the academically backward students and drop-outs was found to have suffered severe kind of socio-emotional problems and almost all the academically backward and drop-out respondents exhibited low level of vocational interest.

5.2.2 Extension and Communication Management

- Based on qualitative and quantitative and data, a study identified several factors to contribute to sustainability of women groups. Adherence to proper procedure and cohesiveness & like mindedness among interested group members, meeting at regular intervals with participation of all members, regularity in contribution and deposition of money in bank, involvement of members in entrepreneurial and income generating activities along with microfinance, regular monitoring during initial years and hand holding for marketing were identified to be essential elements for sustainability of the groups.

- A study on work education programmes of the school education showed that 69 percent elementary schools had 40 minutes for each period for work education but there was no uniformity in terms of their allocation in their class routine and showed that 59 percent teachers had unfavourable attitude.
towards work education programme and the problems reported were lack of fund, lack of proper guide book, lack of skilled and sufficient number of teachers, lack of necessary equipment and boundary wall, lack of proper concept in the subject and assessment

- A survey in Jorhat, Dibrugarh, Udalguri and Darang districts showed that 78 percent of the rural women had involvement in vegetable cultivation and livestock rearing and 42.77 percent had medium level of knowledge on these activities. The inhibiting factors to women’s involvement were identified to be lack of leisure time & courage for risk taking in entrepreneurial activities, hesitation to interact with govt. personnel, bank and NGOs; negative attitude of society towards the women’s modern business outlook, male dominance, lack of proper guidance from the relevant organizations, insufficient working capital, high cost of paid labour, weak marketing linkage, lack of producing adequate volume of production and involvement of middle man. The five strategic actions identified in the study for economic empowerment of women were (i) providing specific training to the entrepreneurs on selected enterprises, (ii) continuous assistance on production process and production management, (iii) help/guidance to establish linkages with inputs suppliers and markets (iv) access to current and reliable market information and (v) ensuring easy availability of low cost high yielding breed/variety.

- A study revealed that 98 percent entrepreneurs had sole ownership with average 4 hours time spent daily; 86.66 percent started their enterprise with own capital and self marketing was recorded for more than 80% in expo/trade fair in and outside own village. For women entrepreneurs, financial problems emerged as most important followed by marketing and than managerial skill which were ranked I, II and III, respectively

- The impact of micro enterprise on economic empowerment of women entrepreneurs was found to be highly significant in different aspects such as control over their income, contribution to family decision, purchase of household property, availing and repayment of loan, engagement of labour, opening and operating of own account, contribution in child education, contribution in health care and clothing and also in social functions.

5.2.3 Family Resource Management

- Drudgery load was found to be highest in uprooting of seedlings (62.29) and lowest in seed selection (27.69). Depending on the drudgery load of the different activities, technology packages were developed and/or modified, evaluated and transferred for mitigating drudgery of farm women in the selected production systems.

- In tea cultivation, drudgery load was the highest in levelling (70.87), followed by transplanting of tea seedlings (70.07), removing of stalks and stubbles (67.23) and plucking (62.25) in case of women exclusive activities.

- Improved ginger peeling knife was designed. The knife with crescent shaped blade with cutting edge in outward curve was found worker’s friendly for peeling of ginger. The handle gets well fitted with handgrip, causing less fatigue as compared to existing one (Fig. 5.27).

- A study to strategize to improve the Work Ability Index score (WAI score) of workers engaged in different occupations indicated that there existed a definite connection between stress at work and WAI score. Early retirement was found to be related to reduced-WAI score, common among the workers exposed to both physical and mental load, specially, workers engaged in service sector like hospitals. In a study, female respondents were found to have average awareness level on the role of surface reflectance in enhancing lighting performance. Majority of female respondents with high awareness level were highly educated and employed and the respondents were found to usually select those colours which they preferred most in the interior spaces.

5.2.4 Textile and Apparel Designing

- Protective clothing kits were developed for agriculture and allied activities and their suitability and acceptability were assessed through On Farm Trial (OFT) in different KVKs of Assam (Fig. 5.28).

- Non conventional fibres were extracted from agro-waste i.e. the stem of Bhindi (Abelmoschus esculanta L.) and non-woven fabrics were made
5.2.5 Food Science and Nutrition

- Cooking treatments were found to cause decrease in bioactive components like total phenolic content (TPC), total flavonoid content (TFC) and total antioxidant capacity (TAC) in cereals and millets, pulses and legumes, roots and tubers whereas in green leafy vegetables and other vegetables cooking showed positive impact on bioactive components. Pressure cooking emerged as most effective cooking method in lowering the loss of antioxidant capacity and phytochemicals. The study indicated that cooking might cause both positive and negative impact on the TPC, TFC and TAC of the samples depending on the cooking method employed and type of foods.

- A study with 300 school going adolescent girls from rural areas with haemoglobin level of less than 12 g/dl clearly indicated that nutrition education programme could significantly increase the mean food and nutrient intake and improved the haemoglobin level (from 10.01 ± 1.08 g/dl to 11.18 ± 0.77 g/dl).

- Methods were standardized for preparation of several value added products from minor fruits of Assam and preparation methods for 8 such products were transferred to three entrepreneurs viz., Barhamthuri, Rajamaidam, Jorhat -1, Smriti’s Griha Udyog, Hem Baruah path, Jorhat and Madhur Food Products, Sonitpur, Assam.

- Shelf life, organoleptic as well as microbiological studies showed that spray dried powder from ripe banana (var: Jahanji) could be kept qualitatively unchanged upto 30 days in high density polyethylene pouches.

5.3 Veterinary Research

The Directorate of Research (Vety) coordinates and administers the research activities in the field of Veterinary and Fishery Sciences in the University. There are two research stations under the Directorate of Research (Vety) viz., Livestock Research Station (LRS), Mondira and Goat Research Station (GRS), Burnihat. Research on Fishery is conducted mainly at College of Fisheries, Raha and Fishery Research Centre (FRC), Jorhat. Besides, fishery research is also conducted at LRS, Mondia and GRS, Burnihat under its Fishery Research Scheme. During the period under report i.e from April 1, 2016 to March 31, 2017,
altogether 67 research projects were in operation under this Directorate, of which 57 in the Veterinary Faculty and 10 in the Fishery Faculty. Some of the achievements as well as salient research findings of these projects during 2016-17 are presented below:

5.3.1 Significant Achievements

Some of the significant achievements during 2016-17 in veterinary research were as follows:

**Pig Variety Released:** A synthetic variety of pig HD-K 75 (with 75% genetic materials from Hampshire and 25% from desi pig) developed under AICRP on Pig was released on October 14, 2016 by Dr. Habibur Rahman, Deputy Director General (Animal Science), Indian Council of Agricultural Research, New Delhi, in the College of Veterinary Science, AAU, Khanapara in presence of Hon’ble Vice-Chancellor, Assam Agricultural University, Dr. K. M. Bujarbaruah; ADG (AP & B), ICAR; Director NRC on Pig and other dignitaries (Fig. 5.30).

**Pig Variety Registered:** ‘Doom’, a native variety of pig of Assam, had been registered as a breed with accession number ‘INDIA_PIG_0200_DOOM_09006’ by the Breed Registration Committee of the Indian Council of Agricultural Research (ICAR), New Delhi (Fig. 5.31). The ‘Doom’ pig is the first livestock of Assam ever registered as a breed.

**Commercialization of Technology:** MoU was signed between AAU and M/S SDB Agrochem Sikaria Complex, Christian Basti, G.S. Road, Guwahati for commercial production of fish feed ‘SUSHMA’.

**Package of Practices Published:** Package of Practices for livestock was developed and released on April 27, 2016. The earlier package was published during 1989-1990. The package contains all relevant and recent information in livestock sector.

**Breed Descriptor for Some Indigenous Breeds:** Breed descriptor for indigenous cattle- ‘Lakhimi’, indigenous duck - ‘Pati Duck’, swamp buffalo - ‘Luit’, Assam hill goat - ‘Asomi’ and indigenous chicken-’Jyanendra’ had been developed. The required documents for registration of indigenous cattle, indigenous duck and indigenous chicken had already been submitted. A team of scientists from NBAGR had visited the institute for on the spot survey and verification for registration of ‘Lakhimi’ cattle in the month of April.

**Patent Filed:** The method of making calcium phosphate nanoparticle adjuvanted outer-membrane protein vaccine and poly-lactide co-glycolide-micro-particle adjuvanted outer-membrane protein vaccine had been sent to the Patent Facilitation Cell of Department of Biotechnology (DBT), New Delhi. A novel polyherbal formulation with adaptagenic property and a method to prepare the product were also submitted to DBT on July 22, 2016.

5.3.2 Pig

- Under AICRP on Pig, a total of 237 piglets were obtained from 29 farrowing (3rd Crop) during 2016-17. The average litter size at birth, litter weight at birth, litter size at weaning and litter weight at weaning were 8.17 ± 0.15, 8.09 ± 0.91 kg, 7.93 ± 0.16 and 80.79 ± 1.23 kg, respectively. The average body weight at birth, at 6th week (weaning) and at 8 month of age were 0.99 ± 0.01 kg, 10.17 ± 0.01 kg and 73.62 ± 0.19 kg, respectively.
- During 2016-17, a total of 1451 piglets with 50% Hampshire genetic material were produced under ICAR Seed Project (Fig. 5.32).
- Pilot survey was conducted to record the pig rearing practices in various areas of Kamrup, Darrang, Nalbari, Mangaldoi, Lakhimpur and Karbi Along districts of Assam.
- Ninety five (95) samples collected from both clinically affected pigs with symptoms of respiratory tract infection and apparently healthy
Pigs were screened and *P. multocida* could be isolated from 4 samples (4.21%) of which 3 were recovered from clinically affected pigs, while one was from apparently healthy. Two each of the isolates were identified as capsular type A and D. All the four isolates (Both type A and D) revealed similar restriction pattern (PFGE), indicating genetic relatedness. Other 19 samples collected from an outbreak of suspected pig pasteurellosis (dead = 6 and clinically affected = 13) were also screened, of which 12 (63.16%) allowed isolation of *P. multocida*. Isolation was possible from lung and heart blood of all the six dead animals, while isolation of *P. multocida* was possible from another 6 (46.15%) nasal swabs collected from 13 diseased pigs. All the 12 *P. multocida* isolates were identified to be capsular Type D. Majority of the affected pigs, particularly those positive for *P. multocida* were found to be positive for Circo virus infection. A flock of 30 animals were affected with different severity rate. Among the Type D isolates recovered from the outbreak with Circo virus infection, 10 *P. multocida* strains were found to be closely related to each other. However, the remaining two isolates (Type D) could not reveal any restriction patterns.

- Fresh vaccination trial was initiated against swine pasteurellosis in a group of 4 piglets of 4 weeks of age with Aluminium hydroxide adjuvanted bacterin vaccine prepared from the most pathogenic isolate of *P. multocida* Type A. Rising trend of the ELISA titer was observed in the vaccinated animals from the day 7 onwards till 8 months of post vaccination. Immunized pigs were found to be protected against homologous challenge on 8th month of post vaccination. The vaccine preparation has to be validated by the other centres of Net Work Project on HS, before being used as commercial vaccine in field.

- Two different types of vaccine were prepared viz., the whole outer membrane protein of *Pasteurella multocida* capsular type A and D and complexed with calcium phosphate nanoparticles (CAP-OMP) and poly-lactide co-glycolide microparticles (PLG-OMP). The antibody response against the two candidate vaccine preparations were compared to that of Alum-adjuvanted or oil adjuvanted vaccine in mice. The mice immunized with CAP-OMP and PLG-OMP showed significantly higher antibody titre than that of conventional vaccine. The vaccine preparations CAP-OMP and PLG-OMP conferred 100% protection in mice against the homologous challenge and heterologous challenge, respectively. It was concluded that the candidate vaccines had better immune-protective potential than that of conventional alum adjuvanted bacterin vaccine. The calcium phosphate nanoparticle adjuvanted OMP (Capsular Type A and D) was found to possess the heat stability upto 90 days in 37°C.

- Classical Swine Fever continues to be the major viral disease of pigs with high mortality rate. During the period under review, altogether 10 outbreaks were recorded in 5 districts of Assam viz., Udalguri, Karimganj, Kokrajhar, Baksa and Nalbari. The maximum outbreak (4) was recorded from Udalguri district. GIS based kriging interpolation for CSF using NDVI and LST (Satellite Imageries) was prepared in collaboration with NIVEDI to predict CSF outbreaks. Single dilution i-ELISA kit was released.

- Diagnosis of Circo virus infection in pigs from an organized Pig Farm of Kamrup district was noted as significant.
evaluated in goats infected with gastrointestinal nematodes managed under unorganized farm. The efficacy of Fenbendazole was found to be 94.12% on 10 days and 97.85% on 14th day of post-treatment and the efficacy of Ivermectin was found to be 100% on 10 and 14 days post-treatment. MUMB, Herbal (AAU/CI) by licking showed 99.86% and 99.87% reduction on 10 days and 14 days post-treatment while group treated with Fenbendazole was found to develop resistance.

- Use of Vitamin E @ 2 ml as antioxidant in Tris extender before freezing could improve the quality of Beetal buck frozen semen in respect of sperm motility, live sperm and intact acrosome.

- A study indicated that leaves of *Artocarpus heterophyllus, Terminalia bellerica* and *Carica papaya* had antioxidant properties serving as free radical scavengers. The activity observed may be attributed to the presence of phenolic and flavanoid contents. Thus, these plants may be used in place of chemical antioxidants in the treatment of oxidative stress.

- The leaves of *Artocarpus heterophyllus, Terminalia bellerica* and *Carica papaya* were found to be a rich source of tannin, saponin, flavonoids, steroid and glycosides and feeding goats at 5% and 10% level along with standard diet did not have any significant effect on the rumen enzymes.

- Pox in domestic and wild goats, pigs and avian has re-emerged in North Eastern States.

- The most common bacterial disease affecting the small ruminants mainly goat during the period under report was found to be Enterotoxaemia which appeared to be the major killer bacterial disease of goats. All total 20 outbreaks of enterotoxaemia were recorded from 13 districts of Assam. The temporal distribution of the disease reveals the occurrence of the disease through out the year.

