ANNUAL REPORT
2021-22

CENTRAL AGRICULTURAL UNIVERSITY

Lamphel Pat, Imphal 795 004, Manipur, India

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LAMPHEL PAT, IMPHAL 795004, MANIPUR, INDIA

Annual Report 2021-22

(April, 2021 to March, 2022)

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Foreword

ALTHOUGH situation is somewhat better as compared to the last year, due to the pandemic our University has faced another extraordinary year of interruptions and challenges; however we have come together to achieve many incredible outcomes in the face of continued uncertainty which is being reflected in this Annual Report of 2021-22. Our University has been ranked 13th position in the ranking status of Agricultural Universities for the year 2020 by ICAR. Nineteen (19) students have secured Junior Research Fellowship (JRF) examination, two (2) students ICAR SRF examination and four (4) GATE examinations. A total of 103 students were placed in various capacities in different organizations during the year 2021-22. The academic activities remained functional through both offline and online platform by the noteworthy efforts made by our faculty, adjunct faculty and staffs. There was timely completion of academic activities so that none of our students suffered. We had taken maximum preventive measures against covid-19 infections in the campuses. Through webinars and other online interaction programs, the University has taken effortsto combat stress and anxiety during the pandemic and for maintaining a sense of normalcy during the lockdowns. In addition our University continued to go beyond to support our farmer friends through the pandemic by organizing programme on Community Empowerment through Technology Products where inputs were distributed in 38 distribution points covering 5222 farmers in 38 districts of the seven states of North East India by voluntary contribution of one day salary of the employees of the University.

Our scientists are focusing to evolve new agricultural technologies for the development of north east India by undertaking contingency research projects and station research and trials which are of great concern and need immediate attention in the region. Five food products which were developed from local raw material were FSSAI registered. Database of 303 NE fish species was prepared. 26 accessions number of local citrus germplasm were received from NBPGR, New Delhi. Our extension centers are working tirelessly to provide latest research and new technologies to the end users. The extension functionaries of the University - KVKs, MTTC/VTCs and the constituent colleges are making their constant efforts through organization of trainings, field demonstrations, TVs and Radio talks etc. The University web site is updated regularly for disseminating latest agricultural information.

Many achievements set out in this Report are testament to the effort of our hardworking students, faculty, staff and senior officers and together we remain focused on setting our University up to succeed in 2022 and beyond. I would also like to extend our sincere thanks to State and Central Governments, Esteemed Indian Council of Agricultural Research, National and International Funding Agencies and Local communities for their extended support and providing necessary energy in executing our programmes. The cooperation and guidance provided by Hon'ble members of the Board of Management, Finance Committee, Academic Council, Research Council and Extension Education Council is also acknowledged with gratefulness. I thank all the University colleagues, faculty and staff members of the constituent colleges for their enormous contribution and looking forward of the same with confidence in the coming years ahead.

Dated: 12-06-2022
Imphal

(Anupam Mishra)
Vice Chancellor

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Executive Summary

The year 2021-22 was still a difficult year for all the educational institutes around the world because of the pandemic though the situation is improved a little bit. The University has taken all possible measures to prevent the spread of covid-19 in the campuses and has taken maximum preventive measures by regular sanitisation of all the premises and buildings of the constituent colleges and University. Covid Management Task Force for effective prevention and management of Covid-19 in the campuses were formed in each constituent colleges of the University. Essential items like sanitizers, steam inhalers, medicines, thermometers, oximeter, oxygen cylinders *etc*. were procured. Daily necessities were arranged and supplied through University canteen to the faculty, staff and student. The University directed for 100% vaccination for prevention of Covid 19 by the faculties, students and all the permanent and contractual staffs working in the constituent colleges. In those campuses where regular doctors are not appointed, the University engaged temporary doctors and other medical staffs. By effective management, the University had negligible covid positivity cases and was able to perform its academic, research and extension activity mostly by offline mode by following Covid-19 protocols and SOP's of the Central and respective state governments.

Academic

The Central Agricultural University (CAU), Imphal was established under Department of Agricultural Research and Education (DARE) on 26th January, 1993 by Central Agricultural University Act, 1992 (No.40 of 1992) of Parliament with its headquarters at Imphal, Manipur. It is a fully residential University covering all the North-East Hill states under its jurisdiction except Assam. Like other Agricultural Universities of India, the CAU, Imphal also has integrated programmes of teaching, research and extension education. The University is equipped with well-established laboratories, research and demonstration farms, 6 KVKs, 6 multi-technology testing centres and 6 vocational training centres. The Central Agricultural University offered 9 Undergraduate, 47 Masters and 25 Ph. D. Degree Programmes in different subjects/ disciplines through its 13 constituent colleges. The University was ranked at 13th position in the ranking status of Agricultural Universities for the year 2020 by ICAR.

The new academic session started from 1st October, 2021 for UG and 10th November, 2021 for Master's courses. The Ph. D. Programmes for all the colleges started from 23rd December, 2021. A total of 570, 239 and 52 students were admitted in various Under-graduates, Masters and Ph.D programmes, respectively during the academic year 2021-22. A total of 408 UG and 133 PG students completed their degrees and 15 students were also awarded Ph. Ds during this period. Out of the total students' strength of 2658 in the University, 451 students belong to the general category, 186 scheduled castes, 1312 scheduled tribes, 673 other backward

class, 36 EWS/Physically handicapped/others. Out of them, 1118 students were male and 1540 were female amounting to Male: Female ratio as 1:1.38.

The students of the University showed excellent performance at national level competitive examinations and admissions in national/ premier institutes of higher studies. During the period under report, 19 students have secured Junior Research Fellowship (JRF) examination, 2 students ICAR SRF examination and 4 GATE examination. The University has an exemplary record of placement in a number of private and public sector organizations, government undertakings. 103 of our students were placed in various capacities in different organizations during the year 2021-22.

Students' Welfare

The University offers excellent opportunities to young minds and facilitates the accomplishment of their creative talent with emphasis on character building. The University provides a very healthy and conducive environment for co-curricular and extra-curricular activities for all round development of moral and physical health of students. The University has good play grounds/gymnasium, information centre and placement cell in constituent colleges. Each college has good auditorium with all facilities, health center, canteen, ATM booth and post office. All colleges celebrated the college week where students competed in various sports, games and literary cum cultural activities. All colleges have either N.C.C. or N.S.S. units under which students are engaged in actual social works in and around college campuses to develop a sense of service, team spirit and dignity of labour. The University organize the annual games, sports and literary cum cultural meet and annual fresher's meet in all the constituent colleges.

The staff and students of the University also actively participated in implementation of all the major flagship programmes initiated by the Government of India by maintaining the SOPs of the Central government and also respective State governments. "International Day of Yoga" was celebrated with great enthusiasm and vigour which was held physically by social distancing. "Hindi Diwas" was celebrated with debates, essay writing, poetry competition for creating awareness and promotion of uses of Raj Bhasa-Hindi in the official/everyday work. Cleanliness drive under the "Swachhata Hi Seva" campaign was also conducted along with planting of saplings in the college campus and its premises, and central farm at Lamphelpat, Imphal, Manipur under the University.

Research and Development

The University research aims to develop need based research projects through sustainable and eco-friendly scientific and technical approaches for developing agricultural technologies/ practices/agricultural machines and equipments which can bring about a far reaching impact on productivity and profitability of crops, animals and fishes and develop new products for value addition, enhance income generation and in turn the socio-economic upliftment of the people of North Eastern Hill Region. During the year under report, University carried out 56 (fifty six) Intramural Research Projects (IRPs) where 18 IRPs were newly sanctioned, 13 ongoing and 8 completed under University Funded Research Programmes. Out of the 146 (one hundred fortysix) Externally Funded Research Projects, 37 were newly sanctioned, 83 ongoing and 23 were completed.

The University also took up, from time to time, the contingency research projects and station

research and trials which are of great concern and need immediate attention in the region. The University was successful in developing location specific recommendations and research findings on agriculture and allied disciplines for the farmers and agripreneurs of the N.E.H. Region. A number of recommendations have been made that helped in the development of agro based crop improvement, plant protection, and economically sustainable technologies specific for different agro-climatic conditions of the region. A database of 303 NE fish species was prepared. The drinking sweat and tears *Lisotrigona* bees of the first kind were reported by the Department of Entomology from Thenzawl area of Mizoram. Overall 32 collections of citrus accessions were made during the trip from various parts of Sikkim viz. Khamdong, Yangyang, Mamging, Ravangla, Radhukhandu, Dentam, Dzongu, Bermiok, Lum. IC numbers for 26 accessions out of 32 collections were received from NBPGR, New Delhi. Out of total number of 7 local collections of cassava from Manipur, 1 germplasm got accession number from NBPGR, New Delhi.

The University has successfully studied a preservation technique for local delicacy *i.e.* bamboo shoot in brine and frozen form. In addition, five products are developed from local raw material such as ginger candy, tamarind candy, aonla candy, papaya tutti frutti, Hatkora (*Citrus macroptera*). Squash which were branded as '*Zo Foods'* under FSSAI registration.

Extension Education

The Directorate of Extension Education provides extension services to the farmers of seven North-Eastern states through various programmes and activities. The programmes implemented during the year include trainings, demonstration, field days, Kisan melas, farmer congress, exhibitions, radio talks, TV telecast, film shows, workshop, etc. Transfer of technology activities were planned and coordinated in different districts of the seven states through its 13 constituent colleges, six Krishi Vigyan Kendras and six Multi Technology Testing and Vocational Training Centres.

The Directorate also organized 3 on-campus awareness program which benefitted 459 beneficiaries. 2 training programmes for extension functionaries were also organized which benefitted 67 beneficiaries. A total of 13 off-campus awareness cum training program were also held which benefitted 529 numbers of beneficiaries. During whole programme COVID-19 protocol and SOP were maintained as per GOI and GOM. In addition, the directorate organized a number of webinars and workshops for the farmers, unemployed youths and extension functionaries.

Financed by the MeitY, GOI, and implemented by DIC, New Delhi and CAU, Imphal, "Mobile Based Agro-Advisory" for farmers of College of Fisheries, Tripura, College of Vety. Sciences and AH, Mizoram; College of Horticulture and Forestry, Arunachal Pradesh, College of Agriculture, Manipur; College of Post Graduate Studies in Agril. Sc., Meghalaya were developed for the welfare of the farmers. All the KVKs under the extension department along with constituent colleges of the University located in different states of the northeastern region also conducted a number of awareness camps, trainings, FLDs and method/result demonstrations for the farmers, unemployed youths and extension functionaries. Moreover, under the externally funded programs sanctioned to the directorate, like RKVY-RAFTAAR Agri-Business Incubator (R-ABI) sponsored by Ministry of Agriculture and Farmers Welfare; ICAR-IGFRI, Jhansi, UP

Sponsored Project/Programme; Farmers FIRST Programme**;** ICAR NIBSM NEH programme etc., a number of webinars, trainings, awareness camps, FLDs, method/result demonstrations, input distribution, Scientist-Farmers interaction programme etc. were held by following COVID-19 protocol and SOPs of respective State and Central Governments.

COF R-ABI incubated pre-seed stage funded startup **"**GITA CHANDRA GROUP**"** had received the "Statehood Day Award- Best Startup Entrepreneur Award (Fishery) 2022" on 21st January, 2022 from Govt. of Tripura, during the celebration of 50 years of Tripura's Statehood Day.

Human Resource Development

The University has total staff strength of 1086 including 21 administrative, 312 teaching and 753 non-teaching positions. At the headquarters, there are 10 executive officers in the administrative positions supported by 35 technical and 107 non-technical staff. In the constituent colleges of the University, there are 11 administrative staff, 312 teaching and 611 non teaching staff. During the year, 2 professors were newly appointed at College of Veterinary Sciences and AH, Jalukie, Nagaland, 15 staff members were transferred and 25 were superannuated/resigned/demised from the service during the period under report. A total of 465 trainings, workshops, conferences, seminars, summer schools *etc* were organized at different constituent colleges of the University. Among faculty members 45 were deputed for participation in international conference and seminar, 89 national conferences and seminars, 60 workshops and 27 long term training courses and 98 for short term training programs. 378 lectures, keynote address and invited talks were delivered by the faculties at various trainings, workshops and other programs. 45 faculty members served as external examiners at various institutes. 34 guest lectures were delivered by reputed scientists from other institutes at different constituent colleges of the University. 38 faculty members were served as external member and 18 were served as expert committee member at various institutes. A total of 27 faculties of the University were also recognized for their excellence in research and developmental works and 10(ten) MOU's were signed with reputed institutes during the period for cooperative relationship through mutual assistance in the areas of education, research and extension activities.

Under IDP-NAHEP sanctioned to the University by ICAR, seven numbers of 7 kwp Photovoltaic OnGrid Solar power Plant has been installed and commissioned successfully in 7 campuses of the University including the headquarter. 1 Wastepaper Recycling Plant is also commissioned successfully in College of Agriculture, Iroishemba, Imphal as part of the environment sustainability plan. Workshop on business Management Skills (3 nos. with 593 participants), 19 communication skills and personality development (816 participants), 19 trainings on entrepreneurship development (2675 participants), 7 faculty development programme (256 faculties), 1 innovation and leadership development programme (220 participants) and 11 trainings on environment sustainability plan (776 participants) were conducted. 46 students from different constituent colleges were going for 3 months foreign training at various foreign institutes.

Infrastructure Development

Various civil construction works were taken up during the year for meeting the required infrastructural facilities of the University. It

included construction works of college buildings, laboratories, hostels, staff quarters, auditorium, information centers, canteen, post office, bank, security barracks etc. The University is giving special emphasis for speeding up of construction activities of the newly established colleges so that academic classes can be started at the permanent campus of the colleges at the earliest. Following infrastructures are being developed in six constituent colleges of the University under the Institutional Development Project under NAHEP, ICAR (i) Established 7 numbers of smart virtual classrooms with 70 seat capacity. (ii) Established 6 numbers of language laboratories with 30 seat capacity (iii) Established 6 numbers of Incubation Centre (iv) Laboratory modernization (v) Green and disabled friendly campus

University Publications

During the reporting year, faculties of constituent colleges of the University have published 407 full length research papers, 41 seminar/symposia/workshop proceedings;148 abstract papers, 78 popular articles, 56 books, 161 book chapters and 92 technical bulletins;150 practical manuals/study manuals/ pamphlets *etc.* are also published.

Visitors

The University witnessed the visits of 95 visitors in different college campuses located in seven states of the north east hill region of India during the reporting year which is less as compared to previous years due to the pandemic and lockdowns. The visitors included eminent administrators, scientists, faculties, meritorious students and progressive farmers of varied experiences.

1

THE UNIVERSITY

CENTRAL Agricultural University (CAU), Imphal was established in the year 1993 under the Central Agricultural University Act, 1992 of the Parliament (Act No. 40 of 1992). The act authorized CAU to establish need based Educational Institutions in Agriculture in the North-Eastern Hill (NEH) Region of India. The Central Agricultural University, Imphal has thirteen constituent colleges viz.,the College of Agriculture (Iroisemba, Imphal, Manipur), College of Fisheries (Lembucherra, Agartala, Tripura), College of Home Science (Tura, Meghalaya), College of Horticulture & Forestry (Pasighat, Arunachal Pradesh), College of Veterinary Science & Animal Husbandry (Selesih, Aizawl, Mizoram), College of Agricultural Engineering & Post Harvest Technology (Ranipool, Gangtok, Sikkim), College of Post Graduate Studies, (Barapani, Meghalaya), College of Food Technology (Lamphelpat, Manipur), College of Agriculture (Kyrdemkulai, Meghalaya),College of Agriculture (Pasighat, Arunachal Pradesh), College of Horticulture (Bermiok, Sikkim), College of Horticulture (Thenzawl, Mizoram) and College of Veterinary Sciences & Animal Husbandry (Jalukie, Nagaland) to carry out teaching, research and extension education programmes in agriculture and allied disciplines in the NEH region. The University is equipped with well-established laboratories, research and demonstration farms, 6 KVKs, 6 multi-technology testing centres and 6 vocational training centres.

I.I Mandates, Mission, Goals and Objectives

1.1.1 Mandate

The mandate of the University as stipulated in the Act are:

- To impart education in different branches of agriculture and allied sciences as it may deem fit,
- To further the advancement of learning and prosecution of research in agriculture and allied sciences,
- To undertake programmes of extension education in the states under its area of jurisdiction and
- To undertake such other activities as it may determine from time to time.

1.1.2 Mission

Keeping the mandate in view, the mission of the university is to be a Centre of Excellence in Teaching, Research and Extension Education in the field of Agriculture and Allied Sciences.

1.1.3. Goal

To fulfill the mission, the university has set the following goals:

- To produce globally competitive graduates and postgraduates in agriculture and allied sciences.
- To develop sustainable and profitable farming systems for enhancing productivity, production and profitability in agriculture and allied sectors.
- To educate the extension functionaries for effective dissemination of agro-technologies to the farmers, entrepreneurs and agro-industries.
- To be an important link in the chain for transforming agriculture and allied vocations into profitable enterprises and ensuring food and nutritional security to the people of NEH region.

1.1.4 Objectives

To meet the goals, the University has laid down the following objectives:

- To establish and develop excellent constituent colleges that offer under-graduate and postgraduate education in various states of the NEH Region under the area of jurisdiction of the university in the fields of agriculture, agricultural engineering, food technology, fisheries, home science, horticulture, forestry and veterinary sciences and animal husbandry.
- To impart quality education so as to produce globally competitive graduates and post-graduates in different areas of agriculture and allied sciences including interdisciplinary areas, who are confident and capable of working as scientists, entrepreneurs, managers, agro-industrial workers and progressive farmers.
- To establish research stations and specialized research lab-oratories for taking up basic and applied research by the scientists and postgraduate students.
- To develop and demonstrate alternative farming systems which help the farmers to improve their productivity and profitability while preserving and improving the environment.
- To establish transfer of technology centers including Krishi Vigyan Kendras (Farm Science Centers) for developing effective extension methodologies and training the trainers in information dissemination.
- To popularize improved farming systems, technologies and equipment on pilot basis as a model for other extension agencies.
- To offer short-term refresher and vocational courses and training programmes to the officials of state government departments, farmers, entre-preneurs and agro-industrial houses.
- To have collaborations in the field of teaching, research, transfer of technology and developmental activities with the development departments of the state as well as national and international institutions including industrial and business houses.
- To provide consultancy services to progressive farmers, agro-industries and others involved in agriculture and allied sectors.
- To act as documentation and information center on agricultural education, research, extension methodology and rural development.

1.2 Area of Jurisdiction

The Central Agricultural University, Imphal has its area of jurisdiction over North-Eastern Hill (NEH) Region of India. It encompasses the states of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, Tripura and Nagaland. The states of Arunachal Pradesh and Sikkim are located in the Biodiversity Hotspot of Eastern Himalayan region while the states of Manipur, Meghalaya, Mizoram, Tripura and Nagaland are located in the Indo-Burma Biodiversity Hotspot region. There are 6 (six) camp offices of the Vice Chancellor in six states of NEHregionfor stay and monitoring of constituent campuses at regular intervals. It provides students and employees easy access to the competent authority and can discuss any issues, grievances etc for amicable solution. To avoid any administrative constraints, all the constituent colleges are well connected digitally and can communicate at any time.

1.2.1 Constituent Colleges of the University

1.2.1.1 College of Agriculture, Iroisemba, Imphal, Manipur

The College of Agriculture, Imphal was established as first constituent College of Central Agricultural University, Imphal after taking over the erstwhile Manipur Agricultural College from Manipur University in November, 1993. The College is situated in an extensive area of Iroisemba, at a distance of about 6.0 km from Imphal city. The picturesque campus of College, covering an area of about 44 acres of land is surrounded by Langol Hillocks to its Western and Northern sides.

College of Agriculture, Imphal

1.2.1.2. College of Veterinary Sciences & Animal Husbandry, Selesih, Aizawl, Mizoram

The College of Veterinary Sciences & Animal Husbandry, was established on 30th October, 1998. The college is located at Selesih, North Aizawl, 12 km away from Aizawl, the capital city of Mizoram. The campus is spread over 168.61 acres of land, mostly of hilly terrain at an altitude of 965 meter above the mean sea level.

College of Veterinary Sciences & Animal Husbandry, Selesih, Aizawl

1.2.1.3. College of Fisheries, Lembuchera, Tripura

The College of Fisheries, Lembuchera, Tripura was established on 3rd October, 1998 and is located at Lembucherra, at a distance of 12 km north of Agartala, having a total area of 60.32 acres. The College of Fisheries has been working on generating qualified human resources besides imparting research and training needs to the thurst area of fisheries and aquaculture in the entire NE region

College of Fisheries, Lembucherra

1.2.1.4. College of Horticulture & Forestry, Pasighat, Arunachal Pradesh

The College of Horticulture and Forestry, was established on 7th March, 2001 at Pasighat, Arunachal Pradesh. Located on the banks of the

College of Horticulture & Forestry, Pasighat, Arunachal Pradesh

river 'Siang'. The college campusis spread over in an area of 145 acres which includes research farm, instructional cum demonstration farm, KVK farm, and experimental farm.

1.2.1.5. College of Community Science, Tura, Meghalaya

College of Community Science was established on 24th September, 2004 at Tura, East Garo Hills, Meghalaya with a goal to refine and promote the skills of rural and tribal women and to improve the quality of life of families in the North-East Region with an objective to cater to women's education, bearing in mind the key role that they play in their homes, and farm and allied activities. Meghalaya, being a state which follows a matrilineal system, was perhaps thought of as the most suitable place to start a college that imparts education in Community Science to girl students by refining their visible roles as home makers and income generators. The College campus spread over 52.1 acres of land.

College of Community Science, Tura

1.2.1.6. College of Agricultural Engineering & Post Harvest Technology, Ranipool, Gangtok, Sikkim

The College of Agricultural Engineering and Post-Harvest Technology, Gangtok was established by CAU, Imphal in May 2006. The college is situated at Ranipool, at a distance

College of Agricultural Engineering & Post Harvest Technology, Ranipool, Sikkim

of 10.0 km from Gangtok, the capital city of Sikkim. The College campus is spread over an area of 19.26 acres of land at an altitude of 2438.4 m above the mean sea level, mostly hilly terrain comprising of terraces, hill slopes and valley land.

1.2.1.7. College of Post Graduate Studies in Agricultural Sciences, Umiam, Barapani, Meghalaya

The College of Post Graduate Studies in Agricultural Sciences (CPGSAS), Barapani was established in 2006 at Umiam (Barapani) in Ri-bhoi District which is at a distance of 20.0 km from Shillong, the capital city of Meghalaya. The main objective of the college is training of post graduate students of agriculture so that these students would eventually become torch bearers for enhancing agricultural growth and livelihood support for the farming and rural

College of Post Graduate Studies in Agricultural Sciences, Umiam

community as a whole. The college campus is spread over in an area of 36.26 acres of land.

1.2.1.8. College of Food Technology, Lamphelpat, Imphal, Manipur

The College of Food Technology was recently established at Lamphelpat, Imphal and started its first academic session from July, 2015. The college campus is spread over in an area of 30 acres. Currently classes are conducted in prefabricated structures of the college and it will continue till the construction of the permanent structures.

College of Food Technology, Lamphelpat, Imphal

1.2.1.9. College of Agriculture, Pasighat, Arunachal Pradesh

The College of Agriculture was also established recently at Pasighat, Arunachal Pradesh and started its first academic session from July, 2015. The college is temporarily operating from the campus of College of Horticulture and Forestry, Pasighat. However, the college has acquired 86.20 acres of land and permanent college buildings are on the urge of completion.

College of Agriculture, Pasighat, Arunachal Pradesh

1.2.1.10. College of Agriculture, Kyrdemkulai, Meghalaya

The College of Agriculture at Kyrdemkulai, Meghalaya is temporarily operating from the campus of College of Post Graduate Studies, Barapani, Meghalaya and started its first academic session from July, 2015. The college has acquired 200 acres of land and permanent college buildings are going to be completed.

College of Agriculture, Kyrdemkulai, Meghalaya

1.2.1.11. College of Horticulture, Bermiok, Sikkim

The College of Horticulture was recently established at Bermiok, Sikkim which falls under Namchi Block of South Sikkim district in Sikkim and is temporarily operating from the campus of College of Agricultural Engineering and Post Harvest Technology, Ranipool, Gangtok, Sikkim and which will be shifted as soon as the basic requirement of the College are created at Bermiok, South Sikkim. The college started its first academic session from July, 2015. The

College of Horticulture, Bermiok, Sikkim

college campus is spread over in an area of 38.60 acres and permanent college buildings are going to be completed.

1.2.1.12. College of Horticulture, Thenzawl, Mizoram

The College of Horticulture was recently established at Thenzawl, Mizoram. The site of the college is at TuitamZau, Thenzawl which is 92 kms from Aizawl City. The college campus has a land area of 296.52 acres, with undulating hills and beautiful topography. The college started its first academic session from 15th July, 2016. Currently classes are held at prefabricated structures of the college and it will continue till the completion of permanent structures.

College of Horticulture, Thenzawl, Mizoram

1.2.1.13. College of Veterinary Sciences & Animal Husbandry, Jalukie, Nagaland

College of Veterinary Sciences and Animal Husbandry,Jalukie, Peren Dist., Nagaland was inaugurated by the Union Minister of Agriculture and Farmers Welfare Shri. Radha Mohan Singh on 6th August 2016 and became functional with the admission of first batch of students to BVSc & AH Degree programme on 15th September 2016. The College is located at Jalukie Town under Peren District about 71.1km away from Dimapur, Nagaland at an altitude of 800-2500 meters above the sea level. The campus of the College

is spread over 266 acres of land which is mostly semi slope area. The permanent hostels of both girls and boys are completed and classes are conducted in the prefabricated structures.

I.3. Statutory Authorities and Officers of the University

The Board of Management, Academic Council, Research Council, Extension Education Council, Finance Committee, Board of Studies and such other authorities as prescribed by the statute are the statutory authorities of the university.The statutory officers of the university are the Chancellor, Vice-Chancellor, Director of Instruction, Director of Research, Director of Extension Education, Dean of Colleges, Registrar, Comptroller and Estate officer.

I.4. Highlights of Academics & Students' Welfare

1.4.1 Academic Activities

The Central Agricultural University(CAU), Imphal was established under Department of Agricultural Research and Education (DARE) on 26th January, 1993 by Central Agricultural University Act, 1992 (No.40 of 1992) of Parliament with its headquarters at Imphal, Manipur. It is a fully residential

University covering all the North-East Hill states under its jurisdiction except Assam. Like other Agricultural Universities of India, the CAU also has integrated programmes of teaching, research and extension education. The University is equipped with well-established laboratories, research and demonstration farms, 6 KVKs, 6 multi-technology testing centres and 6 vocational training centres. The Central Agricultural University offered 9 Undergraduate, 47 Masters and 25 Ph. D. Degree Programmes in different subjects/ disciplines through its 13 constituent colleges.

The University was ranked at 13th position in the ranking status of Agricultural Universities for the year 2020 by ICAR. On the recommendations of the ICAR Peer Review Team, the National Agricultural Education Accreditation Board, ICAR, New Delhi granted accreditation for various academic programmes (UG/PG/Ph.D's) to the Central Agricultural University, Imphal (Manipur) and its constituent colleges from 28th March, 2021 to 27th March, 2026.

A total of 570, 239 and 52 students were admitted in various Under-graduates, Masters and Ph.D programmes, respectively during the academic year 2021-22. A total of 408 UG and 133 PG students completed their degrees and 15 students were also awarded Ph.Ds during this period. Out of the total students' strength of 2658 in the university, 451 students belong to the general category, 186 scheduled castes, 1312 scheduled tribes, 673 other backward class, 36EWS/Physically handicapped/others. Out of them, 1118 students were male and 1540 were female amounting to Male: Female ratio as 1:1.38. The Students of the University showed excellent performance at national level competitive examinations and admissions in national/ premier institutes of higher studies. During the period under report, 15 students have secured Junior Research Fellowship (JRF) examination, 1 students ICAR SRF examination, 70 ICAR-NET, 3 UGC-NET, 1 CSIR-NET and 5GATE examination. The University has an exemplary record of placement in a number of private and public sector organizations, government undertakings. 109 of our students were placed in various capacities in different organizations during the year 2021-22.

1.4.2. Students' Welfare

The university offers excellent opportunities to young minds and facilitates the accomplishment of their creative talent with emphasis on character building. The university provides a very healthy and conducive environment for co-curricular and extra-curricular activities for all round development of moral and physical health of students. The university has good play grounds/gymnasium, information centre and placement cell in constituent colleges. Each college has good auditorium with all facilities, health center, canteen, ATM booth and post office. All colleges celebrated the college week where students competed in various sports, games and cultural activities. All colleges have either N.C.C. or N.S.S. units under which students are engaged in actual social works in and around college campuses to develop a sense of service, team spirit and dignity of labour.

All colleges celebrated the college weed where students competed in various sports, games and literary cum cultural activities. All colleges have either N.C.C. or N.S.S. units under which students are engaged in actual social works in and around college campuses to develop a sense of service, team spirit and dignity of labour.

The constituent colleges of the University organize the annual games, sports and literary cum cultural meet and annual fresher's meet.

The staff and students of the university also actively participated in implementation of all the major flagship programmes initiated by the Government of India by maintaining the SOPs of the Central government and also respective State governments. "International Day of Yoga" was celebrated with great enthusiasm and vigour which was held virtual and also physically by social distancing. "Hindi diwas" was celebrated with debates, essay writing, poetry competition for creating awareness and promotion of uses of Rajbhasa-Hindi in the official/everyday work. Cleanliness drive under the "Swachhata Hi Seva" campaign were also conducted along with planting of saplings in the college campus and its premises.

I.5. Highlights of Research and Developmental Activities

The University research aims to develop need based research projects through sustainable and eco-friendly scientific and technical approaches for developing agricultural technologies/practices/agricultural machines and equipments which can bring about a far reaching impact on productivity and profitability of crops, animals and fishes and develop new products for value addition, enhance income generation and in turn the socioeconomic upliftment of the people of North Eastern Hill Region. During the year under report, University carried out 76 (seventysix) Intramural Research Projects (IRPs) where 18 IRPs were newly sanctioned, 56 ongoing and 2 completed under University Funded Research Programmes. Out of the 146 (one hundred fortysix) Externally Funded Research Projects, 37 were newly sanctioned, 83 ongoing and 23were completed.

For strengthening the research activities, the University is implementing 34 AICRPs in agriculture and allied sciences. The University also took up, from time to time, the contingency research projects and station research and trials which are of great concern and need immediate attention in the region. The University was successful in developing location specific recommendations and research findings on agriculture and allied disciplines for the farmers and agripreneurs of the N.E.H. Region.

A number of recommendations have been made that helped in the development of agro based crop improvement, plant protection, and economically sustainable technologies specific for different agro-climatic conditions of the region. A database of 303 NE fish species was prepared. The drinking sweat and tears *Lisotrigona* bees of the first kind were reported by the Department of Entomology from Thenzawl area of Mizoram. Overall 32 collections of citrus accessions were made from various parts of Sikkim viz. Khamdong, Yangyang, Mamging, Ravangla, Radhukhandu, Dentam, Dzongu, Bermiok, Lum. IC numbers for 26 accessions out of 32 collections were received from NBPGR, New Delhi. Out of total number of 7 local collections of cassava from Manipur, 1 germpasm got accession number from NBPGR, New Delhi.

The University has successfully studied a preservation technique for local delicacy *i.e.* bamboo shoot in brine and frozen form. In addition, five products are developed from local raw material such as ginger candy, tamarind candy, aonla candy, papaya tutti frutti, Hatkora (*Citrus macroptera*). Squash which were branded as '*Zo Foods'* under FSSAI registration.

I.6. Highlights of Extension Education

The Directorate of Extension Education provides extension services to the farmers of seven North-Eastern states through various programmes and activities. The programmes

implemented during the year include trainings, demonstration, field days, Kisan melas, farmer congress, exhibitions, radio talks, TV telecast, film shows, workshop, etc. Transfer of technology activities were planned and coordinated in different districts of the seven states through its 13 constituent colleges, six Krishi Vigyan Kendras and six Multi Technology Testing and six Vocational Training Centres.

The Directorate also organized 3 on-campus awareness programs which benefitted 459 beneficiaries. 2 training programmes for extension functionaries were also organized which benefitted 67 beneficiaries. A 13 off-campus awareness cum training program was also held which benefitted 529 numbers of beneficiaries. During whole programme COVID-19 protocol and SOP were maintained as per GOI and State Governments. In addition, the Directorate organized a number of webinars and workshops for the farmers, unemployed youths and extension functionaries.

I.7. Highlights of Human Resource Development

The overall performance of the staff and officers of the University have been improved through updating and upgrading their knowledge by allowing them to participate in advanced trainings, workshops, and conferences, symposia of national and international levels. The University encourages and supports all the colleges by deputing the staff and faculty members for higher studies.

Each college arranges distinct on-campus and off-campus trainings of common interests by inviting the experts from outside the institution. Faculty members were deputed for participation in 45 international, 89 national conferences and seminars, 60 workshops and 27 faculty members were deputed for long term training courses and 98 for short term training programs. 378 lectures, keynote address and invited talks were delivered by the faculties at various trainings, workshops and other programs. 34 guest lectures were delivered by the reputed scientists from other institutes at different constituent colleges of the University. 38 faculty members were served as external member and 18 were served as expert committee member at various institutes. A total of 27 faculties were recognised for their excellence in research and developmental works.

I.8. Highlights of Works and Infrastructure Development

Best possible efforts have been made to improve the infrastructural facilities in all the constituent colleges of the university. Nevertheless, significant achievements were made on various infrastructure development works in all the constituent colleges including the college buildings, laboratories, hostels, staff quarters, auditoriums, information centers, canteen, bank and post office buildings and also, other buildings required for smooth running of the colleges. Following infrastructures viz. (i) Established 7 numbers of smart virtual classrooms with 70 seat capacity each (ii) Established 6 numbers of language laboratories with 30 seat capacity each (iii) Established 6 numbers of Incubation Centre (iv) Laboratory modernization (v) Green and disabled friendly campus are being developed in six constituent colleges of the University under the Institutional Development Project under NAHEP, ICAR

I.9. Highlights of University Publication

During the reporting year, faculties of constituent colleges of the University have published 407 full length research papers, 41 seminar/symposia/workshop proceedings;148 abstracts 78 popular articles, 56 books, 161 book chapters and 92 technical bulletins;150 practical manuals/study manuals/ pamphlets *etc.* are also published. ■

2

ACADEMIC & STUDENT WELFARE ACTIVITIES

THE Central Agricultural University offered 9 Undergraduate, 47 Masters and 25 Ph. D. degree programmes in different subjects/disciplines through its 13 constituent colleges. The University was ranked at 13th position in the ranking status of Agricultural Universities for the year 2020 by ICAR. The University maintains common Academic Calendar for all courses except B.V.Sc. and AH, which is governed by the Minimum Standards for Veterinary Education (MSVE Regulations of 2008, Veterinary Council of India). Admission in all the courses is made on the basis of rules framed by the admission committee of the University and Constituent Colleges. The selection/ nomination of candidates are made through Competitive Entrance Test conducted by the concerned member state located within the jurisdiction of CAU, Imphal for undergraduate programme. Common entrance test was conducted by University for PG and Ph.D programme and AIEEA conducted by Indian Council of Agricultural Research (ICAR), Krishi Anusandhan Bhawan, Pusa, New Delhi. Candidates seeking admission for UG programme should be a permanent resident or domicile of any of the seven states of the NE Region covered under the jurisdiction of the University. However, this condition is not applicable to the nominees of ICAR/VCI or any special category of nominees as decided by the University and Department of Agricultural Research and Education, Government of India. The University also has reserved some seats of open higher fee category for some of the undergraduate degree programmes of the University. These seats are against payment of higher fee and are admissible to Indian Nationals from different states of the country.

2.1. Academic Activities of the University

On the recommendations of the ICAR Peer Review Team, the National Agricultural Education Accreditation Board, ICAR, New Delhi granted accreditation for various academic programmes (UG/PG/Ph.D's) to the Central Agricultural University, Imphal (Manipur) and its constituent colleges from 28th March, 2021 to 27th March, 2026. All the colleges have well qualified experienced faculty members catering to the academic needs of the students. The comfortable staff to student ratio creates an engaged and interactive teaching environment. The University follows student advisory system where each faculty is allotted student to help him/her with academic or other personal problems during their degree programme. Classrooms are well secured, adequately furnished and equipped with the latest state of art technology including smart class room facilities and close circuit camera etc. Sanitary lavatories for both the boys and girls and teaching and non teaching staffs are also attached with the classrooms. All the laboratories are well furnished and equipped with high tech equipments for classroom, research and extension activities. Every college has computer laboratory which is connected with high speed internet facilities which can be accessed 24 x 7 hours.

2.1.1 Teaching

The details of seats allocated to different UG programmes in constituent colleges during 2021-22 are given in Table 2.1.

Table 2.1: Students Allocation during 2021-22 for UG programme

S. No.	Name of College	Degree Programme	States										Total
			Arunachal Pradesh	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura	ICAR/ VCI	0thers (please Specify)	Higher Fee Category	
1.	College of Agriculture, Iroisemba, Manipur	B.Sc. (Hons.) Agriculture	12	16	14	9	9	9	16	19	-	15	**119**
2.	College of Veterinary Sciences & A.H., Selesih, Aizawl, Mizoram	B.V.Sc. & A.H.	12	9	9	12	4	6	11	12	2	3	**80**
3.	College of Fisheries, Lembucherra, Tripura	B.F.Sc	4	9	3	3	5	3	9	5	-	10	**51**
4.	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	B.Sc. (Hons.) Hort.	7	7	6	6	6	6	7	10	-	7	**62**
		B.Sc. (Hons.) Forestry	4	5	3	4	3	3	4	4	-	5	**35**
5.	College of Community Science, Tura, Meghalaya	B. Sc. (Hons.) Community Science	7	9	11	5	5	5	8	5	-	-	**55**
		B.Sc. (Hons.) Food Nutrition & Dietetics	2	3	5	2	2	2	3	3	-	-	**22**
6.	College of Agril. Engg. & PHT, Ranipool, Sikkim	B.Tech. (Agril. Engg)	6	8	6	5	5	5	8	10	-	5	**58**
		B.Tech. (Food Technology)	2	4	2	2	2	3	4	3	-	-	**22**
7.	College of Agriculture, Pasighat, Arunachal Pradesh	B.Sc. (Hons) Agri	7	5	3	3	3	3	5	3	-	5	**37**
8.	College of Agriculture, Kyrdemkulai, Meghalaya	B.Sc. (Hons.) Agriculture	3	6	6	3	3	2	6	3	-	-	32

S. No.	Name of College	Degree Programme	States										Total
			Arunachal Pradesh	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura	ICAR/ VCI	0thers (please Specify)	Higher Fee Category	
9.	College of Food Technology, Lamphelpat, Manipur	B.Tech. (Food Technology)	2	8	4	3	2	1	4	3	-	5	**32**
10.	College of Horticulture, Bermiok, Sikkim	B. Sc. (Hons.) Horticulture	2	5	3	2	3	5	4	3	-	-	27
11.	College of Horticulture, Thenzawl, Mizoram	B.Sc. (Hons.) Horticulture	3	6	3	6	3	2	6	3	-	-	**32**
12.	College of Veterinary Sciences, Jalukie, Nagaland	B.V.Sc. & A.H	3	4	3	3	8	2	4	5	-	-	32
	Total		**76**	**104**	**81**	**68**	**63**	**57**	**99**	**91**	**2**	**55**	**696**

Table 2.2: Intake capacity, admitted and passed out students during the academic session, 2021-22.

A. Undergraduate programme

S. No.	Name of College	Degree Programme	Intake Capacity	No. of Students Admitted	No. of Students Graduated
1)	College of Agriculture, Iroisemba, Manipur	B.Sc. (Hons.) Agriculture	119	118	80
2)	College of Veterinary Sciences & A.H., Selesih, Aizawl, Mizoram	B.V.Sc. & A.H.	80	61	61
3)	College of Fisheries, Lembucherra, Tripura	B.F.Sc	51	46	34
4)	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	B.Sc. (Hons.) Horticulture	62	60	38
		B.Sc. (Hons.) Forestry	35	32	23
5)	College of Community Science, Tura, Meghalaya	B.Sc. (Hons.) Community Science	55	38	24
		B.Sc. (Hons.) Food Nutrition & Dietetics	22	22	13
6)	College of Agril. Engg. & PHT, Ranipool, Sikkim	B.Tech. (Agril. Engg)	58	50	21
		B.Tech. (Food Technology)	22	14	10

S. No.	Name of College	Degree Programme	Intake Capacity	No. of Students Admitted	No. of Students Graduated
7)	College of Agriculture, Pasighat, Arunachal Pradesh	B.Sc.(Hons.) Agriculture	37	33	19
8)	College of Agriculture, Kyrdemkulai, Meghalaya	B.Sc. (Hons.) Agriculture	32	28	18
9)	College of Food Technology, Lamphelpat, Manipur	B.Tech (Food Technology)	32	20	10
10)	College of Horticulture, Bermiok, Sikkim	BSc. Hon.(Horticulture)	27	26	16
11)	College of Horticulture, Thenzawl, Mizoram	B.Sc (Hons.) Horticulture	32	22	17
12)	College of Veterinary Sciences, Jalukie, Nagaland	B.V.Sc. & A.H	32	0	24
		Total	**699**	**570**	**408**

B. Master's programmes

S. No.	Name of College	Degree Programme	Discipline	Intake Capacity	No. of Students Admitted	No. of Students awarded
1.	College of Agriculture, Iroisemba, Manipur	M.Sc. (Agri.)	i) Agronomy	7	07	3
			ii) Agril. Economics	7	07	2
			iii) Entomology	8	08	4
			iv) Extn. Education	8	08	1
			v) Genetics & Plant Breeding	7	07	7
			vi) Plant Pathology	8	08	2
			vii) SSAC	7	07	4
			viii) Horticulture	11	11	5
			Total	**63**	**63**	**28**
2	College of Veterinary Sciences and Animal Husbandry, Selesih, Aizawl, Mizoram	M.V.Sc.	Veterinary Biochemistry	7	01	-
			Veterinary Anatomy	4	-	1
			Animal Reproduction, Gynaecology and Obstetrics	5	05	3
			Veterinary Medicine	5	05	2
			Veterinary Parasitology	3	-	1
			Veterinary Pathology	5	03	3
			Veterinary Microbiology	5	02	2
			Veterinary Surgery and Radiology	5	06	3
			Veterinary Public Health and Epidemiology	5	02	-
			Animal Genetics & Breeding	5	02	1

S. No.	Name of College	Degree Programme	Discipline	Intake Capacity	No. of Students Admitted	No. of Students awarded
			Animal Nutrition	5	03	1
			Veterinary Physiology	4	-	1
			Livestock Production and Management	5	05	2
			Livestock Products Technology	5	03	2
			Veterinary and Animal Husbandry Extension	4	03	1
			Veterinary Pharmacology & Toxicology	5	-	-
		Total		**77**	**40**	**23**
3	College of Fisheries, Lembucherra, Tripura	M.F.Sc.	Aquaculture	7	7	4
			Fish Biotechnology	5	5	1
			Fish Genetics & Breeding	5	5	7
			Fisheries Resource Management	5	5	5
			Fisheries Extension	5	5	4
			Aquatic Animal Health Management	5	5	5
			Fish Processing Technology	5	5	4
		Total		**37**	**37**	**30**
4	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	M. Sc. (Hort.)	Vegetable Science	5	5	5
			Fruit Science	5	5	5
			Floriculture & Landscape Architecture	4	4	1
			Total	**14**	**14**	**11**
		M.Sc. (Forestry)	Forest Products Utilization	3	-	1
			Forest Biology and Tree Improvement	3	1	1
			Silviculture and Agroforestry	3	2	-
		Total		**9**	**3**	**2**
5	College of Community Science, Tura, Meghalaya	M.Sc. (Community Science)	Home Science in Extension and Communication Management	03	02	01
			Food Science and Nutrition	03	02	02
		Total		**06**	**04**	**03**

S. No.	Name of College	Degree Programme	Discipline	Intake Capacity	No. of Students Admitted	No. of Students awarded
6.	College of Agricultural Engg. &Post Harvest Technology, Gangtok, Sikkim	M. Tech.	Soil & Water Cons. Engg.	5	4	04
			Processing & Food Engg.	5	3	01
			Farm Machinery & Power Engg.	6	4	02
			Irrigation & Drainage Engg.	3	2	Nil
			Renewal Energy Engg.	3	2	Nil
			Total	**22**	**15**	**7**
7.	College of Post Graduate Studies in Agril. Sciences, Barapani, Meghalaya	M.Sc. (Ag.)	Agronomy	7	7	5
			Soil Sc. and Agril. Chemistry	7	7	7
			Genetic and Plant Breeding	7	6	4
			Plant Molecular Biology and Biotechnology	7	6	4
			Entomology	9	9	2
			Plant Pathology	8	8	1
			Nematology	3	3	-
			Agril. Economics	7	7	3
			Agril. Extension	8	8	2
			Total	**63**	**61**	**28**
		MBA	Agri. Business Management	5	2	1
			Total	**5**	**2**	**1**
			Grand Total	**296**	**239**	**133**

C. Ph. D. Programmes

S. No.	Name of College	Degree Programme	Discipline	Intake Capacity	No. of Students Admitted	No. of Students awarded
1.	College of Agriculture, Iroisemba, Manipur	Ph.D. (Agri.)	Agronomy	2	2	-
			Entomology	2	2	-
			Plant Pathology	2	2	1
			Genetics and Plant Breeding	3	3	-
			Soil Science & Agril. Chemistry	4	4	-
			Total	**13**	**13**	**1**

S. No.	Name of College	Degree Programme	Discipline	Intake Capacity	No. of Students Admitted	No. of Students awarded
2	College of Veterinary Sciences and Animal Husbandry, Selesih, Aizawl, Mizoram	Ph.D	Animal Nutrition	3	-	-
			Livestock Production and Management	3	-	-
			Veterinary Biochemistry	2	-	-
			Veterinary Microbiology	3	-	-
			Veterinary Pathology	2	-	-
			Veterinary Medicine	3	-	-
			Animal Reproduction, Gynaecology and Obstetrics	2	-	-
			Veterinary Anatomy and Histology	2	01	-
			Veterinary Parasitology	2	-	-
		Total		**22**	**01**	**-**
3	College of Fisheries, Lembucherra, Tripura	Ph.D.	Fish Processing Technology	4	4	-
			Aquaculture	3	3	-
			Aquatic Animal Health Management	3	3	3
			Total	10	10	3
4	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	Ph.D. (Hort.)	Vegetable Science	3	3	1
			Fruit Science	3	3	1
			Total	6	6	2
5	College of Agril. Engg. & PHT, Ranipool, Sikkim	Ph. D	Farm Machinery & Power Engg.	3	2	-
		Ph. D	Soil & Water Cons. Engg.	2	2	1
		Ph. D	Processing & Food Engg.	2	2	-
			Total	**7**	**6**	**1**
6	College of Post Graduate Studies in Agril. Sciences, Barapani, Meghalaya	Ph.D. Programme	Agronomy	3	2	1
			Soil Sc. and Agril. Chemistry	3	2	1
			Genetic and Plant Breeding	4	2	1
			Plant Molecular Biology and Biotechnology	3	2	-
			Plant Pathology	3	3	5
			Agril. Economics	3	2	-
			Agril. Extension	3	3	-
			Total	**22**	**16**	**8**
			Grand Total	**80**	**52**	**15**

The total student strength of the university in the year was 2658 comprising of 2030 students at the Under-graduates [Table 2.3. (A)], 460 students at Masters [Table 2.3. (B)] and 168 students at Ph.D [Table 2.3. (C)] degree programmes

Table 2.3: Students Strength in 2021-22

A. Under Graduate Programmes

S. No.	Name of College	Degree Programme	Year wise students strength						No. of Students Graduated in 2021-22
			1st	2nd	3rd	4th	5th	Total	
1	College of Agriculture, Iroisemba, Manipur	B.Sc. (Agri.)	118	93	84	84	-	379	80
2	College of Veterinary Sciences & A.H., Selesih, Aizawl, Mizoram	BVSc. & A.H.	61	75	78	72	45	331	61
3	College of Fisheries, Lembucherra, Tripura	B.F.Sc.	46	39	43	39	-	167	34
4	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	B.Sc.(Hort.)	60	41	45	49	-	195	38
5		B.Sc.(Forestry)	32	25	25	23	-	105	23
	College of Community Science, Tura, Meghalaya	B.Sc. (Hons) Community Science	38	19	23	33		113	24
6		B.Sc. (Hons) Food Nutrition & Dietetics	22	13	10	16		61	13
	College of Agril. Engg. & PHT, Ranipool, Sikkim	B. Tech. (Agril. Engg.)	50	32	43	30	-	155	21
7		B. Tech. (Food Tech.)	14	9	10	7	-	40	10
	College of Agriculture, Pasighat, Arunachal Pradesh	B.Sc.(Hons.) Agri.	33	28	22	18	-	101	19
8	College of Agriculture, Kyrdemkulai, Meghalaya	B.Sc.(Agri.)	28	23	16	19	-	86	18
9	College of Food Technology, Lamphel, Manipur	B.Tech(FT)	20	16	11	07	-	54	10
10	College of Horticulture, Bermiok, Sikkim	BSc. Hon. (Horticulture)	26	13	18	14	-	71	16
11	College of Horticulture, Thenzawl, Mizoram	B.Sc (Horti.) Hons.	22	22	13	14	-	71	17
12	College of Vety. Sc. & AH, Jalukie, Nagaland	B.V.Sc. & A.H	-	23	27	25	26	101	24
		Total	**570**	**471**	**468**	**450**	**71**	**2030**	**408**

B. Master's programmes

S. No.	Name of College	Degree Programme	Departments/ Disciplines	Intake Capacity	Students Strength (M. Sc./M.V.Sc./M.F. Sc./M.Tech.)			No. of Students awarded in 2021-22
					Prev.	Final	Total	
1.	College of Agriculture, Lamphel, Manipur	M. Sc. (Agri)	i) Agronomy	7	7	3	10	3
			ii) Ag. Economics	7	7	7	14	2
			iii) Entomology	8	8	4	12	4
			iv) Extn. Education	8	8	1	09	1
			v) Genetics & Plant Breeding	7	7	7	14	7
			vi) Plant Pathology	8	8	5	13	2
			vii) SSAC	7	7	2	09	4
			viii) Horticulture	11	11	6	17	5
			Total	**63**	**63**	**35**	**98**	**28**
2	College of Veterinary Sciences & A.H., Selesih, Aizawl, Mizoram	M.V.Sc.	Veterinary Biochemistry	7	1	3	4	-
			Veterinary Anatomy	4	-	2	2	1
			Animal Reproduction, Gynaecology and Obstetrics	5	5	3	8	3
			Veterinary Medicine	5	5	4	9	2
			Veterinary Parasitology	3	-	2	2	1
			Veterinary Pathology	5	3	5	8	3
			Veterinary Microbiology	5	2	4	6	2
			Veterinary Surgery and Radiology	5	6	2	8	3
			Veterinary Public Health and Epidemiology	5	2	6	8	-
			Animal Genetics & Breeding	5	2	4	6	1
			Animal Nutrition	5	3	4	7	1
			Veterinary Physiology	4	-	2	2	1
			Livestock Production and Management	5	5	4	9	2
			Livestock Products Technology	5	3	4	7	2
			Veterinary and Animal Husbandry Extension	4	3	3	6	1
			Total	77	40	52	92	23

S. No.	Name of College	Degree Programme	Departments/ Disciplines	Intake Capacity	Students Strength (M. Sc./M.V.Sc./M.F. Sc./M.Tech.)			No. of Students awarded in 2021-22
					Prev.	Final	Total	
3	College of Fisheries, Lembucherra, Tripura	M.F.Sc.	Aquaculture	7	7	4	11	4
			Fish Biotechnology	5	5	4	9	1
			Fish Genetics & Breeding	5	5	5	10	7
			Fisheries Resource Management	5	5	5	10	5
			Fisheries Extension	5	5	4	9	4
			Aquatic Animal Health	5	5	5	10	5
			Fish Processing Technology	5	5	3	8	4
			Total	**37**	**37**	**30**	**67**	**30**
4	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	M.Sc. (Hort.)	Vegetable Science	5	5	5	10	5
			Fruit Science	5	5	5	10	5
			Floriculture & Landscape Architecture	4	4	3	7	1
			Total	**14**	**14**	**13**	**27**	**11**
		M.Sc. Forestry	Forest Products Utilization	3	-	1	**1**	1
			Forest Biology and Tree Improvement	3	1	2	3	1
			Silviculture and Agroforestry	3	2	2	4	-
			Total	**9**	**3**	**5**	**8**	**2**
5	College of Community Science, Tura, Meghalaya	M.Sc. (Community Science)	Home Science Extension and Communication Management	3	2	1	3	1
			Food Science and Nutrition	3	2	1	3	2
			Total	**06**	**04**	**02**	**06**	**03**
6	College of Agricultural Engg. & Post Harvest Technology, Gangtok, Sikkim	M.Tech.	Soil & Water Cons. Engg.	5	4	8	12	3
			Farm Machinery & Power Engg.	6	4	5	9	2
			Processing & Food Engg.	5	3	8	11	1
			Irrigation & Drainage Engg.	3	2	3	5	-
			Renewal Energy Engg.	3	2	2	4	-
			Total	**22**	**15**	**26**	**41**	**06**

S. No.	Name of College	Degree Programme	Departments/ Disciplines	Intake Capacity	Students Strength (M. Sc./M.V.Sc./M.F. Sc./M.Tech.)			No. of Students awarded in 2021-22
					Prev.	Final	Total	
7	College of Post Graduate Studies in Agril. Sciences, Barapani, Meghalaya	M.Sc. (Ag.)	Agronomy	7	7	8	15	5
			Soil Science &Agril. Chem.	7	7	8	15	7
			Genetics & Pl. Breeding	7	6	7	13	4
			Pl.Mol.Biology & Biotechnology	7	6	3	9	4
			Entomology	9	9	7	16	2
			Pl. Pathology	8	8	8	16	1
			Nematology	3	3	2	5	-
			Agril. Economics	7	7	4	11	3
			Agril. Extension	8	8	7	15	2
			Total	63	61	54	115	28
		MBA	Agri. Business Management	5	2	4	6	1
			Total	**5**	**2**	**4**	**6**	**1**
			Grand Total	**291**	**239**	**221**	**460**	**132**

C. Ph.D. Programmes

S. No.	Name of College	Departments/ Disciplines	Intake Capacity	Students Strength (Ph. D.)					No. of Students awarded in 2021-22
				1st year	2nd year	3rd year	Extended	Total	
1.	College of Agriculture, Iroisemba, Manipur	Agronomy	2	2	2	2	5	11	-
		Entomology	2	2	1	1	2	6	-
		Plant Pathology	2	2	1	1	4	8	1
		Genetics and Plant Breeding	3	3	1	2	5	11	-
		Soil Science and Agril. Chem.	4	4	1	2	3	10	-
		Total	134	13	6	8	19	46	1
2.	College of Veterinary Sciences and Animal Husbandry, Selesih, Mizoram	Animal Nutrition	3	-	-	-	-	-	-
		Livestock Production and Management	3	-	-	-	-	-	-

S. No.	Name of College	Departments/ Disciplines	Intake Capacity	Students Strength (Ph. D.)					No. of Students awarded in 2021-22
				1st year	2nd year	3rd year	Exten-ded	Total	
		Veterinary Biochemistry	2	-	-	-	-	-	-
		Veterinary Microbiology	3	-		1	1	2	-
		Veterinary Pathology	2	-	1	1	1	3	-
		Veterinary Medicine	3	-	2	1	-	3	-
		Animal Reproduction, Gynaecology and Obstetrics	2	-	1	1	-	2	-
		Veterinary Anatomy and Histology	2	1	-	-	1	2	-
		Veterinary Parasitology	2	-	-	-	-	-	-
		Total	**22**	**1**	**4**	**4**	**3**	**12**	-
3	College of Fisheries, Lembucherra, Tripura	Fish Processing Technology	3	4	1	1	1	7	-
		Aquaculture	3	3	2	-	-	5	-
		Aquatic Animal Health Management	3	3	3	1	2	9	3
		Total	**10**	**10**	**6**	**2**	**3**	**21**	**3**
4	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	Vegetable Science	3	3	3	2	2	10	**1**
		Fruit Science	3	3	3	2	2	10	**1**
		Total	6	6	6	4	4	20	2
5	College of Agricultural Engg. &Post Harvest Technology, Gangtok, Sikkim	Processing and Food Engg.	2	2	1	1	2	6	-
		Farm Machinery & Power Engg.	3	2	2	2	1	7	-
		Soil & Water Conservation Engg.	2	2	-	-	-	2	**01**
		Total	**7**	**6**	**3**	**3**	**3**	**15**	**01**

S. No.	Name of College	Departments/ Disciplines	Intake Capacity	Students Strength (Ph. D.)					No. of Students awarded in 2021-22
				1st year	2nd year	3rd year	Exten-ded	Total	
6	College of Post Graduate Studies in Agril. Sciences, Barapani, Meghalaya	Agronomy	3	2	1	-	3	6	1
		Soil Science &Agril. Chem.	3	2	1	1	3	7	1
		Genetics & Pl. Breeding	4	2	2	4	3	11	1
		Pl. Mol.Biology& Biotechnology	3	2	2	2	-	6	-
		Pl. Pathology	3	3	3	1	1	8	5
		Agril. Economics	3	2	3	1	2	8	-
		Agril. Extension	3	3	3	2	-	8	-
		Total	**22**	**16**	**15**	**11**	**12**	**54**	**8**
		Grand Total	**201**	**52**	**40**	**32**	**44**	**168**	**15**

The details of category wise break-up of students' strength in various UG, PG and Ph.D. programmes of the university are given in Table 2.4. Out of the 2658 students, 451 students belonged to the general category, 186 scheduled castes, 1312 scheduled tribes, 673 other backward class and 36 students from EWS/PC/others.

Table 2.4: Category wise student's strength during 2021-22

S. No.	Name of College	Degree programme	Students Strength					
			Gen.	SC	ST	OBC	EWS	Total
1.	College of Agriculture, Iroisemba, Manipur	B. Sc. (Agri)	45	31	199	91	13	379
		M. Sc. (Agri)	24	15	13	43	3	98
		Ph.D. (Agri)	17	2	9	18	-	46
		Total	86	48	221	152	16	**523**
2.	College of Veterinary Sciences & A.H., Selesih, Aizawl, Mizoram	B.V.Sc. & A.H.	39	19	211	62	-	331
		Master of Veterinary Sciences	17	8	48	19	-	92
		Ph.D.	5	1	4	2	-	12
		Total	**61**	**28**	**263**	**83**	**-**	**435**
3.	College of Fisheries, Lembucherra, Tripura	Bachelor of Fisheries Science	30	14	84	39	-	167
		Master of Fisheries Science	22	8	11	24	2	67
		Ph.D.	7	2	3	9	-	21
		Total	59	24	98	72	2	255

S. No.	Name of College	Degree programme	Students Strength					
			Gen.	SC	ST	OBC	EWS	Total
4.	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	B.Sc. (Horticulture)	15	14	126	40	-	195
		B.Sc. (Forestry)	14	9	64	17	1	105
		M.Sc. (Horticulture)	10	2	4	8	3	27
		M.Sc. (Forestry)	3	2	2	1	-	8
		Ph.D. Programme.	4	-	4	11	1	20
		Total	46	27	200	77	5	355
5	College of Community Science, Tura, Meghalaya	B.Sc. (Hons) Community Science	12	6	59	36	-	113
		B.Sc. (Hons) Food Nutrition & Dietetics	9	1	31	20	-	61
		M. Sc. (Community Sciences)	-	-	2	4	-	06
		Total	**21**	**7**	**92**	**60**	**-**	**180**
6.	College of Agricultural Engineering & Post Harvest Technology, Gangtok, Sikkim	B. Tech. (Agril. Engg.)	35	11	68	36	5	155
		B. Tech. (Food Tech.)	6	2	19	13	-	40
		M. Tech.	19	2	7	11	2	41
		Ph. D	9	1	-	5	-	15
		Total	69	16	94	65	7	251
7	College of Post Graduate Studies in Agril. Sciences, Barapani, Meghalaya	M.Sc. (Ag.)	34	9	21	46	5	115
		MBA(Agri. Business Management)	2	-	1	3	-	6
		Ph.D.	16	6	10	22	-	54
		Total	**52**	**15**	**32**	**71**	**5**	**175**
8	College of Agriculture, Pasighat, Arunachal Pradesh	B.Sc. (Hons) Agriculture	15	2	63	20	1	101
9	College of Agriculture, Kyrdemkulai, Meghalaya	B.Sc.(Agri.)	9	2	56	19	-	86
10	College of Food Technology, Lamphelpat, Manipur	B.Tech (Food Tech.)	15	6	15	18	-	54
11	College of Horticulture, Bermiok, Sikkim	B.Sc. (Hons.) Horticulture	5	4	47	15	-	71
12	College of Horticulture, Thenzawl, Mizoram	B.Sc (Horti) Hons	5	2	55	9	-	71
13	College of Veterinary Sciences, Jalukie, Nagaland	B.V.Sc. & A.H	8	5	76	12	-	101
		Grand Total	451	186	1312	673	36	2658

During the academic year, 2021-22, 1118 (42.06%) male and 1540 (57.94%) female, respectively, were enrolled in different degree programmes at constituent colleges. The male: female student ratio was 1:1.38. The college wise break-up of male and female students enrolled in various courses is given in Table 2.5.