- Goat Pox appeared to be most emerging and killer viral disease in small ruminants especially in goat followed by PPR. Goat Pox was recorded in 9 districts of the Brahmaputra Valley. The maximum outbreaks was reported from Karbi Anglong (5). Except in the month of April, 2016 and March, 2017, Goat Pox was recorded throughout the year.

- All total 13 outbreaks of PPR was recorded from 9 districts of Assam located in the upper Brahmaputra Valley and middle Brahmaputra Valley. One outbreak of PPR was recorded from Karimganj district of Barak Valley.

- Two outbreaks of Orf were recorded with high mortality amongst kids (Fig. 5.33).

- Amongst protozoal diseases of animals, Theileriosis was recorded from Dhemaji and Karbi Anglong districts of Assam.

- Fasciolosis and Amphistomiasis are the other two common parasitic diseases recorded during the period of report.

### 5.3.4 Bovine

- Breed descriptors of indigenous cattle of Assam were developed and submitted to NBAGR for registration (Fig. 5.34).

- Post-partum anoestrus in cows could be successfully addressed with the supplementation...
of either Mineral Mixture + Bypass Protein + Herbal Anti Stressor or Mineral Mixture + Bypass Protein + Selenium & Vitamin E in feed leading to response rate of above 70.00 per cent. The conception rate to first A.I. was found to be 60.00 per cent or above on non-return basis.

- Application of GnRH (i.v.) before A.I. followed by hydroxy progesterone caproate (i.m.) on day 5 and COX inhibitor on day 16 and 17 was moderately effective in treating non-infectious repeat breeder crossbred cows.
- Hormonal interventions either Heatsynch or Ovsynch protocol could be adopted to address post-partum anoestrus in cows in field condition and the present work revealed response rate above 85.00 per cent.
- IBRV, BVDV and Brucella infections in breeding cattle with reproductive complications are frequently detected in dairy farms in Assam.
- In a herd of swamp buffalo, milk fat percentage was found to range from 6.29 to 11.71 with an average 8.62 %, SNF from 8.93 to 9.84 % with an average 9.31 %; total solids ranging from 16.19 to 20.14 with an average 18.41 % and protein percentage from 2.18% to 3.56 % with an average value of 3.21%.
- The most common bacterial disease affecting large ruminant species was found to be Haemorrhagic Septicaemia (HS) and Black Quarter (BQ).

5.3.5 Foot and Mouth Disease (FMD)
- From 46 FMD outbreaks, 188 samples were found to be positive virus antigen. A total of 112 serum samples were collected for retrospective study and 4 Milk and 1 Lymph Node samples were found to be negative, but other samples collected from the same outbreak were found to be positive. Species wise animals affected by FMD are local cattle, crossbred cattle, buffalo, goat, mithun and pig.
- Economics of FMD incidences was found to be around Rs. 4.9 crores which included loss due to death (Rs 2,32,000), loss of milk (Rs 3,73,68,000), loss of draught power (Rs 52,70,400) and cost of treatment (Rs 61,62,000).

5.3.6 Poultry
- Breed descriptors of indigenous “PATI Duck” was developed and submitted to NBAGR for registration.

In all the duck plague outbreaks, mortality was found to be higher in ducklings as compared to grower and adult ducks. I-ELISA, a new sensitive diagnostic tool has been developed to assay DPV antibody in population as well as in vaccinated flock. Spatial distribution of duck plague outbreaks was studied and OIE recommended DNA PCR was used as preclinical diagnostic tool for detection of DPV infection in non-invasive cloacal as well as in ocular swabs (Fig. 5.35). Duck embryo fibroblast (DEF) cell culture can be the best alternative living host to isolate wild duck plague virus in primary host system.

5.3.7 Post Harvest Engineering & Technology
- In a solar drier fabricated in AAU, pork balls could be prepared by sun drying for a period of 36-40 hrs. Sensory evaluation of the dried products under
two different drying conditions revealed higher overall acceptability of the solar dried products.

- A liquid smoke production plant had been fabricated in pilot scale. Based on its performance the design of the final liquid smoke, production plant was finalized and the fabrication work is in progress.
- Isolation of bioactive peptides having iron binding and antihypertensive properties from slaughterhouse blood was completed.
- An innovative meat snack “Meat Jalebi” has been developed.
- Pork samples collected from the markets and roadside stalls of Assam, Manipur and Nagaland were analyzed for residues of Oxytetracycline, Ciprofloxacin and Fenbendazole using Ultra High Performance Liquid Chromatography Technique and where trace residues of the drugs were detected in few of the samples but all were below the maximum permissible limit.

5.3.8 Microbiology

- Linear relationship with dose on anti-microbial effect of all peptides was observed in disc diffusion antimicrobial test. The relative potencies of different peptides were found to be different against both S. aureus and E. coli as shown by clear zone formation with different radius at various concentrations of peptides. Comparatively more concentration of peptide was required for E. coli (gram negative) than S. aureus (gram positive). Short length peptides were found to be more effective as compared to longer one.
- Methicillin Resistant Staphylococcus aureus, Extended Spectrum Beta Lactamase producing E. coli and Kiebsiella pneomona, Goat Pox Virus and three strains of ESBL positive E. coli, six strains of Kiebsiella pneomona and five strains of Staphylococcus aureus were isolated and characterized. The study indicated emergence of drug resistant strains of bacteria in animals and birds.
- A total of 1845 serum samples were collected from cattle (1557), goat (226), pig (50) and sheep (12) from different districts of Assam. The samples were tested for Brucella antibody. Seroprevalence of brucellosis in cattle and Pig was 12.07% and 4.00%, respectively. None of the samples from goat and sheep was found positive for Brucella antibody. The prevalence was more in cows aged 4.1-6 years (16.25%) followed by 6.1-8 years (13.45%) and animals with problem of ROP (46.52%) and history of abortion (43.00%). There was significant association of age, breed and clinical symptoms with prevalence of brucellosis. A total of 11 (eleven) Brucella spp. were isolated from 101 clinical samples including aborted foetus, vaginal discharge, placenta and hygroma fluid of cattle and pig. The cultures were identified as Brucella abortus based on morphological, cultural and biochemical characteristics and Brucella genus specific PCR, species specific PCR (AMOS & Bruce Ladder) and Real Time (RT) PCR.
- A total 240 samples including blood samples (155) of sero-positive cattle and Brucella suspected cultures (85) were used for isolation of DNA using commercial DNA extraction kit and tested by Brucella bscp 31 genus and species specific PCR (AMOS & Bruce Ladder PCR). Of these, 127 samples including blood samples (116) and Brucella suspected cultures (11) were found positive for Brucella DNA by genus PCR. Out of 118 Brucella DNA, 108 were identified as Brucella abortus DNA by species specific AMOS and Bruce Ladder PCR.
- Sero-prevalence of BTV antibody was evident in Karbi Anglong, Lakhimpur, Nalbari, Golaghat, Darrang, Kamrup, Dhubri and in Udalguri (Fig. 5.36). Over all prevalence percentage was 57.18%. Highest percentage was detected in Karbi Anglong District.

5.3.9 Ethnoveterinary Medicine

- A herbal product (AAU-EVM-NW-3) had shown anti-stress and memory enhancing activity in
various models of stress. It could ameliorate endoplasmic reticulum stress by reverting the status of harmful free radicals. Up regulation of various genes like Caspase 3, CHOP, Grp 78 which are upregulated during stress were down regulated following treatment with the compound. In scopolamine induced amnesia, the compound showed anti-amnestic activity in Morris water, Radial and Barnes maze. Antioxidant enzyme levels like SOD, Catalase were elevated and level of LPO, NO were reduced. AChE activity was also reduced in treated group. Expression of various genes like Nfêâ, Nrf2, Caspase-3 were up/down regulated due to its positive effect on memory. The expression of genes BDNF and TRKB were up regulated which have contributory effect in maintaining the plasticity of the neuron.

Three plants were initially screened for antidepressant activity in lipopolysaccharide induced depressive behaviour in mice. The hydroalcoholic and hexane extract of two plants, (ZAHA and ELHA) showed antidepressant activity in open field test, forced swimming test and tail suspension test. There is an increase in sucrose preference and feed intake due to antidepressant property. The antioxidant activity of SOD, catalase, GSH increased due to their free radical scavenging property while levels of MDA, NO got reduced. Various proinflammatory cytokines (IL-1B, TNF-a) which were increased during depression were reduced with subsequent elevation of anti inflammatory cytokine, IL-10. BDNF, the important marker for depression, was downregulated in depressed animals, whereas, in the extract and standard drug (Imipramine) treated animals, they were upregulated. The anti inflammatory and antioxidant enzyme markers NFêa, Nrf-2 etc were also elevated in depression which was significantly decreased in the treatment group with plant extracts. The catecholamine levels which are deficient in depressed mice, (NE, DA) and 5HT were increased in the treated mice in the hippocampus, which is primarily affected during depression. These all strongly indicated antidepressant activity of the extracts. Micro compound from the aqueous extract is being tested in the same models to determine dose and compare the efficacy with the crude hydroalcoholic extract presently.

5.3.10 Zoonotic Diseases

- **In vivo** antimycobacterial activity of *Alstonia scholaris* and *Mucuna imbricata* was standardized based enumeration of colony forming unit in murine model.
- Acid-pepsin digestion was carried out for detection of Trichinella larva in tongue and diaphragm of marketed pig and rat.
- Pork inspection was carried out for detection of Cysticercosis cyst.
- ELISA test was conducted for detection of IgG antibody against *T. solium* and its cysticerci in pig serum.
- In a survey, out of 192 dairy cows in peri-urban areas of Guwahati city, 10 SICTT positive reactors (5.20%) and 12 inconclusive (6.25%) animals were recorded. Cattle slaughter house examination was done in 2459 animals for diagnosis of tuberculous lesions and out of 363 suspected carcasses 211 (8.58 %) were found ZN stain positive in different abattoirs of Assam and Meghalaya.
- In Assam, surveillance of 1952 pork samples for Cysticercosis revealed only 15 positive for Cysticercosis. In Meghalaya, out of 528 pork samples, 17 were positive for Cysticercosis cyst from Khasi Hills Division (Ribhoi, East & West KH) and Jayantia Hills division. In Arunachal Pradesh, out of 143 pork samples only 3 were positive for Cysticercosis from Papumpare and Subansiri districts.
- Sero-prevalence of Cysticercosis in Assam was found to be 2.90 %, Meghalaya 5.66 % and in Arunachal Pradesh 2.38%.
- A total of 266 pigs and 52 rats (tongue and diaphragm) were inspected for Trichinellosis, but no larva was detected by acid-pepsin digestion.
- *Alstonia scholaris* and *Mucuna imbricata* were selected based on folk lore claim of North East India for *in vitro* and *in vivo* study in murine model. H37Rv was found to be sensitive against extracts of *A. scholaris* and *M. imbricata*.

5.4 Fishery

- Low cost aquaponics model had been developed for incorporation in polyhouse system for advanced breeding of carps. Nutrient rich water from brood fish raising pond under polyhouse was recycled back to the pond using a sand gravel media for filtration. Horticultural crops including tomato,
ladies finger, leafy vegetables etc. were grown in sand gravel media by using the nutrient from recycled pond water thereby opening possibility of enhancing utility of the polyhouse area (Fig. 5.37).

- **Advanced breeding of minor carps** *Labeo gonius* and *L. calbasu* had been successfully conducted for 4th year in Jan-March, 2017 through enhancing environmental temperature and photoperiod artificially under polyhouse condition.
- **Study on use of polyhouse for enhancing breeding and seed production efficiency in common carp** (*Cyprinus carpio*) for the second year had been found to be viable in terms of rate of hatching, incubation period and larval development. The breeding of the species generally commences during the months of January-February in Assam, when the water temperature varies between 15º-20ºC. The prevailing low temperature resulted in low rate of hatching (50-65%) and longer incubation period (144-150 hrs.). An experiment under enhanced water temperature (by using polyhouse) within the range of 24-28º C revealed that the rate of hatching could be increased to 85-90% and incubation period could be decreased to 48-55 hrs. These findings indicate the possibility of using polyhouse for intensive breeding of the species under controlled environment.

- **A study of 90 days duration was conducted on Indian minor carp i.e. Labeo calbasu** by raising one set of carp in cloth enclosure (hapa) fitted in pond under polyhouse at Fisheries Research Centre and raising another set in pond with ambient condition during the winter season. The fishes were (initial average weight 78 gm) supplemented with SUSHAMA - the AAU fish feed. During the experimental period (Nov to Feb), the water temperature inside polyhouse was 20-25ºC and was 14-19ºC in normal pond under condition. It was observed that a temperature difference of 5-7ºC during winter could enhance the growth by about 15 percent over the control after 90 days of culture period (Fig).

- **A massive parasitic Helminth infestation in small indigenous commercially important fish Amblyparyngodon mola** locally known as Moa had been recorded in a partially weed infested unmanaged culture pond with high organic load in Jorhat district of Assam. The *Helminth* species was identified as *Diphyllobothrium latum* (order Pseudophyllidea and family Diphyllobothriidae, common name Fish tape worm) known to cause Diphyllobothriasis in human through consumption of raw or undercooked fish. The length of helminth in different species was found to be 7.5-18.1 cm while the length of the fish body was recorded to be 8.2 - 9.0 cm (Fig. 5.38).

- **An automatic fish seed grader cum counter had been designed in collaboration with Design Innovation Centre (DIC), IIT Guwahati under the project ‘Development of Automatic Fish Seed Grader cum Counter’** for instant grading of fish seed (fry and fingerlings) up to 4 different size groups and counting size wise. On farm application of the product is under progress.

- **The study on amazing self-healing and regeneration capacity of Magur Clarias batrachus** is under progress for the 3rd year.

- **Digenetic trematode called Isoparorchis hypselobagri** in two forms, i.e. mature and immature, were found infecting bottom dwelling fishes like *Mestacemballus armatus* and *Notopterus notopterus*.

- **Incorporation of probiotics (BioSyn AÒM) @ 0.2%** has significant positive effect on weight gain and survivability of carps.