Table 2.5: Enrolled male and female students and their ratio during the academic session, 2021-22

S. No.	Name of College	Degree Programme	Total students	Male students		Female Students		M:F Ratio
				No.	%	No.	%	
1.	College of Agriculture, Iroisemba, Manipur	A. B.Sc. (Agri)	379	169	44.60	210	55.40	1:1.24
		M. Sc. (Agri)	98	46	46.94	52	53.06	1:1.13
		Ph.D. (Agri)	46	15	32.60	31	67.40	1:2.06
		Total	523	230	44	293	56	1:1.27
2.	College of Veterinary Sciences & A.H., Selesih, Aizawl, Mizoram	B.V.Sc. & A.H.	331	129	38.97	202	61.83	1: 1.56
		MVSc	92	44	47.83	48	52.17	1: 1.09
		Ph.D.	12	05	41.67	07	58.33	1:1.40
		Total	435	178	**40.92**	**257**	**59.08**	**1: 1.44**
3.	College of Fisheries, Lembucherra, Tripura	B.F.Sc	167	75	45	92	55	1:1.22
		M.F.Sc.	67	28	41.80	39	58.20	1:1.39
		Ph.D.	21	12	57.20	9	42.90	1:0.75
		Total	255	115	45	140	55	1:1.21
4.	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	B.Sc.(Hort.)	195	75	38.5	120	61.5	1:1.60
		B.Sc.(Forestry)	105	49	47	56	53	1:1.14
		M.Sc.(Horticulture)	27	13	48	14	52	1:1.07
		M.Sc.(Forestry)	8	3	37.5	5	62.5	1:1.66
		Ph.D. Programme.	20	11	55	9	45	1:0.81
		Total	355	151	42.54	204	57.46	1:1.35
5.	College of Community Science, Tura, Meghalaya	B.Sc. (Hons.) Community Science	113	-	-	113	100	0:100
		B.Sc. (Hons) Food Nutrition & Dietetics	61	-	-	61	100	0:100
		M.Sc. Community Science	6	-	-	6	100	0:100
		Total	180	-	-	180	100	0:100
6	College of Agril. Engg. & PHT, Ranipool, Sikkim	B.Tech. (AE)	155	103	66.45	52	33.54	1:0.50
		B.Tech. (FT)	40	22	55	18	45	1:0.81
		M.Tech.	41	30	73.17	11	26.83	1:0.36
		Ph.D.	15	8	45.45	7	54.54	1:1.20
		Total	251	**163**	**63.29**	**88**	**36.70**	1:0.58

S. No.	Name of College	Degree Programme	Total students	Male students		Female Students		M:F Ratio
				No.	%	No.	%	
7	College of Post Graduate Studies in Agril. Sciences, Barapani, Meghalaya	M.Sc. (Ag.)	115	47	40.87	68	59.13	1:1.44
		MBA (Agri. Business Management)	6	6	100	0	0	6:0
		Ph.D.	54	30	55.56	24	44.44	1:0.80
		Total	175	83	47.43	92	52.57	1:1.10
8	College of Agriculture, Pasighat, Arunachal Pradesh	B.Sc. (Hons.) Agriculture	101	54	53.47	47	46.53	1:0.87
9	College of Agriculture, Kyrdemkulai, Meghalaya	B.Sc.(Agri.)	86	40	46.51	46	53.49	1:1.15
10	College of Food Technology, Lamphelpat, Manipur	B.Tech (Food Technology)	54	18	33.3	36	66.7	1 : 2
11	College of Horticulture, Bermiok, Sikkim	BSc. (Hons.) Horticulture	71	23	32.39	48	67.61	1: 2.08
12	College of Horticulture, Thenzawl, Mizoram	B.Sc (Hons.) Horticulture	71	27	38.03	44	61.97	1:1.63
13	College of Veterinary Sciences, Jalukie, Nagaland	B.V.Sc. & A.H	101	36	35.64	65	64.36	1:1.80
		Grand Total	**2658**	**1118**	**42.06**	**1540**	**57.94**	**1:1.38**

2.6. Rank holders of UG and PG programmes 2021-22

A: First Rank Holders under UG Programme in different Colleges during the year, 2021-22

S. No	Name of College	Degree Offered	Names of Students	OGPA
1.	College of Agriculture, Iroisemba, Manipur	B.Sc. (Hons.) Agri.	R.K. Loken	8.66
2.	College of Veterinary Sciences & A.H., Selesih, Aizawl, Mizoram	BVSc. & A.H.	Phoebe C. Lalremruati	8.45
3.	College of Fisheries, Lembucherra, Tripura	B.F.Sc	Priyabati Devi Brahmacharimayum	8.58
4.	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	B.Sc. (Hons.) Hort.	Ms. Ningthoujam Mira Devi	8.60
		B.Sc. (Hons.) Forestry	Ms. Chandam Bidyarani	9.00

S. No	Name of College	Degree Offered	Names of Students	OGPA
5	College of Community Science, Tura, Meghalaya	B.Sc. (Hons) Community Science	Nancy Phurailatpam	8.58
		B.Sc. (Hons) Food Nutrition & Dietetics	Allegra T. Sangma	8.83
6	College of Agril. Engg. & PHT, Ranipool, Sikkim	B.Tech (AE)	Mr. Abhinav Kumar	8.75
		B.Tech (FT)	Ms. Mousumi Khanam	8.28
7	College of Agriculture, Pasighat, Arunachal Pradesh	B.Sc. (Hons.)Agri.	Ms. Mumdi Pertin	8.88
8	College of Agriculture, Kyrdemkulai, Meghalaya	B.Sc. (Hons.) Agri.	Ms Debasree Bhowmik	8.78
9	College of Food Technology, Lamphelpat, Manipur	B.Tech (Food Technology)	Raneswari Maibam	8.18
10	College of Horticulture, Bermiok, Sikkim	B.Sc. (Hons.) Horticulture	Mr. Bomchai L. Ong	8.56
11	College of Horticulture, Thenzawl, Mizoram	B.Sc (Hons.) Horticulture	Toko Nilly	8.95
12	College of Veterinary Sciences, Jalukie, Nagaland	BVSc. & A.H.	Clarinia Nongrang	8.51

B: Subject wise first rank holders in Master's Programme in different colleges during the year, 2021-22

S. No.	Name of College	Subject	Names of Students	OGPA
1.	College of Agriculture, Iroisemba, Manipur	Agronomy	Thoudam Anupama Devi	8.67
		Agril. Econ.	Gayathri H.	8.33
		Entomology	Loganathan R	8.30
		Ext. Education	Suparna Dey	8.60
		Horticulture	Humtu Rangai Jukhi	8.77
		Genetics and Plant Breeding	Raaghul R.	8.53
		Plant Pathology	Yengkhom Premica Devi	8.68
		SSAC	Hiren Das	8.30
2.	College of Veterinary Sciences & A.H., Selesih, Aizawl, Mizoram	Veterinary Anatomy	Rupan Sarkar	7.81
		Animal Reproduction, Gynaecology and Obstetrics	Anurag Garg	8.58
		Veterinary Medicine	Elone Lucy	8.44
		Veterinary Parasitology	K. Lalawmpuii	8.11
		Veterinary Pathology	Pinaki Bhattacharyay	8.94
		Veterinary Microbiology	Richa Sarkar	8.96
		Veterinary Surgery and Radiology	Gokul Raj S.	8.63

S. No.	Name of College	Subject	Names of Students	OGPA
		Animal Genetics and Breeding	Arjun Alapatt	8.80
		Animal Nutrition	Jayanta Banik	8.88
		Veterinary Physiology	Susmita Majumder	8.62
		Livestock Production and Management	Rubyta Chanam	8.39
		Livestock Products Technology	Santanu Nath	8.56
3	College of Fisheries, Lembucherra, Tripura	AQC	G.Deepak Reddy	9.10
		AAH	Kallol Barui	8.65
		FPT	Alok Singh Panwar	8.35
		FBT	Lukram Sushil Singh	8.79
		FEX	Kwabi Koreti	8.80
		FRM	Rayan Bhattacharya	8.74
4	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	Vegetable Science	Mr. Yogesh M.	8.81
		Fruit Science	MS. Nilakshi Bordoloi	8.78
		Vegetable Science	Ms. L. Mashini	8.78
		Fruit Science	Ms. Sanabam Indira Devi	8.67
		M.Sc. Forestry	Ms. Divya Serkeck	8.84
		M.Sc. Forestry	Ms. N. Sunena Devi	7.93
5	College of Community Science, Tura, Meghalaya	Extension Education and Communication Management	Huidrom Bliss	8.36
		Food Science and Nutrition	Chungkham Nganthoibi	8.27
6	College of Agril. Engg. & PHT, Ranipool, Sikkim	Processing & Food Engg.	Mr. Bharat Bhushan	8.40
		Farm Machinery & Power Engg.	Mr. Rahul Nath	8.38
		Soil and Water Conservation Engg.	Ms. Mandru Srilakshmi	8.83
7	College of Post Graduate Studies in Agril. Sciences, Barapani, Meghalaya	Agronomy	Mr. Pradosh Kumar Parida	8.59
		Soil Sc. & Agril. Chem.	Ms. Pritisha Patgiri	8.89
		Genetics & Pl. Breeding	Mr. Lokeshkumar K	8.65
		Pl. Mole. Biology & Biotechnology	Ms. Akunuru Sreeja	8.63
		Entomology	Ms. Sunita Chetry	9.09
		Pl. Pathology	Ms. Christina Thokchom	8.88
		Agril. Economics	Mr. Richu Mathew Sunil	8.86
		Agril. Extension	Ms. Progati Borah	8.31
		Agri.-Business Management	Mr. Kishan Reang	8.17

C: Students awarded Ph.D. degree in different colleges during the year, 2021-22

S. No.	Name of College	Subject	Names of Students	OGPA
1.	College of Agriculture, Iroisemba, Manipur	Plant Pathology	Konjengbam Sarda Devi	8.49
2.	College of Fisheries, Lembucherra, Tripura	Aquatic Animal Health	Mukta Singh	9.00
			Idrish Raja Khan	8.53
			Shongsir Raja Khan	8.83
3.	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	Vegetable Science	Ms. Naorem Bidyaleima Chanu	8.97
		Fruit Science	Ms. Megha Raghavan	9.03
4.	College of Agril. Engg. & PHT, Ranipool, Sikkim	Soil & Water Conservation Engineering	Mr. Aribam Priya Mahanta Sharma	8.21
5.	College of Post-Graduate Studies in Agricultural Sciences, Umiam, Meghalaya	Agronomy	Mr. Premaradhya, N.	7.98
		Soil Science & Agril. Chemistry	Ms. Carolyn Zothansiami	7.75
		Genetics &Plant Breeding	Ms. Bharati Lap	8.06
		Plant Pathology	Mr. Maaragaani S.V. Satyanarayana	8.35
		Plant Pathology	Ms. Lipa Deb	8.90
		Plant Pathology	Ms. Nongthombam Olivia Devi	8.79
		Plant Pathology	Mr. Tanmoy Das	7.88
		Plant Pathology	Ms. Monika Hajong	8.97

Table. 2.7: Placement of pass out students in different positions/organizations during 2021-22

S. No.	Name of College	Name of student	Year of passing from college	Organizations joined	Position/ joined as
1	College of Agriculture, Iroisemba, Manipur	Wankitkupar Fernandov Nadon	2017	Govt. of Meghalaya	LDA
		BankerlangKhongwir	2017	NABARD, Lamphelpat	Asst Manager
		L. Sekherjit Singh	2018	Governor office, Manipur	Garden Superintendent
		Aribam Sonali	2018	MOMA	Horticulture Asst.
		Longjam Boris Singh	2019	KVK Thoubal	SMS
		Tashi Pandem	2020	ADC office, Tawang, AP	UDC
		TakheTayang	2020	Arunachal Police	Sub-Inspector
		Dr. Indira Moirangthem	2014	Nagaland University	Asst. Prof.
		Dr. Deepa Thangjam	2016	Nagaland University	Asst. Prof.
		Dr. K. Dinesh	2018	Dr.Y.S.R. Horticulture University, Andhra Pradesh	Asst. Prof.

S. No.	Name of College	Name of student	Year of passing from college	Organizations joined	Position/ joined as
2	College of Veterinary Sciences & A.H., Selesih, Aizawl, Mizoram	1. Dr. (Miss) Himjyoti Hajong		Department of Veterinary and Animal Husbandry, Government of Meghalaya.	Veterinary Officer
		2. Dr. Aibaniairi Funcon		-do-	-do-
		3. Dr. Meiaishan Eliezer Lyngdoh		-do-	-do-
		4. Dr. (Miss) Lewamangphika Rapthap		-do-	-do-
		5. Dr. Ramaikhel Dkhar		-do-	-do-
		6. Dr. (Miss) Beatrice R. Marak	MVSc. 2022	-do-	-do-
		7. Dr. (Miss) Allie Sengo M. Sangma		-do-	-do-
		8. Dr. Penthom M. Marak		-do-	-do-
		9. Dr. (Miss) Ibandamer Wanniang		-do-	-do-
		10. Dr. Sankey Jones L. Nongbri		-do-	-do-
		11. Dr. (Miss) Febron Kristy Linda Lyngkhoi		-do-	-do-
		12. Dr.Pynkupar Manik Syiemlieh		-do-	-do-
		13. John Beizalaisa Khithie		Animal Husbandry and Veterinary Department, Govt. of Mizoram	Veterinary Officer
		14. Michael V. Lalrinzuaia		-do-	-do-
		15. Dr.Zothanpuii		-do-	-do-
		16. Lalramliana		-do-	-do-
		17. Lalawmpuia		-do-	-do-
		18. G Lulinlu Kabui		Veterinary & Animal Husbandry Services, Manipur	Veterinary Officer
		19. G Poulinlu		-do-	-do-
		20. Kamei Kakhulan		-do-	-do-

S. No.	Name of College	Name of student	Year of passing from college	Organizations joined	Position/ joined as
		21. Thangjam Reena Devi		-do-	-do-
		22. Shah Ayub Almas		-do-	-do-
		23. Jamlianthang		-do-	-do-
		24. Dilrash Mayanglambam		-do-	-do-
		25. Maibam Wanta Khuman		-do-	-do-
		26. Reihii John D.		-do-	-do-
		27. Lanchalung Malangmei		-do-	-do-
		28. M. Pule Addison		-do-	-do-
		29. Hb Warngam Anal		-do-	-do-
		30. Laishram Arjun Singh		-do-	-do-
		31. Chang L		-do-	-do-
		32. Wahengbam Pipelu		-do-	-do-
		33. Deepa Devi Thangjam		-do-	-do-
		34. Reema Sarangthem		-do-	-do-
		35. K. Puhle Japheth		-do-	-do-
		36. Losa Rose		-do-	-do-
		37. Soya Rungsung		-do-	-do-
		38. Achun Panmei		-do-	-do-
		39. L L Michael Khoveio		-do-	-do-
3.	College of Fisheries, Lembucherra, Tripura	Mr. Dang Tatin	2019	Govt. of Arunachal Pradesh	FO
		Ms. Pijir Zirdo	2020	Govt. of Arunachal Pradesh	FO
		Mr. Kime Tath	2018	Govt. of Arunachal Pradesh	FO
		Ms. Dawa Droma	2017	Govt. of Arunachal Pradesh	FO
		Mr. Toni Apang	2015	Govt. of Arunachal Pradesh	FO
		Mr. Lalruatfela	2018	Department of Fisheries, Govt. of Mizoram	ADF/DFDO

S. No.	Name of College	Name of student	Year of passing from college	Organizations joined	Position/ joined as
		Ms. Christina Lalramchhani	2010	Department of Fisheries, Govt. of Mizoram	ADF/DFDO
		Ms. Alish Debbarma	2016	KVK, Gomati, Govt. of Tripura	SMS (Fisheries)
		Ms. Nely Debbarma	2017	KVK, North Tripura, Govt. of Tripura	SMS (Fisheries)
		Mr. Somlang Tesia	2017	DC office, Tirap, Govt. of Arunachal Pradesh	UDC
		Mr. Siddhnath (ICAR)	2017	Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana	Asst. Prof.
		Mr. Pranab Rudra Paul	2020	KVK, Khowai, Tripura	Programme assistant
		Mr. Sagar Datta	2020	Govt. Of tripura	PA
		Mr. Kallol Barui	2021	Govt. Of WB	FEO
		Mr. Sumit Majumder	2021	Maharastra	Bank Officer, IDBI bank
		Ms. Monalisha Kumar	2020	Govt. Of WB	Fishery extension officer
		Mr. Sourav Debnath	2019	CAU PROJECT	Project assistant
4.	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	Mr. Kalom Tasing	2017	APSC	Circle officer
		Mr. Talo Moyong	2017	APSC	Circle officer
		Ms. Asunam Perme	2010	APSC	Circle officer
		Mr. M. Daisinlung	2020	Delhi Development Authority	Section Officer
		Mr. Panchaal Bhattacharjee	2016	Delhi Development Authority	Section Officer
		Mr. Andrew L Myrthong	2014	Meghalaya Civil Services	Block Development Officer
5.	College of Community Science, Tura, Meghalaya	Tage Asha	2018	Arunachal Public Service Commission	Circle officer
		Rikamchi Ch Marak	2018	Higher secondary School, Meghalaya	Asst. Teacher (Contractual)
		Anchie Maliva A. Sangma	2016	ICDS project, Sangsak, East Garo Hills, Meghalaya	Lower Divisional Assistant (contractual)

S. No.	Name of College	Name of student	Year of passing from college	Organizations joined	Position/ joined as
		Pheelina Bhujel	2019	Sikkim Manipal Institute of Medical Sciences.	Dietitian
6	College of Agril. Engg. & PHT, Gangtok, Sikkim	Ms. Rupa Biswas	2021	Byju's (Think & Learn Pvt. Ltd)	PSA (Pre Sales Associates)
7	College of Post-Graduate Studies in Agricultural Sciences, Umiam, Meghalaya	Mr. Nathaniel Leong Nonghuloo	2013	Meghalaya Agriculture Service	Horticulture development officer
		Mr. Emdor Shylla	2013	-do-	Agriculture Development Officer
		Mr. Adelbert Kharlyngdoh	2013	-do-	Horticulture development officer
		Mr. David Nonglait	2011	-do-	Horticulture development officer
		Dr. Markynti Shangpliang Lyngdoh	2011	-do-	Agriculture Development Officer
		Ms. Rebekka Syiem	2014	-do-	Horticulture development officer
		Mr. Heipormi Papang	2018	-do-	Agriculture Development Officer
		Mr. Wadbok Rani	2018	-do-	Scientific Officer
		Labuhty Giri Mawlong	2016	-do-	Horticulture development officer
		Ms. Rimikini Laloo	2016	-do-	Scientific Officer
		Mr. Achin Kharmudai	2017	-do-	Agriculture Development Officer
		Ms. Saphina Mary Kurkalang	2015	-do-	Agriculture Development Officer

S. No.	Name of College	Name of student	Year of passing from college	Organizations joined	Position/ joined as
		Ms. Amenisha Lyngdoh	2014	-do-	Agriculture Development Officer
		Mr. Rupaia Siangshai	2013	-do-	Horticulture development officer
		Ms. Baiamon Sutnga	2018	-do-	Agriculture Development Officer
		Dr. Euwanrida Adleen Lyngdoh	2019	-do-	Scientific Officer
		Dr. Sao Evalwell Dkhar	2019	-do-	Agriculture Development Officer
		Ms. Flamia Chimachi R. Marak	2018	-do-	Horticulture development officer
		Ms. Sengmitchi D. Sangma	2019	-do-	Agriculture Development Officer
		Mr. Along B. M. Sangma	2017	-do-	Agriculture Development Officer
		Ms. Itirekha R. Marak	2010	-do-	Agriculture Development Officer
		Ms. Baltachina G. Momin	2016	-do-	Scientific Officer
		Mr. Romeo M. Marak	2014	-do-	Horticulture development officer
		Dr. Baiarbor Nongbri	2020	CPGSAS , CAU, Umiam	Asstt. Professor (Contractual)
		Dr. Chiphang Singyala	2020	CPGSAS, CAU,Umiam	Asstt. Professor (Contractual)
		Ms. Bhubana	2021	Private college	Asstt. Professor (Contractual)
		Mr. MSV Satyanarayana	2021	SKV College of Agri. SSR Puram, Murapaka Srikakulam-532403, Andhra Pradesh	Asst. Professor (Plant Pathology)
		Mr. Chandrabhan Bharti	2022	Plant Protection and Quarantine, Mumbai	Quarantine Officer

S. No.	Name of College	Name of student	Year of passing from college	Organizations joined	Position/ joined as
8	College of Food Technology, Lamphelpat, Manipur	Bhavesh Datla	2020	Price Water House and Cooper, Bangalore	Associate Technology Consultant
		Arrowal C. Syngkon	2021	Pelagic Foods, Bangalore	Internship
		Tyngshainmi Kharsanoh	2021	Pelagic Foods, Bangalore	Internship
		Bhavesh Datla	2020	PriceWater House and Cooper, Bangalore	Associate Technology Consultant
9	College of Horticulture, Bermiok, Sikkim	Mr. Nyalen Hakom	2021	Govt of Arunachal Pradesh, Department of Personnel, Civil Secretariate, Itanagar, AP.	APCS

2.2. Library Services

All the constituent colleges of the University have well equipped libraries which provides its services to scholars, teachers and staff of the college. Library has e-resources including KOHA Online Library, IP-based academic e-journals, e-books and other e-literature, *etc.* In addition, library is receiving newsletters, annual reports, bulletins *etc.*from difference organization. The Library provides circulation and reference services. All the in-house operations of the Library are fully computerized using the networked version of the software LibSys – 4 with OPAC facilities. The Library also has access to CeRA and India Agri Stat Consortium. Photocopying facility is also available in the Library. The detail of books, theses, journals, magazines and other reading material along with its expenditure is furnished as under:

2.2.1. College of Agriculture, Iroisemba, Manipur

S. No	Library Collections	Nos.
i.	Books (Total holdings)	21198
ii.	Theses (Reference Section)	1685
iii.	Journals	
	a. Indian Journals	112
	b. International Journals	19
	c. Total Bound Volume Journals	1193
iv.	Popular Magazines	8
v.	Newspapers	
	a. National Newspapers	Nil
	b. Local Newspapers	Nil

S. No	Library Collections	Nos.
	Total amount spent on newspapers & magazines	
vi	Miscellaneous	
	a. Books/Journals sent for binding during 2021-22	Nil

Number of Academic Books purchased during 2021-22

S. No.	Titles	No. of Copies	Expenditure (Rs.)
1	57	177	101500

2.2.2. College of Horticulture & Forestry, Pasighat, Arunachal Pradesh

S. No.	Library collection	Nos.
i.	Books (Total holdings)	**1388**
	Text Books Bank (Text Book)	977
ii.	Theses (Reference Section)	
iii.	Journals	
	a. Indian Journals	
	b. International journals	
	c. Total bound Volume Journals	
iv.	Popular Magazines	
v.	Newspapers	
	a. National Newspapers	
	b. Local Newspapers	
	Total amount spent on newspapers & magazines	
vi.	Miscellaneous	
	a. Books/Journals sent for binding during 2021-22	Nil

Number of Academic Books purchase during 2021-22

S. No.	Titles	No. of Copies	Expenditure
1.	20	77	39868.00
Total			39868.00

2.2.3. College of Post Graduate Studies in Agricultural Sciences, Umiam, Meghalaya

S. No	Library Collections	Nos.	Added during 2021-22
i.	Books (Total holdings)	5654	174 books
ii.	Theses (Reference Section) MSc = 402, PhD = 48		MSc = 47 PhD = 11
iii.	Journals		
	a. Indian Journals	17	Renewed = 10 during 2021 -22
	b. International Journals		
	c. Total Bound Volume Journals		
iv.	Popular Magazines	8	

S. No	Library Collections	Nos.	Added during 2021-22
v.	Newspapers	10	2
	a. National Newspapers	6	
	b. Local Newspapers	4	2
	Total amount spent on newspapers & magazines		
vi	Miscellaneous		
	a. Books/Journals sent for binding during 2021-22		nil

Number of Academic books purchased during 2021-22

S. No.	Titles	No. of Copies	Expenditure
1.	105	174	1, 46,810.00

2.2.4. College of Fisheries, Lembucherra, Tripura

Sl. No	Library Collections	Nos.
i.	Books (Total holdings)	8798
ii.	Theses (Reference Section)	161
iii.	Journals	
	d. Indian Journals	8
	e. International Journals	-
	f. Total Bound Volume Journals	-
iv.	Popular Magazines	15
v.	Newspapers	5
	c. National Newspapers	3
	d. Local Newspapers	2
	Total amount spent on newspapers & magazines (2021-22)	
vi	Miscellaneous	
	b. Books/Journals sent for binding during 2021-22	-

Number of Academic Books purchased during 2021-22

S. No.	Titles	No. of Copies	Expenditure (Rs.)
1	39	61	Rs. 1,36,846.00

2.2.5. College of Veterinary Sciences & A.H., Selesih, Aizawl, Mizoram

S. No.	Library Collections (2021-2022)	Nos
i.	Books (Total holdings)	10547
ii.	Theses (Reference Section)	227 as on 16.03.2022
iii.	Journals	
	a. Indian Journals	12 (For 2021)
	b. International Journals	Nil
	Total Bound Volume Journals	354 (Nos.)

S. No.	Library Collections (2021-2022)	Nos
iv	Popular Magazines (2021-2022)	01 (2021-2022) (3 Copies)
v	Newspapers (subscribed during 2021-2022)	
	a. National Newspapers	Nil
	b. Local Newspapers	Nil
	Total amount spent on newspapers & magazines	Nil
vi.	Miscellaneous	Nil
	a. Books/Journals sent for binding during 2021-2022	Nil
	No. of CD/DVD	153 (Nos.)

Number of Academic Books purchased during 2021-22

S. No.	No. of Titles	No. of Copies	Expenditure
1.	30 (as on 30.03.2022)	63	Rs. 106,729.00

2.2.6. College of Agricultural Egineering & P.H.T., Ranipool, Sikkim

S.No.	Library Collections	Nos.
i.	Books (Total holdings)	8027
ii.	Theses (Reference Section)	316
iii.	Journals	Nil
a.	Indian Journals (Subscribed during 2021-22)	-
b.	International Journals (Subscribed during2021-22)	-
c.	Total Bound Volume Journals	Nil
iv	Popular Magazines (Subscribed during2021-22)	08
v	Newspapers (Subscribed during2021-22)	Nil
a.	National Newspapers	-
b.	Local Newspapers	-
	Total amount Spent on Newspapers & Magazines	
vi	Miscellaneous	
a.	Books/ Journals sent for binding during 2021-22	Nil

Number of Academic Books purchased during 2021-22

S. No.	No. of Titles	No. of Copies	Expenditure
1.	38	171	Rs. 106,729.00

2.2.7. College of Community Science, Tura, Meghalaya

S. No.	Library Collections	Nos.
i.	Books (Total holdings) From 2004 to 2022 (6928 collections) Books Acquired during 2021-22	55 titles
ii.	Theses (Reference Section) * Tura Campus has no PhD. Scholars	Nil
iii.	Journals	

S. No.	Library Collections	Nos.
	g. Indian Journals (subscribed during 2021-22)	5
	h. International Journals	Nil
	i. Total Bound Volume Journals	Nil
iv.	Popular Magazines (subscribed during 2021-22)	
v.	Newspapers (subscribed during 2021-22)	
	e. National Newspapers	
	f. Local Newspapers	1
	Total amount spent on newspapers & magazines	
vi	Miscellaneous	
	c. Books/Journals sent for binding during 2021-22	Nil

Number of Academic Books purchased during 2021-22:

S. No.	Titles	No. of Copies	Expenditure (Rs.)
1	55 Titles	1 copy each	Rs 73528/-

2.2.8. College of Veterinary Sciences & A.H., Jalukie, Nagaland

S. No.	Library Collections	Nos.
1	Books (Total holdings)	1416
2	Thesis (Reference Section)	-
3	Journals	-
	a. Indian Journals	-
	b. International Journals	-
	c. Total Bound Volume Journals	-
4	Popular Magazines	-
5	Newspapers	03
	a. National Newspapers	-
	b. Local Newspapers	03
	Total amount on Newspapers and Magazines	03
6	Miscellaneous	-
	a. Books/ Journals sent for binding during 2021-22	

Number of Academic Books Purchase during the year 2021-22

S. No.	Titles	No. of Copies	Expenditure (Rs.)
1	43	126	3, 44,101.00

2.2.9. College of Horticulture, Bermiok, Sikkim

S. No.	Library Collections	Nos.
i.	Books (Total holdings)	2259
ii.	Theses (Reference Section)	Nil

S. No.	Library Collections	Nos.
iii.	Journals	
a.	Indian Journals (Subscribed during 2021-22)	Nil
b.	International Journals (Subscribed during 2021-22)	Nil
c.	Total Bound Volume Journals	Nil
iv	Popular Magazines (Subscribed during 2021-22)	Nil
v	Newspapers (Subscribed during 2021-22)	Nil
a.	National Newspapers	Nil
b.	Local Newspapers	Nil
	Total amount Spent on newspapers & magazines	Nil
vi	Miscellaneous	
a.	Books / Journals sent for binding during 2021-22	Nil

No. of Academic Books purchased during 2021-22

S. No.	Titles	No. of Copies	Expenditure (Rs.)
1	50	152	270627.00

2.2.10. College of Horticulture, Thenzawl, Mizoram

S. No.	Library Collections	Nos.
i.	Books (Total holdings)	1843
ii.	Theses (Reference Section)	
iii.	Journals	
	j. Indian Journals	
	k. International Journals	
	l. Total Bound Volume Journals	
iv.	Popular Magazines	
v.	Newspapers	
	g. National Newspapers	
	h. Local Newspapers	
	Total amount spent on newspapers & magazines	
vi	Miscellaneous	
	d. Books/Journals sent for binding during 2021-22	

No. of Academic Books purchased during 2021-22

S. No.	Titles	No. of Copies	Expenditure (Rs.)
1.	Total Books(105)	561	563862.00

2.2.11. College of Food Technology, Lamphelpat, Manipur

S. No.	Library Collections	Nos.
i.	Books (Total holdings)	1568
ii.	Theses (Reference Section)	-
iii.	Journals	-
	m. Indian Journals	-
	n. International Journals	-
	o. Total Bound Volume Journals	-
iv.	Popular Magazines	-
v.	Newspapers	-
	i. National Newspapers	-
	j. Local Newspapers	2
	Total amount spent on newspapers & magazines	
vi	Miscellaneous	-
	e. Books/Journals sent for binding during 2021-22	-

Number of Academic Books purchased during 2021-22

S. No.	Titles	No. of Copies	Expenditure (Rs.)
1	16	117	99,170.00

2.2.12. College of Agriculture, Pasighat, Arunachal Pradesh

S. No.	Library Collections	Nos.
i.	Books (Total holdings) Text Books Bank (Text book)	1388 977
ii.	Theses (Reference Section)	
iii.	Journals	
	a. Indian Journals	
	b. International Journals	
	c. Total Bound Volume Journals	
iv.	Popular Magazines	
v.	Newspapers	
	a. National Newspapers	
	b. Local Newspapers	
	Total amount spent on newspapers & magazines	
vi	Miscellaneous	
	a. Books/Journals sent for binding during 2021-22	

Number of Academic Books purchased during 2021-22

S. No.	Titles	No. of Copies	Expenditure (Rs.)
1	20	77	39868.00

2.2.13. College of Agriculture, Kyrdemkulai, Meghalaya

S. No.	Library collections	Nos.	Expenditure (Rs)
1	Prashant Book Agency	353	266,621.00
2	Atlas Books & Periodicals	2	34,226.00
TOTAL		355	3, 00847.00 (Rupees three lakhs eight hundred and forty seven) Only

Number of Academic Books purchased during 2021-2022

S. No.	Titles	No. of Copies	Expenditure (Rs.)
1	55	355	3, 00847.00

2.3: Computer facilities

2.3.1. College of Agriculture, Iroisemba, Manipur

The Computer Lab of College of Agriculture, Iroisemba, provides many facilities like conducting practical classes for UG/PG/Ph.D. students, statistical computing with statistical packages (say, SAS, IBM SPSS), internet serving for searching of research materials, organizing other training program/examination related to computer, etc. The Lab is now open during office hours in all working days for all students, faculties, scientists, staff of the College. Besides this, there is one Language laboratory having 31 numbers of computer systems to enhance computing skills as well as improving language skills of the students.

2.3.2. College of Horticulture & Forestry, Pasighat, Arunachal Pradesh

The College has well-furnished air-conditioned Computer Laboratory. It houses 20 numbers of Desktop Computers with Internet facility. The lab is used for conducting practical classes for B.Sc. Horticulture, B.Sc. Forestry and M.Sc. students. Students also use the Computer Lab for their research, statistical calculation and other academic activities. The college has 2 Mbps Leased line Internet connection from BSNL. The College provides unlimited Internet facility to the staffs and students. Wi-Fi Internet hotspot facility has been provided at Academic building, old College building, VC Camp, Guest House and Daisy Girls' Hostel. Faculty members and students utilize internet and computer facility for carrying out academic research and extension activities.

2.3.3. College of Community Science, Tura, Meghalaya

The college has an Information Technology Laboratory with 17 computers and 10 mbps Wi-Fi internet facility that caters to the practical courses of Computer Aided Interior Designing, Agricultural Informatics, and Statistics. To achieve effective teaching-learning goals, it has four interactive white boards in the four main lecture halls, and in the current session (2020-21) a smart classroom facilitated through NAHEP (Institutional Development Programme) has been set up. A Language Laboratory with 30 computers having 20 mpbs internet connection has also been established in an endeavor to improve the communication and life skills of the students. The computers and internet connection will also be utilized to meet the other requirements of the students. The college library also has internet connection that is used for various purposes. Although there are no separate computers for the students in the library, there are adequate IT facilities in the IT lab and in the Language Lab to meet their requirement. The library is fully automated with KOHA library software and database entries of all collections have been completed as of now. Circulation section of Issue return and users Card are all done through Barcode. OPAC (Online Public Access Cataloguing) service is provided to all users.

2.3.4. College of Fisheries, Lembucherra, Tripura

A computer laboratory with Internet (16 MBPS) facility is set up to cater the needs of the students/faculty/research staffs of the college. Presently 15 numbers of computers are provided to facilitate the computation/ analytical need of the students for their practical and research purposes. Statistical Package for Social Sciences (SPSS-22) is recently procured and installed. LAN Topology and Connectivity: Mesh Topology and 16 MBPS leased line connection from BSNL for the entire college. Plagiarism software has been purchased to stop Plagiarism in writing of thesis and research paper. Online procurement system has been started through government e-procurement/ GEM portal. Online financial management system PFMS has been started. The college also has smart class facility.

2.3.5. College of Post Graduate Studies in Agricultural Sciences, Umiam, Meghalaya

The network facility in CPGSAS (CAU-I) Umiam campus has been upgraded to a planned decentralized manner which includes two major parts – namely a ***Public Domain*** (via the College Website – www.cpgs.ac.in) and a ***Private Domain*** (via the College's Intranet Setup). A setup consisting of Bharat Fibernet BSNL FTTH connections (currently 20 Nos.) has

been installed in various locations of the college campus. Students and staff of the college can use these connections to connect directly to the Internet and/or to the CPGS Intranet (provided through OpenVPN Access) for all facilities such as KOHA OPAC Online Library, CeRA journals, IP-based academic e-journals, e-books and all other e-resources.

2.3.6. College of Veterinary Sciences & A.H., Selesih, Aizawl,Mizoram

The College provides the computing facilities to the teaching staff and Research students. It also provides Internet browsing to all teaching staff, administrative staff and Students. There are nearly 150+ users which are using internet facilities and computing facilities. There are two Computer Labs in this College. Both are well equipped with internet facilities to all the 27(17+10) PCs. This centre is being used for imparting teaching computer classes to the first year students as per VCI norm. This facility is also accessible to all the students, faculty and staff of the college. The College supports a wide High Speed fiber optic and Wireless network Bridge that connects administrative Building, all the Departments, library, Hostels, VC camp and other central facilities to the Computer Centre. The College procured 50 Mbs with uploading speed of 1:1 lease line connection from private service provider for internet connectivity. Users can use the computing resources of Computer Center from their offices, Academics Unit and Hostels. Computer Centre operates 24 hours a day, 365 days a year. It has a power back up through a 10 KVA UPS and a 300 KVA generator set. Facility is provided to all the students, faculty and staff members for browsing Internet. The computer centre is also installed with high capacity printer and service is provided to the end users (faculty members, staff and student).

2.3.7. College of Agricultural Engineering & P.H.T., Ranipool, Sikkim

The College of Agricultural Engineering and Post-Harvest Technology (CAEPHT) Computer Laboratory, under Central Agricultural University (CAU), Imphalis well-equipped with 20 new computers for computing facilities to all the students of the college, teaching and non-teaching staff members along with Internet connectivity. It is equipped with some industry-standard software to cater to

various extension activities that the college may be hosting at regular intervals. It also provides Internet facilities to all teaching staff, administrative staff and all students of the college. There are approximately more than 300 users who are availing the Internet and computing facilities.The Computer Centre supports a wide 1000 Mbps fiber optic network (OFN) that connects all the academic units, hostels, library, dispensary, residence and other central facilities to the Computer Centre. Users can use the computing resources of Computer Center from their offices, academics unit, hostels and residences.Login is provided to all the students, faculty and staff members for Internetbrowsing.Besides, Wi-Fi facilityis provided to boys' hostel, girls'hostel, ATIC Building, guest house, dispensary, VC camp, and Dean's residence. LAN is provided through optical fiber connection in North Academic building, South Academic building, new girls' hostel, auditorium, staff quarter, medical unit and Farmers Produce Processing cum Skill Development Centre. The network Security is Provided through UTM/Firewall.

2.3.8. College of Agriculture, Pasighat, Arunachal Pradesh

Presently faculties and students of the College of Agriculture, Pasighat, Arunachal Pradesh were utilizing the computers laboratory/facilities of the College of Horticulture and Forestry, Pasighat, Arunachal Pradesh.

2.3.9. College of Horticulture, Thenzawl, Mizoram

The College of Horticulture, Thenzawl has 15 nos. of desktop and 5 nos. of laptops at present. There is no separate computer laboratory yet in the college.

2.3.10. College of Veterinary Sciences & A.H., Jalukie, Nagaland

The College have two computer labs which are attached with the Department of Animal Genetics & Breeding (15 Computers) and Department of Veterinary and Animal Husbandry Extension Education (09 computers).

2.3.11. College of Horticulture, Bermiok, Sikkim

Presently the faculties and students of College of Horticulture, Bermiok, South Sikkim are utilizing the computer facilities available at College of Agriculture Engineering and Post Harvest Technology, Ranipool, Sikkim

2.4: Students' Welfare & Extra Co-Curricular Activities

2.4.1. Hostel facilities

The hostels are located inside the college campuses that ensure close proximity and connectivity. The academic programmes of the university are purely residential and co-education except College of Home Science, Tura, Meghalaya where only girl students are admitted. Hostels are well furnished with telephone, TV, computers with free wi-fi

Boys Hostel of College of Agriculture, Imphal

facilities, kitchens, indoor games (TT board, carom, chess etc.), gymnasium, newspapers, first aid box & medical facility, inverter and generator systems and other basic facilities. There are separate hostels for boys and girls as well as for under graduate, post graduate and doctoral research scholar also. Wardens monitored the hostels 24x7 hours pattern. Student clubs run their mess in their respective hostels. 24 hours security is provided by security guards in the hostel.

Gymnasium in Boys hostel

2.4.2. Canteen facilities

All the constituent colleges are having well organized hygienic canteens located within the campus. The facility is available for the students and staff of the college at the nominal rate. A committee monitors the hygienic and nutritional food prepared in the canteen.

Canteen at College of Agriculture, Imphal

2.4.3. Medical Facilities

Each constituent college has well equipped medical unit for regular health check-up of staff and students. These 24x7 hours medical facilities are available in all campuses with well qualified resident medical officers assisted by compounder cum dresser, trained nurses and attendants. Ambulance services are also provided for the students and staffs for emergencies and effective health care management. The centre is also the place for conducting students' counseling as and when required under the guidance of the clinical psychologist.

Medical Cell

2.4.4. Placement cell

The University has placement cell in all campuses which facilitates placement for the students in different agri allied sectors including banks, private establishments, NGO's,

industry etc. Pass out students of the University also qualified for UPSC / State Civil Services examination and many of them are working in the ICAR, State Agricultural Universities, Technical Institutes of Higher Education, Krishi Vigyan Kendras, and Research Institutes of high repute etc. Many students are doing Doctoral Degree Research in International Research Institutes as well as in the Universities in India and abroad.

2.4.5.1. Some glimpses of major activities observed during the year

The University promotes co-curricular activities and encourages students participation in all aspects of campus life. All constituent colleges of the university have well managed games and sports infrastructure including all season indoor facilities, auditoriums and gymnasiums. A separate cell for cocurricular activities was opened in the Directorate of Instruction *w.e.f.* 1st November, 2013 to co-ordinate and improve various Games and Sports & Cultural activities of the University. To inculcate the sense of competitiveness among the students, the constituent colleges organized co-curricular activities in the form of annual College Week, Sports & Games and Social/Cultural meets. However, due to the pandemic, this year the University could not organize extracurricular activities in physical mode. Every activity was conducted in online mode or physically by maintaining SOPs.

REPUBLIC DAY CELEBRATION: The University headquarters and all constituent colleges of the University observed the Republic Day Celebration with great enthusiasm and proudness on 26th January, 2022.

30TH FOUNDATION DAY CELEBRATION OF THE UNIVERSITY: The University observed its 30th Foundation Day celebration on 26th

January, 2022 in hybrid mode. All the previous Vice Chancellors of the University delivered a talk on the reflections during their tenure in the University. The program was viewed by all the staffs/students/ faculty of the constituent college of the University.

TEACHERS' DAY CELEBRATION: Every constituent college of the University observed Teachers' day celebration on 5th September 2021 by following government protocols on social distancing and also through video conferencing.

ANNUAL FRESHER'S SOCIAL: Annual fresher's social program was organized in every constituent colleges of the University to welcome the newly admitted students.

INTERNATIONAL YEAR OF MILLETS: The international year of Millets under National campaign on Poshan Vatika Maha Abhiyan

was celebrated in all the constituent colleges on 17th September, 2021. The major function was held at College of Post Graduate Studies in Agricultural Sciences where the programme was graced by Hon'ble Chancellor, Dr. S. Ayyappan, and other dignitaries and was attended by faculty members, non- teaching staff and students. Experts from the University and KVKs delivered lectures on various aspects of nutrition and awareness on the importance of Poshan Vatika for food and nutritional security particularly of children and women was emphasised. Covid-19 - Standard Operating Procedures (SOPs) were followed during the programme. On the day tree plantation program was also held.

INTERNATIONAL DAY OF YOGA: International day of yoga was celebrated in the constituent colleges of CAU, Imphal on 21st June, 2021 with great enthusiasm and vigour via social distancing and also on online mode. The practise of yoga helps to create overall

harmony of body and mind thus providing mental and physical strength and enables to lead a healthy life.

CELEBRATION OF BIRTH ANNIVERSARY FATHER OF NATION: In commemoration of the birth anniversary of Father of Nation, Mahatma Gandhi, the constituent colleges of the University organised essay writing, Quiz and painting competitions. "Swachh Campus" drive was also initiated in the constituent colleges with the objective to create clean, safe, healthy, plastic free and green environment campus.

WORLD ENVIRONMENT DAY: Mass tree plantation campaign was undertaken in Headquarters and all the campuses of the constituent colleges of the University during the celebration of World Environment Day held on 5th June, 2021.

AGRICULTURAL EDUCATION DAY: Every constituent college of the University observed Agricultural Education Day on 3rd **December,**

2021 by following government protocols on social distancing and also through video conferencing. On this day online Quiz program was held in which the students participated.

WORLD WATER DAY: All constituent colleges of the University observed the World Water Day on 22nd March 2022. Painting competitions under the theme "Valuing water", an awareness lecture on "Water status in 21st century", essay writing competition was organised to mark the occasion.

WORLD FOOD DAY: All constituent colleges of the University observed the World Food Day on 16th October 2021in hybrid mode. The programme was conducted under the theme "Our action are our future, better nutrition better environment and better life"

HINDI SAPTAH-2021: All constituent colleges of the University celebrated the Hindi Saptah divas from 14th to 20th September, 2021. Essay competition, extempore speech, Hindi knowledge quiz competition, Hindi typing competition and antakshari competition was conducted.

MASS TESTING OF COVID-19 / VACCINATION DRIVE FOR THE STUDENTS/ FACULTY/STAFF: In all the constituent colleges mass testing of Covid-19 was conducted to prevent the spread and control of COVID-19 in the campus.

COMMUNITY EMPOWERMENT THROUGH TECHNOLOGY PRODUCTS

The Central Agricultural University,Imphal successfully organized a programme on Community Empowerment through Technology Products on 9th June, 2021 in 13 constituent colleges of the University in 7 states of North – Eastern Region. The programme was conducted using physical as well as virtual mode. Hon'ble CM of Manipur, Shri N. Biren Singh graced the occasion as Chief Guest while Shri Pema Khandu, Hon'ble CM of Arunachal Pradesh, Shri Ratan Lal Nath, Hon'ble Minister of Education, Govt. of Tripura, Dr. K. Beichhua Hon'ble Minister of Veterinary, Govt. of Mizoram, Smt. Agatha Sangma, Hon'ble MP, Tura Constituency, Meghalaya, Dr. R. K. Ranjan Singh, Hon'ble M.P., Inner Manipur Constituency, Dr. Lorho S Pfoze, Hon'ble M.P., Outer Manipur Constituency and Dr.Anupam Mishra, Vice Chancellor, CAU, Imphal graced as Guest of Honour and President respectively. The programme was attended by Commissioners/Secretaries, Deputy Commissioners, Directors of line departments, Directors of ICAR institutes, representatives of NGO, farmer groups/organizations/NGOs of seven north eastern states. Altogether 8240 farmers including officers and staff of the University/line department/IIVIG/NGOs/FPOs participated the program through virtual/ YouTube/Facebook/ physical platform. The programme was organized with the objective to show the solidarity to the 24 million farming community of the north-eastern states with the theme CAU, Imphal stand with you during the crucial COVID Pandemic. As part of social responsibility, the University through voluntary contribution of one day salary of the employees supported 5222 from 38 out of 87 districts of the NER by distribution of technology products (quality seeds, planting materials, farm equipments and machines, animal feeds, fertilizers and post harvest and processing machinery. Finally, it will helps in increasing livelihood of the farmers through crop diversification, integrated farming systems, processing and value addition. The inputs were distributed in 38 distribution points covering 5222 farmers in 38 districts of the seven states. Altogether 41 institutions / organizations participated the programme.




3

RESEARCH ACTIVITIES

3. Research and Development

The outcome of internal and external funded research endeavors, the University was successful in developing location specific deliverable achievements, recommendations and research findings on agriculture and allied disciplines for the farmers and agripreneurs of NEH Region. The salient research achievements of the University are highlighted below:

3.1. Agriculture and Horticulture

A. Crop Improvements

3.1.1. Identification of maize lines for Manipur condition

Four QPM hybrids viz. HQPM-1, HQPM-5, IMHQPM-1530 and IMHQPM-1610 have been identified to be highly promising and among these HQPM-1 and HQPM-5 have been popularly adopted by farmers of Manipur. Identified two Baby corn lines *viz*., IMHB-1537 and BVM-2 which are stable during *pre-kharif* and *kharif* season in Manipur. Two hybrids, DMRH-1301 and DMRH-1305 have also been identified to be promising and well adapted during *pre-kharif* and *kharif* season, and are being popularized among the maize growers of Manipur under FLD programme of AICRP (Maize). Sweet corn varieties viz. FSCH-5 and AKSH-4 have been identified to be highly suitable to the agro-climatic condition of the state during *pre-kharif* season. Collection and maintenance of available germplasms (43 nos.) are being carried out. Six (6) new local collections have been made from Churachandpur and Chandel districts of Manipur.

3.1.2. Mapping and inheritance studies for Northern Corn Leaf Blight resistance in maize

Three biparental populations were studied for inheritance to *Turcicum* blight resistance which revealed the presence of non-allelic interactions in Cross 1 and Cross 3 and a preponderance of dominance gene action. Of the 127 SSR markers associated with major genes and QTLs for NCLB resistance and other reported R genes, a total of thirty-six, twenty-eight and seventeen polymorphic SSR markers were detected for the parents in Cross 1, Cross 2 and Cross 3 respectively. Two rounds of multilocation studies for AUDPC at Umiam and Varanasi indicated near comparable consistent response to NCLB although the intensity of the disease was much higher in Varanasi compared to Umiam under artificial epiphytotic conditions. The RIL population generated from Cross 1 with 'a' of additive genetic variance has been phenotype for disease components and genotyped with polymorphic markers for major genes as well as for QDR. Marker -trait association studies for Single Marker Analysis of extreme F_2 individuals (10 each of resistant and susceptible) revealed the association of disease progress in Cross 1 with the markers in bins 2.08 and 8.06 located in proximity to major genes *Ht1* and *HtP* and *Ht2*, respectively. Additionally, the marker umc2246 (bin 2.00)

Table No. 3.1.4

Crop	Collections during the year	Total collections at the centre	Total no for which accession number received from NBPGR
Cassava	-	7 (Local collection)	1
Sweet potato	-	9 (Local collection)	
Elephant foot yam	-	1 (Local collection)	
Greater yam	1	4 (Local collection)	
Winged bean	-	6 (Local collection)	
Colocasia	3	6 (Local collection)	

in Cross 1 was found associated with the progress of NCLB for the same panel although not located in proximity of any reported major *Ht* gene pointing to a possible association with Quantitative Disease Resistance (QDR).

3.1.3. Rice improvement in NEH region

Three plant breeding trials were conducted: IVT-M (H) - 36 entries; AVT-M (H)-14 entries; IVT-U (H)-14 entries. One entry CAUS-124 (IET28907) was promoted to AVT2 trials. CAUS-107 (IET28201) is being retested in AVT1. Two new entries were nominated to AICRIP trials.

3.1.4. Evaluation of genetic resources of tuber crops in Manipur

Genetic evaluation of 36 local collections are evaluated and 1 collection has got accession number from NBPGR, New Delhi

Germplasm collection during 2021-2022

3.1.5. MLT on Colocasia

In the experiment MLT on Colocasia maximum number of cormels per plant was observed in Sree Reshmi (20.75 which was at par with local line (19.60) and followed by TTr17-3 (17.43). The maximum cormel yield was observed in Local line (18.59 t ha^{-1}) which was at par with Sree Reshmi (18.52 t ha^{-1}) whereas the maximum total yield (23.10 t ha^{-1}) was also observed in Sree Reshmi.

3.1.6. MLT on Swamp Taro

In the evaluation of seven entries of Swamp taro in four locations BCST-3 recorded maximum number of stolon per plant (11.46). However maximum weight of stolon per plant (229.04 g) and maximum stolon yield 8.48 t ha^{-1} were observed in BCST-13. But the maximum

caudex yield was observed in CAUST-1(14.31 t ha^{-1}). In pooled data maximum stolon yield was observed in BCST-1 (8.09 t ha^{-1}) and maximum caudex yield was observed in CAUST-1 (13.89 t ha^{-1}).

3.1.7. Collection, documentation and maintenance of some underutilized medicinal plants

Seven genotypes of *Curcuma caesia*, 3 genotypes of *Piper mullesua*, 5 genotypes of *Kaempheria parviflora*, 3 genotypes of *Clerodendrum coolebrookianum*, 7 genotypes of *Eryngium foetidum* and 3 genotypes of *Solanum torvum* were collected and maintained in the field. IC numbers of the collected genotypes were obtained from NBPGR. Differences in the various morphological and biochemical characters of the collected genotypes of a species were observed. Good morphological characters like high yielding in combination with high bioactive content genotypes can be considered for Germplasm registration at NBPGR for further research.

Eryngium foetidum

Solanum torvum

3.1.8. Molecular mapping and linkage maps for improving aluminium tolerance and phosphorus acquisition efficiency in lentil

Evaluation of F_6 generation of RILs has been done during the main season at research plots in CPGS-AS (Umiam), ICAR (Umiam) and CAU (Imphal). The following RILs showing good performance for yield and other yield contributing characters have been identified and listed below: Small seeded lines: LRIL 92, LRIL 103, LRIL 143 and LRIL 148 and Bold seeded lines: LRIL 18, LRIL 33, LRIL 64 and LRIL 104. Hydroponic study for the performance of the RILs for aluminium tolerance and phosphorus acquisition efficiency has been done and the following are the lines identified as being aluminium tolerant: LRIL 1, LRIL 37, LRIL 42, LRIL 113, LRIL 124, LRIL 144, LRIL 143, LRIL 148, LRIL 31, LRIL 92. Organic acid exudation estimation using HPLC has been done and the following line has been identified with higher exudation of organic acids: LRIL 124, LRIL 42, LRIL 113, LRIL 148, LRIL 3, LRIL 37, LRIL 92.

3.1.9. Identified the promising line of water mimosa

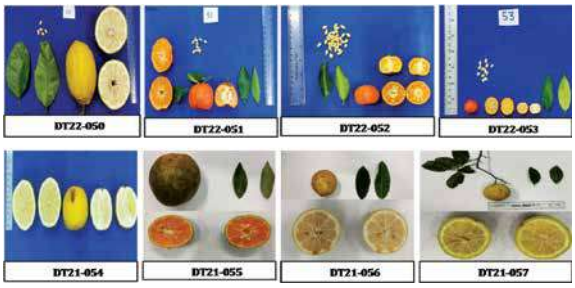
The CAU-WM-1 collected from field of Manipur state and maintained clonally (cutting) for particular trait. This genetic material is developed through selection and its produce 40 stems harvested per plant and 12345 numbers plants per hactare traits. This germplasm contain moisture (88%), vitamin A (5.4mg/100g), crude fat (1.2%), crude fiber (16%) and total ash (5.4%). A pond of an area 1ha can yield 493800 stems from an initial plant population of 12345 during 6 months of growing period. By selling the harvest at Rs. 10 / bundle (7 stems) the farmer could fetch a profit of Rs.5,05,420/- by the year 2020 and Rs. 6,31,775/- in the next year 2021.

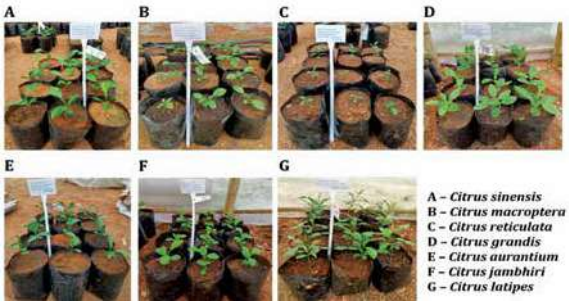
3.1.10. Development of location specific varieties of groundnut with emphasis on yield and leaf spot disease tolerance

Hybridisation programme with the objective of imparting leaf spot resistance in better yielding genotypes viz. JL-1224, PBS-12201, RG-638, JSSP-66 and ICGS-76 with leaf spot resistant donors *i.e*. ICGV-100152, GPBD-4 and ICGV-100149. Maintained 55 breeding/ segregating materials in various filial stages for selection of desired genotypes in advanced generation.

3.1.11 Morpho-phenological Characterization of Citrus Germplasm in North East India

Altogether 57 numbers of citrus germplasm were collected from various places of Meghalaya (mainly from Garo Hills Districts and Ri-Bhoi districts). Out of 57, the accession numbers for 32 ermplasms were obtained from the ICAR-NBPGR, New Delhi. The sufficient numbers of seeds of these 32 germplasms were handed over to the curator for Cryo-Preservation at NBPGR, New Delhi. The passport datasheets for all 57 germplasm were developed. The morpho-taxonomic studies on leaves, fruits,





seeds and tree types as per IPGRI descriptors were completed for all 57 germplasms.

Citrus seedlings belong to species *Citrus sinensis, C. macroptera, C. reticulata, C. grandis, C. aurantium and C. latipes* were grown successfully in nursery bags and maintained in the polyhouse where Al-toxicity levels (0, 100 and 200 ppm) were imposed for profiling root exudates patterns and physiological stress parameters.

3.1.12 Exploration and collection of citrus germplasm in Sikkim

Exploration and collection of Citrus germplasm in Sikkim under the project was conducted from 21st November, 2021- 27th, Nov, 2021 in collaboration with Scientist NBPGR.

Citrus medica (Citron) from Barfung, West Sikkim

Rough lemon and Sweet lime from Dentam, South Sikkim

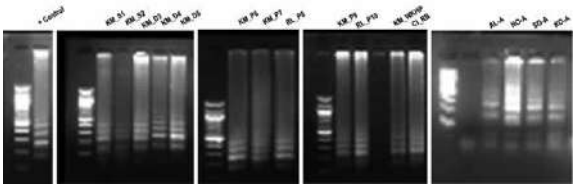
Acid lime and Pumello from Mangzing, South Sikkim

Grafting of Sikkim mandarin on rough lemon at COH, Bermiok

Overall 32 collections of citrus accessions were made during the trip from various parts of Sikkim viz. Khamdong, Yangyang, Mamging, Ravangla, Radhukhandu, Dentam, Dzongu, Bermiok, Lum. Morphological characterization of each accession was also taken on the same day of collection. Grafting was done and 180 numbers of graft unions was successfully produced. IC numbers for 26 accessions out of 32 collections were received from NBPGR, New Delhi.

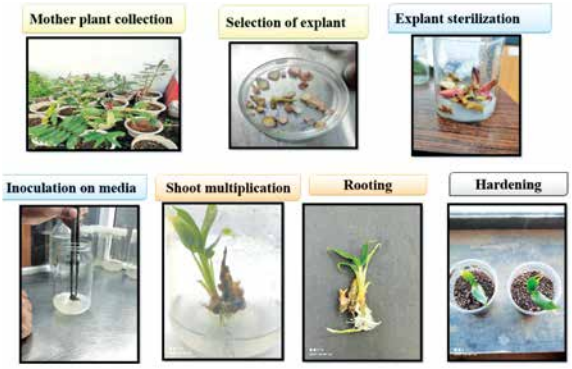
3.1.13. Development of diagnostic Kits for quick detection of CTV, HLB and Phytophthora rot diseases in Citrus of North East India

28 numbers of citrus greening samples have been collected covering districts from three different North-Eastern states (Meghalaya, Assam, and Arunachal Pradesh). CLas specific LAMP primers have been procured and optimization with gDNA of Clas collected from IARI, New Delhi has been carried out. With optimized LAMP reaction condition 16 samples has been found positive for the presence of CLas. 16SrRNA assessment for the collected samples is under process and so far amplification has been carried out for three numbers of samples. PCR amplification with universal primer and also CLas specific primer suggest the presence of CLas in the collected sample *viz.* KM_BC and KM_GH1.



3.1.14 Clonal propagation of Hedychium rubrum – a rare ornamental herb of north east India

In vitro regeneration of red ginger lily



(*Hedychium rubrum*) using rhizomatous buds standardized and evaluation of its field performance is being recorded.

3.1.15 Conservation and utilization of horticultural genetic resources in Mizoram

For the conservation and utilization of horticultural genetic resources, faculty has explored Mizoram for various vegetable biodiversity hotspot and made systemic germplasm collection of three crops *viz.,* Mizo bird's eye chilli, pumpkin and French bean. Keeping in view of the admixture quality of the first GI crop of Mizoram *i.e* Mizo Bird's eye chilli (*Capsicum fruitescens* L) the department has successfully characterized and evaluated 143 germplasm lines. The first season data provided 5 promising pre bred lines for fungal

resistant, and ChLCV screening will be carried on the upcoming summer season. The F_2 populations of these 143 lines were conserved in seed storage at -20^{0}C condition. Moreover, 34 pumpkin (*Cucurbita moschata*) germplasm lines were characterized based on Biodiversity International criteria. Three pre bred lines for high starch content and CMV were identified on field condition. The seeds were conserved at -20^{0}C refrigerator and subsequent screening of germplasm lines will be taken in the upcoming season. The work on French Bean (*Phaseolus vulgaris*) germplasm lines focuses mainly on the conservation of germplasm in seed banks and development of pre bred lines for photo insensitive bush type with rust and FBGMV.

3.1.16 Micropropagation of *Kaempheria parviflora*

Treatment T_7 was found to be the most effective treatment in terms of the axenic culture established (30%) of *Kaempferia parviflora* rhizomes. The rate of the fungal contamination was higher and difficult to control due to endophytic fungal spores which reside inside the plant tissue. Among the different media compositions tested BG_6 (MS

+ 3 mgl^{-1} BAP + 4% Sucrose + 0.25 % Gelrite) recorded maximum sprouting percentage (90%) and took minimum number of days to sprout induction (15 days).

B. Crop Production

3.1.17. Standardization of training system of Dragon fruit for higher yield

Several research activities such as standardization of training system of Dragon fruit for higher yield, propagation of dragon fruit through cuttings and nutrient management of dragon fruit were studied and standardized.

3.1.18 Introduction of Saffron cultivation in Meghalaya condition

College of Agriculture, Kyrdemkulai has taken up saffron cultivation at the campus with 200-300 saffron corms were planted under the project “Saffron Farming in North Eastern

States of India under Kesar Mission funded by NECTAR, Shillong. Different nutrient treatments and spacing was given in six replicates under two sowing dates. As of crop response, rooting was observed to have initiated during 3rd week of September and initial shoot germination was observed during 1st week of October. The germination and crop response is still under observation. Inter-cultural operation like weeding is being carried out as and when required. Saffron flowering was observed during November.

3.1.19 Effect of Molybdenum and Boron on growth and yield of Cauliflower

An experiment was carried out to study the yield of cauliflower (var. Ingkholei) as affected by molybdenum and boron application.It is found that the effect of boron and molybdenum application was significant in respect of yield of cauliflower. Among various treatments, significantly highest yield of 20.08 t/ha was recorded with application of Borax @10kg/ha + Sodium molybdate @2kg/ha as compared to controlled (11.33 t/ha). The curd diameter was also found highest with the application of Borax @10kg/ha + Sodium molybdate @2kg/ha with a mean of 14.43 cm as compared to controlled (8.73 cm).

3.1.20 Effect of boron and sulphur on soil properties and crop yield of blackgram

A field experiment was conducted at the research farm of the College of Agriculture, Imphal to study effect of boron and sulphur on blackgram (var. PU-31).The results indicate that the effect of boron and molybdenum application was found to be significant in respect of yield of blackgram. Among various treatments, significantly highest yield of 4.17 q/ha was recorded with application Boron @1.5 kg/ha + sulphur @20kg/ha as compared to controlled (1.67 q/ha).

3.1.21 Effect of sulphur and boron on yield and quality of Soybean

Field trials conducted at College of Agriculture, Imphal under the project AICRP-MSPE, CAU, Imphal Centre to study the yield and quality of soybean (var. DSB-32) to boron and sulphur application, found that the effect of boron and molybdenum application was significant in respect of yield of cauliflower.

Among various treatments, significantly highest yield of 3.24 t/ha was recorded with application Boron @1.5 kg/ha + sulphur @20kg/ha as compared to controlled 1.47 t/ha.

3.1.22 Identified climate resilient traditional rice varieties for Manipur

The yield variability under varied agro-ecology were narrow in shallow- land cultivar Akhanphou (18%) and upland cultivar Takanu (19.9%) showing higher tolerance capacity to varied agro-ecology.

3.1.23 Evaluation of gladiolus genotypes for vegetative and flowering characters

In the first year of evaluation for various vegetative and flowering characters; Pusa Manm ohak (T_1) performed well in regards to maximum plant height at 30 days after planting, rachis length, number of florets per spike, number of spikes per plant; Punjab Glad-3 in terms of maximum plant height at 60 and 90 days after planting, spike length, diameter of the second floret, vase life and cormels per plant; Pratap Glad-1 performed well in terms of number of florets remained open at a time, number of spike per plant, vase life, and fresh weight of the cormels. For the corm characters, Arka Rajini (T_3) performed well which registered the maximum number of corms per plant, diameter of the corms and number of cormels.


Pusa Manmohak


Punjab Glad-3


Arka Rajini


Pratap Glad-1


White prosperty


Punjab Don

3.1.24 Evaluation of African marigold genotypes for loose flower

In the first year of evaluation, Pusa Arpita (T1) performed well in regards to maximum plant height, plant spread, number of secondary branches and maximum number of flowers per plant; AAU-M4 in terms of maximum number of primary branches and number of flowers per plant. KAU-M-1 had recorded the maximum duration of flowering, diameter of the flower and loose flower yield per plant.


Pusa Arpita


Bidhan marigold-4


KAU-M-46


KUM-M-1

3.1.25 Collection, characterization, evaluation and maintenance of tropical Orchids germplasm

In the year 2021-22, nearly 20 species of orchids have been collected and is being maintained.Out of these 20 species collected, 10 species have already flowered and the data has been recorded for various vegetative and flowering parameters. It includes a total of 7 sympodial and 3 monopodial species. Based on their habitat, 9 orchids collected are epiphytic in nature and only one terrestrial orchid i.e. *Epidendrum radicans* has been collected.

Coelogyne viscosa

Aerides odorata

Dendrobium chrysanthum

Cleisosostoma paniculate

Dendrobium aduncum

Eria spp.

3.1.26 Standardization of drying and dehydration techniques of native wild ornamentals

During the year 2021-22, a total of sixteen (16) species of plants have been collected from different districts of Arunachal Pradesh. Data revealed that the fresh and dry weight of the plant samples was found to be maximum in wild tulsi (8.49 g and 6.31 g) followed by *Erioscirpus spp.* (8.08 g and 6.08 g) respectively. The minimum moisture loss (7.13%) was noted in *Anaphilis busua* and it was at par with

Anabilis busua

Scirpus cyperinus

Sample 1 (unidentified

Elsholtzia cristata

Sample 2 (unidentified)

Sample 3 (unidentified

Open vertical drying of plant specimens

Uptake method of Dendrolycopodium obscurum

Uptake method of Dicranopteris linearls

Uptake method of Sample 1 (unidentified)

Glycerine drying of plant speciment

Barleria cristata, Mountain grass, sample 5, 1, 2, 4, 5, 6 and *Setaria parviflora*. Amongst the plants sample, the maximum score for texture (4.83) was noted in *Setaria parviflora* which suggest that it has a very smooth texture.

The results were at par with *Erioscirpus spp.*, Sample 6, *Scirpus cyperinus* and sample 3 which had a score ranging from 3.50 to 4.17 suggesting medium to smooth texture of the plants. Similarly, plant samples viz. sample 1, 2, 4, 5, Anaphilis yellow, mountain grass and sample 7 had rough texture. The highest score for brittleness (4.00) was recorded in Anaphilis yellow and sample 6 which suggest that the plant parts remained intact. The minimum score (1.50) was noted in sample 7 followed

by sample 3 (1.67) indicating that the plant samples were brittle to very brittle. With regard to shape retention and overall acceptance, *Erioscirpus spp*. scored the maximum (4.83 and 4.50, respectively) which implies that the plants were very good to excellent and suitable for air drying.

3.1.27 Collection and evaluation of buckwheat germplasm from Arunachal Pradesh

Eight numbers of new germplasm of Buckwheat were collected from different parts of Arunachal Pradesh and performance were evaluated under Pasighat condition and found that three landraces are superior to check. The yield (4.90-9.40 g/plant) were recorded for the eight germplasm. The check yield was recorded 6.45 g/plant.

3.1.28 Collection, identification and conservation of wild edible and medicinal mushrooms

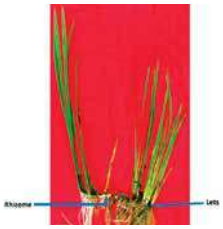
Twenty-two wild edible /medicinal mushroom species were collected from different parts (four district *viz*. East Siang, Lower Dibang Valley, Lohit and Namsai) of Arunachal Pradesh instantly after rainy season on the basis of GPS data. The species were immediately cultured on PDA medium. Few species studied up to on preparation of spawn

production/cultivation and few of them were spoiled due to weather change frequently in this region. Two species like *Calocybe* species and *Schizophyllum* species used for cultivation under foot hills of Pasighat conditions of Arunachal Pradesh.

3.1.29 Characterization and evaluation of 40 accessions of *Acorus calamus* (IC-0632778 to IC-0632817)

Traits such as plant height, number of leaves, leaf length, leaf width and leaf area index can be selected, whereas number of leaflets, number of scales, rhizome length, rhizome width, rhizome weight, rhizome yield and essential oil content can be selected upon for successful crop improvement programme (as revealed by analysis of variance, genetic parameters, correlation and path coefficient analysis). There was enough diversity among the accessions studied as indicated by diversity analysis, suggesting enough variation is present among the collection for future selection programme.

Field view



Acorus colanus

Extracted essential oils

C. Crop Protection

3.1.30 First report of Lisotrigona bees to damage through drinking tear and sweat from India

The drinking sweat and tears *Lisotrigona* bees of the first kind were reported by the Department of Entomology from Thenzawl. The studied on feeding were observed from 0900 to 1530 hours which concluded the drinking on tear and sweat lasted for 35 to 180 seconds.

3.1.31 Identified hive designing for *Apis cerana himalaya*

ISI A type with 8 frames has the maximum egg laying area of (324.33 cm^2), brood area of

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First report of drinking tear and sweat by *Lisotrigona* bees (Apidae: Meliponini) from India

Rojeet Thangjam, Shubham Rao, Shashidhar Viraktamath & L. Devarishi Sharma

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To link to this article: https://doi.org/10.1080/00218839.2021.1933369

(1216 cm^2), honey store of (533.66 cm^2) pollen stores of (521.00 cm^2) followed by local made hive with (252.33 cm^2), (1197 cm^2), (526.66 cm^2) and (471.33 cm^2) of egg laying area, brood area, honey store and pollen store respectively and the least was found in modified ISI A type hive with brood chamber and frame reduced by 2 inches with 6 frames. This shows that ISI A type with 8 frames is a scientific and most advance hive for *Apis cerana himalaya.* It is recommended to use ISI A type hive followed by local made bee hive for Manipur state.

3.1.32 Efficacy of fungicides in control of Polysora rust disease of Maize

Foliar application of Mancozeb 75%WP @ 0.20% found significantly superior with respect to disease control efficacy (48.32%) and increase in grain yield (42.76%).

3.1.33 Efficacy of bio-pesticides for the management of insect pests of *Curcuma caesia*

In this experiment, among all the treatments the chemical check was found to be the most efficient followed by Spinosad 45SC @ 0.4ml/L with 54.07 % pseudostem damage reduction over control against shoot borer of *Curcuma caesia* followed by *Bacillus thuringiensis* @ 2g/L with 41.55% pseudostem damage reduction over control.