- **The stem and leaf meal of Ipomea aquatica which contains an average of 28.43% crude protein could be substituted for mustard oil cake in the feed of India major carps fry and fingerlings.**
6. Extension Education

The University has a full-fledged Directorate of Extension Education with its head quarters at Jorhat to look after the extension activities of the University. The Directorate with a network of Agricultural Technology Information Centre (ATIC), Agri-clinics and Agri-business Training Cell, Facilitation Centre for Medicinal Plants and a Publication and Information Unit besides one Regional Level Institute viz., Extension Education Institute (EEI) in the head quarters and 23 Krishi Vigyan Kendras (KKVs) spread across the state is responsible for preparing extension training curriculum and methodologies and also for capacity building of extension personnel and farmers. Besides, the Regional Agricultural Research Stations, Commodity Research Stations and the departments of the constituent colleges are also involved in the demonstration and training programmes organised for farmers as well as extension officials. In collaboration with the Departments of Agriculture, Veterinary, Fishery, Sericulture and other allied departments of the Government of Assam and in liaison with various promotional institutions and organizations of the Government of India, the Directorate through the well-organized network is striving to improve the agrarian economy of Assam.

The Directorate has the specific mandates such as (i) Developing linkages between various govt. and non govt. organizations concerned with agricultural and allied extension programmes, (ii) Organizing need based training for extension functionaries, farmers, farm women, rural youth and SHG members, (iii) Advisory services to farmers, (iv) Functioning as a centre for collecting, storing and disseminating information to farmers and extension functionaries, (v) Conducting demonstration for transfer of technology, (vi) Entrepreneurship development in agriculture and allied areas and (vii) Publication.

The important extension activities of the Directorate, Regional Research Station, Commodity Research Stations and the constituent Colleges of the University carried out during 2016-17 are presented below under the following heads of broad organized mandate - (i) Advisory Services (ii) Training and Skill Development, (iii) Demonstration & Transfer of Technology (iv) Farm Information and Publication and (v) Entrepreneurship Development

6.1 Agricultural Extension

6.1.1 Farm Advisory Services

Extension Specialists/scientists and other field staff of the University provide technical guidance to the farmers through individual, farm and home visit, personal contact and correspondences. Similarly, farmers including farm women regularly visit the University for seeking guidance in agricultural technology, animal production, livestock management, sericulture, community science and other farm problems and they are well attended by scientists/staff of the University. The farm advisory service has received its momentum after establishment of ATIC in the University in January, 2003. The extension specialists/scientists make themselves available in the Centre for providing advisory service to the farmers whenever needed. Scientists also respond urgent call on farm problems encountered by Departments of Agriculture, Veterinary, Fishery and Sericulture etc. A well knit liaison also exists with different funding agencies such as NABARD, Nationalized Bank, DRDA etc.

6.1.2 Training & Skill Development

The Directorate of Extension Education undertakes the training programmes mainly in the the Head quarters, the Extension Education Institute (EEI) and the Krishi Vigyan Kendras (KVKS). The trainings conducted during the year are discussed below:

6.1.2.1 Directorate of Extension Education

During the year, the Directorate organized 4 training programmes for the SMS of KVKS, 1 on soil health management and soil health cards and other 3 on increasing rabi pulse and oil seed production. Besides, 2 meetings for SMS (i) MoU signing with Petroleum Conservation Research Association, New Delhi and (ii) Review Meeting of KVKS; 1 Conference on “Linking Prospective Food
Entrepreneurs with Government Schemes & Markets” for farmers, scientists and students and 1 Fertilizer Orientation Programme for scientists and students were also organized by the Directorate.

6.1.2.2 Krishi Vigyan Kendras (KVKS)

Assam Agricultural University presently has 23 Krishi Vigyan Kendras functioning directly under the Directorate of Extension Education. To achieve the set mandate, the KVKS are imparting training to the farmers, farm women, rural youths, extension functionaries, conducting Front Line Demonstration (FLD) and On Farm Trials (OFT). The KVKS also organize Field Day, Kishan Mela, Agri Expo, Exposure Visit, Farmers-Scientists Interaction, Awareness camp, PRA exercise. During 2016-17, 1,434 numbers of scheduled training programmes (on/off campus) were conducted by all these KVKS where more than 37,611 trainees participated (Table 6.1 and Fig. 6.1 to Fig. 6.6)

Table 6.1: Training Programmes (on/off farm) conducted by the KVKS during 2016-17

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of KVK No.</th>
<th>No. of Training</th>
<th>Participants</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>1.</td>
<td>Baksa</td>
<td>63</td>
<td>1281</td>
<td>383</td>
</tr>
<tr>
<td>2.</td>
<td>Barpeta</td>
<td>46</td>
<td>799</td>
<td>496</td>
</tr>
<tr>
<td>3.</td>
<td>Bongaigaon</td>
<td>94</td>
<td>1743</td>
<td>613</td>
</tr>
<tr>
<td>4.</td>
<td>Cachar</td>
<td>78</td>
<td>996</td>
<td>509</td>
</tr>
<tr>
<td>5.</td>
<td>Chirang</td>
<td>76</td>
<td>1125</td>
<td>770</td>
</tr>
<tr>
<td>6.</td>
<td>Darrang</td>
<td>28</td>
<td>565</td>
<td>163</td>
</tr>
<tr>
<td>7.</td>
<td>Dhemaji</td>
<td>82</td>
<td>1225</td>
<td>872</td>
</tr>
<tr>
<td>8.</td>
<td>Dhubri</td>
<td>63</td>
<td>1228</td>
<td>458</td>
</tr>
<tr>
<td>9.</td>
<td>Dibrugarh</td>
<td>66</td>
<td>1324</td>
<td>648</td>
</tr>
<tr>
<td>10.</td>
<td>Golaghat</td>
<td>70</td>
<td>1064</td>
<td>877</td>
</tr>
<tr>
<td>11.</td>
<td>Jorhat</td>
<td>75</td>
<td>1043</td>
<td>911</td>
</tr>
<tr>
<td>12.</td>
<td>Kamrup</td>
<td>91</td>
<td>1746</td>
<td>811</td>
</tr>
<tr>
<td>13.</td>
<td>Karbi Anglong</td>
<td>44</td>
<td>656</td>
<td>504</td>
</tr>
<tr>
<td>14.</td>
<td>Karimganj</td>
<td>64</td>
<td>1262</td>
<td>324</td>
</tr>
<tr>
<td>15.</td>
<td>Kokrajhar</td>
<td>57</td>
<td>1012</td>
<td>391</td>
</tr>
<tr>
<td>16.</td>
<td>Lakhimpur</td>
<td>51</td>
<td>1321</td>
<td>318</td>
</tr>
<tr>
<td>17.</td>
<td>Morigaon</td>
<td>47</td>
<td>670</td>
<td>641</td>
</tr>
<tr>
<td>18.</td>
<td>Nagaon</td>
<td>33</td>
<td>759</td>
<td>129</td>
</tr>
<tr>
<td>19.</td>
<td>Nalbari</td>
<td>70</td>
<td>1233</td>
<td>574</td>
</tr>
<tr>
<td>20.</td>
<td>Sivasagar</td>
<td>50</td>
<td>677</td>
<td>528</td>
</tr>
<tr>
<td>21.</td>
<td>Sonitpur</td>
<td>48</td>
<td>743</td>
<td>572</td>
</tr>
<tr>
<td>22.</td>
<td>Tinsukia</td>
<td>46</td>
<td>958</td>
<td>280</td>
</tr>
<tr>
<td>23.</td>
<td>Udalguri</td>
<td>92</td>
<td>1277</td>
<td>1086</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1434</td>
<td>24707</td>
<td>12858</td>
</tr>
</tbody>
</table>
6.1.3: Demonstration and Transfer of Technology

6.1.3.1 Demonstration

Technology dissemination is a major aspect of KVKs and it was carried out through a number of Front Line Demonstrations (FLDs) and On-farm-Trials (OFTs). During 2016-17, 328 OFTs and 444 FLDs were conducted by the KVKs covering 1502 farmers + 5 villages and 5505 farmers + 30 SHGs respectively. The KVK-wise details of OFTs and FLDs along with their farmers’ coverage is shown in Table 6.2 & Fig. 6.7 to Fig. 6.18)

6.1.3.2 Transfer of Technology

The role of appropriate information technology and its dissemination to the farmers or other end users are very much vital. The important point is not only to generate the technology, but also to ensure that the required information is delivered rapidly to the farmers with the least dissemination loss.

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 considered important for attaining food self sufficiency despite population explosion. For this purpose, the farmers’ priorities are quality seeds, planting materials and

Table 6.2: OFTs and FLDs conducted by KVKs during 2016-17

<table>
<thead>
<tr>
<th>Name of KVK</th>
<th>OFT</th>
<th>FLD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Target achieved</td>
<td>Farmers covered</td>
</tr>
<tr>
<td>Baksa</td>
<td>11</td>
<td>36</td>
</tr>
<tr>
<td>Barpeta</td>
<td>12</td>
<td>130</td>
</tr>
<tr>
<td>Bongaigaon</td>
<td>17</td>
<td>71</td>
</tr>
<tr>
<td>Cachar</td>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>Chirang</td>
<td>23</td>
<td>62</td>
</tr>
<tr>
<td>Darrang</td>
<td>17</td>
<td>49</td>
</tr>
<tr>
<td>Dhemaji</td>
<td>11</td>
<td>45</td>
</tr>
<tr>
<td>Dhubri</td>
<td>17</td>
<td>67</td>
</tr>
<tr>
<td>Dibrugarh</td>
<td>13</td>
<td>31+5villages</td>
</tr>
<tr>
<td>Golaghat</td>
<td>16</td>
<td>67</td>
</tr>
<tr>
<td>Jorhat</td>
<td>25</td>
<td>128</td>
</tr>
<tr>
<td>Kamrup</td>
<td>18</td>
<td>55</td>
</tr>
<tr>
<td>Karbi Anglong</td>
<td>10</td>
<td>39</td>
</tr>
<tr>
<td>Karimganj</td>
<td>16</td>
<td>72</td>
</tr>
<tr>
<td>Kokrajhar</td>
<td>9</td>
<td>24</td>
</tr>
<tr>
<td>Lakhimpur</td>
<td>11</td>
<td>145</td>
</tr>
<tr>
<td>Morigaon</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Nagaon</td>
<td>11</td>
<td>27</td>
</tr>
<tr>
<td>Nalbari</td>
<td>21</td>
<td>56</td>
</tr>
<tr>
<td>Sivasagar</td>
<td>13</td>
<td>54</td>
</tr>
<tr>
<td>Sonitpur</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>Tinsukia</td>
<td>13</td>
<td>48</td>
</tr>
<tr>
<td>Udalguri</td>
<td>14</td>
<td>234</td>
</tr>
<tr>
<td>Total</td>
<td>328</td>
<td>1502+5villages</td>
</tr>
</tbody>
</table>

Fig.6.7: OFT on introduction of AAU developed poultry bird “Kamrupa” (KVK Marigaon)
other inputs, diagnostic services, information through print, audio, video and electronic media and consultancy services.

Fig. 6.8: OFT on organic cabbage (KVK North Lakhimpur)

Fig. 6.9: OFT on spraying of urea at flowering stage in Toria (KVK Kokrajhar)

Fig. 6.10: OFT on multiple stocking and harvesting of fish (KVK Karimganj)

Fig. 6.11: OFT on Performance of papaya variety Sapna F1 (KVK Karbianglong)

Fig. 6.12: OFT on feeding low cost feed to cattle and buffalo during scarcity period (KVK Cachar)

Fig. 6.13: FLD on commercial cultivation of summer marigold (KVK Nalbari)

Fig. 6.14: FLD on development of eco-friendly low cost holi colour (KVK Marigaon)

Fig. 6.15: FLD on backyard nursery pond management for stunted fingerlings (KVK Karimganj)
• **Farmers’ Visit**: During the year, a total of 5310 farmers comprising 2935 male and 2375 female visited the centre for technical guidance. The scientists in ATIC as well as other staff of the University were involved in farm advisory service. A well-knit liaison also exists with different funding agencies such as NABARD, Nationalized Bank, DRDA etc.

• **Products Sold**: Various items like rice seeds of different varieties, vegetables seeds, planting materials and other products like tea, black pepper, honey, fresh vegetables produced in the University farms were sold in the sale counter of ATIC with a total sale proceed of Rs. 3,16,450.00.

• **Farmers’ Website “Briddhi”**: Constant developmental works in designing, updating and inclusion of additional contents in the website ‘BRIDDI’ is being continued. Meteorological information along with the crop advisories has been included for the benefit of the farming community.

### 6.1.4 Publication and Information

This unit under the Directorate of Extension Education looks after the activities like (1) Publication of bulletins, newsletter, farm newspaper ‘Ghare-pathare’ and other extension literature (2) Equipping the Information Center at the Directorate and (3) Coordinating in organization of Farmers’ Day, Exhibition, Radio Talk, T.V. Programme, Farmers’ visit etc. The activities of this unit during 2016-17 are as follows.

#### 6.1.4.1 Publication

The Directorate of Extension made 33 publications including newsletters (4), farm newspaper ‘Ghare-pathare’ (24), book (1) and training manuals (4) during the year. All these publications have been printed at AAU Printing Press, Jorhat.

#### 6.1.4.2 Radio Talk

**Radio talk**: Altogether 126 programmes were broadcast through AIR, Jorhat and Dibrugarh.

#### 6.1.4.3 Phone- in Programme

Altogether 94 questions on various aspects relating to Agriculture, Veterinary, Animal Husbandry, Horticulture, and Fisheries were received from 94 farmers which were replied by the scientists of the University.

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\* Agricultural Technology Information Centre (ATIC)

The ATIC provides facilities of information technology for technology dissemination 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. The achievement of ATIC during the year is as follows:
6.1.4.4 Exhibition

The Directorate participated in different exhibitions viz., 4th Assam International Agri-Horticultural Show-2017 at C.VSc. Playground, Khanapara jointly organized by Dept. of Agriculture, Govt. of Assam and AAU during January 6-9, 2017; Rongali Festival-2017 at C.VSc. Playground, Khanapara during Feb 3-5, 2017 and Namami Brahmaputra Festival at Court Field, Jorhat during March 31 to April 4, 2017:

6.1.5 Entrepreneurship Development

6.1.5.1 Certificate Courses Conducted

For entrepreneurship development amongst the unemployed youth, the Directorate conducted 4 certificate courses during 2016-17, each of which covered 23/25 unemployed youth participants. The courses were (i) Dairy Farming and Fodder Production (ii) Bakery (iii) Tea Production Technology & Management and (iv) Pig Farming

6.1.6 Additional Extension Activities of the KVKs

The scientists of the KVKs under the Directorate also undertook the following extension activities during the year.

6.1.6.1 Pulse Seed Hub for Seed Production

The ICAR has selected five KVKs under AAU, for Pulse Seed Hub at an estimated budget provision of Rs.1.50 lakh each for seed production of pulses to make the State self sufficient in pulses seeds. The KVKs selected for Pulse Seed Hub Programme are Jorhat, Lakhimpur, Kamrup, Karimganj and Nalbari under the Nodal Agency of Dy. Director General (AE), ICAR. Another Pulse Seed Hub has also been allocated to RARS, Shillongoni under the nodal agency of IIPR, Kanpur under AICRP.

The construction works are going on and the equipments for seed processing were also procured. Seed production programmes have been undertaken by each KVK under the Pulse Seed Hub programme which are given in Table 6.3.

6.1.6.2 Other Extension Activities of KVK

- Published 37 s research papers, 5 books / book chapters, 333 manuals, 130 popular articles and others.
- Attended 212 international/national/regional level trainings / workshops / seminars / conferences.
- Carrying out 18 externally sponsored projects, 4 at KVK Dhemaji; 3 each at KVK Karbianglong & KVK Kamrup; 2 each at KVK Jorhat& Sonitpur and 1 each at KVK Cachar, Dhubri, Dibrugarh and chirang. Of all these projects, seven were completed and rest 11 projects are being continued.

6.1.7 Extension Activities by the Constituent Colleges of Agriculture

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

6.1.7.1 College of Agriculture, Jorhat

- Participated in the Farmers’ fair/ Exhibition/ Technology fair (8); conducted demonstrations (28) and OFTs (61) ; distributed Soil Health Cards (407); organized trainings (20) and awareness programmes (3); delivered Radio Talks (9); attended (i) invited lecture as resource person (51) (ii) phone –in- programme (7) and (iii) TV Programme (8); provided consultancy/ advisory services (501) covering different aspects of agriculture and livestock farming.
- Under TSP programme i.e Livelihood promotion of tribal farmers through vegetable cultivation in Jorhat district, the faculties from Dept. of Nematology of the College selected 25 farmers including women from a Missing Community dominated village (about 40 km away from Jorhat city ) being infested by the nematode Meloidogyne incognita in vegetable and M.graminicola in upland rice. The selected farmers were provided training on nematode symptoms and management strategies. Besides, the farmers were demonstrated how to enrich the vermicompost with the biogreen and how to use in the field against nematode.

Table 6.3: Seed Production under Pulse Seed Hub Programme, 2016-17

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Seed Hub No.</th>
<th>Crop</th>
<th>Seed Produced (qts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KVK, Nalbari</td>
<td>Lentil</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>KVK, Kamrup</td>
<td>Blackgram</td>
<td>300</td>
</tr>
<tr>
<td>3</td>
<td>KVK, Jorhat</td>
<td>Urd bean</td>
<td>325</td>
</tr>
<tr>
<td>4</td>
<td>KVK, Lakhimpur</td>
<td>Blackgram</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>KVK, Karimganj</td>
<td>Urd bean</td>
<td>96</td>
</tr>
</tbody>
</table>
6.1.7.2 Biswanath College of Agriculture, Biswanath Chariali

- Under National Initiative on Climate Resilient Agriculture (NICRA) Project, a model farming system with different components of rice, horticultural crops (citrus and banana) + fish + duck was demonstrated to the farmers of Chamua village where crop diversification with high value crops along with organic mulch-cum-manuring proved to be more resilient to stress situation viz., mid season and terminal dry spells. Besides, eight units of low cost poly house and one unit of roof top rain water harvesting structure were also developed in the village (Fig. 6.19 to Fig. 6.22). Besides, Rice hispa forecasting was done for the benefit of 10,000 farmers by Gramin Krishi Mousam Sewa, AAU.

- NICRA village model of NICRA-AICRPDA, Biswnath Chariali centre was displayed in the 4th Assam International AGRI-HORTI Show-2017 held at AAU Campus, Khanapara from Jan. 6 – 9, 2017; XXIII Agricultural Science Congress, 2017 held at UAS, Bangalore during February, 21 – 24, 2017 and “Farmers First for Conserving Soil and Water Resources in North Eastern Region (FFCSWR-2017) held at AAU Campus, Khanapara during February 9-11, 2017.

- Participated in the Exhibition of ‘Kisan Mela’ organized by District Administration, Biswanath at Kamala Kanta Khetra, Biswanath Chariali on December 17, 2016.

6.2 Community Science Extension

6.2.1 Training and Awareness Programme Organized

- Dept. of HDFS conducted two trainings – A five days training (from May 2-5, 2016) for rural youth in collaboration with AICRP on Honey Bee and one 2 months 24 days training on “Cutting & Tailoring” for rural dropout adolescent girls in collaboration with Clothing and Textile component of AICRP on Community Science from October 1 to December 24, 2016 (Fig. 6.23).

- Dept. of ECM organized 8 one-day trainings on (i) “Mushroom Cultivation” (ii) “Importance of Breast Feeding” (iii) “Bio-fertilizer (Vermicompost)” in Borodia Gaon and Silikha Sanaton Gaon (iv) “Food Processing” (v) “Post harvest Management of Rice” (vi) “Capacity building of Self Help Group” (vii) “Food Preservation” (viii) “Income generating through Handloom product” during September 2016-March 2017 (Fig. 6.24).

- Dept. of TAD organized 10 trainings of different duration during the year under report. Six of these were given to the women folk of the operational village of AICRP on Community Science covering the aspects such as construction of protective clothing kit, Petticoat & Kurta; Stencil printing, Block Printing & fabric printing; One refresher training to SMS of NE region on AICRP work and 3 other trainings on “Hand Embroidery” for the master trainers under the scheme of PMKVY, “Twill Weave” to the trainees of Teok Krishi Vigyan Kendras and “Macrame Work” to some women of Jorhat during August 2016 to March, 2017 (Fig. 6.25).

- Dept. of FRM conducted three trainings on “Decorative Candle Making”, “Preparation of Mat Nursery” and “Drudgery reducing tools and techniques for farm women” during May to November, 2016 (Fig. 6.26).

- Dept. of FSN organized 2 one day training in the areas of “Entrepreneurship development through preparation of pickles from locally available food ingredients” for rural women and “Breast Feeding” to ICDS Supervisors.

- Three one day awareness programmes on ‘Reproductive Health’, ‘Handmade Paper and Fibre Industries’ and ‘Health and Sanitation’ were organized by the Dept. of HDFS, ECM and FRM respectively (Fig. 6.27 & 6.28).
6.2.2 Exhibition Organized

- An exhibition was organized in the Dept. of TAD on Feb 25, 2017 for a group of Ladies (30) from Zagpuria Gaon of Titabor, Jorhat.

6.2.3 Important Days/Weeks Observed

- The faculties and students of the Dept. of FRM and FSN observed (i) World Consumer Day (March 15, 2016); World Health Day (April 7, 2016); World Ozone Day (Sept. 16, 2016); (Fig. 6.29); World Consumer Rights Day (March 29, 2017); World Diabetes Day (Nov. 14, 2016); World Breast Feeding Week (Aug. 1-6, 2016) and National Nutrition Week (Sept. 1-7, 2016).

6.2.4 Other Extension Activities

- A family counseling centre was established by AICRP-CD with support from Sansad Adharsha Gram Yojna (SAGY) on 8th April, 2016 in Balijan Shyam Gaon, Mariani.
- Two talks, one on “Formation and strengthening of SHG” on Oct. 4, 2016 and the other on ‘Diet During Life Cycle’ during National Nutrition Week on Sept. 7, 2016 were organized by the faculties of Départements of HDFS and FSN of the College of Community Science.
- Two campaigns on Swachh Bharat Abhiyan were also organized outside the college by the faculties of HDFS and FRM Depts during the year (Fig. 6.30).
- The Dept. of HDFS also organized a free Eye Screening camp in collaboration with Lions Club Jorhat on Nov. 30, 2016 at Titaram Bordoloi High School and Subarna Prabha Girls Higher Secondary School. A total of 240 to 250 school students were screened along with teachers and staff of the schools.

6.3 Veterinary Extension

6.3.1 The Associate Directorate of Extension Education, Khanapara

The Associate Directorate of Extension Education, AAU, Khanapara carried out the following extension activities during 2016-17 in collaboration with other establishments of the University including DEE and EEI, Jorhat

6.3.1.1 Training Programmes Organized

- During the year, 13 collaborative training programmes of 5/6 days duration comprising 2 in collaboration with Centre for Microfinance & Livelihood (CML), Guwahati on (i) Scientific Management of Backyard Poultry (ii) Skill Development Training on Pig Farming and 11 in collaboration with the State Institute of Panchayat and Rural Development (SIPRD), Guwahati on Scientific Management of Pig Farming covering a total of 568 Unemployed Youths/Farmers of 8 districts viz., Dhemaji, Bongaigaon, Chirang, Baska, Kamrup (M), Lakhimpur, Majuli and Biswanath Chariali (Fig. 6.31).
The Directorate in association with 1st BN, National Disaster Response Force (NDRF), Ministry of Home Affairs, Patgaon, Guwahati also organized a training programme for Veterinary Nursing Assistants (24) of NDRF Personnel from May 30 to June 3, 2016 (Fig. 6.32)

6.3.1.2 Exposure Visit cum Training for Farmers/Extension Facilitators

- A three days Exposure Visit cum training for 32 (thirty two) farmers/extension facilitators of Namsai District, Arunachal Pradesh on Scientific Dairy, Piggery and Goat farming was organized in collaboration with District A.H. & Vety. Office, Namsai Arunachal Pradesh during September 21-23, 2016 in order to expose the farmers/Extension facilitators to modern and latest farm management and health care practices adopted in various organized farms. In addition to class room training, the participants were taken to National Research Centre on Pig (ICAR), Rani; Goat Research Station, AAU, Burnihat and Instructional Livestock Farm, CVSc, AAU, Khanapara for on-farm practical demonstration.

6.3.1.3 Scientific Exhibition Participated

- The Associate Directorate of Extension Education, Khanapara participated in three scientific exhibitions during the year viz., (i) “Pig Expo 2016” organized by ICAR National Research Centre on Pig at Rani, during November 28-29, 2016 (ii) 4th Assam International Agri-Horti Show at Khanapara during January 6-9, 2017 organized by Dept. of Agriculture, Horticulture and Food Processing, Govt. of Assam in association with Indian Chambers of Commerce and AAU and (iii) Rongali-2017 organized by TREND MMS Guwahati where AAU-developed and recommended technologies and products were displayed. CVSc, Khanapara stall received the award under the best innovative product display out of the three awards received by AAU in the Agri-Horti show (Fig. 6.33 to Fig. 6.36).

6.3.1.4 Demonstration Unit on Dairy Farm and Fodder Cultivation

- Dairy and fodder demonstration units have been maintained adjacent to the AAU Guest House No.2 for imparting practical training and demonstration on integrated farming system for the benefit of farmers and unemployed youths. With the suggestion of the experts and extension specialists of this Directorate, a concept of economic utilization of the waste/barren...
land was scientifically developed and different improved varieties of fodders were cultivated. A small model dairy cattle shed was also constructed with the locally available low cost materials. Visitors showed keen interest in integrated farming system, low cost housing for dairy cattle & impressed upon the scientific and economic utilization of the waste land in the demonstration units. The activities of both the units are in operation and running successfully.

6.3.1.5 Services Provided as Resource Persons

- The Senior Extension Specialists of different disciplines viz., Animal Nutrition, Livestock Production & Management and the Disease control provided their valuable services as resource persons by conducting Training cum Demonstration classes organized by different institutes / organizations such as SIPRD, NIRD, IRM and some NGOs etc.
- The Directorate also provides various advisory services on animal husbandry practices besides imparting training to farmers, farm women, educated unemployed youths, members of SHGs and and entrepreneurs of different districts of the state.

6.3.1.6 Participation of Rural Programme Advisory Committee Meeting at AIR, Guwahati

The Faculty members and the Associate Director of Extension Education attended the Rural Programme Advisory Committee meetings of AIR, Guwahati regularly and actively involved in the preparation of the schedule for season and need specific topics / subject, for Radio talk, discussion, interview and field based programmes on animal husbandry sector broadcast by AIR.

6.3.1.7 Linkage with Different Institutions and Organizations

A strong linkage has been maintained with various institutions and organization like state A.H. & Vety. Dept., Govt of Assam, EEI, Jorhat, State Forest & Wild Life Dept., KVK, SIRPD, NIRD, ALDA, DRDA(Assam), ICAR Research Complex for NER, Barapani, NRC on Pig, NRC on Mithun, NRC on Yak, NEDFi and NGOs like Institute of Rural Management, Blue Cross Society (Assam), Asomi etc. for the development of animal husbandry and overall rural development.

6.3.1.8 Annual Village Extension Camp attended

A day long livestock treatment and vaccination camp was organized by the Dept. of Extension Education, College of Veterinary Science, AAU, Khanapara at Mayong Development Block under...
Morigaon district on March 19, 2017 with participation of the Associate Director of Extension Education AAU, Khanapara, faculty members and students. In the camp, about 751 Cattle and Goat were vaccinated against infectious diseases. There was a ‘Farmer-Scientist Interaction’ session with special emphasis on the adoption of modern and latest scientific management system by the farmers for enhancing the productivity of their livestock, poultry, and fish in their area (Fig.6.37 & Fig.6.38).

6.3.2 Lakhimpur College of Veterinary Science

6.3.2.1 Training Organized

- A “Farmers’ level training on scientific management of cattle” was organized by LCVSc, AAU on Dec.30, 2016. A total 20 farmers attended the training programme (Fig.6.39).

6.3.2.2 Visit to Flood Affected Areas

- A team of faculty members visited the flood devastated areas of Lakhimpur and Dhemaji districts during August 3-4, 2016. The team inspected the extent of damage on the livestock population caused by the flood and identified the affected areas for conducting a series of flood relief vaccination cum animal treatment camps (Fig.6.40).