3.1.34 Evaluation of indigenous technology knowledge (ITK) practice for the management of fall armyworm

All the treatments recorded minimum Davis score <2 whereas in control it varied from 3.05 to 4.15. Minimum ear damage rating was observed in Bait+Chlorantaniliprole 18.5 SC @ 5 ml/kg compared to untreated control (5.57). Maximum grain yield was obtained in Bait+ Chlorantaniliprole 18.5 SC @ 5 ml/kg (159.85 q/ha) compared to untreated control (57.56 q/ha).

3.1.35 Establishment of disease-free elite Khasi mandarin and Sweet Orange genetic stocks through shoot tip grafting (STG)

Survey was conducted in citrus growing areas of Meghalaya (East Khasi Hills, West Jaintia Hills, Ri-Bhoi district, West Garo Hills and West Khasi Hills) to identify elite candidate plants of Khasi mandarin. At least two candidate plants from each location were identified as potential candidate plant and data was collected. These candidate plants (20 years old and above) have been selected for their vigour, lack of disease symptoms and bearing intensity. Leaf and fruit samples were also collected for virus indexing using molecular method and qualitative analysis using biochemical methods

Candidate plants from Nongjrong village, East Khasi Hills District

Candidate plants at Mawphu village, East Khasi Hills District

MAWPHU-1 MAWPHU-2

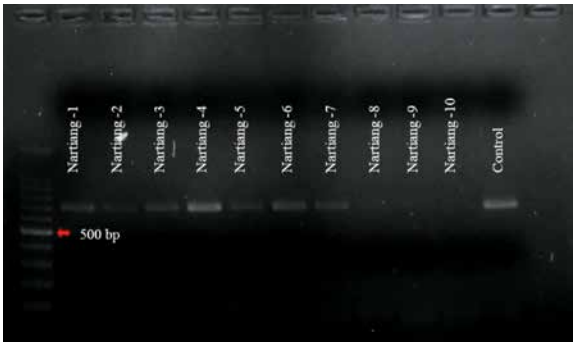
MAWPHU-3 MAWPHU-4

respectively. 9 candidate plants have been selected based on their fruit quality (size, weight, rind thickness, juice content, etc) and yield (>1000 fruits per season).

3.1.36 Development of disease-free quality planting material of Khasi mandarin (*Citrus reticulata Blanco*) from North East India

Survey and collection of samples for CTV incidence in citrus growing areas in four

A declined tree of Khasi Mandarin due to CTV infection at Nartiang, WJH



RT-PCR amplification of Khasi mandarin samples collected from Nartiang, West Jaintia HIlls

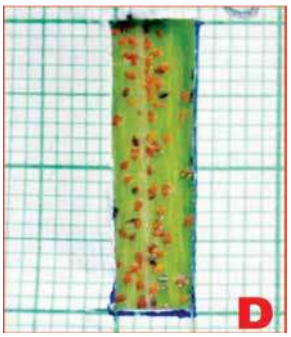
(A) Inoculation of brood lac

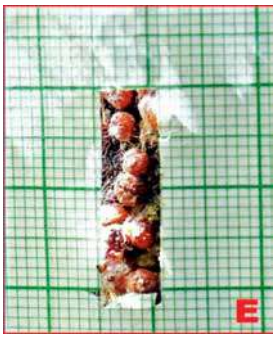
(B) Emergence of first instar crawlers

districts of Meghalaya done including East Khasi Hills, Ri-Bhoi district, West Jaintia Hills and West Garo Hills. Molecular detection of CTV showed disease incidence of 70%, 83% and 60% respectively from West Jaintia Hills, East Khasi Hills and Ri-Bhoi district of Meghalaya.

3.1.37 Biology and host preference of lac insect studied in Manipur condition

The host preference was studied on five host plants (*Cajanus cajan*, *Flemingia macrophylla, Flemingia semialata, Calliandra surinamensis and Malvaviscus penduliflorus*). The mean initial density of crawlers was found to be highest with 112.89 per cm^2 on *Flemingia macrophylla*. The mean initial mortality was found to be maximum on *Cajanus cajan* with 19.56% and minimum on *Flemingia macrophylla* with 11.74%. The mean final density of crawlers varied from 75.17 per cm^2 on *Cajanus cajan* to 94.24 per cm^2 on *Flemingia macrophylla*. The mean density at crop maturity (number of female cells per cm^2) was found to be the maximum with 7.85 per cm^2 on *Flemingia macrophylla*. The maximum mean cell weight was 21.49 mg on *Flemingia macrophylla.* The maximum mean fecundity of female cell (per female cells) was 318.42 on *Flemingia macrophylla.* The maximum mean total yield of scrapped-lac(g) was 166.84 g on *Flemingia macrophylla.*

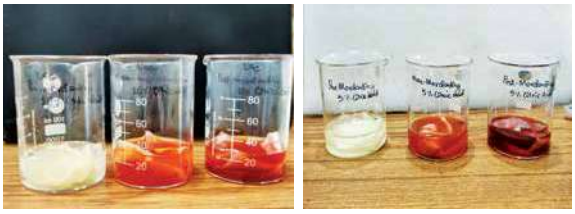




(D) Final density of settlement (E) Density at crop maturity

3.1.38 Effect of mordants on silk dying with lac dye

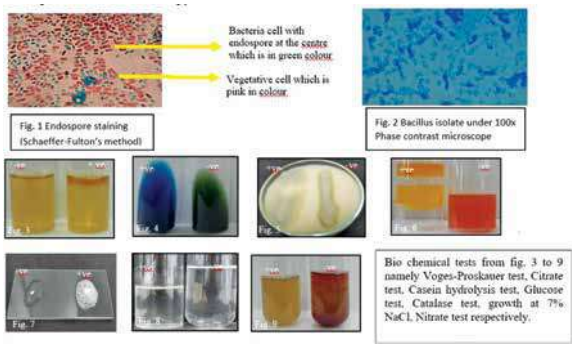
It has been observed that pre-mordanting methods with 10% Potassium Alum ($KAl(SO_4)_2$) at the ml ratio of 1:10 of the lac dye produces more darker intensity whereas in case of citric acid meta-mordanting methods with 5% citric acid at the ml ratio of 1: 10 gives more darker intensity. lac dye produces 6 different shades as it is screened for 24 treatments. However colour eveness and intensity could develop only in perfect mordant at definite amount under specific process. The shades of all the treatments have been analyzed through Munsell colour chart as given below in table.



Photographs showing the silk dyeing procedure

3.1.39 Exploring the diversity of Bacillus thuringiensis in the NER for mining of novel insecticidal genes

Saline + Enrichment method has been sorted as efficient method for Bt isolation. T3 Agar was found best in sorting the *Bacillus* like colonies. Isolation has been done for a total of 20 samples collected from three districts of Meghalaya namely Ri-bhoi, East khasi hills, Jaintia hills and 8 samples collected from the two districts of Manipur namely Bishnupur and Imphal west, and a total of 32 *Bacillus* like isolates were isolated. Morphological characterization of 32 *Bacillus* like isolates has been done using gram staining and endospore staining (Schaeffer-Fulton's method). All the 32 isolates showed positive results for these tests. Seven biochemical tests has been conducted so far for the 32 test isolates, of which 21 isolates were tested positive for nitrate reduction test; 27 isolates were tested positive for VP test; 10 isolates were tested positive for citrate test; 20 isolates were tested positive for casein hydrolysis; 28 isolates were tested positive for glucose test; 28 isolates showed positive results for catalase test; and 27 isolates showed positive results for growth in 7 % NaCl. Further confirmation of these isolates for *Bacillus thuringiensis* will be done using phase contrast microscopy and molecular characterization.



3.1.40 Integrated Pest Management in Rice

Farmers participatory location specific IPM trials were conducted in Rice crop in 10 ha area involving 25 farmers during *Kharif* 2021 at Village Umeit, Thadnongjaw, Marangar, Nongpoh of Rhi-Bhoi district, Meghalaya. The components of IPM validation were rice variety CAU R-1 and Ranjeet, seed treatment with Bavistin @ 2g/kg seed/ *Pseudomonas fluorescens* @ 8g/kg of seeds, transplanting of 2-3 seedlings/hill, installation of Scirpo pheromone traps @ 20 traps/ha for stem borer management, installation of rotten crab or carcus @ 50 traps/ha for trapping gundhi bug during milky stage and need based spraying of Bavistin @ 2g/l water/neem pesticides @ 2.5 l/ha. The average incidence of insect pests recorded in IPM fields were, stem borer (5%), leaf folder (12%), gundhi bug (6%) as compared to farmer fields which recorded stem borer (11%), leaf folder (17%) and gundhi bug (9%). The average incidence of sheath blight and brown spot diseases were rerecorded as 11 and 12% in IPM whereas it was 18.0 and 19.5% in farmers' fields. Average yield under IPM was 42.5 q/ha compared to 36.0 q/ha in farmer fields with benefit cost ratio of 1.51 in IPM as compared to 1.42 in farmers' fields.

3.1.41 Management of rhizome rot of ginger and turmeric

Different varieties of ginger and turmeric were used in the study. Out of which the performance in terms of highest germination was observed in Singbah variety of ginger and

local turmeric-2 but the yield was higher in Local ginger-1 and Local turmeric-2. Incidence of rhizome rot was observed in most of the varieties. Mulching with green leaves, paddy straw, dry leaves etc. is an important component in the management practices of ginger and turmeric which resulted in higher germination in ginger and turmeric.

D. Post Harvest Technology

3.1.42 Value added products from local fruits and other plants

The department has successfully studied a preservation technique for local delicacy *i.e.* bamboo shoot in brine and frozen form. In addition, five products are developed from local raw material such as ginger candy, tamarind candy, aonla candy, papaya tutti frutti, Hatkora (*Citrus macroptera*). Squash which were branded as '*Zo Foods*' under FSSAI registration.

Post harvest products

3.1.43 Pre-mix for instant preparation of Black scented rice (Chak-hao) kheer

Chak-hao kheer pre-mix was developed in the College of Food Technology, CAU, Imphal with an aim to provide instantly prepared food to general public. *Chak-hao* rice is pretreated through a standard protocol and thoroughly mixes with other ingredients. Mixtures are sealed, packed and marketed for instant pre-mix use.One kg of *Chak-hao* rice yields about 2 kgs of *Chak-hao* instant pre-mix product with all the required ingredients and the cost of production of 2 kgs instant pre-mix product is approximately Rs.500/- which could be marketed at Rs.2,000/- (approximately) resulting in Rs.1,500/- net profit.

Black Scented Rice (*Chak-Hao*) Kheer

3.1.44 Standardized suitable curing mixture for preparation of Vawksa rep

Suitable curing mixture was developed for preparing *Vawksa rep* with a different taste by developing a spice formulation of the commonly found spices and also by using *Nisin* (food grade bacteriocin) spray just before packaging of the product in order to extend the shelf life of the product. Throughout the storage period the

Cured Modified *Vawksa rep*

modified *Vawksa rep* exhibited much lower Tyrosine value (less than 2mg/100g of meat sample) whereas the traditional sample was more than 8mg/100g of meat sample. Same is the case with TBArs value, Oxidative rancidity was not observed as the value was also less than 1mg malonaldehyde/ Kg meat sample. The modified product could be successfully stored up to 20th days of storage whereas the traditional one has developed sliminess, mold growth and rancidity after 6 days of storage at refrigeration temperature (4±1˚C). Cost of production was comparable with the traditional one as only Rs 4.00/Kg is to be invested more to produce the modified *Vawksa rep.*

3.1.45 Formulation and standardization of value added products of pumpkin

Successful formulation of pasta using pumpkin powder and fnalization of formulation of pumpkin seed butter with spices and locally available condiments has been made. Proximate composition analysis is done for Pumpkin flour, pumpkin seeds flour, Roti, Puri.

Pumpkin powder Incorporated Pasta

Pumpkin Seed butter with different flavor

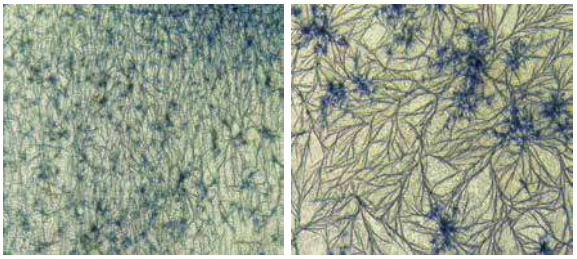
3. 2. Veterinary Science

3.2.1 Selective breeding on Mizo Local (Zovawk) of pig

During period 10 farrowings were obtained from Zovawk to produce 59 Zovawk piglets. Average litter size at birth of Zovawk was 7.38± 0.42.The corresponding mean value at weaning was 4.88± 1.47. The average individual weight (kg) at birth and weaning of Zovawk was 0.60±0.02 and 3.78±0.08 respectively. The pre-weaning growth rate (g/day) in Zovawk was 76.01±0.02and the post-weaning growth rate (g/day) was 161.69±1.50.

3.2.2 Identification of key determinant (s) of immune competence in pigs through proteomic approach

The proliferative response of Zovawk PBMCs stimulated with 5, 10 and 20 µg/ml of Poly I:C was found to be 1·755±0·014, 1·897±0·065, 1·617±0·03 respectively, whereas the proliferative response of LWY PBMCs at the same concentrations was found to be 1.015±0.004, 0.977±0.006, 0.952±0.007 respectively. The proliferative response of Zovawk PBMCs stimulated with 5, 10 and 20 µg/ml of LPS was found to be 1·31±0·02, 1·327±0·03, 1·239±0·022 respectively, whereas the proliferative response of LWY PBMCs at the same concentrations was found to be 1.089±0.020, 1.133±0.019, 1.059±0.026 respectively. The proliferative response of Zovawk PBMCs stimulated with 5, 10 and 20 µg/ml of PGN was found to be 1.092±0.012, 1.053±0.023 and 1.008±0.066 respectively, whereas the proliferative response of LWY PBMCs at the same concentrations was found to be 1.018±0.005, 0.969±0.006 and 0.950±0.009 respectively.



3.2.3 Gene expression studies in Zovawk

Time course relative gene expression studies in Poly I: C (5µg/ml) stimulated PBMCs of Zovawk pigs revealed a continuous increase in the expression of TLR3 (26 folds), IL6 (97 folds) and IL8 (204 folds) up to 12 h and then their expression was decreased (Fig. 2). Whereas the relative expression of IFNG was found to be decreased from 0 to 24 h (20 folds). In LPS (10µg/ml) stimulated PBMCs of Zovawk pigs,IL1B (94 folds) and IL6 (163 folds) were found to be increased significantly from 0 h to 12 h and their higher expression was maintained up to 24 h (Fig. 3). TLR4 expression was found to be increased from 0 to 24 h (3 folds). In PGN (5µg/ml) stimulated PBMCs of Zovawk pigs, a significantly higher expression of IL6 at 4 h (103 folds) was observed and its higher expression was maintained up to 24 h (23 folds)(Fig. 4). IL1B expression also increased up to 4 h (29 folds) and maintained its expression up to 24 h (20 folds). Interestingly, IL10 expression was not observed in both LPS and PG stimulated PBMCs of Zovawk pigs.

3.2.4 Gene expression studies in LWY

Time course relative gene expression studies in Poly I: C (5µg/ml) stimulated PBMCs of LWY revealed a continuous decrease in IFNG and TNFA expression from 0 to 24 h. The relative expression of TLR3 and IL6 increased significantly up to 4 h and then their expression was slightly decreased. On the other hand, IL8 expression was found to be increased significantly from 0 to 24 h. IL1B and IL6 expression in LPS (10 µg/ml) stimulated PBMCs of LWY was found to be increased significantly from 0 to 24 h. TLR4 and IL10 expression was also found to be increased significantly from 0 to 12 h and a higher expression of both the genes are maintained up to 24 h. In PGN (5 µg/ml) stimulated PBMCs of LWY, a significant higher expression of TLR2 and IL6 from 0 to 24 h was observed. The expression of IL1B and IL10 increased significantly from 0 to 4 h and then their expression was slightly decreased by 24 h. TNFA expression was slightly increased initially (up to 4 h) and then decreased by 24 h.

3.2.5 *Salmonella Typhimurium* via synthetic genome recoding of key metabolic regulators

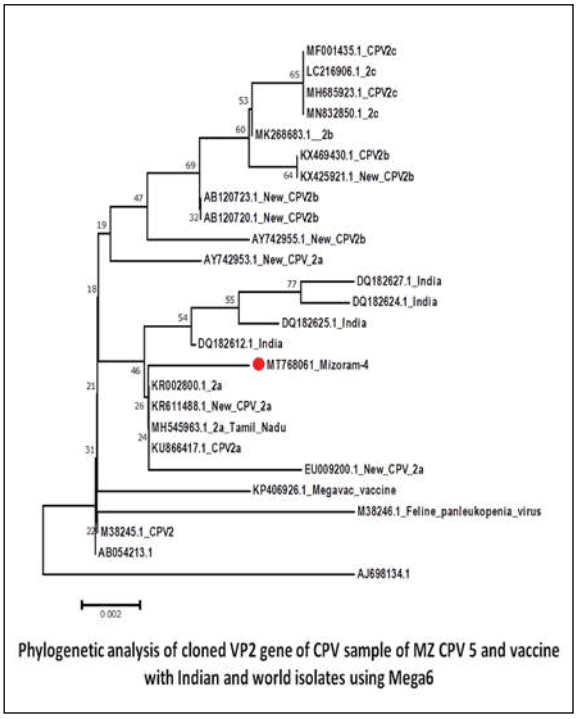
The target gene *i.e*. *ArcA* was retrieved from National Centre for Biotechnological Information (NCBI) website. The gene was recorded by replacing the normal codon with synonomous rare codons using codon usage table of *Salmonella* Typhimurium. The recoded gene was synthesized commercially and was obtained as a cloned product in pUC 57 vector. The recoded *ArcA* gene was amplified by using this recombinant pUC57 plasmid as template. The amplified product of 809 bp has been shown. The amplicon was then gel purified by using QIAgen gel extraction kit as per the manufacturer's instructions and directionally cloned in p KSI1 vector using Eco RI and Kpn I restriction enzymes. The clone was also confirmed by colony PCR.

FPCR amplification of recoded ArcA gene from recombinant p UC 57 vector

Colony PCR showing amplification of recoded ArcA from recombinant p KSI vector

3.2.6 Molecular epidemiological studies of canine parvovirus-2 variant(s) from clinical cases of dogs and cats

Prevalence rate of CPV-2 cases among dogs in 8 NEH states of India from January 2020 through May, 2022: 42.52% (202/475). State-wise prevalence rate of CPV-2 cases among dogs: Arunachal Pradesh (16.21%), Assam (20%), Manipur (43.18%), Meghalaya (49.09%), Mizoram (59.44%), Nagaland (31.81%),



Phylogenetic analysis of cloned VP2 gene of CPV sample of MZ CPV 5 and vaccine with Indian and world isolates using Mega6

Sikkim (33.33%) and Tripura (25.0%). Age of occurrence: 44days-18 months (2-3 months). Breed-wise incidence: Highest occurrence in mixed breed dogs (52.83%). Month-wise incidence: Jan & Feb (Highest); September & October (Lowest). Season-wise incidence: Highest in winter followed by summer and rainy season, respectively. Percentage of dogs unvaccinated against CPV-2: 86.58%. Clinical variants observed in dogs with acute CPV-2 (n=51): Anorexia (75%), moderate vomiting (65%), hemorrhagic watery diarrhea (64%), mild to moderate depression (61%), and mild dehydration (44%). Culture & Identification of bacteria from CPV-2 affected fecal samples (n=25): (i) *E. coli* (91.1%), *Salmonella* spp. (4.41%) and *Klebsiella* spp. (4.49%). Antibiogram for ESBL *E. coli* (n=25): 100% sensitivity to Carbapenem, 48% sensitivity to Ceftriaxone, 45% sensitivity each to Ciprofloxacin and Enrofloxacin.

3.2.7 Molecular biological studies on porcine reproductive and respiratory syndrome (PRRS) virus in pig

The epidemiology, clinic pathology of outbreaks was studied and the circulating ASFV strain characterized as genotype II. A total of 10 isolates from field outbreaks of PRRS have been successfully isolated in MA104 cell lines. Five of the isolates were characterized as HP-PRRSV belonging to Lineage 8/ sublineage 8.7 and subgroup IV on the basis of full genome sequencing and other five are submitted for full genome sequencing. The N gene of PRRSV genotype 2 Indian isolates (PRRS/MZ/IND/109A/18, Genbank#MK315210.1) is successfully cloned into pET21a expression vector and recombinant N protein of PRRSV is expressed and purified. Indirect ELISA using purified N protein as antigen for detection of antibody against PRRSV in field porcine sera samples is optimized and under process of validation. Monoclonal antibody production against Nucleocapsid Protein of PRRSV virus for development of pen side diagnostics for rapid detection of PRRS is under process. The epitope I of GP3 protein (aa 61–72, QAAAEAYEPGRS) and epitope IV of GP5 protein (aa 186–200, TPVTRVSAEQWGRP) of PRRSV are being cloned into C-terminal of PCV2 capsid region for development of recombinant chimeric PCV1-2 expressing PRRSV antigen(s) DIVA vaccine.

3.2.8 Identification of the indigenous local animal population available in the state of Manipur

Data collection on 400 Indigenous Manipuri Cattle has been completed in two valley districts of Manipur.Data analysis work on Indigenous Haofa Dog has also been initiated. Under "Conservation of Manipuri Pony" Project, eight foals were produced under scientific breeding programme, thereby increases the herd strength of this endangered breed.

Manipuri Cattle - Bull

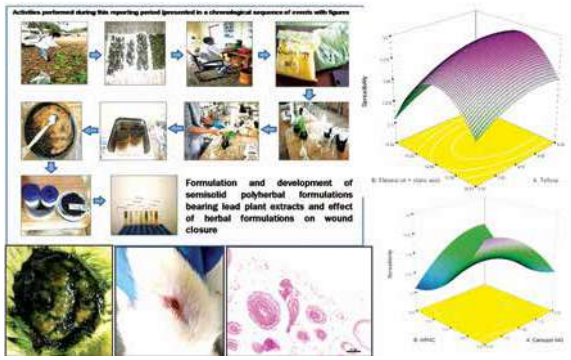
Manipuri Cattle - Cow

Haofa Dog

UH with foel

3.2.9 Efficacy of identified herbal leads on wound healing and veterinary dermatological complication

Prepared semisolid methanolic extracts from eight plants after identification and authentication by Botanical Survey of India (BSI) as well as GPS tagging. Phytochemical analysis of 4 plant extracts out of 8 extracts showed presence of terpenoids, flavonoids, glycosides and tannins. Under *in vivo* wound model study in rats with 4 herbal formulations prepared out of 8 extracts, it was observed that rats of group-1 showed fastest wound



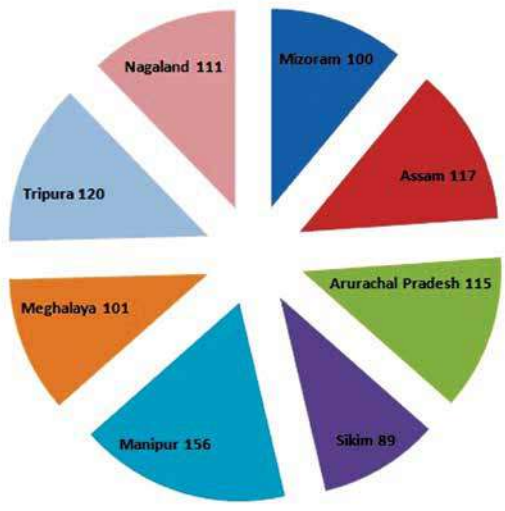
Plant collection, methanolic extract preparation, *in-vivo* wound model study in rats with pre-formulation study

closure on treatment with herbal formulation 'C1' on day 27th and there was complete scar tissue formation as compared to the other herbal preparations and controls. The percentage wound closure was highest in group-1 (70.10%) on day 21st of treatment. We have sent methanolic plant extracts of all the plant extracts leads to CSIR-CDRI, Lucknow (collaborative center) for initiation of the pre-formation and development of semisolid polyherbal formulation.

3.3. Fisheries Science

3.3.1 Taxonomic confirmation of the collected fish specimens based on classical and molecular tools

A total of 247 fish species from 15,650 samples collected from NE states were taxonomically identified.The fishes were classified under 13 orders, 33 families and 96 genera. A total of 303 fish species were collected so far under the component from 2012 to 2021. This included 23987 samples. The fishes were classified into 13 orders, 33 families and 104 genera. Out of these, 162 fish species were barcoded. Purified PCR products of 16 species (including 2 new species from Nagaland) of collected specimens from Tripura, Mizoram and Nagaland that has not been barcode in phase I are ready for sequencing. 128 samples of 26 fish species under 21 genera collected in a sampling survey conducted in the state of Tripura were taxonomically identified and confirmed. 150 samples of 8 fish genera collected in a sampling survey conducted in rivers of state of Nagaland were taxonomically identified and confirmed. The scientists suggested fresh sample collection for taxonomical confirmation and erection of new species, if any. Database of 303 NE fish species were prepared and ready for uploading in the College website.



3.3.2 Effects of variable dietary Protein supplements on sperm, egg quality, and breeding performance of O. bimaculatus

A significant differences (P<0.05) were observed in reproductive parameters with different dietary protein levels. Highest relative fecundity, GSI were found in female fishes fed with 40g protein per kg diet. After performing the breeding both quantity of eggs

Collection of pabda brooder | Weighing of Brooder | Breeding tank set up

Fertileed eggs collection | Fertileed Eggs | Incubation of eggs

Fertileed eggs T1 | Fertileed eggs T2 | Fertileed eggs T3

and fertilization rate were found significantly different and maximum in case of Treatment-3 (40% protein).It is clear that protein is involved in the reproduction of a fish. Reproductive genes like LH, FSH shows higher expression in treatment 3 ($P<0.05$) in both male and female gonads.

3.3.3 Effects of variable dietary Vitamin E supplements on sperm, egg quality, and breeding performance of O. bimaculatus

A significant differences ($P<0.05$) were observed in reproductive parameters with different dietary Vitamin E levels. Highest relative fecundity, GSI and HIS were found in female fishes fed with 100mg Vitamin E per kg diet, After performing the breeding fertilization rate and hatching % were calculated and found significantly different and maximum in case of Treatment-1 (100mg Vitamin E). Important reproductive genes like *RXR ß-A, LH, FSH, brdt, androgen receptor, estrogen receptor* etc. showed highest expression in T1 ($P<0.05$) as compared to other treatments.

3.3.4 Developed an integrated biofloc technology and recirculating aquaculture system (iBFT-RAS) for water quality management in aquaculture

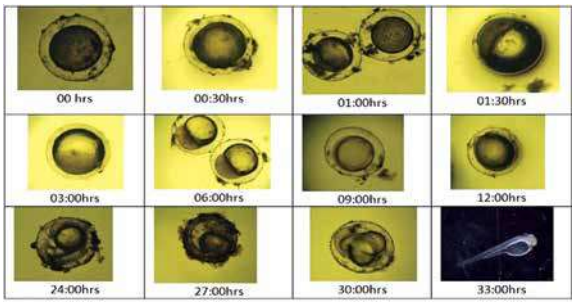
Three different carbohydrate sources such as wheat flour, rice flour and maize flour were taken in six number of FRP tanks of capacity 1000 liters for biofloc production. It was observed that at C: N = 10, inorganic nitrogen (TAN, NO_2 and NO_3) concentration significantly reduced as compared to the other treatments. The VSS (volatile suspended solids) levels varied significantly between the three treatments and by the sampling dates. Significantly higher values of VSS and BOD_5 were achieved at C:

N = 10 with their average values around 170 mg L^{-1} and 120 mg L^{-1}, respectively. The biofloc quality in terms of fish nutrition contained 35% protein, 1% lipid, 15% fibre, 15% ash and 19 MJ kg^{-1} energy (dry matter basis). Thus, the biofloc developed in the study is certainly appropriate for IMC culture except high fibre and ash content as high fibre content results in the decrease of the quantity of the usable nutrient in the diet. The energy content, mineral content and C: N ratio of biofloc produces from wheat flour as a carbohydrate sources. Images of three weeks old biofloc produce from wheat flour with 6000 magnifications were analyzed. The flocs were more or less similar in shape but varied in size ranging from 10 to 100 µm. The floc contained rod shaped bacteria (bacilli) (4.01 µm), spherical algae (1410 nm), clumps of algae mosses (5.02 µm), micro tubular type flagella spirilla (0.51 µm), peanut shaped diatom (2.8 µm), algal mat (3.617 µm), died cells of diatoms, protozoa, rotifer and other microbes. Biofloc produce from carbohydrate source is having good nutritional source and no harmful micro organism was found in biofloc which may cause problem to fish so it provided continuous natural food within the culture system.

3.3.5 Brood stock development of *Devario aequipinnatus*, Giant Danio using different diets

Methodology for evaluating different diet for brood development of *Devario aequipinnatus* is depicted hereunder. Embryonic development stages of *Devario aequipinnatus* is also shown in the figure.

Sex	Weight(g)	Length(cm)
Male	8.1±0.7	10.1±0.8
Female	7.5±0.5	10.5±0.9



Embryonic development stages of *D. aequipinnatus*

3.3.6 Interactive Evaluation of Olive Barb (*Systomus sarana*) as alternative to Rohu (*Labeo rohita*) and Mrigal (*Cirrhinus mrigala*) in Carp Polyculture System

A replacement ratio of rohu and mrigal with olive barb as 1:2.6 appeared to not significantly impact the growth performances of any of IMC on individual level in comparison that of control. The complete replacement of mrigal with olive barb resulted in significant increase in net fish biomass gain as well as the net fish yield of the culture system over the conventional polyculture or IMC. There was no significant impact of replacement of rohu and/or mrigal with olive barb on overall feed efficiency of the culture system. Exclusive complete replacement of mrigal with olive barb resulted in 59% increase in gross return and 68% increase in net return of the culture system over that of conventional polyculture of IMC. There was no significant impact of replacement of rohu and mrigal with olive barb on mean water quality parameters of the culture system.

3.4. Agriculture Engineering

3.4.1 Developed of a small manually operated device for easy separation of large cardamom capsules from its spike

A hand tool has been design and developed for segregation of capsules (bulbs) from large cardamom spikes (inflorescence). It is made up of mild steel, and the total weight of the tool

Fresh capsules separated from the spike

Hand tool for separation of capsules from large cardamom spike

Traditional method of segregating large cardamom capsules from its spike

Segregating large cardamom capsules from its spike using developed device

is 325 gram (g) with total length as 150 mm. It is designed in the form of a cone structure to ensure easy penetration of the tool in between the capsules. The cone diameter and height of developed tool were 90 mm, and 80 mm respectively. To minimize the weight of the tool, welding rods of 4 mm diameter were used to build up the cone structure. Once the tool is inserted between the capsules, the capsules can then be easily separated by a slight turning motion. The feasibility trial of the developed device was undertaken and response of the workers was recorded. With the use of the fabricated hand tool, it was observed that the separation of the capsules was faster and required less efforts and labour. However, some obstructions were felt in the current design because of the pointed tip. It is also suggested that blade shaped working element would perform the task more effectively. It was also suggested that requirement of shifting of the tip of the tool at different locations during the operation would be better.

3.4.2 Developed a thresher for buckwheat crop for small farms

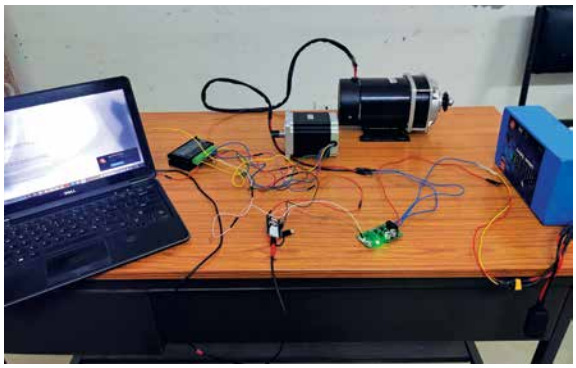
The design of thresher was conceptualize as a flow through type unit in which the crop was to be fed from one side and then the crop would move radially between cylinder and concave after threshing is done. The non grain material was to be discharged on the other side of the cylinder after threshing. The Fabrication of buckwheat thresher was done in the workshop of the College of Agricultural Engineering and Post-Harvest Technology, Ranipool, Sikkim. For the fabrication of the buckwheat thresher locally available and low cost materials were selected. The structural frame was made of mild steel to give enough strength and rigidity to the machine. The threshing efficiency increased with decrease in concave clearance, while the effect of cylinder speed and concave grate openings were not significant within the studied range. This indicates the easy thresh ability of the crop. The cleaning efficiency decreased with increase in cylinder speed, decrease in concave clearance and increase in concave grate opening size.