6.3.2.3 Free Vaccination-cum-Treatment Camps

- A series of ‘Free vaccination-cum-treatment camps’ was organized by the faculties of the College at Laomukhi & Kechukhana Koch Village, Naruathan, Seshu Dighali in Dhemaji District and Gorsiga, Salmora, Ranganadi, Tapo village and Diju Chapor in Lakhimpur district where altogether 5023 animals including cattle, goat, pig and poultry were treated and vaccinated after their health checkup (Fig.6.41).

6.3.2.4 Faculty Members acted as Resource Person

- Faculty members of LCVSc participated as resource person in 6 training programmes on Comprehensive Agriculture Farming organized by Rural Self Employment Training under United Bank of India, North Lakhimpur during Jan. to March, 2017. Besides, faculties also participated as resource person in the (i) Discussion with Deputy Commissioner (Dhemaji) regarding ‘Poultry Development’ in Dhemaji District (ii) Training
programmes on (a) ‘Egg Village in Dhemaji District’ organized by DRDA (b) ‘Concept of Dairy Farmers’ at KVK, Dhemaji (iii) ‘Krishak Mohotsav’ organized by RARS, AAU, North Lakhimpur and (iv) ‘Farmer-Scientist Interaction’ in connection with Technology Week, KVK, North Lakhimpur, v) 4 programmes on Livestock Management/ care/ Training & Demonstration organized by Global Social Service Society, Lakhimpur and Dhemaji Unit (Fig.6.42).

- Two awareness programmes on the benefits of artificial insemination were organized by the faculties, one at Joyhing and the other at Dizu-Chapori, North Lakhimpur on December 8 and 14, 2016 (Fig.6.43).

6.3.2.5 Participat in Exhibition
- Faculties participated in two Agri-Exhibitions organized under Pradhan Mantri Fasal Bima Yojana, KVK, Dhemaji on May 31, 2016 and KVK, North Lakhimpur on June 2, 2016 (Fig.6.44).

6.3.3 Directorate of Research (Veterinary) Khanapara
- Under ICAR AICRP (118 piglets) and MSP on Pig (154 piglets), 272 piglets were sold during the year benefitting a total of 259 farmers.
- Artificial insemination programme on Pig is being continued in collaboration with the Department of ARGO, C.V.Sc., Khanapara under a DBT Twinning Project (Fig.6.45).
- Under Goat Improvement Programme, twelve awareness-cum-training camps have been organized in the field units for augmenting knowledge on goat rearing. Besides, twenty five vaccination camps to immunize 6241 animals, 22 camps for deworming of 5786 animals and 32 treatment camps were organized to treat 1824 animals (including non-adopted animals).
- During 2016-17, two vaccination cum treatment camps were organized in buffalo *khuties* where
large number of buffaloes were vaccinated and treated against various diseases.

- A post-flood diagnostic visit Majuli and vaccination treatment cum awareness camp in the village Haloogaon, Kamrup, and Jhajimukh area, Jorhat were organized under the FMD Awareness Programme (Fig.6.46).

- Besides, three training programmes were organized in different places of Kamrup and Lakhimpur districts of Assam in collaboration with respective KVK, State Veterinary Dispensary and Local NGOs where farmer participants (120) were trained on different zoonotic diseases along with the prevention and control strategies.

6.3.4 LRS, Mondira and GRS, Burnihat

- In Poultry Seed Production Unit of LRS, AAU, Mondira, a total of 6467 improved variety day-old chicks of Vanaraja (2847), Gramapiya (2750) and Srinidhi (870) for backyard rearing were hatched and distributed / sold to various organizations, KVKs and farmers during the year.

- A Training was organized jointly by KVK, Kamrup and LRS, Mondira on the topic of ‘Modern Techniques of Boro Paddy cultivation with special reference to Climate Change Effects’. A total of 50 trainees participated in the training programme.

- A training on ‘Fisheries Perspective in Wetlands(Beel) and their management’ was organized from March,15-19, 2016 sponsored by NFDB, GOI, Hyderabad. Fifty Fish farmers participated in the training.

- Students from Hekra Higher Secondary School and Bimala Prasad Chaliha College, Nagarbera visited LRS, AAU, Mondira and learned about fish breeding techniques, poultry hatchery, cultivation techniques of cashew nut & citrus, buffalo unit and the Integrated Farming System.

- In Goat Research Station, Burnihat ten training cum exposure visits were conducted and 4050 dozen semen were produced for artificial insemination of goat of various clientele groups during the year under report

6.4 Fisheries Extension

- The scientists of the CFSc., Raha demonstrated different technologies in fish farming to the farmers of Meghalaya and Manipur visiting the college in an exposure visit. The scientists also explained about fish farming technology to the students from Raha HS school (30) and Kaliabor College (20) during their visit to the college.

- Faculties and students of College of Fisheries, Raha observed Fish Farmer’s Day on July 10, 2016 and released fish seed in Thekeraguri Beel to mark that day.

- The CFSc., Raha took part in the International Agri-Horti Show held during January 5-9, 2017 at Guwahati.

- CFSc, Raha also took part in Kisan Mela organized by Bhartiya Kisan Sangha at Raha during March 4-5, 2017. The college showcased various technologies in the exhibition.

- CFSc., Raha also took part in the mega event “Rongali Good Vibes” at Guwahati from Feb,3-5, 2017 and exhibited different technologies in the event.

- The Fishery Research Centre (FRC), Jorhat organized 3 training programmes on “Carrier Oriented Course on Industrial Fish and Fisheries” ‘Fish Seed Production and Hatchery Management’ and Vocational training for students of Mariani
• The FRC scientist, Jorhat delivered 4 lectures on Potentialities for skill development in fishery in NE India; Up-scaling the workshop outputs with special reference to fishery; Pisciculture based Integrated Farming as a Gender Friendly Agro-Based Enterprise and Fish farming as a livelihood option for capacity building of SHG in the training programme organized by EEI, Jorhat during May 2016 to March 2017.

• Conducted one Phone-in-Programme on fish disease and management through AIR, Dibrugarh on Jan. 21, 2017.

• Quality fish seed and balanced fish feed (Sushama-The AAU fish feed) was produced and distributed to farmers during the year, along with advisory services and technology demonstration to farmers. A total of 3254 farmers and students visited the integrated fishery based farming system models developed by the Centre (Fig. 6.48).
7. Developmental Activities

The developmental activities continued in the University during 2016-17 also with the support from ICAR and other agencies. Some of the important developmental activities carried out during the year with the support mostly from ICAR are as follows:

7.1 College of Agriculture/Community Science, Jorhat

- **50 Lakhs & Above**
  - Construction of pre-fabricated structure of single storied Girl’s Hostel is in progress.

- **20 Lakhs & Above**
  - Additional construction at Community Science complex viz. providing ceiling, grill, aluminium work with site development completed.
  - Additional work for construction of (i) Community Science Complex and (ii) pro.stell Railing, drain apron, ACP of Community Science Building is in progress (Fig.7.2).

- **5 Lakhs & Above**
  - Construction of approach road to newly constructed Boys’ hostel at Jorhat completed.
  - Construction of RCC Ground Water Reservoir 3000 lit. capacity with Pump house, Pipe line, P. Board completed.

7.2 Biswanath College of Agriculture, Biswanath Chariali

- **20 Lakhs & Above**
  - Construction of Dry Land Agriculture Building in the College completed (Fig.7.1).

7.3 College of Veterinary Science, Khanapara

- **50 Lakhs and Above**
  - Vertical extension of Kitchen/ Dinning hall for PG girls’ hostel completed.
  - Construction of (i) Bull shed (ii) Sewage Treatment Plant (iii) State of the Art Lab Building under DBT and (iv) Pig rearing unit (Gr.-A), Pig sties and Site Development (Gr.-B), and Administrative Building & Feed Mill in the college campus, each costing more than 50 lakhs are in progress.
  - Installation and commissioning of composting plant at Directorate of Clinics is also in progress.

- **20 Lakhs and Above**
  - Works relating to improvement of Teaching Veterinary Clinics Complex of the college is being continued.
  - Repair/renovation of (i) Old Gynaecology Building for accommodation of placement cell, DPGS & LPT Dept. and (ii) Old Administrative building having Dean’s office, and Dept. of Extension Education, each costing more than 20 lakhs completed (Fig.7.3).

- **10 Lakhs and Above**
  - Construction of an RCC bridge and raising adjoining road surface over farm road in the college almost completed.
  - Repairing of pig sties (1X2 units) under AICRP on Pig completed.
  - Furnishing New FMD Laboratory almost completed.
  - Providing floor tiles in the Dept. of Animal Nutrition is in progress.

- **5 Lakhs and Above**
  - Construction of Seminar Hall of LPM Dept. completed.
  - Completion of tiles fitting to the Girls’ Hostel building.
  - Renovation of (i) Staff Training Hostel (Eastern part of the 1st floor) and (ii) Ladies toilet block in the administrative building of the college, each costing more than five lakhs completed.
  - Face-lifting works(painting work)on (i) Different road side buildings (ii) outside wall & corridor of LPM, AGB &Nutrition Departments and (ii) external wall &Toilets of Assam Type Hostel, each costing more than 5 lakhs completed.
  - Completion of repairing of pig sties (MSP-9) under MSP on pig.
  - Providing floor tiles in the LPM Dept. completed.
• Repair, renovation and construction work under the Mega Seed Project on Pig (AICRP) almost completed.
• Repairing of Pig sties under AICRP on Pig (Shed No.3) completed.

7.4 Lakhimpur College of Vety. Science, Joyhing , North Lakhimpur

❖ 50 Lakhs and Above
• Construction of (i) Academic Block AB-B, AB-C, AB-G under Ph-1 and (ii) students’ Hostel, each costing more than 50 lakhs completed.

❖ 20 Lakhs and Above
• Construction of (Ph-1) Academic Block AB-B, AB-C, AB-G almost completed.

❖ 10 Lakhs and Above
• Installation of 100 KVA DG Set in the college including laying of U.G. cable to the Dept. & Hostel completed.

❖ 5 Lakhs and Above
• Creation of additional facilities in the Boys’ and Girls’ Hostels for accommodation of new students completed.
• Repair and renovation of (i) existing go down converted to temporary College Canteen and (ii) existing Associate Professors’ Quarter (1st & ground Floor), each costing more than 5 lakhs completed.
• Construction of road to the play ground completed.
• Improvement of campus main road is in progress.

7.5 College of Fisheries, Raha

❖ 50 Lakhs and Above
• Construction of (i) Fishery College at its new site and (ii) Boys Hostel (wing-1), each costing more than 50 lakhs is in progress.
• Alteration of 3 phase line to the construction site is completed.

❖ 10 Lakhs and Above
• Construction of 11KV line & 11/0.4 KV 315 KVA substation for providing power supply to the college completed.
• Repair and renovation of boundary wall (i) in the North side and (ii) South side of the college, each costing more than 10 lakhs completed.

❖ 5 Lakhs and Above
• Improvement of campus main road of the college is completed.
• Repair and renovation of Girl’s Hostel completed.
• Installation of LED Street Light with octagonal hot dip galvanized pole for campus lighting completed.
• Laying underground cable for 415 volt distribution line for service connection of newly constructed college building completed.

7.6 SCS College of Agriculture, Dhubri

❖ 20 Lakhs and Above
• Construction of internal roads towards (i) academic administrative buildings and (ii) hostel building in the college, each costing more than 20 Lakhs completed.
• Water supply works including installation of DTW at the college campus completed.

❖ 10 Lakhs and Above
• Construction of college Guest House is completed.

7.7 College of Horticulture, Nalbari

❖ 50 Lakhs and Above
• The site development and construction of Administrative block, Academic building and Hostel building of the College of Horticulture at Nalbari have been continuing.

7.8 KVK, AAU

❖ 50 Lakhs and Above
• Extension of Guest House at Kahikuchi, Kamrup is completed.

❖ 10 Lakhs and Above
• Construction of shed for farm machineries under Agril. Hub at (i) KVK, Borpeta (ii) KVK, Kamrup (iii) KVK, Nalbari, each costing more than 10 lakhs were completed.

❖ 5 Lakhs and Above
• Replacement of Water Distribution Network at KVK, Cachar at Arunachal, Silchar is in progress.
• Provision of external water supply works at KVK, Sibsagar completed.
Fig. 7.1: Dry land Agriculture Laboratory, BNCA, Biswanath Chariali

7.2: New Community Science College Building at Jorhat in progress
Fig. 7.3: Renovation of Dean Administrative Building, AAU, Khanapara.

Fig. 7.4: Newly Constructed Administrative Building of KVK, Lakhimpur
Fig. 7.5: Newly Constructed Administrative Building of KVK, Karimganj

Fig. 7.6: Newly Constructed Girl’s Hostel, LCVSc., Joyhing, Lakhimpur
8. Visit of Dignitaries

Altogether 107 dignitaries visited different Colleges and Research centre both inside and outside of the University headquarters during the year under report. The details of their visit are given below:

A. College of Agriculture, Jorhat

- Dr. Upasana Kashyap, Assistant Professor, Assam’s Kaziranga University paid an official visit to Dept. of Agro-Meteorology on May 12 & 13, 2016.

- Dr. M.K. Bhattacharya, Professor, Dept. of Agronomy, Soil Science & Ecology, Iowa State University of Sci & Technology, USA visited the Dept. of Biochem. and Agril. Chemistry on Feb.7, 2017 and had interaction with the faculty member.

- Dr. R. K. Walia, Project Coordinator, AICRP on Nematode was in the Dept. of Plant Pathology on April 12, 2016 to visit Nanotechnology laboratory and had interaction with the scientist on bio-formulation.

- Sjt.Bidyananda Borkatoky, Vice Charman, Tea board of India visited Plant Pathology Dept. on May 5, 2016, to discuss on use of bio-formulation in tea.

- Dr. K. Prabhakar, Dean, PGP College of Agriculture Sciences, TNAU paid a visit to Plant Pathology Dept. on June 3, 2016 and interacted with the faculties.

- Dr. U. Subasinghe, Dept. of Forestry and Envt. Sci, Univ. of Ari Jayasedenepur, Sri Lanka visited Plant Pathology Dept. on June 3, 2016 to discuss on artificial inoculation technique for oleoresin deposition in Agar.

- Mr. Atul Bora, Minister of Agriculture, Govt. of Assam was in the Dept. of P. Pathology on June 17, 2016 to inaugurate New Building of Plant Pathology Department.


- Dr. N.B. Singh, Dean, CPGS, Barapani was in the Dept. of Plant Pathology on Sept.29, 2016 for interaction with faculties.

- Dr. C.D. Mayee, Ex ASRB Chairman and Dr. A. N. Mukhopadhya, Ex VC, AAU visited Plant Pathology Dept. on Dec.27, 2016 and interacted with the scientists.

- Dr. N.S. Rathore, DDG (Edu.), ICAR, New Delhi visited the Dept. of Plant Pathology, Horticulture, Animal Husbandry and Dairying and the Bio-fertilizer Production Unit of the Soil Science Dept. on Feb.9, 2017.

- Dr. T. Mahapatra, DG, ICAR, New Delhi was in the Dept. of Plant Pathology for Interaction with the scientists and also visited Biofertilizer Production Unit of Dept. of Soil Science and Horticulture on Feb., 27, 2017.

- Dr. N.S. Rathore, DDG(Edn), ICAR, New Delhi in the Dept. of Agril. Engineering on Feb.11,2017 in connection with the Technology & Machinery Demonstration Mela.

- Dr. K. S. Sangha, Professor & Dr. Sudhendu Sharma, Assistant Professor, PAU; Dr. R. K. Gupta, Associate Professor and Dr. Kamlesh Bali, SKUAST; Dr. T.V. Sanjeev, Head & Dr. Hrideek, Scientist , Thrissur; Dr. Pratibha Bhatnagar, Head & Scientist, Jabalpur; all were in the Dept. of Entomology on Dec.6 & 7, 2016 in connection with the participation in the “Workshop of conservation of Lac Insect Genetic Resources”.

- Dr. J. Chouhan, Chairman, Social Science, CAU, Barapani & Coordinator, Agril, Extension & Education Affairs, Ministry of Agriculture & Farmers’ Welfare, Govt. of India visited the Entomology Dept. on March 6, 2017 and delivered a lecture on “Investment analysis in personality development”.

- Dr Prem Singh & Dr Punya, Principal Scientists, IIIFS, Modipuram , Meerut paid an academic visit (Monitoring) to the Dept. of Agronomy on March 6, 2017.

- Dr. Bhaskar, ADG of ICAR visited Agronomy Dept. on April.8, 2017 for purpose of monitoring.

- His Excellency, Shri Banwarilal Purohit, Governor, Assam and Chancellor of the University visited the Dept. of Agril. Biotechnology, Horticulture and the Bio-fertilizer Production Unit of the Soil Science Dept. on Jan.18, 2017.
• Dr. N. S. Rathore DDG, ICAR (Education) visited the Agril. Biotechnology Dept. on Feb.22, 2017.
• Dr. Trilochan Mahapatra, DG, ICAR and Secreatary DARE visited Agril. Biotechnology Dept. on Feb.28, 2017.
• Dr. Ashok Alur, Special Officer, University of Horticultural Sciences, Balaghat as member of the Peer Review Team visited the Biofertilizer Production Unit of the Soil Science Dept. on June 8, 2016.
• Mr. C. L. Denzongpa, IRS, Chief Commissioner of Income Tax, NER visited the Bio-fertilizer Production Unit of the Dept. of Soil Science on Sept.28, 2016.
• Mr. P. S. Pandey, ADG, ICAR, New Delhi visited the Bio-fertilizer Production Unit of the Soil Science Dept. on March 25, 2017.
• Dr. R. K. Walia, Project Co-ordinator, AICRP on Nematodes, Division of Nematology, IARI, New Delhi visited the Dept. of Nematology on November, 2016 to review the progress of works under AICRP on Nematodes at Jorhat Centre.
• Mrs. G. D. Bora and Mrs. P. Sarma, APS, Jorhat Rowriah visited the Dept. of Animal Husbandry and Dairying on May 14, 2016.
• Dr. Ranuj Pegu, CEC, Mising Autonomous Council, Gogamukh, Dhemaji and MLA Dhemaji paid a visit on June 26, 2016 to the Dept. of Animal Husbandry and Dairying.

B. DBT, AAU Centre, AAU, Jorhat
• Dr. Richard Quilliam and Dr. Jennieer DiCiciel, Biological and Environmental Sciences, School of Natural Sciences, University of Stirling, UK paid an official visit to the Centre on May 4, 2016
• Prof. Sampa Das and Prof. Debabrata Bose, Bose Institute, Kolkata visited the Centre on Dec. 15, 2016 for official purpose.
• His Excellency, the Governor of Assam and Chancellor, AAU Jorhat, Shri Banwarilal Purohit visited the Centre on Jan.18, 2017.
• Dr. T. Mohapatra, Director General, ICAR, New Delhi and Dr. H. S. Gupta, Ex Director General, Borlaug Institute for South Asia, New Delhi visited the centre on Feb.27, 2017.

C. College of Veterinary Science, Khanapara
• Dr. L. R. Bisnoi, DIG, Assam Police visited the College on April 23, 2016.
• Dr. R. Prabhakaran, Ex. Vice Chancellor, TANUVAS, Tamil Nadu and Dr. R. N. Chatterjee, Director, Directorate of Poultry, Hyderabad paid an academic visit to the college on June 10&11, 2016.
• Dr. K. Devada, Director of Research, KAU as a member of Accreditation team visited the college on June 23, 2016.
• Sri Atul Bora, Minister for Agriculture, Horticulture & Food Processing, Animal Husbandry & Veterinary, Assam and Sri Atul Bora, MLA, Dispur Constituency visited the college on July 15, 2016.
• Dr. Radha Mohan Singh, Hon’ble Union Minister of Agriculture & Farmers Welfare, GOI; Dr. T. Mahapatra, DG, ICAR, New Delhi and Sri Atul Bora, Minister for Agriculture, Horticulture & Food Processing, Animal Husbandry & Veterinary, Assam paid visit to the college on July 17, 2016.
• Dr. T. Madan Mohan, Adviser DBT, New Delhi; Dr Lalkrishna, ADG (Retd) ICAR and advisor DBT, New Delhi; Dr Pabawn Sharma, Adviser DBT, New Delhi and Dr J M Kataria, Director CARI Izatnagar visited the college on July 26, 2016.
• Sri C. K. Das (IAS, Retd), Member, NEC, GOI and Director, Department of Fisheries, Govt. of Assam were in the college on Aug. 30, 2016.
• Dr. Habibur Rahman, Deputy Director General (AS), ICAR and Dr. R S Gandhi, ADG (AP&B), ICAR, New Delhi visited the college on Oct.14, 2016.
• His Excellency, Shree Banwarilal Purohit, Hon’ble Governor of Assam and Sri Atul Bora, Minister for Agriculture, Horticulture & Food Processing, Animal Husbandry & Veterinary, Assam visited the college on Nov.3, 2016.
• Dr. A. Jalaluddin, Special Officer, Faculty of Poultry Science, KVASU, Kerala visited the college on Nov.03-05, 2016.
• Mrs. Maries Chambers, World Animal Protection, United Kingdom visited the college on Nov.11, 2016.
• Sri Ranjit Das, Hon’ble Speaker, Assam Legislative Assembly paid a visit to the college on Nov. 16, 2016.
• Dr. Amam Zonaed Siddiki, Director and Prof. Md. Alamgir Hossain, Director, Student Welfare, One Health Institute, Chittagong Veterinary & Animal Sciences University, Bangladesh were in the college on Jan.3-6, 2017 for an academic visit.
• Dr. S. V. Ngachan, Director, ICAR Research Complex, NEH Region visited the college on Jan., 19, 2017.
• Sri Sarbananda Sonowal, Hon’ble Chief Minister; Sri Naba Kumar Doley, Hon’ble Minister of State for Cultural Affairs Assam and Dr. A.K. Singh, Deputy Director General (Agricultural Extension), ICAR, New Delhi visited the college on Feb.9, 2017.
• Sri Hiren Chandra Nath, IPS, Commissioner of Police, Guwahati Metro and Sri Dhruba Jyoti Hazarika, IAS, APSC Member paid visit to the college on March 3, 2017.

D. Biswanath College of Agriculture, Biswanath Chariali
• Dr. D. P. Ray, Dr. Gautam Roy, Dr. S. C. Saha and Amitava Sarkar, NIRJAFT, ICAR, Kolkata visited the college on Nov.30, 2016.
• Dr. H. B. Sharma, Minister of Education, Health, Finance etc; Mr. P. Borthakur, MLA, Biswanath LAC; Mr. P. Hazarika, Ex MLA, Biswanath LAC and Sri Ashok Singhal, MLA, Dhekiajuli LAC, Govt of Assam were in the college on Dec.20, 2016.
• Sri Ranjit Dutta, Minister of Irrigation, Sericulture, Handloom & Textiles, Govt. of Assam; Padmashree Jadav Paying, Jorhat and Mr. A. Chakraborty, DC, Biswanath district paid visit to the college on Feb.18, 2017.
• Prof Arupjyoti Choudhury, Dean (Academic), KKHSOU visited the college on April 18, 2016.
• Mr. Bakul Gogoi, Social Worker, Gohpur, Assam was in the college on April 20, 2016.
• Dr. Richard Quilliam and Dr Jen Dickie, Biological and Environmental Science University of Sterling, UK visited the college on April 30, 2016.
• Dr. S. S. Jambhulkar, Scientist, BARC, Mumbai paid a visit to the college on Nov.6, 2016.

E. College of Fisheries, Roha, Nagaon
• Dr. R. Suresh, Senior Consultant, NFDB, Hyderabad, India visited CFSc., Raha on May 14, 2016.
G. Lakhimpur College of Veterinary Science, Joyhing
- Dr. Vipan Kr. Gupta, Dr. R. S. Dalvi and Dr. Vinod Kumar who visited LCVSc on April 25-27, 2016 in connection with inspection of the college.
- Dr. K. P. Tripathi and Dr. P. Maliwal as members of the ICAR Peer Review team visited LCVSc on June 9, 2016 for inspection of the college.
- Dr. Surajit Bhuyan, Principal, Lakhimpur Girl’s College visited LCVSc on the occasion of Annual Freshmen Social, 2016 on October 5, 2016.

H. SCS College of Agriculture, Dhubri
- Dr. K. K. Vaas, Retd. Director, CIFRI, Berrakpur and Dr. A. Alur, Principal Scientist, UHS, Bangalore visited the college on June 10, 2016.
- ICAR Accreditation Committee visited the college for academic purposes.

I. College of Community Science, AAU, Jorhat
- Peer Review & Monitoring Team visited all five departments of the Faculty.
9. Finance

The University received its financial resources from various sources like State Govt., ICAR, GOI and internal source of the University. During 2016-17 financial year, the University received an amount of Rs. **31124.31 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 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 the University during 2016-17

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<tr>
<th>Receipt</th>
<th>State</th>
<th>ICAR</th>
<th>GOI</th>
<th>Internal receipt</th>
<th>Total</th>
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<tr>
<td>Non-Plan</td>
<td>13315.80</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>13315.80</td>
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<td>Plan</td>
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<td>21739.71</td>
<td>5708.40</td>
<td>3221.20</td>
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<td><strong>31124.31</strong></td>
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APPENDIX-I

Externally Funded Research Projects in operation in the Faculty of Agriculture and Community Science during 2016-17