Pictorial view of the developed buckwheat thresher

View from the performance evaluation of the developed buckwheat thresher

3.4.3 Developed of a remote controlled sensor based direct rice seeder

A remote controlled direct rice seeder design has been design of the equipment is conceptualized as a battery operated unit, which can be remotely controlled with a mobile application or remote control device. The equipment consist of a seed drum for



two row seeding, battery, drive DC motor, stepper motor for steering gear, ESP 32 Wi-Fi module, motor drivers, frames and wheels. The instructions from the mobile application are sent to the ESP 32 micro controller through wifi. The microcontroller is programmed to operate the DC motor driver and stepper motor driver as per the instructions received from the mobile application. The DC motor is used to drive the drive wheels, while the stepper motor drives the front wheel for steering. The forward and reverse speed of the drive motor can be controlled at specified level. The degree of rotation of the stepper motor can also be controlled for desired steering. The system is powered by a 24V 20Ah Li-ion battery.

3.4.4 Evaluate the hold-on type threshers for threshing paddy crop in Sikkim farming conditions

The Goodwill paddy thresher from Renuka Engineering Pvt. Ltd., Kolkata was evaluated. The thresher has wire loop type threshing cylinder with wire mesh concave. The crop has to be held by the operator against the threshing cylinder during threshing. The Goodwill thresher, being lighter in weight was easier to transport and handle. However, the machine suffered some damage during handling due to very light material and poor fabrication quality. The throughput capacity also depends on the skill of the operator while feeding the crop. The farmers gave a very positive feedback for the thresher.

Views from the PFT of the paddy thresher

3.4.5 Development of animal drawn single row maize planter

The implement was operated with one pair of bullocks and have trapezoidal shape of seed box capacity 3.0 kg made by plastic consisted seed metering plate, shaft with adjustable opening through rack and pinion mechanism for free flow of seed in seed tube. The power wheel (lugged ground wheel) having 12 lugs, 5 cm height of each lugs. The effective diameter of power wheel is 30 cm. The Size of the planter i.e Length 67 cm, width 25.5 cm and height 80 cm, The seed metering mechanism was selected triangular cell on vertical rotor having three number of cells for metering of maize seed which was recommended by the manufacturer to achieved require rate (20 kg/ha). Developed maize planter has single row with adjustable depth of Jet- type

Developed animal drawn single row maize planter

furrow opener for planting application of maize seed at required sowing depth (5-6 cm). The required power for operation of metering mechanism shaft is achieved through sprockets chain mechanism from lugged ground wheel, weight of planter is 11.5 kg, it means easier to transport the implement from one terrace to other terrace.

3.5. Status of university and externally funded research projects (2021-22)

During the year 2021-22, University carried out 76 Intramural Research Projects (IRPs) under University Funded Research Programmes and 145 Externally Funded Research Projects. The details of the research projects are given below:

A. University Funded Intramural Research Projects (IRP)

S. No.	Directorate/College	Year (2021-22)			Total
		Completed	On going	Newly sanctioned	
1.	College of Agriculture, Iroisemba, Manipur	0	16	0	16
2.	College of Veterinary Sciences & AH, Selesih, Mizoram	2	13	2	17
3.	College of Fisheries, Lembucherra, Tripura	0	2	3	5
4.	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	0	6	8	14
5.	College of Community Science, Tura, Meghalaya	0	6	0	6
6.	College of Agricultural Engineering & PHT, Gangtok, Sikkim	0	10	2	12
7.	College of PostGraduate Studies in Agricultural Sciences, Umiam, Meghalaya	0	3	1	4
8.	College of Agriculture, Pasighat, Arunachal Pradesh	0	0	0	0
9.	College of Agriculture, Krydemkulai, Meghalaya	0	0	0	0
10.	College of Horticulture,Bermiok, Sikkim	0	0	0	0
11.	College of Food Technology, Lamphelpat, Manipur	0	0	0	0
12.	College of Horticulture,Thenzawl, Mizoram	0	0	1	1
13.	College of Veterinary Sciences & Animal Husbandry, Jalukie, Nagaland	0	0	1	1
	Total	**2**	**56**	**18**	**76**

B. Externally Funded Research Projects (EFRP)

S.No.	Name of the College	Year (2021-22)			Total
		Completed	On going	Newly sanctioned	
1.	Directorate of Research, CAU, Imphal	0	3	0	3
2.	College of Agriculture, Iroisemba, Manipur	1	7	2	10
3.	College of Veterinary Sciences & AH, Selesih, Aizawl, Mizoram	2	13	1	16
4.	College of Fisheries, Lembucherra, Tripura	1	15	4	20
5.	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	14	19	10	43
6.	College of Community Science, Tura, Meghalaya	1	0	0	1
7.	College of Agricultural Engineering & PHT, Gangtok, Sikkim	0	6	4	10
8.	College of Post-Graduate Studies, Umiam, Meghalaya	3	18	15	36
9.	College of Agriculture, Pasighat, Arunachal Pradesh	0	2	0	2
10.	College of Agriculture, Krydemkulai, Meghalaya	0	0	0	0
11.	College of Horticulture, Bermiok, Sikkim	0	1	1	2
12.	College of Food Technology, Lamphelpat, Manipur	0	0	0	0
13.	College of Horticulture, Thenzawl, Mizoram	0	1	0	1
14.	College of Veterinary Sciences & Animal Husbandry, Jalukie, Nagaland	0	1	0	1
	Total	**22**	**86**	**37**	**145**

4

EXTENSION ACTIVITIES

THE Directorate of Extension Education, CAU, Imphal is responsible for dissemination of useful and latest agricultural information to the farmers through thirteen constituent colleges and six Krishi Vigyan Kendras (KVKs), six Vocational Training Centres (VTCs) and six Multi Technology Testing Centres (MTTCs) of the University besides planning, monitoring and execution of extension progress based on results of the researches conducted in all campuses/units of the University.

The Directorate encourages to work in groups at the grass root level in the region for overall development. Although, agriculture as a whole is state subject but being the origin centre of technology generation and refinement of need-based technologies through rigorous experimentation, the educational/research institutions bear the responsibility to train the master trainers of the states and to conduct elite demonstrations. Owing this responsibility, Directorate of Extension Education, CAU, Imphal deals with front line activities to disseminate agricultural know how and emphasizes over to get acquainted with the technologies among the farming communities for further adoption through different constituent colleges situated all over the North Eastern Region except Assam and with the help of six KVKs *i.e.,* Imphal East, Andro (Manipur); Aizawl, Selesih (Mizoram), East Siang, Pasighat (Arunachal Pradesh), East Garo Hills (Meghalaya), South Garo Hills (Meghalaya) and Sepahijala (Tripura); six VTCs and six MTTCs. The farming community can avail the services of any of the units of the University to get the solutions for their farming problems and to improve their livelihood.

4. TRAINING PROGRAMMES

4.I On Campus

The Directorate organized following capacity building training programme for farmers and farm women, rural youth and Extension functionaries of the line departments, KVKs and ATMAs to keep them updated with latest technical know-how in identified area of agriculture and allied fields:

4.1.1. Awareness cum Training programme for Farmers and Farm women

S. No.	Title of the Training	Sponsored by	Duration Date (Venue)	Male	Female	Total
1.	One day training programme on Organic seed	ICAR-ATARI, Zone VII, Umiam, Meghalaya	CAU- NEC Model Farm, Lamphelpat, Imphal, 5th Feb., 2022	36	0	36
2.	One day Awareness programme on Entrepreneurship development and Biological Control	TRIFED, New Delhi and ICAR- NBAIR, Bangaluru	CAU- NEC Model Farm, Lamphelpat, Imphal, 25th March., 2022	54	219	273

S. No.	Title of the Training	Sponsored by	Duration Date (Venue)	Male	Female	Total
3.	One day Awareness programme on Biological Control of Insect Pest of Vegetable	ICAR- NBAIR, Bangaluru	CAU- NEC Model Farm, Lamphelpat, Imphal, 30th March., 2022	72	78	150
	Grand Total			**162**	**297**	**459**

4.1.2 Training Programmes for Extension Functionaries

S. No.	Title of the Training	Sponsored by	Duration Date (Venue)	Male	Female	Total
1.	Faculty Development Programme for the faculties from CAU, Imphal	ICAR- NARM, Hyderabad	8/11/2021 to 12/11/2021	27	13	40
2.	Training Management for Effective Extension	ICAR-ATARI, Zone VII, Umiam, Meghalaya	23/3/2021 to 25/3/2022	17	10	27
	Grand Total			**44**	**23**	**67**

4.2. Off Campus

4.2.1 Awareness cum Training programme for Farmers and Farm women

S. No.	Title of the Training	Sponsored by	Place, Date	Male	Female	Total
1.	One day Awareness cum Training Programme on "Recent Advances in Agri and Allied Sector and Distribution of Inputs"	ICAR-NIBSM, Raipur, MP	Haraorou, Imphal East, 25th Sept., 2021	12	48	60
2.	One day Awareness cum Training Programme on "Recent Advances in Agri and Allied Sector"	ICAR-ATARI, Zone VII, Umiam, Meghalaya	Oinam, Bishnupur, 6th Dec., 2021	25	29	54
3.	One day Awareness cum Training Programme on "Recent Advances in Agri and Allied Sector"	ICAR-ATARI, Zone VII, Umiam, Meghalaya	Phougakchao Ithai, Bishnupur, 7th Dec., 2021	14	21	35
4.	One day Awareness cum Training Programme on "Recent Advances in Agri and Allied Sector"	ICAR-NIBSM, Raipur, MP	Pungdongbam, Imphal East, 16th Dec., 2021	22	13	35
5.	One day Awareness cum Training Programme on "Recent Advances in Agri and Allied Sector"	ICAR-NIBSM, Raipur, MP	Khetri Leikai, Thoubal, 17th Dec., 2021	3	29	32
6.	One day Awareness cum Training Programme on "Recent Advances in Agri and Allied Sector"	ICAR-NIBSM, Raipur, MP	Kanto Khulen, Sekmai, 18th Dec., 2021	5	30	35
7.	One day Awareness cum Training Programme on "Recent Advances in Agri and Allied Sector"	ICAR-NIBSM, Raipur, MP	Molnom Village, Churachnadpur, 21st Jan., 2022	15	13	28
8.	One day training programme on Biological Control of Insect Pest of Vegetable	ICAR-NBAIR, Bangaluru	Oinam Law College, Bishnupur; 29 March, 2022	26	6	32
9.	One day training programme on Biological Control of Insect Pest of Vegetable	ICAR-NBAIR, Bangaluru	Kakching Wairi, Kakching, 30th March, 2022	19	6	25
10.	One day training programme on Biological Control of Insect Pest of Vegetable	ICAR-NBAIR, Bangaluru	Saiton Awang Leiakai, Bishnupur , 30th March, 2022	12	10	22
11.	One day training programme on Biological Control of Insect Pest of Vegetable	ICAR-NBAIR, Bangaluru	Soram Tangkhul, Village, Urkhul 31st March, 2022	6	22	28
12.	One day Awareness programme on Biological Control of Insect Pest of Vegetable	ICAR-NBAIR, Bangaluru	Chadong Village, Kamjong, 31st Mach, 2022	11	42	53
13.	One day Awareness programme on Biological Control of Insect Pest of Vegetable	ICAR-NBAIR, Bangaluru	New Cannan Village , Ukhrul , 31st March, 2022	0	90	90
	Grand Total			**170**	**359**	**529**

4.3. Externally Funded Projects/Programme

4.3.1. ICAR-IGFRI, Jhansi, UP Sponsored Project/Programme

The NEH programme under this project was implemented in 6 districts of the state covering more than 75 dairy farmers. The programme has helped the farmers for production of green fodder crops, human resource development in fodder production and allied activities, distribution of improved fodder seeds, agricultural inputs etc. Under this programme, different villages under different districts of Manipur i.e. Imphal West, Imphal East, Bishnupur, Thoubal, Churachandpur and Kakching were benefited through this programme. Extension activities like training, discussion and demonstration on advance agricultural practices, livestock rearing was conducted. To address the gaps in scientific production technology including rationale of Agro- chemicals and Front-Line Demonstration (FLD) on technology development by CAU, Imphal were also demonstrated extensively in the selected areas particularly on fodder and forage Crops, covering more than 45 ha.

A training and interaction programme was also conducted successfully under the Theme "Fodder and Livestock based intervention for livelihood improvement of NEH Farmers" on 21st March 2022 at DEE, CAU-NEC Model Farm, Lamphelpat, Imphal. About 65 farmers from different villages under the district of Imphal west, Imphal East, Bishnupur, Thoubal, Churachandpur and Kakching, Manipur were benefited through this training programme. "Fodder and Livestock based intervention" in Manipur was also discussed under this programme.

4.3.2. ICAR-CIFT (Central Institute of Fisheries Technology)

CIFT has implemented in 1. KVK, Imphal East, Manipur 2. KVK, Aizawl, Mizoram 3. KVK, Sepahijala, Tripura 4. KVK, South Garo Hills, Meghalaya 5. KVK, East Garo Hills, Meghalaya 6. KVK, East Siang, Arunachal Pradesh 7. College of Vety. Science and Animal Husbandry, Jalukie, Nagaland through demonstration on COFISKI and training. A total of 11 taining programmes were organised on preparation of value added products of fishers. Altogether 153 farmers were benefitted under the CIFT sponsored programme.

4.3.3. PMVDY-ESDP sponsored by Tribal Co-operative marketing Development fed of India Ltd (TRIFED)

Implemented in four nos. of MTTC and VTCs: a. MTTC and VTC, Manipur; b. MTTC and VTC, Mizoram c. MTTC and VTC, Sikkim. d. MTTC and VTC, Tripura.

Achievement of programme: Skill development training programme on value addition and processing of locally available fruits and vegetables conducted for VDVK constituted by tribal women as per the guidelines of the project as follows:

Name of MTTC/VTC	Total Target (no. of VDVK)	Target as per fund received (50%)	Achievement (no.)	Beneficiary covered (no.)
MTC & VTC, Manipur	175	87	36	900
MTC & VTC, Mizoram	100	50	25	625
MTC & VTC, Sikkim	54	27	18	450
MTC & VTC, Tripura	29	14	13	325

4.3.4. DST (KIRAN Division) Sponsored Women Scientist Scheme-B (WOS-B) under S and T Intervention for Societal Benefit

Backyard Bio-floc tank: After four months of culture of monosex tilapia in Bio-floc tank, the average weight was 180g and more than 30kgs were harvested from the tank and sold. Some of the remaining fishes were stocked in ponds and second batches of local Ukabi/ anabas were stocked in the Bio-floc tank.

Standardization of induced breeding of Japanese koi: Different varieties of Japanese koi brooders namely Kohaku (10nos), Milky (4nos) and Orange (1no) varieties were purchased from local hobbyist and reared in the fish tanks. The matured brooders breed voluntarily in the fish tanks. After breeding, the brooders were transferred to a new pond while the eggs were kept in the same fish tanks for further development and hatching. The hatchlings were fed after three days with powder feed and grown for more than a month @5% body weight. After the fishes attained a length of about 3cm, the fries were transferred to nursery ponds as the tanks were too small for growth. After 6 months, the fishes were sampled and transferred to larger stocking ponds.

Standardization of induced breeding of indigenous fishes of Manipur: Induced breeding was conducted in the months from May to Aug 2021, on several species of fishes such as ngaton, local anabas/ukabi and silver barb by hormonal manipulation in ponds using hapa at the CAU-Central Farm, Lamphelpat. Larval rearing of the above-mentioned fishes was done in nursery ponds of the farm. Feeding was done using commercial Dust feed @ 3% bw. Fingerlings were obtained after two months and transferred to rearing ponds. Feeding was done with commercial feed @ 3% bw. Local anabas fry were cultured in Bio-floc tank.

Table 3A. Breeding of indigenous fishes of Manipur (Ngaton)

Bangana devdevi (Ngaton) Brooder

Bangana devdevi (Ngaton) embryo

Ngaton Fingerling

4.3.5. RKVY-RAFTAAR AGRI-BUSINESS INCUBATOR (R-ABI) SPONSORED BY Ministry of Agriculture & Farmers Welfare, Govt., of India

4.3.5.1. College of Horticulture & Forestry, Pasighat, Arunachal Pradesh

The incubation centre is actively engaged in incubation programmes and paves way for induction of Agritech startups in the region, with the successful incubation and handholding of 55 incubatees and 5 startups covering the entire North Eastern Region.

Nine of the innovative projects of incubatees of RKVY-RAFTAAR Agri Business Incubation Centre, got approved and sanctioned for pre-seed stage (Agripreneurship Orientation Programme) funding of each 5 lakhs and One Startup under Seed Stage Funding of 25 lakhs, with a total of 70 lakhs from the Ministry of Agriculture and Farmers' Welfare, New Delhi and successfully completed two-months internship / incubation programmes for six batches of incubatees.

The incubation centre has come out with wide array of innovative products like low- cost mushroom dryer, low-cost laminar flow, low-cost steam boiler, bamboo-made mushroom hut, value added mushroom, lotus herbal tea, varieties of high quality sugar-free chips and pickles, nutrient enriched vermicompost and vermiwash, value added dried flower table decors, dried flower candles and corsages, bamboo-made round sticks and agarbathi, Mealworm Poop, Spicy Vie, Digital floral market, Elephant Apple Energy Drink, King Chilli Sauce, Premium continental condiment with intrinsic manipuri flavour, Instant Kabab Mix, Instant Briyani Mix, Dry Meat, Sauce Fry, etc.

Protein and Fertilizer Supplement

Meat Pickle and spices

Digitalization of flowers business

4.3.5.2. College of Fisheries, Lembucherra, Tripura

Conducted two (2) months 5th cohort Incubation programmes "Agripreneurship Orientation Programme (AOP)" & 'Startups Incubation Programme (SIP)' "from 26th July to 25th September, 2021.

Demo Grant-In-Aid Cheque Distribution event was organized in National Seminar on Agri business Potential in North Eastern Region with Special Reference to Tripura at Auditorium hall in College of Fisheries on 8th November, 2021. Demo cheques of Rs. 3 lakhs are handed

over to all 6 funded startups by our invited dignitaries.

Public Advertising: Advertising through leaflets and Postering in various institutions' campuses, employment exchanges notice boards, ATMs, other public gathering places, etc.

Conducted two (2) months 6th cohort Incubation programmes "'Agripreneurship Orientation Programme (AOP) & 'Startups Incubation Programme (SIP)' "from 6th January to 5th March, 2022.

College of Fisheries, Lembucherra, Tripura organised a showcasing of technology products-cum-interface meeting and hosted the inauguration of added infrastructures on 17th November 2021. COF, R-ABI organized an exhibition and promotion stall where our funded as well as non-funded Startups and incubates showcased their product and services. During this event COF, R-ABI participated in the promotional activity of R-ABI schemes, also disseminated the schemes among the visitors. During interactive session incubates also explains how their start-ups benefiting the farmers.

COF R-ABI incubated pre-seed stage funded startup **"**GITA CHANDRA GROUP**"** had received the "Statehood Day Award- Best Startup Entrepreneur Award (Fishery) 2022" on 21st January, 2022 from Govt. of Tripura, during the celebration of 50 years of Tripura's Statehood Day.

4.3.5.3. College of Veterinary Sciences & AH, Selesih, Mizoram

Three batches of co-hurts were trained for two months duration each for Agripreneurship Orientation Programme (AOP). Twenty five Agripreneurs were trained, mentored and incubated.

Four of the incubates/Agripreneurs from this R-ABI centre are selected for pre-stage funding of Rs. 5 lakhs each by the Ministry of Agriculture and Farmers Welfare, Govt. of India.

4.3.5.4. Programmes under ICAR-NBAIR, Bengaluru NEH Component

A. Directorate of Extension Education, CAU, Imphal

Conducted a workshop on 'Biological Control of Insect Pests of in North-East Region of India" during 02-04 March, 2022 at College of Fisheries, Lembucherra, Tripura.

B. College of Agriculture, Iroisemba, Manipur

In year 2021-22, around 300 Tricho card distributed to famers of maize, rice and vegetables crops. The Department of Entomology, College of Agriculture, Iroisemba, Manipur maintained the *Corcyra*, *T. chilonis* and *T. japonicum* culture for production of Tricho card. Promotion of biocontrol in NEH region, we have developed one video on 'Biocontrol future for organic farming in NEH region' and youTube link is https://youtube/PiFOFCci-qo.

Demonstration of Tricho card at farmer's field of maize, rice and vegetable crops

4.3.5.5. Programmes under ICAR-NIBSM Raipur NEH Component

4.3.5.1. KVK, Aizawl, Mizoram

Purchased farm implements and machineries for establishment of Custom Hiring Centre are mentioned below:

S. No.	Particulars	Qty.
1.	Brush Cutter with multiple attachment including weeder	2
2.	Manual/ Hand operated Seeder/ Dibbler (25 x 23 x 10 cm; 10 kilograms) Manufacturer: Kishan, Kishanagri machinery.	2
3.	139 CC Manual Start Mini Power Weeder	2
4.	Tapas Handy Manual Vegetable Planter	7
5.	Manual Wheel Hoe with Oscillating Hoe, Plow Set,Cultivation Teeth & Marker	7

4.3.5.2. KVK, East Siang, Arunachal Pradesh

S. No.	Name of the programme	Village	Date/ Duration	Number of participant			Target group
				M	F	Total	
1	Awareness cum demonstration on drudgery reduction tools and implements	Tulab Area Pasighat	28/10/21 (01 Day)	22	7	29	Progressive Farmer
2	Training cum demo on small tools.	Jampani	27/11/21 (01 Day)	19	6	25	Progressive Farmer
3	"Operation, Repair & Maintenance & Management of Power tiller & Matching Equipments"	On campus	16th to 30th March, 2022 (15 Day)	25	0	25	Progressive Farmer & Rural Youth

4.3.5.3. KVK, East Garo Hill, Meghalaya

- Details about purchased items for creating Custom Hiring Centres (CHC) :

i) Purchased Self propelled Power Reaper (Qty. 01)

4.3.5.4. KVK, South Garo Hill, Meghalaya

Activity	Unit conducted/ numbers distributed	Dist./village of beneficiary farmer	Number of beneficiaries	Other details if any
◆ Equipments purchase through GeM for establishment of CHC i) Brush cutter ii) Egg incubator iii) Fish net ◆ Equipments purchase through LPC i) water Pipe 58 meters ii) Pipe small 110 meters iii) Water pump (0.5 hp)	◆ Received Brush cutter, Egg incubator & Fish Net (through GeM) ◆ water Pipe 58 meters, Pipe small 110 meters, Water pump (0.5 hp) (through LPC)	Warima	10	i) Phillipson T Sangma (M) ii) Migen M Sangma (Nokma) iii) Centina Ch Marak (F) iv) Sebina Ch Marak (F) v) Lucksme Ch Sangma (F) vi) Sengjan Ch Marak (M) vii) Kening Ch Marak (M) viii) Hansting Ch Marak(M) ix) Butchu M Sangma (M) x) Gresalline Ch Sangma (F)

4.3.5.5. KVK, Sephajala, Tripura

Minor equipment farm tools and minor processing machinery namely Drum Seeder (5 nos.), Multiseed oil maker machine (2 nos.) and Water pump (2 nos.) were purchased and received to KVK Sepahijala and soon the equipments will be distributed/ developing Custom hiring Centres (CHCs) and popularized among the farming community of Sepahijala district.

4.3.5.6. KVK, Imphal East, Andro, Manipur

Distributed to M/S Leimalen Food Entrepreneur of aromatic black rice product and M/S Ami foods for value added products of fruits and vegetables for promotion of quality package processed food and act as common utility machinery for SHG in adjoining area as follows: Leveler Blade, Cage Wheel, Band Sealer (2 unit).

4.3.5.7. MTTC and VTC, Manipur

S. No.	Name of Training	Duration	Participant	Off/On campus
1.	Mushroom spawn production	28-30 Dec.,2021	30	On campus
2.	Low cost vermicomposting	26-29 March,2022	30	On campus
3.	Value addition of locally available horticultural crops of Manipur	3 days		On campus
4.	Entrepreneurship development of unemployed youth	26-29 March,2022	30	On-Campus

4.3.5.8. MTTC & VTC, Meghalaya

Training conducted on biotic stress management in potato, cauliflower and other cole crops. Target group/ Geographical region: Farmers and rural youth different districts of Meghalaya (Ri-Bhoi district, West Khasi Hills district, East and West Garo Hills district of Meghalaya. Number of beneficiaries: 43.

4.3.5.9. MTTC & VTC, Mizoram

1. Conducted training programme on 'Quality seed production and varietal purity' with 120 nos. of beneficiary from the village, viz., 1. Thenzawl 2) Mualthuam 3) Buangpui 4) Ramlaitui Serchhip district, Mizoram (13th Jan., 2022 to 17th Jan., 2022).
2. Conducted training programme on 'Integrated farming system for sustainable development in Mizoram' with 120 nos. of beneficiary from the village, viz., 1. Thenzawl 2) Mualthuam 3) Buangpui Serchhip district, Mizoram (8th Feb., 2022 to 31st March, 2022).

3. Conducted training programme on 'Preparation, Demonstration and Popularization of Vermicomposting' with 90 nos. of beneficiary from the village, viz., 1) Thenzawl 2) Ramlaitui 3) Buangpui Serchhip district, Mizoram(29th March, 2022 to 31st March, 2022,).
4. Conducted training programme on 'Silkworm Rearing' with 90 nos. of beneficiary from the village, viz., 1) Thenzawl 2) Ramlaitui 3) Buangpui Serchhip district, Mizoram.

4.3.5.10. MTTC & VTC , Arunachal Pradesh

1. Conducted programme on 'Post-harvest Management and Value addition of Horticultural crops' and benefiting 14 female and 1 male.
2. Organized programme on 'Plant Tissue culture and Micropropagation Techniques' with 15 female and 6 male participants.
3. Conducted programme on 'Plant health management of citrus under different biotic Stress' and benefited 25 female participates.
4. Conducted programme on 'Skill Development in Plant Molecular Breeding' and 21 female and 4 male participants.


4.3.5.11. MTTC & VTC, Tripura

Conducted Awareness programme cum demonstrator and input distribution programme on "Oyster Mushroom cultivation" and 52 no. of beneficiary for inputs distribution of

mushroom spawn, mushroom bags, fungicides, jute ropes, paddy straw.

4.3.5.12. MTTC & VTC , Sikkim

1. Conducted programme on Entrepreneurial Skill Development for Economic Empowerment of Rural Women with 20 nos. of farm women(8th-10th December, 2021).
2. Conducted programme on Improved Composting Methods with 20 nos. of Farm women/farmers/Rural Youth(27th-29thDecember, 2021).
3. Conducted the programme on Operation and Maintenance of Improved Farm Equipment for Hill Agriculture (15th-17th February, 2022).

4.3.5.13. Directorate of Extension Education

1. One day awareness cum training programme on "Recent Advances in Agri & Allied Sector" on 25 / 9/2021 at Haraorou, Imphal East and 12 male and 48 female participants.
2. One day awareness cum training programme on "Recent Advances in Agri & Allied Sector" on 16/12/2021 at Pungdongbam, Imphal East.
3. One day awareness cum training programme on "Recent Advances in Agri & Allied Sector" on 17/12/2021 at Khetri Leikai, Thoubal.
4. One day awareness cum training programme on "Recent Advances in Agri & Allied Sector" on 21/1/2022 at Monlnom Village, Churachandpur with 15 male and 13 female participants.
5. One day awareness cum training programme on "Recent Advances in Agri & Allied Sector" on 18/12/2021 at Kanto Khulen, Sekmai with 15 male and 13 female participants.

4.4 Mobile Based Agro-Advisory System funded by MeitY, GOI, New Delhi

4.4.1 Mobile Based Agro Advisory System in Mizoram *(Ran Vulhtute* Thian) implemented by College of Veterinary Sc. and Animal Husbandry, Selesih, Mizoram

A total of 2857 farmers registered, organized 16 numbers of awareness cum training prorammes, 4 numbers of health campus and 12 nos. of leaflets, 15 nos. of SMS voice and 4 nos. of videos were produced. Altogether 7,45,247 advisories (pull based and pushed based) were delivered.

4.4.2. Mobile Based Agro Advisory System in Tripura *(Matsya Varta)* implemented by College of Fisheries, Lembucherra,Tripura

Altogether 1392 fish ponds and 8620 farmers registeredduring the period. 24 nos. of awareness programmes, 2 workshops and 2 health campus were also organised benefiting 987 farmers. A total of 1,361,300 advisoires were delivered through text and voice messages.

4.4.3. Mobile Based Agro Advisory Services in Sikkim *(Jaivik Varta Sikkim)* implemented by College of Agril. Engg. & Post Harvest Technology, Ranipool, Sikkim

Achievements of the Project during 2021-22 in brief with targets:

Quarter	Farmer Registration	Awareness Program/Training to farmers			Advisory		Message
		Program	Calls Received	Calls Made	Text	Voice	
29th June, 2021 (Project started)	1500	64	3300	10000	3000	42000	42000
Achieved as on 31stMarch, 2022	3213	14	560	2349	179	198/103979 Consumed	74/66445 Consumed

4.4.4. Integration and application of UAV for Crop Health Assessment and Monitoring with IIDS in Providing Evidence Based Agro-Advisory Services to Farmers of North-East India (*DHaBReT*) implemented by College of Post Graduate Studies in Agril. Sciences, Umiam, Meghalaya

Achievements of the Project during 2021-22 in brief with targets:

- 3 Districts &6 Crops covered: East Khasi Hills (Cabbage & Cauliflower), Ri-bhoi (Paddy, Ginger & Pineapple) and West Jaintia Hills (Turmeric) DHaBReT:
- A total of 600 farmers (100 farmers with respect to Cabbage, Cauliflower, Paddy, Ginger, Turmeric and Pineapple) have been registered.
- Twenty-Eight (28) #s of UAV data acquisition flights on the project villages.
- Development of DSM, DTM, Contour, Slope, Aspect, Stream and NDVI.
- Crop & Soil Indices such as SOC, SNM & SMC have been analyzed and disseminated to the respondents.
- Made 302 proactive calls and 74 SMSs have been pushed.

4.4.5. Mobile based Agro advisory services in Manipur (Loumisingi Paojel) implemented by College of Agriculture, Iroisemba, Manipur

Achievements of the Project during 2021-22 in brief with targets:

Deliverables/ Milestones	Target (From April, 2021-March 2022)	Achievement (From April, 2021-March, 2022)
Farmer Registration	2800	2666 nos. of Farmers Male – 1829 Female – 837
No. of Call Received	28000-30000	6417
No. of Call Made	8200-9000	5394
Awareness Building / Sensitization Programs among Farmers	70 Nos.	44 Nos. No. of Participants=1472 Male=878 Female=594
Need Based Training Programme	7 No.	6 Nos. No. of Participants= 243 Male=141 Female=102
Content development in Animal Husbandry, Agri/Horti	5 Nos.	04 Nos. [Fish farming calendar- 1 (Manipuri), Leaflet on Covid-19 And the Health Benefits of Small Wonder the Micro greens- The Nutritious Foods - 1 (English), Leaflet on Fall Armyworm- Damage Symptoms and Its Management -1 (English), A Leaflet on Value Addition of King Chilli (*Capsicum chinense* Jacq.) -1 (English)].
SMS (text & Voice)	132000	Text = 3045/3330694 Voice = 187/644411
Advisory Delivered	Not specified	1932

4.4.6. Mobile based Agro advisory services in Arunachal Pradesh (*Arik Abik Lunom*) implemented by College of Horticulture & Forestry, Pasighat, Arunachal Pradesh

Achievements of the Project during 2021-22 in brief with targets:

S. No.	ACTIVITIES	TARGET	TARGET ACHIEVED	TARGET TO BE ACHIEVED
1.	No. of Farmer Registration with detailed profile (Farm & Farmer)	1500	2014	-
2.	Awareness Building/ Sensitization Programs/ Trainings among farmers in cluster	40	19*	21
3.	No. of Content /Manual/Crop Calendar	7-10	7*	-
4.	No. of calls Received from Farmers	9000-10000	295*	8705
5.	No. of calls made to farmers	30% of (9000-10000)	472*	2528
6.	No. of Need Based Text SMS Sent to Farmers	41000-42000	19,116*	21,884
7.	No. of Need Based Voice SMS Sent to Farmers	41000-42000	16,408*	24,592

4.4.7. Farmers FIRST Programme sponsored by ICAR, New Delhi

Achievement during the year 2021-22

Module	Intervention	Villages covered	Area covered (ha)/Animal (No.)	Number of Households covered/Farmers
Crop based	Quality seed production of Rice/ Paddy Var. CAUR-1	Yairipok Top Chingtha & Yairipok Yambem	20 ha	60
	Horizontal expansion of no tillage Rapeseed-Mustard cultivation in Rice fallows	Yairipok Top Chingtha & Yairipok Yambem	34 ha	52
	Scientific cultivation of Pea for higher income generation	Yairipok Top Chingtha & Yairipok Yambem	20 ha	40

Module	Intervention	Villages covered	Area covered (ha)/Animal (No.)	Number of Households covered/Farmers
Horticulture Based	Production of High value crops using improved varieties of vegetables & fruits under polyhouse condition.	Yairipok Top Chingtha & Yairipok Yambem	3 polyhouses (20x15 feet) each	3
	Multiplication of nursery & cuttings (Black pepper) in polyhouse for increasing income.	Yairipok Top Chingtha & Yairipok Yambem	1000 black pepper cuttings	10
	Promotion of scientific kitchen garden for sustainable nutritional security and conservation of traditional crop varieties.	Yairipok Top Chingtha & Yairipok Yambem	-	3

4.4.8. FLD on Rapeseed and Mustard Sponsored by ICAR-DRMR, Bharatpur

Total number of the FLDs of Rapeseed-Mustard with varieties TS-38, M-27, CAU Toria 1 and NRCHB-18 actually conducted was 150; the number of village and districts covered under FLDs are shown in the following table:

S. No.	District	Name of Village	Numbers
1.	Bishnupur	Kumbi	32
		Oinam	29
2.	Imphal East	Lamlai	26
		Yairipok Top Cingtha	18
3.	Thoubal	Nongpok Lourembam	45
Total			150

4.5. Activities of KVKs under CAU, Imphal

4.5.1. KVK, East Siang, Pasighat

1. The Kendra has conducted 07 numbers On Farm Trials (OFT) in different topics.
2. The Kendra has conducted 18 numbers of Front Line Demonstrations (FLD) benefitting 856 nos. of farmers.
3. The Kendra has conducted 24 nos. of On Campus training programme for farmers and farm women benefitting 251 male and 619 female altogether 870 nos. of beneficiaries.
4. The Kendra has conducted 57 nos. of Off Campus training programme for farmers and farm women benefiting 549 male and 1255 female altogether 1804 nos. of beneficiaries.
5. The Kendra has conducted 10 nos. of On Campus training programme for rural youth participating 106 male and 76 female altogether 182 nos. of beneficiaries.
6. The Kendra has conducted 03 nos. of Off Campus training programme for rural youth participating 14 male and 40 female altogether 54 nos. of beneficiaries.
7. The Kendra has conducted 01 no. of On Campus training programme for extension personnel participating 21 male and 01 female altogether 22 nos. of beneficiaries.
8. The Kendra has conducted 04 nos. of Vocational training programme / Skill development programmes participating 25 male and 60 nos. of female.
9. The Kendra has conducted Awareness Programme / Field Day / National Fish Farmers Day / World Soil Day / Animal Health Camp / Farmers Scientist Interaction Programmes benefiting 351 nos. of male and 428 nos. of female altogether 779 nos. participants.
10. The Kendra has participated 15 nos. of Kisan Gosthi / Film Show participating 580 nos. of male and 400 nos. of female altogether 980 nos. of participants.
11. The Kendra has published 08 nos. of extension publication.