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the scheme</th>
<th>Funding Agency</th>
<th>In-charge</th>
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<tbody>
<tr>
<td>1.</td>
<td>Faculty of Agriculture</td>
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</tr>
<tr>
<td></td>
<td>All India Coordinated Research Project (AICRP)</td>
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<tr>
<td>1</td>
<td>AICRP on Rice</td>
<td>ICAR</td>
<td>Dr. T. Ahmed</td>
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<tr>
<td>2</td>
<td>AICRP on Fruits</td>
<td>ICAR</td>
<td>Dr. A. Barbora</td>
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<tr>
<td>3</td>
<td>AICRP on Rapeseed &amp; Mustard</td>
<td>ICAR</td>
<td>Dr. N.K. Sarmah,</td>
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<td>4</td>
<td>AICRP on MULLARP</td>
<td>ICAR</td>
<td>Dr. H.K. Bora,</td>
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<td>5</td>
<td>AICRP on Wheat</td>
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<td>Dr. T.P. Saikia</td>
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<td>6</td>
<td>AICRP on Chick pea</td>
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<td>Dr. I.A. Sheikh,</td>
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<td>7</td>
<td>AICRP on Linseed</td>
<td>ICAR</td>
<td>Sri U.K. Bora</td>
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<td>8</td>
<td>AICRP on Palm</td>
<td>ICAR</td>
<td>Dr. J.C. Nath</td>
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<td>9</td>
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<td>Dr. A.A. Ahmed</td>
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<td>11</td>
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<td>AICRP on Forage Crops</td>
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<td>Dr. D. Sarma</td>
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<tr>
<td>7</td>
<td>Introduction of mutations in summer greengram (Vigna radiata L. Wilczek)</td>
<td>DBT</td>
<td>Dr. (Mrs.) A. Sarmah</td>
</tr>
<tr>
<td>8</td>
<td>Development of Gamma ray induced mutant strain on honey/bees resistant to insecticides</td>
<td>BRNS, GOI</td>
<td>Dr. Mukul Kr. Deka</td>
</tr>
<tr>
<td>9</td>
<td>Development of leaf folder, (Cnaphalocrosis medinalis) resistant rice variety through mutation breeding.</td>
<td>BRNS, GOI</td>
<td>Dr. Purnima Das</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Name of the scheme</td>
<td>Funding Agency</td>
<td>In-charge</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>10</td>
<td>Development of stem borer, ((\text{Scripophagus incartulus})) resistant rice variety through mutation breeding.</td>
<td>BRNS, GOI</td>
<td>Dr. Anjumani Devi</td>
</tr>
<tr>
<td>11</td>
<td>Direct seeded rice (DSR)</td>
<td>ICAR, IRRI</td>
<td>Dr. N. T. Rafique</td>
</tr>
<tr>
<td>12</td>
<td>Development of shorter duration mega variety Ranjit with the help of mutation breeding and Marker aided selection</td>
<td>BRNS, GOI</td>
<td>Dr. S. K. Chetia</td>
</tr>
<tr>
<td>13</td>
<td>Identification of genes contributing resistance to (\text{Alternaria brassicae}) from a nonhost plant and their characterization in Arabidopsis for durable crop protection against blight disease in (\text{Brassica rapa})</td>
<td>DBT, GOI</td>
<td>Dr. P. Bhorali</td>
</tr>
<tr>
<td>14</td>
<td>Marketing Strategies for Horticultural Crops in Assam</td>
<td>NIAM</td>
<td>Dr. K. C. Talukdar</td>
</tr>
<tr>
<td>15</td>
<td>Induced mutagenesis for early maturing plant type of Indian mustard ((\text{Brassica juncea (L)} \text{Coss. &amp; Cze}))</td>
<td>BRNS, GOI</td>
<td>Dr. P. K. Baruah</td>
</tr>
<tr>
<td>16</td>
<td>Genome and transcriptome sequencing of aromatic rice from N.E. Region</td>
<td>GOI, DBT</td>
<td>Dr. R. N. Sarmah</td>
</tr>
<tr>
<td>17</td>
<td>Development of HY non lodging and biotic resistant varieties of black scented rice of Manipur and Jaha rice of Assam through biotechnological intervention</td>
<td>GOI, DBT</td>
<td>Dr. A. R. Baruah</td>
</tr>
<tr>
<td>18</td>
<td>DBT scented rice programme for NE</td>
<td>GOI, DBT</td>
<td>Dr. S. D. Deka</td>
</tr>
<tr>
<td>19</td>
<td>Development of HY non lodging and biotic resistant varieties of black scented rice of Manipur and Jaha rice</td>
<td>GOI, DBT</td>
<td>Dr. S. K. Chetia</td>
</tr>
<tr>
<td>20</td>
<td>Biodiversity studies of aromatic rice in N.E. India</td>
<td>GOI, DBT</td>
<td>Dr. M. K. Modi</td>
</tr>
<tr>
<td>21</td>
<td>Genome and transcriptome sequencing of aromatic rice from N.E. Region</td>
<td>GOI, DBT</td>
<td>Dr. M. K. Modi</td>
</tr>
<tr>
<td>22</td>
<td>Biodiversity studies of aromatic rice in N.E. India</td>
<td>GOI, DBT</td>
<td>Dr. T. Ahmed</td>
</tr>
<tr>
<td>23</td>
<td>Establishment/strengthening of biofertilizer and biocontrol production units for increasing pulse production in India</td>
<td>GOI, DBT</td>
<td>Dr. Rajen Baruah, Nodal Officer</td>
</tr>
<tr>
<td>24</td>
<td>Defining miRNA mediated regulation of secondary metabolite accumulation in (\text{Cymbopogon winterianus})</td>
<td>DBT, GOI</td>
<td>Dr. Kamalkashi Devi</td>
</tr>
<tr>
<td>25</td>
<td>Wild mushroom from N.E. India: Evaluation of their nutritional status and medicinal properties</td>
<td>DBT, GOI</td>
<td>Dr. Robin Ch. Boro</td>
</tr>
<tr>
<td>26</td>
<td>Augmentation of Agriculture through “Efficient Resource Utilization with participatory approaches</td>
<td>Oil India</td>
<td>Dr. M. Saikia, PI</td>
</tr>
<tr>
<td>27</td>
<td>Participatory technology assessment for enhancing farming system productivity and developing entrepreneurship for sustainable rural livelihood under Farmer</td>
<td>FIRST PROGRAMME</td>
<td>Dr. P. K. Pathak, PI</td>
</tr>
<tr>
<td>28</td>
<td>Strengthening of Biofertilizer and Biocontrol Production Units for Pulse Production in India</td>
<td>Department of Agri., co-op. &amp; Farmers Welfare (NFSM), GoI.</td>
<td>Dr. L. C. Bora(Co PI)</td>
</tr>
</tbody>
</table>

### C. Ad-hoc Research Projects (Completed)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Project Title</th>
<th>Funding Agency</th>
<th>In-charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Exploration of Micro fauna as biological indicators and bioremediation of some degraded soil ecosystem of Assam</td>
<td>DBT</td>
<td>Dr. B. Bhattacharyya</td>
</tr>
<tr>
<td>2</td>
<td>Molecular breeding for early heading date in Boro rice of Assam</td>
<td>DBT</td>
<td>Dr. A. R. Brauah</td>
</tr>
<tr>
<td>3</td>
<td>Rapid on field detection of citrus tisteza virus by Gold nano particles based dipstick method</td>
<td>DBT</td>
<td>Dr. R. C. Boro</td>
</tr>
<tr>
<td>4</td>
<td>Root—specific Reduction of Cytokinin to enhance Root Biomass and Seed Yield in Rapeseed ((\text{Brassica campestris}))</td>
<td>DBT</td>
<td>Dr. A. M. Baruah</td>
</tr>
<tr>
<td>5</td>
<td>National Initiative of climate Resilient Agriculture (NICRA)” under AICRP on Agro meteorology</td>
<td>ICAR</td>
<td>Dr. R. Hussain</td>
</tr>
<tr>
<td>6</td>
<td>Tracking adoption of stress tolerant rice varities in Assam State</td>
<td>IRRI</td>
<td>Dr. (Mrs) Nivedita Deka</td>
</tr>
</tbody>
</table>

### D. Ad-hoc Research Projects under DBT-AAU Centre

#### D.1 Ad-hoc Research Projects under DBT-AAU Centre (Continuing)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Project Title</th>
<th>Funding Agency</th>
<th>In-charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gene technology for crop improvement</td>
<td>DBT</td>
<td>Dr. B. K. Sarmah (PL), Dr. Sumita Acharjee (PI)</td>
</tr>
<tr>
<td>2</td>
<td>Molecular characterization and gene mining in rice</td>
<td>-do-</td>
<td>Dr. M. K. Modi (PL)</td>
</tr>
<tr>
<td>3</td>
<td>Bioprospecting of soil microbes for acid tolerance gene</td>
<td>-do-</td>
<td>Dr. M. Baroosh (PL)</td>
</tr>
<tr>
<td>4</td>
<td>Biofertilizer programme</td>
<td>-do-</td>
<td>Dr. Rajen Baruah (PC)</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Name of the scheme</td>
<td>Funding Agency</td>
<td>In-charge</td>
</tr>
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</tr>
<tr>
<td>5</td>
<td>Biopesticide programme</td>
<td>DBT</td>
<td>Dr. L. C. Bora (PC)</td>
</tr>
<tr>
<td>6</td>
<td>Prospecting of agricultural weeds and wastes from Assam as the potential energy sources for lignocellulosic alcohol production”</td>
<td>DBT, do-</td>
<td>Dr Tankeshwar Nath (PI)</td>
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</tbody>
</table>

D. Ad hoc Projects under DBT-AAU Centre (Extramural Projects)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the scheme</th>
<th>Funding Agency</th>
<th>In-charge</th>
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<tbody>
<tr>
<td>7</td>
<td>Study of mitochondrial electron transport chain (ETC) dysfunction that modulates aging and development in C. elegans through CEP-1, the worm homolog of mammalian p53”</td>
<td>DBT</td>
<td>Dr. A. Baruah (PI)</td>
</tr>
<tr>
<td>8</td>
<td>Screening of indigenous rice germplasms of Assam for tolerance to anaerobic condition during germination and marker assisted introgression of traits into elite rice</td>
<td>do-</td>
<td>Dr. P. K. Das (PI)</td>
</tr>
<tr>
<td>9</td>
<td>Functional validation of yield related genes</td>
<td>do-</td>
<td>Dr. P. K. Das (PI)</td>
</tr>
<tr>
<td>10</td>
<td>Development of High yielding Non Lodging and Biotic resistant Varieties of Black Scented Rice of Manipur and Joha Rice of Assam through Biotechnological Intervention</td>
<td>do-</td>
<td>Dr. B. K. Sarmah (PI)</td>
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</table>

D. Ad hoc Projects under DBT-AAU Centre (NEW Project)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the scheme</th>
<th>Funding Agency</th>
<th>In-charge</th>
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<tbody>
<tr>
<td>11</td>
<td>ICAR-National Professor programme -</td>
<td>ICAR, Govt. of India</td>
<td>Prof. B. K. Sarmah</td>
</tr>
<tr>
<td>12</td>
<td>Genetic studies to understand mitochondrial electron transport chain dysfunction using Caenorhabditis elegans</td>
<td>DBT, Govt. of India</td>
<td>Dr. Aiswarya Baruah</td>
</tr>
<tr>
<td>13</td>
<td>Understanding the molecular mechanism of anaerobic germination in hypoxia tolerant rice germplasms of Assam through functional genomics study</td>
<td>DBT, Govt. of India</td>
<td>Dr. Prasanta Kr Das</td>
</tr>
<tr>
<td>14</td>
<td>Studies on role of endophytes in variation of acaricidal properties of two acaricide producing plant species NBA 22/FI and NBA18/DI from North Eastern States</td>
<td>DBT, Govt. of India</td>
<td>Dr. Tankeswar Nath PI</td>
</tr>
</tbody>
</table>

2 Faculty of Community Science

A. AICRP

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the scheme</th>
<th>Funding Agency</th>
<th>In-charge</th>
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<tbody>
<tr>
<td>1</td>
<td>AICRP on Community Science</td>
<td>ICAR</td>
<td>Incharge five for five components as below</td>
</tr>
<tr>
<td>1a</td>
<td>Dynamics &amp; performance of women’s group in agricultural and allied sector</td>
<td>ICAR, Dr. Ruplekha Borah</td>
<td></td>
</tr>
<tr>
<td>1b</td>
<td>Drudgery Assessment and Mitigation (FRM Component))</td>
<td>ICAR, Dr. Ruplekha Borah</td>
<td></td>
</tr>
<tr>
<td>1c</td>
<td>Functional clothing to combat occupational hazards of farm workers and Utilization of plant sources and animal fibers for textile applications (CT component)</td>
<td>ICAR, Dr. Nabaneeta Gogoi</td>
<td></td>
</tr>
<tr>
<td>1d</td>
<td>Capacity building of Agrarian families (CD Component)</td>
<td>ICAR, MoFPI Dr. Mala Handique</td>
<td></td>
</tr>
<tr>
<td>1e</td>
<td>Food and nutritional strategies to combat nutritional problems among farm families (FN Component)</td>
<td>ICAR, MoFPI Dr. Pranati Das</td>
<td></td>
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</tbody>
</table>

B. Ad-hoc Research Projects

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the scheme</th>
<th>Funding Agency</th>
<th>In-charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Management of green waste for economic benefits and women empowerment</td>
<td>DBT, Dr. Bijoylaxmi Bhuyan</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Early language acquisition – An approach to alphabet learning in Assamese language.</td>
<td>MHRD under Design Innovation Center, Dr. Juri Baruah</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Efficiency Innovation for pounding of rice</td>
<td>do- AAU, Dr. Bulbul Baruah</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Value addition of handloom fabric for product diversification and higher marketability (FRP)</td>
<td>DBT, Dr. Pranati Das</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Development of waxy and non-waxy foxtail millet genotypes suitable for Assam and Tamil Nadu and preparation of value added food products</td>
<td>ICAR, Dr. Pranati Das</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Pilot project on solar drying of fruits and vegetables</td>
<td>GOI, Dr. Pranati Das</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Development of value added products from minor fruits of Assam</td>
<td>DBT, Dr. Nilima Neog</td>
<td></td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Name of the scheme</td>
<td>Funding Agency</td>
<td>In-charge</td>
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<tr>
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</tr>
<tr>
<td>8</td>
<td>Efficiency Innovation for pounding of rice</td>
<td>MHRD</td>
<td>Dr. Ruplekha Borah</td>
</tr>
<tr>
<td>9</td>
<td>Design approaches for occupational wellness of puckers engaged in manual tea plucking activity</td>
<td>MHRD</td>
<td>Dr. Nandita Bhattacharyya</td>
</tr>
<tr>
<td>10</td>
<td>Development and evaluation of dehydrated and irradiated jack fruit \ (<em>Artocarpus heterophyllus</em>) products</td>
<td>DBT</td>
<td>Dr. Pranati Das</td>
</tr>
</tbody>
</table>

B. Ad-hoc Research Projects (New project)
# APPENDIX II

Externally Funded Research Projects in Operation in Faculty of Veterinary and Fishery Science during 2016-17