4.5.2. KVK, Sephajala, Tripura

- Total 8 numbers of On Farm Testing (OFT) were conducted and 9 numbers of Frontline demonstrations programme were conducted in different topic.
- In the field of Agronomy, four nos. of Off - Campus training programme were conducted with 74 male and 4 female farmers/farm women.
- One training programme was conducted on Single Bud transplanting technique in ginger on May 2021 with 25 farmers and farm women in field of Horticulture.
- 2 nos. off campus training programme in field of Plant Protection with 102 participants i.e 74 Male and 28 female.
- 2 nos. off campus training programme were conducted with 40 nos.(20 male and 20 female) of participants on Animal Science.
- 2 nos. off campus training programme on Agri Engg. with 36 male and 67 female of farmers and farm women.
- For rural youth 4 nos. of off campus training programme were conducted in the Agronomy and benefiting 38 male and 2 female.
- Training programme on cultivation practices on onion was conducted for rural youth with 25 participants.

- In the field of Plant protection, 7 nos. of off campus training programme organized and benefiting 80 male and 65 female rural youth.
- Conducted 9 nos. of Off campus training programme on Fisheries with 146 male and 36 female rural youth.
- Organized 5 nos. of off campus training programme in the field of Agril. Enng. and benefiting 36 male and 54 female rural youth.
- Conducted 6 nos. of training programme for Extension Personnel in the field of Agronomy, Horticulture, Plant Protection, Fisheries, Agril. Engg with 73 nos. of Extension Personnel.
- Conducted 5 nos. of Method demonstration on different topic with 80 male and 30 female farmers & Farm women.
- Celebration of World Soil day with 9 male and 16 female farms and Farm women.
- Celebration of *Poshan Vatika maha abhiyan* and tree plantation programme conducted at KVK, Sepahijala and Suturmura with farmers and farm women and school children.
- 3 nos. of awareness programme were conducted and benefitted 61 male and 74 female farmers and farm women.
- One exposure visit of farmers and farm women visited at the college of Fisheries, Lembucherra, Tripura with 27 farmers and farm women.

4.5.3. KVK, Imphal East, Manipur

1. KVK, Imphal East begged Progressive Mushroom Grower Award during " Virtual National Mushroom Mela" on 10th September, 2021at ICAR-DMR, Solan.
2. Total 10 nos. of On Farm Testing (OFT) were conducted on livestock, fisheries, Home Science, Agril Eng., plant protection, Horti.
3. 9 nos. of Frontline Demonstration (FLD) were conducted on various crops , farm Implements, Livestock enterprises, fisheries
4. Conducted 28 nos. of off campus training programme for farmers and farm women with 885 beneficiaries.
5. 3 nos. of on campus training programme for farmers and farm women with 94 beneficiaries.
6. 4 nos. of off campus training programme for rural youth and benefited 82 nos. of participants.
7. 5 nos. of on campus training programme for rural youth and benefited 70 male and female participants.
8. Cconducted 4 nos. training programme for Extension Personnel and 158 participants.
9. Conducted 7 nos. of Vocational training / skill development programme with 280 beneficiaries.
10. 12 nos. of Awareness programme were conducted and 297 participants.
11. 3 nos. of exhibition were organized with 297 participants.
12. Published 9 nos. of abstract, Research Paper and booklet in English medium.
13. 55 nos. of soil sample analysed through soil testing lab and 50 nos. of water sample anaylsed through Water testing kit.

4.5.4. KVK, South Garo Hills, Meghalaya

1. Total 12 nos. of On Farm Testing (OFT) were conducted with the participation of farmers on various crops, Livestock,

OFT- Management of leaf curl virus, bacterial wilt and early blight disease of tomato

OFT-Management of Fall Army Worm in Maize

OFT- Organic Cultivation of King Chilli in Low Cost Shade net House

Fisheries and other enterprises.

2. 13 nos. of Front Line Demonstration (FLD) programme were conducted with farmers on various Crops, Livestock, Vermicomposting, Fisheries and other Enterprises.
3. 31 nos. of OFF Campus training programme for farmers and farm women has organized with 775 nos. of participant.
4. Another 21 OFF Campus training programme were conducted for Rural Youth with 525 nos. of participant.
5. 6 nos. of training programme were conducted for Extension personnel through online mode with 125 nos. of participants.
6. 3 nos. of Vocational Training/ Skill development programme has conducted through Offline and Online mode benefitting 65 nos. of participants.
7. 10 nos. of Awareness Programme / Field Day / Health Camp were organized benefitting 2616 nos. of participants.
8. Participated in CAU Regional Agri Fair 2020-21 at Jorhat during 12-14th March, 2022.
9. Participated 03 nos. of Exhibition under Mahila Kisan Diwas / World Food Day / World Pulses Day Programme.
10. Celebrated World Bee Day / World Milk Day / Tree Plantation Programme / National Fish Farmers Day / Independence Day / World Rabies Day / Cleaning Drive / International Women Day / World Water Day / World Pulses Day. Under the Tree Plantation Day on World Environment Day, fruit and medicinal planting materials were distributed to the participants.
11. The KVK has organized 10 nos. of OFF / ON sponsored programmes for Rural Youth, Farmers, Farm Women and School Children benefiting 689 nos. of participants. These Programmes were sponsored by ICAR-CIFT, Cochin, AICRP (R-M), NFSM, KSHAMTA.
12. The KVK has published 12 nos. of Folder in English language for farmers, farm women and rural youth.

4.5.5. KVK, East Garo Hills, Meghalaya

1. The KVK has conducted 12 nos. of On Farm Testing (OFT) benefitting 45 nos. of participants.
2. Total 12 nos. of Frontline Demonstration (FLD) were conducted participating 47 nos. of farmers.
3. The KVK has conducted 03 nos. of Cluster Frontline Demonstration (CFLDs) benefitting 123 nos. of participants.
4. Total 52 nos. of off-campus training

programme for farmers and farm women were conducted participating 544 male and 843 female altogether 1387 in nos.

5. The KVK has organised 17 nos. of off-campus training programme for Rural Youth benefitting 152 male and 257 female altogether 409 in nos.
6. The KVK has organised 04 nos. of off-campus training programme for Extension Personnel participating 20 male and 77 female altogether 97 in nos.
7. The KVK has organised 48 nos. of Awareness Programme / Field Day / Health Camp participating 383 nos. of male and 938 nos. of female altogether 1321 in nos.
8. The KVK has participated an Exhibition in Regional Agri-Fair at Jorhat, AAU, Assam during 12-14 March, 2022 for farmers, farm women and rural youth.
9. The KVK has organised 128 nos. of Extension activities other than Demonstration and Training participating 1441 nos. of male and 2055 nos. of female altogether 3496 in nos.
10. The KVK has organised 09 nos. of training programme sponsored under CBT, KSHAMTA, CFLD, NBAIM, CIFT benefitting 17 nos. of male and 537 nos. of female.
11. The KVK has published 02 Research Paper in English language, 02 Book Chapter in English language, and 02 Leaflet in English and Garo for farmers and extension personnel.
12. The KVK has distributed 23 kg and 143 seed kits including Sponge Gourd, Ridge Gourd, Bottle Gourd, Bitter Gourd, Cucumber, Tomato, Cowpea, Okra, Broccoli, Cauliflower and Cabbage benefitting 416 nos. of farmers.
13. The KVK has distributed 7000 nos. of planting materials benefitting 120 nos. of farmers.
14. Besides, KVK has conducted analysis of soil samples and water samples participating 109 nos. of farmers.

4.5.6. KVK, Aizwal, Mizoram

1. Total 13 nos. of On Farm Testing (OFT) were conducted on various crops (Maize + Beans, Rice, tomato, Garden Pea, Lemon, Dragon Fruit, Tooty fruity), Fisheries, vermicomposting technology, Home Science other enterprises.
2. Conducted 14 nos. of Frontline Demonstrations (FLD) with participation of farmers on various crops, Fisheries Agril Engg., Home Science, livestock and other enterprises.
3. Under training programmes (including on campus, off campus, vocational training programme), a total of 52, 19 and 9 trainings were conducted with beneficiaries 1218, 435 and 283 in respect to farmer/farm women, rural youths and extension personals.
4. Organized 4 nos. of Vocational training/ Skill development programme with 63 participants.
5. 4 nos. of Field day has conducted with 400 beneficiaries.
6. Organized 10 nos. of Animal health camp and 637 nos. of beneficiaries have benefited.
7. Organized 10 nos. of Soil Health Camp with 429 nos. of beneficiaries.
8. Organized 5 nos. of awareness campaign with 382 participants.
9. 10 nos. of soil test campaign has organized with 396 beneficiaries.
10. Organized 1 no. of Kissan Mela with 766

beneficiaries.

11. 5 nos. of Exhibition programme were conducted and 6943 beneficiaries has participated.

4.6. Extension Activities at Constituent Colleges

4.6.1. College of Community Science, Tura, Meghalaya

1. Organised 08 nos. of On-Campus Extension training programme under head "Demonstration of New Technology" benefitting 204 nos. of participants.
2. Organised 06 nos. of On-Campus and 03 nos. of Off-Campus training programme for famers, farm women, men, SHGs and rural youths participating 149 in nos.
3. Conducted 02 nos. of training programme for personnel of line department / KVK SMSs participating 39 nos.
4. Conducted 02 nos. of Awareness programme participating 93 nos. of villagers.
5. Conducted 01 no. of Vocational training programme for unemployed youths participating 13 nos. of females.
6. The College has organised World Family Day, National Handloom Day, National Nutrition Day, Hindi Week, World Food Day, International Day of Persons with Disabilities, Development of Utility Articles from Low Cost Materials, World Hindi Day, National Girl Child Day and World Water day under the head "Extension Activities other than Demonstration and Training" participating 386 nos. of students, female and others.
7. Two satellite villages were adopted successfully.

4.6.2. College of Veterinary Sciences and AH, Selesih, Mizoram

1. Organized two technology demonstration programmes in two villages benefiting 53 rural women.
2. Organized 5 on campus training programme for 198 Veterinary officers and one workshop for veterinarians.
3. Conducted 13 trainings (On campus-10 and off campus-3) benefiting 398 farmers/ farm women/rural youth/entrepreneurs.
4. Celebrated World Rabies Day, World Zoonoses Day, National Milk Day, World Egg Day, National Deworming Day, World Environment Day, World Veterinary Day, World Food Day, and World Women Day. Staff, students, NSS volunteers, farmers and school children were participated in these events.

4.6.3 College of Veterinary Sciences and Animal Husbandry, Jalukie, Nagaland

1. Conducted 01 no. of On-Campus training programme for Livestock farmers and entrepreneurs benefiting 25 nos. of participants.
2. Conducted 01 no. of farmer's / ST exposure trip for animal husbandry activities (Block Level) under NLM from district Mon. benefitting 16 nos. of participants.
3. Conducted 06 nos. of Animal Health Camp, World Rabies Day and Campaign on pig benefitting 267 nos. of participants.
4. Conducted 03 nos. of training programme for personnel line department benefitting 42 nos. of participants.
5. Conducted 01 no. of training programme for women farmers benefitting 10 nos. of participants.
6. Celebrated World Veterinary Day, World Environment Day and International Yoga Day benefitting 183 nos. of participants.

4.6.4 College of Horticulture, Thenzawl, Mizoram

1. Organized 4 off-campus(28th Oct., 2021; 15th Nov., 2021; 25th Nov., 2021; 26th Nov., 2021) benefiting 181 farmers and 4 on-campus training programmes(23rd Nov., 2021; 9th to 11th March 2022; 21st to 25th March, 2022 ; 28th March, 2022) with 100 nos. of participants.
2. Organized 10 nos. of Vocational / Skill development Programs.
3. Conducted 18 externally funded training programmes.
4. Completed 6 externally funded projects under ICAR.
5. Total nos. of 21 sponsored programmes was taken up. These programmes were sponsored by ATARI, PFC (CSR), PMKVY, ASCI/NSDC, PDDUUKSY, NFDB, MANAGE, ICAR, KBS (Kisan Business School), FFP (Farmer First), DRMD, TSP, NIAM, PCRA etc.).
6. Conducted Interface meeting regarding Agro Climatic Zone 2022 with line departments from Government of Mizoram- Directorate of Horticulture, Directorate of Agriculture, Directorate of Fisheries, Directorate of Soil and Water Conservation and extension personnel from KVKs through online mode on 8th February, 2022.
7. The College has observed World Bee Day (online), Celebration of International Year of Millets, World Environment Day (online), World Food Day (online), World Soil Day, National Farmer's Day, CAU Foundation Day, World Pulses Day (online), and World Water Day.
8. The College has published 24 extension reading materials both in English and Mizo languages for farmers.


4.6.5. College of Post Graduate Studies in Agril. Sciences, Umiam, Meghalaya

1. Conducted 8 nos. of off campus training programme (22nd Nov 2021. to 28th March, 2022) with 164 male and 355 female.
2. Conducted 1 no. of on campus training programme on Agri-related financial schemes of banks suitable for farmers o n 19th Feb., 2022 with 4 male and 26 female.
3. Conducted 3 nos. of online training programme for personnel line dept. during 24th to 26th Nov., 2021; 17th to 19th Feb., 2022 and 15th to 17th March, 2022 respectively. In this training, total 79 nos. of official were present.
4. Observation of world Soil day; Natural farming day
5. Conducted 11 nos. of training /Awareness/ Input distribution/method demonstration programme. (11/6/2021 to 28/3/2022)

4.6.6. College of Fisheries, Lembucherra, Tripura

1. Organised 6 non formal Education for farmers On-Campuses for (8th Nov., 2021 to 17th March, 2022) with 124 trainers and 2 non formal Education for farmers, Off-Campus training programme with 131 nos. of farmers.
2. Organised 3 nos. of Awareness Programme / Field Day / Health Camp participating 104 nos. of farmers on 4/3/2022; 22/2/22 and 4/3/22 respectively.
3. Organised 3 On-Campus Training programme for Personnel of Line Department / KVK SMSs participating 73 nos. of Line Dept. / KVK officials (during 27-31st Dec., 2021 ; 11th to 17th Jan., 22; 22nd Feb., 22).
4. Organized off campus training programme on Water quality management in aquaculture on 22nd Feb., 2022 with 13 participants.

5. The College has organized 4 nos. training cum demonstration programme on Cotton, rabi, vegetables, livestock, fisheries for increasing farmer income. (21st March, 2022 to 24th March, 2022).
6. Celebration of Important day: Fish Farmers' day, 93rd Foundation day of ICAR, Interanal youth day, National sports day, Women in Agriculture day, World food day, Foundation day, World AIDs day, Agriculture Education day, Wold Soil day, Jai Kisan Jai Vigay Week etc.
7. Organised an Exposure Visit cum training programme on scientific fish farming and Post harvest technology during 8th to 10th Nov., 2021 sponsored by National bank for Agriculture and Rural Development (NABARD), Agartala.
8. Organised Post British Council Workshop Meet under IDP-NAHEP and distribution of certificates and experiences sharing was done on 29th Dec., 2021.
9. Organized one day Interactive-cum showcasing of achievements and technologies on 2nd Dec., 2021 under DBT funded Centre of Excellence in fisheries and Aquaculture Biotechnology.
10. Developed seed production and culture technology of the Pengba. Total 3.7 Million spawn and 25000 fingerlings have been produced and distributed to total 227 nursery seed growers / fish farmers of West Tripura, Khowai, Sepahijla and Gomati districts during July to September.
11. Organised 4 nos. of training and Demonstration cum input distribution programme participating 123 nos. of farmers.
12. One day physical training on 'Fish Health and Environment Management' organised by AAH Lab, Dept. Of Aquatic Health and Environment, College of Fisheries, Tripura on 30th March, 2022 sponsored by PMMSY-NFDB benefiting 51 nos. of farmers.
13. Published 01 training manual, 2 booklets, 1 extension booklet and 6 nos. of leaflet en English and Bengali for official, line department, farmers, researcher and entrepreneurs.

4.6.7. College of Agriculture, Pasighat, Arunachal Pradesh

1. Total five nos. of training programme for farmers were conducted for farmers benefitting 240 nos. of participants (20th Oct., 2021 to 28th March, 2022).
2. Total 02 nos. of Field Day training programme were organised participating 80 nos. of farmers (conducted on 26th Feb., 2022 and 28th March, 2022).
3. Organised 3 nos. of Vocational Training Programme during the 7th to 9th Feb.,

2022, 14th to 16th Feb., 2022 and 16th to 20th Feb., 2022 for unemployed youths benefiting 64 nos. of participants.

4. Organised 21 days (During 1st to 21st July, 2021) training programme on "Technology Intervention towards Transformation of Agriculture, Sericulture, Animal Husbandry and Allied Sectors into Sustainable Enterprise for Atmanibhar Bharat" sponsored by Agro Environmental Development Society (AEDS), India.
5. Organised 3 days (6th to 8th Sept., 2021) Webinar no "Mushroom Production an Opportunity for self Employment" for students, entrepreneur, scientists and faculties sponsored by IDP-NAHEP, College of Horticulture and Forestry, Pasighat, Arunachal Pradesh.
6. Organised 3 days (26th to 28th March, 2022) Webinar on "Recent trends in seed production, processing and marketing: An entrepreneurship development" to students, entrepreneurs, scientists and faculties sponsored by IDP-NAHEP, College of Horticulture and Forestry, Pasighat, Arunachal Pradesh.
7. Published Leaflet, Popular article, Book and Bulletin in English language for the benefit of farmer's community.

4.6.8 College of Food technology, Lamphelpat, Manipur

1. Organised 01 no. of On-Campus and 01 no. of Off-Campus training programme for farmers, women, entrepreneur, and educated youths benefiting 100 nos. of participants.
2. Organised 4 nos. of awareness programme / Field Day / Health Camp for farmers, students and entrepreneurs benefiting 220 nos. of participants.
3. Organised 1 On-Campus and 1 Off-Campus training programme for line department personnel benefiting 40 nos. of participants.
4. Organised 1 nos. of extension activities other than demonstration and training for farmers, food processor and women SHGs benefiting 160 nos. of participants.
5. Celebrated World Environment Day, World Consumer Day, World Pulses Day, World

Food Day, World Water Day, International Yoga Day, Hindi Saptah, Tree Plantation Campaign participating 354 nos. of faculty, staff, students, farmers entrepreneurs, women SHGs and educated youths.

6. Organised 01 no. of training programme on Processing of Indigenous Fruits of Manipur for entrepreneurs, women, SHGs, educated youths benefiting 40 nos. of participants sponsored by ICAR-ATARI, Umiam, Meghalaya.
7. Organised 01 nos. of online training of resource persons by master trainers from COFT under PMFME Scheme benefiting 16 nos. of participants nominated resource persons from different districts of Manipur which is funded by Ministry of Food Processing Industries.
8. The college has published booklet, bulletin and manual in English language.

4.6.9. College of Horticulture and Forestry, Pasighat, Arunachal Pradesh

1. Organised 13 nos. of training programme (7th Feb., 2022 to 23rd March, 2022) for farmers, research scholar, rural youth, housewife, farm women and SHGs benefitting 135 nos. of male and 215 nos. of female altogether 350 nos. of SC, ST and OBC participants.
2. Organised 07 nos. of awareness programme and field day (15th July, 2021 to 30th March, 2022) for farmers and SHGs benefitting 136 male and 209 nos. of female altogether 345 nos. of ST Participants.
3. Organised 1 no. of vocation training programme from 2nd March, 2021 to 2nd June, 2021 for rural youths benefitting 09 nos. of male and 01 no. of female ST participants.
1. Organized vocational training programme on Nursery for self Employment-short term skill training for unemployed youth during 16th to 25th Feb., 2022 for rural youths.
2. Organised fee sample testing for farmers during Oct., to Dec., 2021 with 50 ST Participants.
3. Celebration on MGMG programme during Jan., to March, 2022 for farmers/rural youths and benefiting 70 ST participants.
4. Organised 02 nos. of training programme (8th to 14th Feb., 2022 and 9th to 10th March, 2022) for Mushroom Growers and farmers sponsored by MANAGE, Hyderabad and DASD, Calicut benefitting 14 nos. of male and 86 nos. of female.
5. Published 03 nos. of success story, extension bulletin and 06 nos. of leaflet for farmers, nurserymen and rural youths.

4.6.10. College of Agricultural Engineering and Post Harvest technology, Ranipool, Sikkim

1. Organized 01 no. of on-campus Demonstration of New Technology for training programme (6th to 7th Jan., 2022) for farmers with 17 male and 3 female.
2. The college has also organized 1 no. of off-campus Demonstration of New Technology training programme on 26th March, 2022 for farmers with 15 nos. of participants.
3. Organized technology and Machinery demonstration Mela- 2022 on 26th, March, 2022 with 335 farmers.
4. Organized programme Paddy Harvesting festival on 12th Nov., 2021 with 150 nos. of farmers.
5. Organized 3 nos. of informal education(9th to 11th March, 2022; 1st to 3rd March, 2022; 24th March, 2022 to 25th March, 2022) for farmers with 78 farmers/small land holding farmers.
6. Organized off campus training programme on Installation and maintenance Micro Irrigation system in Terrace Field during 14th Feb. to 16th 2022 for progressive farmers and rural youths.
7. Organized 3 nos. of awareness programme on 5th Aug., 2021; 8th Aug., 2021 and 5th Feb., 22 respectively. In this programme, 33 Male and 24 female farmers were benefitted.
8. Organized 1 no. of on campus training programme (during 14th to 16th March, 2022) for line dept./ KVK SMSs and benefited 14 nos. of participant.
9. Celebrated Important day: World health day, world Environment day, Intentional yoga day, Celebration of World Food day, Agricultural Education Day etc.
10. Organized 3 nos. of sponsored programme (10th Nov., 2021; 13th March; 24th March, 2022) for farmers and benefiting 134 farmers Sponsored ICAR.
11. Organized 31 nos. of awareness programme (from 4th April, 2021 to30th March, 2022) for farmers/SHGs, KSGS with 1000 participants.
12. Under PMKSY three days programme were conducted during 28th to 30th Oct., 2021 with 61 participants.
13. Published 4 nos. leaflet of extension publication in English/hindi language.

4.6.11. College of Horticulture, Bermiok, Sikkim

1. Organized Technology and Machinery demonstration Mela on 24th March, 2022 with 300 particpants.
2. Organized 1 on-campus (17th to 19th March, 2022) and 5 off-campus (23rd to 27th Aug., 2021; 20th to 24th Dec., 2021; 3rd to 5th March, 2022; 28th Feb., to 2nd March, 2022; 3rd March to 5th March, 2022) training programmes with 319 nos. of participants (176 male & 143 female).
3. Organized 2nos. of awareness programme (16th July, 2021; 19th Jan., 2022) on



intellectual property rights, vermi-composting and field day on cultivation practices of large cardamom with 141 participants of farmers including 53 male and 131 female.

4. Organized 5 days training programme (7th to 11th March, 2022) on improved Production Technology and Post -Harvest Management of Horticultural Crops with 20 nos. of participants including 8 male and 13 female.
5. Organized 3 days training programme (21st to 25th Feb., 2022) on entrepreneurship and skill development in horticulture sector for empowering the youth and employment generation participating 22 nos. of students including 12 male and 10 female.
6. Organized 20 nos. of extension activities other than demonstration and training programme (7th April, 2021 to 28th March, 2022) was completed during 2021-22 with 504 nos. of participants.
7. Organized 8 nos. of sponsored programme (16th July, 2021 to 28th March, 2022) with 360 farmers.
8. Total 8 nos. of training leaflets and 10 nos. flex were published in context to educate the farmers.

4.6.12. College of Agriculture, Iroisemba, Manipur

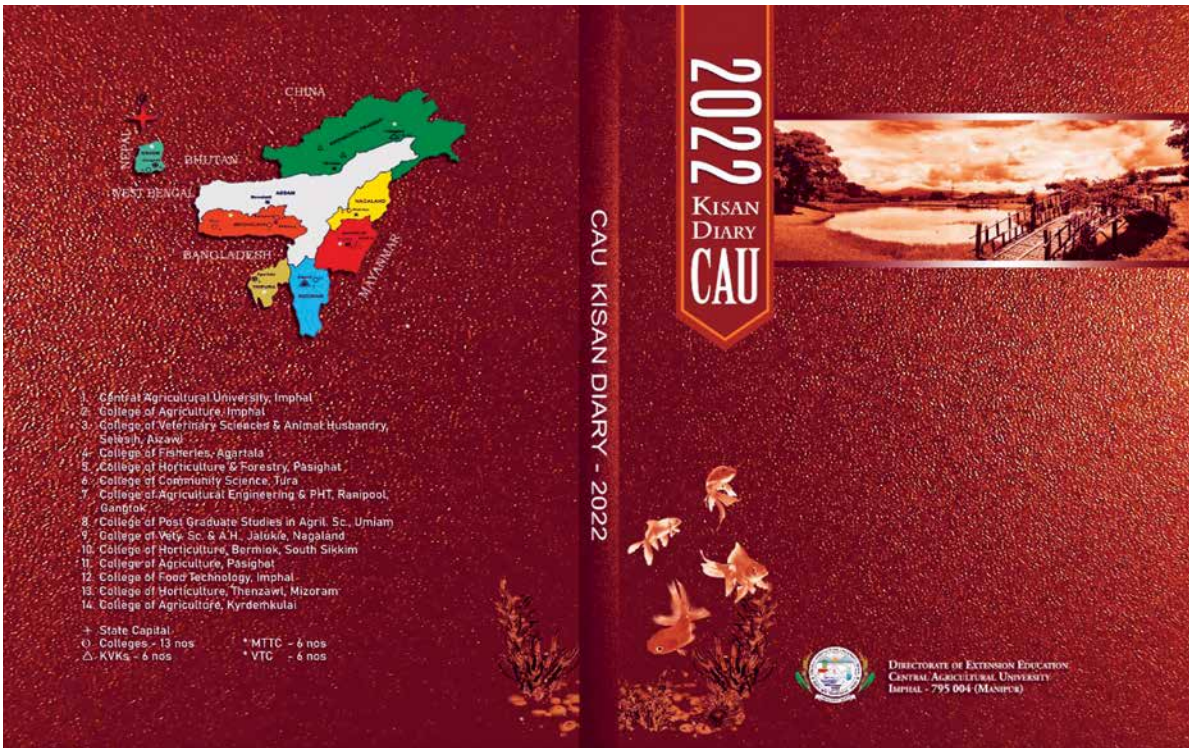
1. Organized 7 nos. of on campus training programme (12th Oct., 2021 to 18th Dec., 2021) for farmers benefiting 215 participants.
2. Organized 7 nos. of off campus training programme (21st Sept. 2021 to 19th March, 2022)
3. Organised 6 nos. of online training programme (17th June, 2021 to 29th August, 2021) with 425 participants.
4. Organised 05 nos. of Health Camps (23rd Dec., 2021 to 30th March, 2022) vaccinating 100 nos. of ponies and cattle.
5. Conducted 3 TV or 2 Radio Talk (Aug., 2021 to Oct. 2021) for farmers.
6. Celebration of Soil health day on 5th Dec., 2021 with 30 participants.

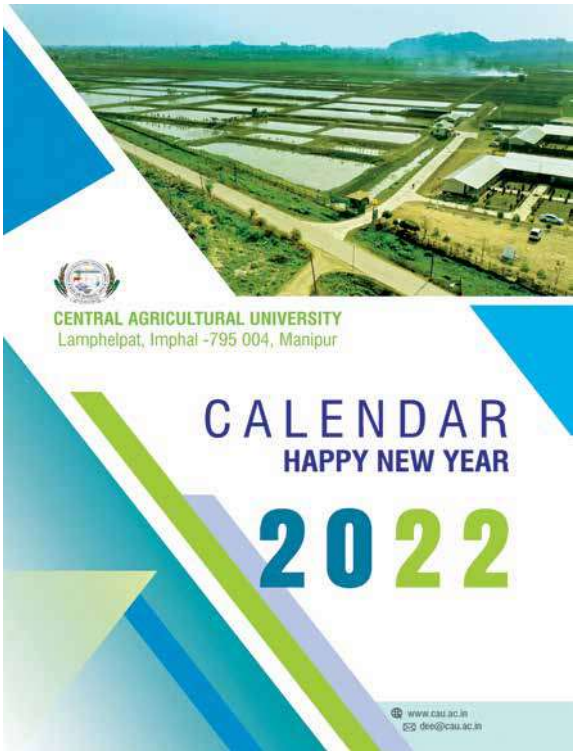
7. Celebration of Important day world Environment day, Yoga day, Campaign on Plantatin and awareness programme, Gandhi Jayanti World food day, World water day.
8. The College has published 04 nos. of Book, 01 Reading manual, 01 no. of Compendium in English and Manipuri.