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the scheme/Project</th>
<th>Funding Agency</th>
<th>In-charge</th>
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<tr>
<td></td>
<td><strong>Faculty of Veterinary Science</strong></td>
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<tr>
<td><strong>A</strong></td>
<td>AICRP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>AICRP on epidemiological studies on FMD</td>
<td>ICAR</td>
<td>Dr. K. Sharma</td>
</tr>
<tr>
<td>2</td>
<td>AICRP on Pigs &amp; Mega Seed Production of Pig under AICRP on Pig</td>
<td>ICAR</td>
<td>Dr. Dhireswar Kalita</td>
</tr>
<tr>
<td>3</td>
<td>AICRP on Nutritional and Physiological Approaches for Enhancing Reproductive Performance in Animal</td>
<td>ICAR</td>
<td>Dr. Ranjan Kumar Biswas</td>
</tr>
<tr>
<td>4</td>
<td>AICRP on post Harvest technology (Meat and Meat products)</td>
<td>ICAR</td>
<td>Dr. M. Hazarika</td>
</tr>
<tr>
<td>5</td>
<td>AICRP on Poultry Breeding</td>
<td>ICAR</td>
<td>Dr. Niranjan Kalita</td>
</tr>
<tr>
<td>6</td>
<td>AICRP on Goat Improvement</td>
<td>ICAR</td>
<td>Dr. Naba Nahar Deka</td>
</tr>
<tr>
<td>7</td>
<td>AICRP on Disease Monitoring and Surveillance(PD-ADMAS)</td>
<td>ICAR</td>
<td>Dr. S.K. Das.</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Network/ Outreach Project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>NWP on Hemorrhagic Septicaemia.</td>
<td>ICAR</td>
<td>Dr. R.K. Sarma</td>
</tr>
<tr>
<td>2</td>
<td>NWP on Swamp Buffalo</td>
<td>ICAR</td>
<td>Dr. G. C. Das</td>
</tr>
<tr>
<td>3</td>
<td>NWP on Brucellosis</td>
<td>DBT, MoST, GOI</td>
<td>Dr. Girindra Kumar Saikia</td>
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<tr>
<td>4</td>
<td>Outreach Programme on Ethno Veterinary medicine in XI</td>
<td>ICAR</td>
<td>Dr. (Mrs.) C. C. Baruah</td>
</tr>
<tr>
<td>5</td>
<td>Outreach Programme on Livestock Related Environmental Pollutants, Contaminants &amp; Toxictans (Monitoring of Drug Residues and Environmental Pollutants)</td>
<td>ICAR</td>
<td>Dr. D. C. Roy Toxicology</td>
</tr>
<tr>
<td>6</td>
<td>Outreach Programme on Zoonotic diseases during XII Five year plan wef 2012-2017</td>
<td>ICAR</td>
<td>Dr. A. G. Baruah</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Extra Mural Project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Molecular Characterization and development of Breed Signatures for Indigenous ducks of North East India</td>
<td>ICAR</td>
<td>Dr. Bula Das</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>Ad-hoc Research Projects</td>
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<tr>
<td><strong>D1</strong></td>
<td>Ad-hoc Research Projects (Continuing)</td>
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</tr>
<tr>
<td>1</td>
<td>Veterinary Type Culture</td>
<td>ICAR NRC on Equines</td>
<td>Dr. A. K. Hazarika</td>
</tr>
<tr>
<td>2</td>
<td>Creation of Online repository of Biotechnology &amp; Bioinformatics resources of north east India (BABRONE)</td>
<td>DBT</td>
<td>Dr. Probodh Borah</td>
</tr>
<tr>
<td>3</td>
<td>Development of Improved Diagnostics with Monitoring and Characterization of Viral and Bacterial Pathogens associated with Piglet Diarrhoea in North Eastern Region of India (In collaboration with CVSc &amp;AH, CAU, Mizoram &amp; IVRI)</td>
<td>DBT</td>
<td>Dr. Durlav Prasad Bora</td>
</tr>
<tr>
<td>4</td>
<td>An Epidemiological Study of Clostridium Difficile : An Emerging Pathogen of Public Heath Importance (In collaboration with National Institute of Choleare &amp; Enteric Diseases, Beliaghata, Kolkata)</td>
<td>-do-</td>
<td>Dr. Rajeev Kumar Sharma</td>
</tr>
<tr>
<td>5</td>
<td>Molecular typing and virulence characteristics of Salmonella with special reference to non-host-specific serovars</td>
<td>-do-</td>
<td>Dr. Probodh Borah</td>
</tr>
<tr>
<td>6</td>
<td>Sero surveillance and association of toll -like receptors Th 1-Th 2 status and viral genotypes in susceptibility and severity of Peste Des Pests Ruminant among goats (Capra hircus) and sheeps (Ovis aries) of North East India.</td>
<td>-do-</td>
<td>Dr. Sutopa Das</td>
</tr>
<tr>
<td>7</td>
<td>Identification of Probiotic Strain(s) from gut metagenome of Assam Indigenous chicken</td>
<td>-do-</td>
<td>Dr. Deben Sapcota</td>
</tr>
<tr>
<td>8</td>
<td>Designing, synthesis and characterization of antimicrobial peptides</td>
<td>-do-</td>
<td>Dr. D. J. Kalita</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Name of the scheme/Project</td>
<td>Funding Agency</td>
<td>In-charge</td>
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</tr>
<tr>
<td>9</td>
<td>Sero- surveillances, molecular characterization and epidemiology of pox viral infections in</td>
<td>DBT</td>
<td>Dr. Durlav Prasad Bora</td>
</tr>
<tr>
<td></td>
<td>animals from NE region of India.</td>
<td>twinning programme for the NE</td>
<td>do-</td>
</tr>
<tr>
<td>10</td>
<td>Aetio pathogenesis and molecular epidemiology of bacterial and viral diseases associated</td>
<td>DBT</td>
<td>Dr. Durlav Prasad Bora</td>
</tr>
<tr>
<td></td>
<td>with the respiratory problems of Yak in the NER of India. (collaborating Institute)</td>
<td></td>
<td>do-</td>
</tr>
<tr>
<td>11</td>
<td>Development of novel molecular diagnostics and improved vaccine for Duck Plague virus.</td>
<td>-do-</td>
<td>Dr. N. N. Barman</td>
</tr>
<tr>
<td>12</td>
<td>Mapping of epidemiology, anthelmintic resistance in gastro intestinal Nematodosis in goat</td>
<td>DBT</td>
<td>Dr. Sulekha Choudhury Phukan</td>
</tr>
<tr>
<td></td>
<td>and effect of indigenous herbal medicine incorporated in urea molasses block to combat</td>
<td></td>
<td>do-</td>
</tr>
<tr>
<td></td>
<td>the anthelmintic resistance in Assam</td>
<td></td>
<td>Dr. Rita Nath</td>
</tr>
<tr>
<td>13</td>
<td>Role of Plants as a modifier of rumen to reduce methane production and improve productivity</td>
<td>DBT</td>
<td>Dr. (Mrs) Sutopa Das</td>
</tr>
<tr>
<td></td>
<td>in small animals.</td>
<td></td>
<td>do-</td>
</tr>
<tr>
<td>14</td>
<td>Molecular epidemiology of Group A rotavirus (RVA) infections in the north Eastern Region</td>
<td>-do-</td>
<td>Dr. (Mrs) Sutopa Das</td>
</tr>
<tr>
<td></td>
<td>(NER) (collaborating Institute)</td>
<td></td>
<td>do-</td>
</tr>
<tr>
<td>15</td>
<td>Development of subviral particle of Infectious Bursal Disease virus as a potential vaccine</td>
<td>DBT</td>
<td>Dr. (Mrs) Sutopa Das</td>
</tr>
<tr>
<td></td>
<td>and diagnostic candidate (in collaboration with GADVASU), Ludhina</td>
<td></td>
<td>do-</td>
</tr>
<tr>
<td>16</td>
<td>Seroservillance, isolation and molecular characterization of bluetongue virus in sheep</td>
<td>-do-</td>
<td>Dr. Nagendra Nath Barman</td>
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<td></td>
<td>and goats of Tripura and Assam states</td>
<td></td>
<td>do-</td>
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<tr>
<td>17</td>
<td>Comparative evaluation of whole outer membrane protein of <em>Pasteurella multocida</em></td>
<td>DBT-AAU Centre for Biotechnology, AAU, Jorhat</td>
<td>Dr. Shantanu Tamuly</td>
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<td></td>
<td>adjuvanted with calcium phosphate nanoparticles and polylactide co- glycolide (PLG)</td>
<td></td>
<td>ICAR, NDRI</td>
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<td></td>
<td>micro particles as a vaccine candidates against swine pasteurellosis.</td>
<td></td>
<td>DBT’s biotechnology based programmes for rural development.</td>
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<td>18</td>
<td>NICRA , Collaborating centre</td>
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<td>NICRA, Collaborating centre</td>
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<td>19</td>
<td>Capacity building and awareness generation towards combating some microbial zoonotic</td>
<td>DBT</td>
<td>Dr. Durlav Prasad Bora</td>
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<td></td>
<td>infections through community participation in Kamrup and Lakhimpur districts of Assam.</td>
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<td>do-</td>
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<td>20</td>
<td>DBT NER Project: Advanced Animal Diagnostics and Management Consortium (ADMaC)</td>
<td>DBT</td>
<td>Dr. S. K. Das</td>
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<tr>
<td>21</td>
<td>Characterization of Cattle of Assam.</td>
<td>NBAGR, ICAR</td>
<td>Dr. Gopal Chandra Das</td>
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<td>22</td>
<td>Characterization of duck of Assam</td>
<td>-do-</td>
<td>Dr Naba Nahardeka</td>
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<td>23</td>
<td>Hair Tissue Mineral Analysis in Cattle</td>
<td>UGC-DAE</td>
<td>Dr. Mohan Bhattacharyya</td>
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<td></td>
<td>Studies on antibiotic usages and bovine tuberculosis in small holder peri-urban dairy</td>
<td>UGC-DAE</td>
<td>Consortium for Scientific</td>
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<td>farms.</td>
<td>Public Health Foundation of India</td>
<td>DBT</td>
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<td>Modulation of lipo polysaccharide-induced depressive behaviour by few indigenous plants</td>
<td>DBT</td>
<td>Dr. R.A. Hazarika</td>
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<td>of Nort East India and their molecular mechanism.</td>
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<td>Life Science Research Board, Defence Research &amp; Development Organisation, New Delhi</td>
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<td>26</td>
<td>Capacity building and awareness generation for enhanced productivity of pig through</td>
<td>DBT</td>
<td>Dr. Kutubuddin Ahmed</td>
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<td></td>
<td>assisted reproductive biotechnology and conservation of biodiversity in North Eastern</td>
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<td>biotechnology based</td>
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<td>Region through community participation</td>
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<td>programmes for rural</td>
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<td>development</td>
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<tr>
<td>Sl. No.</td>
<td>Name of the scheme/Project</td>
<td>Funding Agency</td>
<td>In-charge</td>
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<td>27</td>
<td>Impact study of broiler farmers under the Chief Minister’s Jeeban Jyoti Swa Niyojan Yojana</td>
<td>SIRD</td>
<td>Dr. J. D. Mahanta</td>
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<tr>
<td>28</td>
<td>Pig Farming through promotion of farmers Producer Organisation, Tamulpur Sub division, Baska (BTAD) District, Assam</td>
<td>North East Council, Swa Niyojan Yojana</td>
<td>Collaborative project under PPP mode, AAU with Mothonga Agro Producer Company Ltd., Baska district</td>
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<td>29</td>
<td>Advanced State Biotech Hub (Assam)</td>
<td>DBT</td>
<td>Dr. P. Borah</td>
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<td>30</td>
<td>Bioinformatics Infrastructure Facility Centre</td>
<td>DBT</td>
<td>Dr. P. Borah</td>
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<tr>
<td>31</td>
<td>Culture and propagation of Monopterus cuchia.</td>
<td>ASTEC, Guwahati</td>
<td>Dr. K. Kalita</td>
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<tr>
<td>32</td>
<td>Study on persistence of Japanese encephalitis in reservoir host, pig in je endemic area of Odisha, Manipur and Assam</td>
<td>IBSD</td>
<td>Dr. P. Borah</td>
</tr>
<tr>
<td>33</td>
<td>Socio economic uplift men of fish farmers of Kamrup and Morigaon districts through culture and propagation of Monopterus cuchia, a farmers participatory approach</td>
<td>ASTEC</td>
<td>Dr. Kamaleswar Kalita</td>
</tr>
</tbody>
</table>

**D1 Ad hoc Research Project (New)**

1. A detailed study on “Seasonal influences on Broiler Production Practices, Economics and its role on self employment in 5 BRGF District of Assam”.  
   - SIRD  
   - Dr. B. K. Sarmah

2. Epidemiological studies on emerging infectious diseases of elephants (Elephas maximus) with special reference to tuberculosis (TB) and elephant endotheliotropic herpes virus (EEHV)  
   - DBT’s Twinning Programme for NER  
   - Dr. Gauranga Mahato

3. Development of nanoparticle or micro particle adjuvanted subunit oral vaccine against poultry Salmonellosis  
   - -do-  
   - Dr. Shantanu Tamuly

4. Isolation, characterization and development of a culture method for long term preservation of spermatogonial stem cell from doorn pig.  
   - -do-  
   - Dr. Arpana Das

5. Molecular characterization of fecundity genes in Assam Hill Goat  
   - -do-  
   - Dr. Farzin Akhtar

6. Exploring selected natural plant sources of North East parts of India as potential therapeutic agents useful for the treatment of cancer  
   - -do-  
   - Dr. Chandana Choudhury Barua

7. Sero surveillance of Leptospira infection in animals of North Eastern region of India  
   - -do-  
   - Dr. Durlav Prasad Bora

8. DBT funded twinning project entitled on “Characterization of kisspeptin and kiss1 gene during reproductive cyclicity and pregnancy in assam local and crossbred cows”  
   - DBT, New Delhi, Govt. of India  
   - Dr. Anubha Baruah

9. DBT funded twinning project entitled on “Conservation of indigenous pig of Assam through hand made cloning technique”  
   - -do-  
   - Dr. Nikhil Ch. Nath

**D2 Ad hoc Research Project (completed)**

1. Augmenting pig production through effective microbiological technology  
   - -do-  
   - Dr Jogi Raj Bora

**II Faculty of Fishery Science**

**A College of Fisheries, Raha**

**A1 Ad hoc Research Project (continuing)**

1. National Surveillance Programme for Aquatic Animal Diseases  
   - NBFGR  
   - Dr Binod Kalita

2. Fish Disease Diagnostic laboratory  
   - CIFRI & CIFI  
   - Dr Shamin Ara Begam

3. Creation of enhancement of fishes-alternative livelihood through community bases cage culture in selected beels in Nagaon & Morigaon districts of Assam  
   - NFDB  
   - Dr P.K. Goswami

**A2 Ad hoc Research Project (New)**

1. Refinement of induced breeding, larval rearing and grow out technology of murrel and dissemination of the technology to the farmers through creation of model village for murrel seed production in central and upper Brahmaputra valley of Assam  
   - National Fisheries Development Board (NFDB)  
   - Dr Bipul Phukan
## Fisheries Research Centre, Jorhat

### Ad hoc Research Project (Continuing)

1. **Seed Production of Cat fish (Magur) under the project “Seed production in Agricultural crops & Fisheries”**<br>   Funding Agency: DARE/ICAR<br>   In-charge: Dr. Bibha Chetia Borah

2. **Technology show casing of integrated fish farming technology**<br>   Funding Agency: RKVY<br>   In-charge: Dr. Bibha Chetia Borah

3. **Advanced breeding of Carps by using U.V stabilized LDPE film**<br>   Funding Agency: RKVY<br>   In-charge: Dr. Bibha Chetia Borah

4. **Development of low cost aquaponics model**<br>   Funding Agency: RF, FRC<br>   In-charge: Dr. Bibha Chetia Borah

5. **Development of automatic fish grader cum counter**<br>   Funding Agency: DIC-IIT, Guwahati<br>   In-charge: Dr. Bibha Chetia Borah

### Ad hoc Research Project (NEW)

6. **Enhancement of Omega-3 fatty acids in fresh water fish Catla catla and Clarius batrachus under culture condition in Assam, India**<br>   Funding Agency: DBT<br>   In-charge: Dr. Bibha Chetia Borah