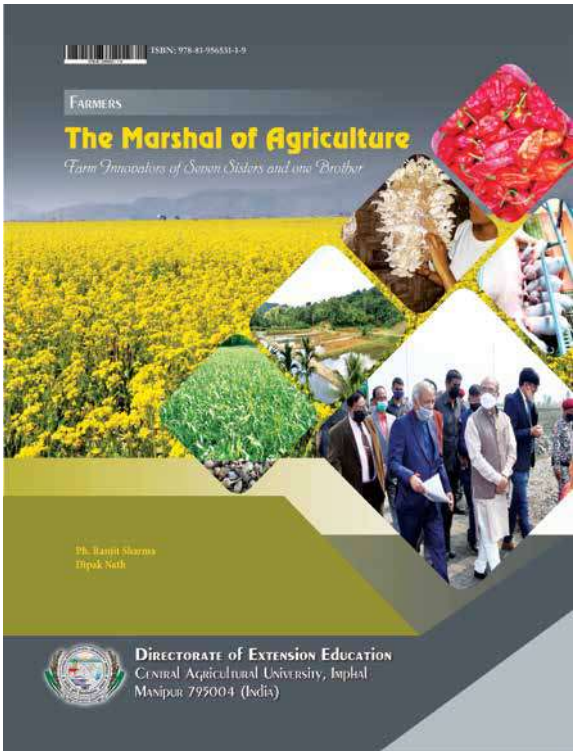
4.6.13. College of Agriculture, Kyrdemkulai, Meghalaya

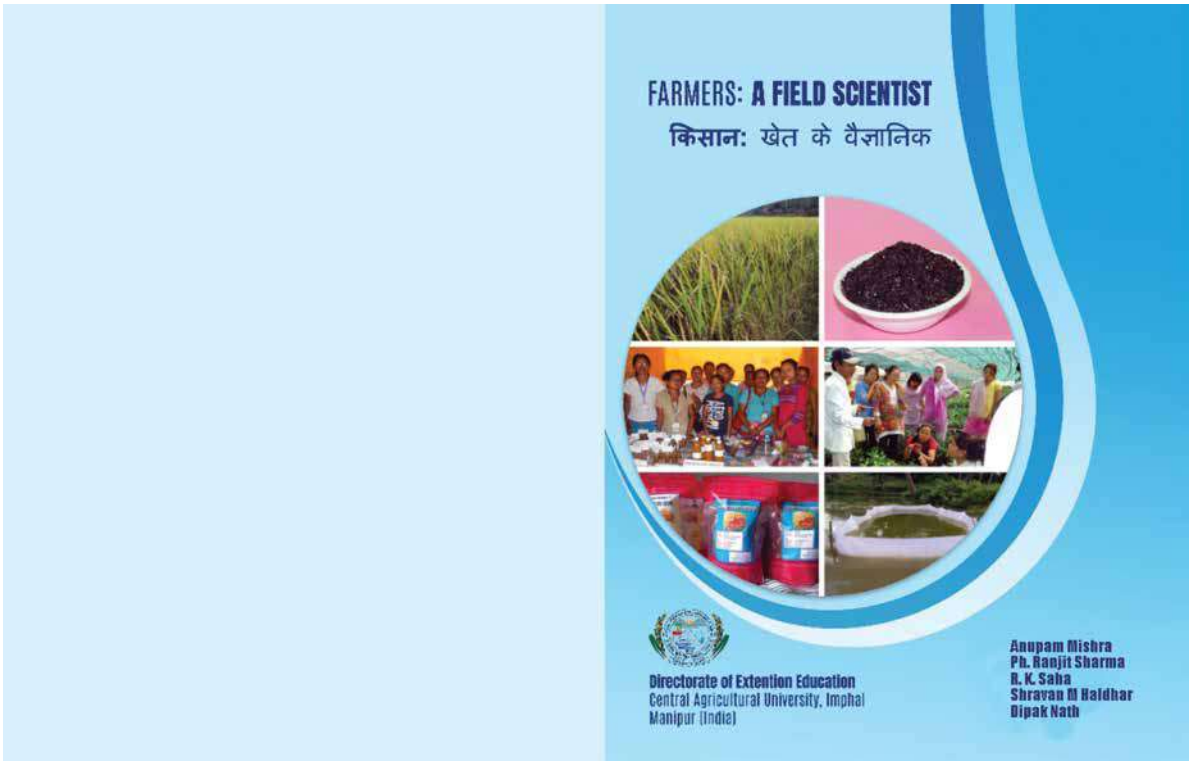
1. Conducted 6 nos. of off campus training programme (10th July, 2021 to 29th March, 2022) with 240 beneficiaries.
2. Conducted 3 nos. of on campus training programme (29th Oct., 2021 to 31st March, 2022) with 101 beneficiaries.
3. Organized one day awareness programme (on 1st Nov., 2021) on Nutritional Security for school Children and Rural Population with 200 students from various schools.
4. Conducted 1 nos. of training proramme (29th Oct., 2021) on Biotic stress management in Potato, cauliflower and other Cole crops and benefited 35 farmers.
5. Conducted training programme (10th Feb., 2022) on Different composting technologies for sustainable management of Agro-waste and forest biomass in Meghalaya
6. Conducted 2 nos. of training programmeon Integrated management of Fall army worm in maize – a recently invaded pest in NE Region (26th March, 2022) and (b) Integrated farming system for improving livelihood status of farmers in Meghalaya with 37 and 35 farmers respectively at Umtham, Ri-Bhoi district (21st Feb., 2022).
7. Conducted 2 nos. of training programme on (a) Improved package and practice for cultivation of cole crops under Meghalaya situation.26th March, 2022) (b) Seed quality enhancement techniques with 38 and 36 farmers at Umshorshor Ri-Bhoi district (28th March, 2022).
8. Published 1 no. of leaflet in English language for farmers, farm women and rural.

4. Extension Publications:








FARMERS: A FIELD SCIENTIST
किसान: खेत के वैज्ञानिक
Directorate of Extention Education
Central Agricultural University, Imphal
Manipur (India)
Anupam Mishra
Ph. Ranjit Sharma
R. K. Saha
Shravan M Haldhar
Dipak Nath

5

HUMAN RESOURCE DEVELOPMENT

INSPITE of its remoteness and other location related disadvantages, the university maintained excellent academic environment in its constituent college campuses for professional success of the students. The comfortable staff per student ratio creates an engaged and interactive teaching environment. The University encourages and supports all the faculty members and staffs to attend trainings, conferances, seminars and worshops at national and international levels. Each constituent college arranges distinct on-campus and off-campus trainings of common interests by inviting experts from within and outside the University.

Table. 5.1. Staff details of Central Agricultural University, Imphal, Manipur

S. No.	Headquarters/College	Administrative	Teaching	Non-Teaching		Total
				Tech	Non-tech	
1.	CAU Headquarters, Imphal	10	-	35	107	**152**
2.	Constituent colleges of CAU, Imphal	11	312	239	372	**934**
	Grand Total	**21**	**312**	274	479	1086

Table. 5.2. List of newly appointed employees

S. No.	Name of employee	Designation	Date of appointment	Date of joining
	College of Veterinary Sciences & AH, Jalukie, Nagaland			
1.	Dr. Sahadeo Sukhadep Cholpade	Professor	18.10.2021	12.11.2021
2.	Dr. Md. Suffaiulha	Professor	18.10.2021	30.11.2021

Table. 5.3. List of Resigned/Retired/Demised Employees

S. No.	Name of employee	Designation	Date of Resignation/Retirement/ Demise
	CAU Headquarters, Imphal, Manipur		
1.	Dr. M. Dinachandra Singh	Deputy Registrar (Acad)	31.01.2022
2.	Er. S. Arunkumar Singh	Executive Engineer	11.06.2021
3.	Shri Kh. Somorendro Singh	Head Assistant	31.12.2021
4.	Shri. L. Jilla Singh	Mechanic	31.12.2021
	College of Agriculture, Iroisemba, Manipur		
1.	Dr. R.K. Bhanisana Devi	Assistant Professor	30.06.2021
2.	Shri R.K. Nurbahon Singh	Assistant Professor	31.12.2021
3.	Dr. S. Jekendra Singh	Assistant Professor	28.02.2022
4.	Shri L. Chandrajit Singh	Accountant	08.09.2021
5.	Mrs. N. Adaphro	Accounts Assistant	31.03.2022
6.	Mr. Th. Shyamkumar Singh	Multi Tasking Staff	31.12.2021

S. No.	Name of employee	Designation	Date of Resignation/Retirement/ Demise
	College of Veterinary Sc. & A.H., Selesih, Aizawl, Mizoram		
1	Dr. Jamlianthanga	Field cum Lab. Assistant	31.12.2021
2	K. Lalbiathanga	Field cum Lab. Assistant	31.01.2022
3	Mr. Lungkhohao Gangte	Security Guard	28.02.2022
4	Mr. K. Pangunga	MTS	31.01.2022
5	Mr. Ngulkhohao Haokip	MTS	20.08.2021
	College of Agril. Engg. & PHT, Ranipool, Sikkim		
1	Dr. S.N. Yadav	Professor	31.10.2021
	College of Horticulture & Forestry, Pasighat, Manipur		
1	Dr. Nicole Lyngdoh	Assistant Professor	24.04.2021
2	Dr. Th. Jefferson	Assistant Professor	05.08.2021
	College of Fisheries, Lembucherra, Tripura		
1	Dr. R.K. Majumdar	Associate Professor	31.03.2022
2	Dr. M. Tijendra Singh	Medical Officer	17.07.2021
3	Gavinda Debbarma	Medial Attendant	30.12.2021
	College of Community Science, Tura, Meghalaya		
1	Dr. F.B. Lyngdoh	Assistant Professor	02.10.2021
2	Dr. R.K. Dhanalaxmi Devi	Assistant Professor	06.10.2021
3	P.N. Sangma	Driver	02.07.2021
	College of Veterinary Sciences & A.H., Jalukie, Nagaland		
1	Dr. H. Gopi	Professor	31.10.2021

Table. 5.4. List of Transfers

S. No.	Name of employee	Designation	Place of Transfer	Date of Transfer
	CAU Headquarters, Lamphelpat, Imphal, Manipur			
1.	Shri Subrangshu Biswas	Accounts Assistant	College of Fisheries, Lembucherra, Tripura	18.11.2021
	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh			
1.	Mr.Archan Rabha	Horticulture Assistant	College of Community Science, Tura	13.05.2021
2.	Mr. M. Chandrakumar Singh	FCLA	College of Agriculture, Imphal	18.06.2021
3.	Dr. S. Romen Singh	Assistant Professor	College of Agriculture, Iroisemba, Imphal.	15.07.2021
4.	Mrs. N. Keinatombi Devi	LSA	College of Agriculture, Imphal	18.06.2021
	College of Post Graduate Studies in Agricultural Sciences, Barapani, Meghalaya			
1.	Ms. Soringla Sareo	Field-cum-Lab. Asst.	College of Agriculture, Iroisemba, Imphal.	01.05.2021

S. No.	Name of employee	Designation	Place of Transfer	Date of Transfer
		College of Community Science, Tura, Meghalaya		
1.	Smt. Sanhita Das	Field-cum-Lab. Asst.	College of Fisheries, Lembucherra, Tripura	01.05.2021
2	Shri N. Debachandra Singh	MTS	College of Agriculture, Iroisemba, Imphal	01.05.2021
		College of Agricultural Engg. & P.H.T., Ranipool, Sikkim		
1	Smt. N. Chandrakala Devi	Field-cum-Lab. Asst.	College of Agriculture, Iroisemba, Imphal	01.05.2021
2	Mr. K. Arunkumar Singh	Assistant	CAU Hqs, Lamphelpat, Imphal, Manipur	01.05.2021
3	Smt. Sunita Yadav	MTS	-do-	01.05.2021
4	Mr. Th. Biaklian	MTS	College of Vety. Sc. & A.H. , Selesih, Aizawl, Mizoram	01.05.2021
		College of Vety. Sc. & A.H. , Selesih, Aizawl, Mizoram		
1	Smt. N. Meena Devi	Field-cum-Lab. Asst.	College of Agriculture, Iroisemba, Imphal.	01.05.2021
2	Mr. Ch. Vikram Singh	-do-	-do-	01.05.2021
3	Shri Mukesh Kumar Prasad	MTS	College of Agril. Engg. & PHT, Ranipool, Sikkim	01.05.2021

5.5. Trainings/Seminars/Conferences/Workshops/Summer Schools, etc. organized by constituent colleges

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
			College of Agriculture, Iroisemba, Manipur				
			• Organized a total of 77 different activities during 2021-22. Some of the important activities are given below.				
1.	State Level Trainers' Programme	AICRP-TC, CAU, Imphal	Tuber crops and their prospects in NE states	2	08.11.21	09.11.21	65
2.	Training Programme	AICRP-Mango, CAU, Imphal	Grafting technique used in Mango plant	1	12.10.21	-	30
3.	Training Programme	ICAR-IISR, Kerala	Promotion of Spices in North East under NEH Component	1	17.06.21	-	55
4.	Online Training Programme	Ministry of Electronics and Information Technology (MeitY)	"Integrated Farming System for Doubling the farmer's income"	3	05.08.21	07.08.21	40

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
5.	Capacity building programme for Extension Personel	ICAR-ATARI, Umiam, Meghalaya	Protected cultivation of high value vegetable crops for nutritional security and generating higher income	3	23.03.22	25.03.22	26
6.	Training Programme	CAU, Imphal	"Scientific Rearing of Pigs for sustainable Income" at DOSS, Mantripukhri	1	17.01.22	-	45
7.	Health Camp–cum-Deworming Demonstration	ICAR- NRCE, Hisar	Health Camp–cum-Deworming Demonstration at KRYPSA, Lamphelpat	1	23.12.21	-	32 ponies
8.	Health Camp–cum-Deworming Demonstration	ICAR- NRCE, Hisar	Health Camp–cum-Deworming Demonstration at MHRPA, Lamphelpat	1	25.12.21	-	32 ponies
9.	Health Camp–cum-Deworming Demonstration	ICAR- NRCE, Hisar	Health camp –cum-Deworming demonstration For Cattle at Haraorou, Imphal East	1	10.03.22	-	32 cattle
10.	Health Camp–cum-Deworming Demonstration	ICAR- NRCE, Hisar	Health camp –cum-Deworming demonstration For Pony at MPPWA, Lamphelpat	1	30.03.22	-	32 ponies
11.	Health Camp	NEC, DONER.	Heath Camp for Bovine (Mithun, Cattle & Buffalo)	1	25-02-22	-	100 animals
12.	Training Programme	NEC, DONER.	"Scientific Mithun Husbandry Practices" at Kabuikhullen, Noney District	1	15.01.22	-	32
13.	Health Camp–cum-Deworming Demonstration	ICAR- NRCE, Hisar	Health Camp–cum-Deworming Demonstration at KRYPSA, Lamphelpat	1	23.12.21	-	32 ponies
14.	Health Camp–cum-Deworming Demonstration	ICAR- NRCE, Hisar	Health Camp–cum-Deworming Demonstration at MHRPA, Lamphelpat	1	25.12.21	-	32 ponies

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
15.	Health Camp–cum-Deworming Demonstration	ICAR- NRCE, Hisar	Health camp –cum-Deworming demonstration For Pony at MPPWA, Lamphelpat	1	30.03.22	-	32 ponies
16.	Training Programme	AICRP Maize, CAU, Imphal	Scientific cultivation and integrated pest management in maize in Manipur condition	1	18.02.22	-	60
17.	Training Programme	Dept. of Vety. & AH, Manipur & CAU, Imphal	"Scientific Rearing of Pig for sustainable income" at Shirui Hotel, MG Avenue, Imphal	1	27.09.20	-	45
18.	Training Programme	AICRP Groundnut, CAU, Imphal	One day Scientific cultivation of Groundnut and its utilization	1	13.03.22	-	40
19.	Training Programme	AICRP Nematodes, CAU, Imphal	Awareness towards nemaotdes	1	22.12.21	-	52
	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh						
	• Organized a total of 104 different activities during 2021-22. Some of the important activities are given below.						
1.	Training Programme	CAU, Imphal	Economics of Horti-based Farming System for Sustainable Development	3	09.02.22	11.02.22	30
2.	Training programme	ICAR-NBPGR, New Delhi	Scientific cultivation Techniques of Jobs tear cum seed distribution of Buckwheat and the training programme on Scientific cultivation techniques of Buckwheat cum seed distribution	1	16.11.21	-	30
3.	Training Programme	ICAR-DFR (NEH Component)	Training cum distribution programme for Commercial Flower Cultivation Mirem Village	1	05.07.21	-	9

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
4.	Skilled development programme	ICAR-NBAIM, MAU, UP	Skilled Development on application of biofertilizer in organic farming"	1	14.03.22	-	30
5.	Skilled development programme	ICAR-NBAIM, MAU, UP	Skilled Development on application of biopesticides in organic framing"	1	15.03.22	-	25
6.	Incubation Programme	RKVY-RAFTAAR	Agripreneurship Orientation Programme & Agri Business Incubation Progrmmae	8	25.10.21	1.11.21	10
7.	Training Programme	NBB, New Delhi through ICAR-ATARI Zone-VI, Guwahati	Online training on 'Scientific Bee Keeping for Farmers of East Siang'	7	08.10.21	14.10.21	80
8.	Webinar	RKVY-RAFTAAR	A Ray of Hope For Promoting Agripreneurship and Startup Ecosystem	1	09.02.22	-	171
9.	National webinar	RKVY-RAFTAAR	Agripreneurship Development and Excellence	1	25.02.22	-	168
10.	Workshop	MEiTY, GOI, DIC, NEW Delhi	Development of Entrepreneurship Based on Natural Resources	1	21.12.21	-	31
11.	Workshop	MEiTY, GOI, DIC, NEW Delhi	Workshop on Issues in Rice Cultivation	1	12.01.22	-	57
12.	Training Programme	ICAR-DMR, Solan (HP)	Oyster mushroom cultivation	1	08.12.21	-	35
13.	Awareness Cum Sensitization Programe and Workshop	MEiTY, GOI, DIC, NEW Delhi	Awareness Cum Sensitizsation Programme and Workshop on Citrus Cultivation with Intercropping of Ginger	1	03.01.22	-	65
14.	Workshop	MEiTY, GOI, DIC, NEW Delhi	Water Management in Horticulture Crops	1	08.02.22	-	27

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
15.	Awareness Cum Sensitization Programme and Workshop	MEiTY, GOI, DIC, NEW Delhi	Workshop on Improved Cultivation Practice of Rice Cultivation of Mobile Based Agro Advisory in Arunachal Pradesh	1	12.02.22	-	43
16.	Vocational Training	Govt. of Arunachal Pradesh	Operation, Repair & Maintenance & Management of Power tiller & Matching Equipments	15	16.03.22	30.03.22	23
17.	Training Programme	DASD, Calicut	Improved Production Technology of Spices in Arunachal Pradesh	2	09.03.22	10.03.22	75
18.	Training Programme	AICRP on MAP&B	Cultivation of medicinal and aromatic plants	1	31.03.22	-	50
19.	Training Programme	National Bee Board	Scientific Beekeeping for farmers of East Siang, Arunachal Pradesh	7	08.03.22	14.03.22	31
20.	Training Programme	SAMETI, Pasighat and MANAGE Hyderabad	Integrated Pest Management in Vegetable crops	7	11.02.22	17.02.22	25
College of Agricultural Engineering and Post Harvest Technology, Ranipool, Sikkim							
• Organized a total of 60 different activities during 2021-22. Some of the important activities are given below.							
1.	Training Programme	TRIFED, Govt. Of India	Enhancement of livelihood through production of Household commodities like beauty bar and dish soap	30	30.08.21	28.09.21	25
2.	Training Programme	AICRP-ESA, CAU, Imphal	One-day training on “portable brush cutter” at Upper Khamdong, East Sikkim	1	15.04.21	-	18

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
3.	Training Programme	AICRP PEASEM, CAU, Imphal	Off-Campus farmer's training programme on " Soil and Plant Health Management" at Kartok, Naya Basti, Pakyong, East Sikkim	3	22.09.21	24.09.21	35
4.	Training Programme	Dept. of Agriculture, Govt. of Sikkim	Implementation and Technical Aspects of Micro Irrigation System	3	28.10.21	30.10.21	30
5.	Training Programme	TRIFED, Govt. of India	Enhancement of livelihood through production of incense sticks	30	29.11.21	28.12.22	25
6.	Training Programme	TRIFED, Govt. of India	Enhancement of livelihood through production of noodle, processed ginger items and disinfectant	30	06.10.21	05.11.21	25
7.	Training Programme	ICAR-NIBSM, Raipur	Improved Composting Methods	3	27.12.21	29.12.21	20
8.	Training Programme	Directorate of Extension Education, CAU	"Value Addition of Horticultural Crops"	3	06.10.21	08.10.21	25
9.	Training Programme	TRIFED, Govt. of India	Value Addition of vegetables and production of disinfectant	30	07.10.21	07.11.21	25
10.	Training Programme	ICAR-NIBSM, Raipur	Entrepreneurial Skill Development for Economic Empowerment of Rural Women	3	08.12.21	10.12.21	20
11.	Workshop	MSME division, Commerce and Industries Department, Govt. of Sikkim	PM formalization of Micro Food Processing Enterprises Scheme (PMFME)	2	10.02.22	11.02.22	40
12.	Training Programme	ICAR-NIBSM, Raipur	Operation and maintenance of improved farm equipment of hill	3	15.02.22	17.02.22	27

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
13.	Training Programme	TRIFED, Govt. of India	Value addition and marketing of locally available vegetables	30	19.02.22	20.03.22	25
14.	Training Programme	NMHS	Management of Piggery and Fishery for small land holders"	2	24.03.22	25.03.22	20
15.	Training Programme	Dept. of Agriculture, Govt. of Sikkim	Processing of horticultural crops & bakery products	3	09.03.22	11.03.22	25
16.	Training Programme	AICRP UAE, CAU, Imphal	One day training programme on"Efficient Utilization of Animal Energy with matching animal drawn equipment"at Tin Katery, West Sikkim	1	26.02.22	-	30
			College of Fisheries, Lembucherra, Tripura				
• Organized a total of 41 different activities during 2021-22. Some of the important activities are given below.							
1.	Webinar	CAU, Imphal	Aquatic biodiversity in Tripura: Its conservation for sustainable well-being of the state	1	22.5.21	-	98
2.	National Webinar	CAU, Imphal	Advancement in Finfish seed production for SMART aquaprenureship	5	13.07.21	17.07.21	175
3.	Training	ICAR-NDRI Karnal	"Promotion of dairy farming among tribal farmers through technological interventions in NEH region.	1	19.06.21	-	30
4.	National seminar	NABARD, ISAM, NESFA	Agribusiness potential in North Eastern region with special reference to Tripura	2	08.09.21	09.09.21	152
5.	Webinar (Official of line department)	CAU, Imphal	"Utilisation of fishery based product for reducing post harvest loss with a focus on the scope of entrepreneurship"	3	27.09.21	29.09.21	99

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
6.	Workshop (Farmer)	DBT, Govt. of India	Livelihood security and entrepreneurship development through on farm mass cultivation and utilization of Wolffia globosa for fish feeding and characterization of of bioactive compound for functional product development.	1	25.01.22	-	11
7.	National Workshop	ICAR-NBAIR, Bengaluru	Identification of insects pest, invasion of crops and their bicontrol in NE region of India	2	02.03.22	03.03.22	45
8.	Technology Dissemination and Capacity building (Off campus)	DBT, Govt. of India	Sustainable Fisheries and Aquaculture with local resources in the state of Mizoram	1	8.03.22	-	50
9.	Online Syposium	RKVY-RAFTAAR	Opportunities in Agri-aalied sectors for Youths in NE India	1	09.03.22	-	30
10.	Training Programme	ICAR-CIFT Cochin	Value Added Fish Products	3	03.03.22	05.03.22	23
11.	Training Programme	ICAR-CIFE, Kolkata	Ornamental Fish Breeding and Culture-	3	10.03.22	12.03.22	25
			College of Community Science, Tura, Meghalaya				
• Organized a total of 58 different activities during 2021-22. Some of the important activities are given below.							
1.	Training Programme (Online and Offline)	CAU, IMPHAL	Enhancing women's participation by fostering Fibre Craft skills and by creating/ enabling environment for women entrepreneurs	4	27.09.21	30.09.21	75
2.	Training Programme	Directorate of Food Processing, Govt. of Meghalaya	Pineapple Processing	5	27.09.21	01.10.21	30

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
3.	Vocational Training	CAU, Imphal	Garment construction and Accessories Designing	25	15.02.22	11.03.22	11
4.	Capacity Building programme	CAU, Imphal	Early Childhood Care and Education	3	09.03.22	11.03.22	20
5.	Online Workshop	CAU, Imphal	Academic Integrity: Creating a Safer Path for Budding Academicians	1	09.07.21	-	53
6.	Faculty Development Programme	CAU, Imphal	Writing Skills	5	21.09.21	25.09.21	27
7.	Workshop (Online)	CAU, Imphal	The Technical Know-How of Entrepreneurship and Start-Up	2	28.09.21	29.09.21	52
8.	Workshop (Online)	CAU, Imphal	Know Where to Publish: An Awareness on Fake/ Predatory Journals	1	23.10.21	-	50
9.	Workshop (Online)	CAU, Imphal	Design Application for Interior Enrichment- Current Trend	1	27.10.21	-	27
10.	Workshop (Online)	CAU, Imphal	Creating Website for Entrepreneurial Enhancement	2	03.12.21	04.12.21	30
11.	Workshop (Online)	CAU, Imphal	Article Writing and Publishing in NAAS Rated & Impact Journal	1	18.12.21	-	55
	College of Post Graduate Studies in Agricultural Sciences, Umiam, Meghalaya						
•	Organized a total of 16 different activities during 2021-22. Some of the important activities are given below.						
1.	2nd Asian Web Conference	Soil Conservation Society of India, New Delhi	Managing Hill Resources and Diversities for Zero Hunger and Climate Resilience	2	12.02.21	13.02.21	239
2.	Training Programme	CAU, Imphal	Agri-related fianancial assistance of banks suitable for farmers.	1	19.02.22	-	30

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
3.	IPS Zonal Symposium (NEZ).	Indian Phytopath-ological Society, New Delhi	Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security	2	10.03.22	11.03.22	160
4.	Seminar	ICAR-NCIPM, New Delhi	Validation of BIPM in Rice	1	13.11.21	-	70
5.	Training Programme	ICAR-NCIPM, New Delhi	Integrated management of pest and diseases of vegetable crops	1	15.12.21	-	30
			College of Veterinary Sciences & AH, Selesih,Mizoram				
•	Organized a total of 26 different activities during 2021-22. Some of the important activities are given below.						
1.	Awareness programme	CAU, Imphal	Awareness programme on agricultural and rural development schemes	1	17.12.21	-	15
2.	Meat Hygiene Training (Butchers Training)	CAU, Imphal	Hygienic Production of Meat and Control of Meat Borne Zoonoses – Food safety issues	3	22.03.22	24.03.22	24
3.	Training Programme	SIRD	Scientific management of Pig	4	07.02.22	10.02.22	96
4.	An interaction meeting	ICAR- NRC Meat, Hyderabad	Pig Production and Processing Technology for entrepreneurship development – a way forward to Atmanirbhar Bharat	2	17.02.22	18.02.22	30
5.	National webinar	CAU, Imphal	National Deworming Day	1	10.08.21	-	144
6.	Training Programme	CAU, Imphal	Recent Advances in Diagnosis, Prevention and Control of Viral Swine Diseases with Special Reference to African Swine Fever (ASF)	5	21.03.22	25.03.22	20

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
7.	Workshop	Anchrom Enterprises (I), Mumbai	Virtual Workshop on HPTLC: Technique and Herbal Applications	1	09.07.21	-	40
			College of Veterinary Sciences and A.H., Jalukie, Nagaland				
•	Organized a total of 7 different activities during 2021-22. Some of the important activities are given below.						
1.	Workshop	CAU, Imphal	African swine fever and classical swine fever awareness programme	1	20.11.21		26
2.	Training cum Demonstration	ICAR- CIFT, Cochin	CIFTEQ Community Fish Smoking Kiln (KOFISKI)	3	15.03.22	17.03.22	20
3.	Training Programme	CAU, Imphal	Use of Advanced Diagnostic Techniques in Animal Disease Investigation	5	07.03.22	11.03.22	10 Veterinary Officers
4.	Training Programme	ICAR-CICR, Nagpur	Training and demonstration on Oyster Mushroom Production	1	22.02.22	-	19
			College of Horticulture, Bermiok, Sikkim				
•	Conducted a total of 11 different activities during 2021-22. Some of the important activities are given below.						
1.	Training Programme	CAU, Imphal	Improved Production Technology and Post -Harvest Management of Horticultural Crops.	5	07.03.22	11.03.22	20
2.	Training Programme	CAU, Imphal	Entrepreneurship and skill development in horticulture sector for empowering the youth and employment generation	5	21.02.22	25.02.22	22
3.	Training Programme	CAU, Imphal	Nursery production and management of horticultural crops for enhancing farmer's income.	5	20.12.21	24.12.21	30

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
			College of Horticulture, Thenzawl, Mizoram				
•	Organized a total of 27 different activities during 2021-22. Some of the important activities are given below.						
1.	Training Programme	CAU, Imphal	Scientific management practices and value addition of Citrus in Mizoram	3	09.03.22	11.03.22	50
2.	Training Programme	CIH, Nagaland	Marketing of Horticultural produce	1	28.10.21	-	65
3.	Training Programme	ICAR- ATARI Zone VII	Quality production system of horticultural crops	5	21.03.22	25.03.22	25
4.	Training Programme	ICAR-NIBSM, Baronda	Quality seed production and varietal purity	4	13.01.22	17.01.22	120
5.	Training Programme	ICAR-NIBSM, Baronda	Integrated farming system for sustainable development in Mizoram	3	08.02.22	10.02.22	120
6.	Training Programme	ICAR-NIBSM, Baronda	Preparation, demonstration & popularization of vermicomposting	3	29.03.22	31.03.22	90
7.	Training Programme	ICAR-NIBSM	Silkworm rearing	3	29.03.22	31.03.22	90
8.	Training Programme	TRIFED, Govt. of India	Entrepreneurship and Skill Development Programme	30	03.02.22	05.03.22	325
9.	Training Programme	TRIFED, Govt. of India	Entrepreneurship and Skill Development Programme	30	02.09.21	02.03.22	300
			College of Food Technology, Lamphelpat, Manipur				
•	Organized a total of 5 different activities during 2021-22. Some of the important activities are given below.						
1.	Training Programme	ICAR-CIPHET, Ludhiana	Processing and Value Addition of Horticultural Crops of Manipur	3	11.03.22	15.03.22	100
2.	Workshop	Directorate of Marketing and Inspection, Govt. of India	World Consumer Day	1	15.03.22	-	70

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
3.	Training Programme	CAU, Imphal and ICAR-ATARI, Umiam, Meghalaya	Processing of Indigenous Fruits of Manipur	3	29.03.22	31.03.22	40
			College of Agriculture, Pasighat, Arunachal Pradesh				
•	Organized a total of 3 different activities during 2021-22. Some of the important activities are given below.						
1.	Training Programme	CAU, Imphal	Production of high value horticultural crops under low cost polyhouse	3	14.02.22	16.02.22	30
2.	Training Programme	CAU, Imphal	Seed and planting material production in Agri- Hort Crops	3	07.02.22	09.02.22	25
			College of Agriculture, Kyrdemkulai, Meghalaya				
•	Organized a total of 30 different activities during 2021-22. Some of the important activities are given below.						
1.	Farmer expo	CAU, Imphal	Farmer's Innovation Expo, 2021	3	06.04.21	08.04.21	400
2.	Brainstorming session	NAAS Regional Chapter, Barapani, Meghalaya	Agriculture as bio-entrepreneurship career options for unemployed youths and graduate students"	1	07.04.21	-	100
3.	Workshop	CAU, Imphal and NECTAR, Shillong	Institute-Line Department-NGO Interface on Promotion of IFS Technology for INRM on Sustainable Development of small and marginal farmers in Hill ecology"	1	01.09.21	-	13
4.	Brainstorming session/ Lecture series 1	NAAS Regional Chapter, Barapani, Meghalaya	Vision for Agricultural Education and Research in India during 21st century: with special reference to NEP, 2020 and Agricultural Education" under the lecture series theme 'Azadi Ka Amrit Mahotsav'	1	20.09.21	-	100

S. No.	Type of the Programme	Sponsored by	Title of the programme	Duration (Days)	From	To	No. of participants
5.	Interface meeting	CAU, Imphal and NABARD	Integrated Farming Systems for livelihood security and doubling the farmer's income through implementation of Farm Development Card	1	23.09.21	-	13
6.	Brainstorming session	NAAS Regional Chapter, Barapani, Meghalaya	Aatma Nirbhar Bharat with Integrated Natural Resources Management and Education Perspective	1	28.10.21	-	60
7.	International Conference	NAAS Regional Chapter, Barapani, Meghalaya	Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario	3	07.12.21	09.12.21	100
8.	Workshop	NECTAR, Shillong	Institute - Line Department-Farmers – NGO interface on promotion of IFS technology for INRM on sustainable development of small and marginal farmers in hill ecology	1	01.09.21	-	32

Table 5.6. Details of the programmes attended by faculty and staff

S. No.	Higher Studies	Conference		Seminars		Workshop	Training		Others (Please specify)
		National	International	National	International		Long term (>3 weeks)	Short term (<3 weeks)	
College of Agriculture, Iroisemba, Manipur									
1.	-	6	4	14	1	17	2	10	1
College of Veterinary Science & A.H., Selesih, Mizoram									
2.		2	2	11	-	12	9	18	42

S. No.	Higher Studies	Conference		Seminars		Workshop	Training		Others (Please specify)
		National	International	National	International		Long term (>3 weeks)	Short term (<3 weeks)	
College of Horticulture & Forestry, Pasighat, Arunachal Pradesh									
3.	-	1	2	-	-	-	-	3	3
College of Fisheries, Lembucherra, Tripura									
4.	0	5	1	10	-	1	2	5	8
College of Agricultural Engineering & PHT, Ranipool, Sikkim									
5.	-	01	2	-	-	5	01	12	1 (webinar)
College of Post Graduate Studies in Agricultural Sciences, Barapani, Meghalaya									
6.	-	6	8	7	3	7	2	10	-
College of Community Science, Tura, Meghalaya									
7.	-	1	1	-	-	8	1	-	11
College of Veterinary Science & A.H., Jalukie, Nagaland									
8.	-	03	01	01	-	-	4	13	-
College of Food Technology, Lamphelpat, Manipur									
9.	-	2	-	4	-	-	-	3	-
College of Agriculture, Pasighat, Arunachal Pradesh									
10.	-	1	-	-	-	-	1	1	-
College of Horticulture, Thenzawl, Mizoram									
11.	-	-	8	10	-	6	5	11	30 webinars
College of Agriculture, Kyrdemkulai, Meghalaya									
12.	-	1	11	1	-	1	0	1	-
College of Horticulture, Bermiok, Sikkim									
13.	-	1	-	1	1	3	-	11	-

Table 5.7. Lectures/keynote address/invited talks/chairperson *etc.* delivered and the guest lecture organized

S. No.	Colleges	Number of lectures/keynote address/invited talks/chairperson *etc.* delivered by the faculties	Number of guest lecture organized
1.	College of Agriculture, Iroisemba, Manipur	48	1
2.	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	102	-
3.	College of Agricultural Engineering and Post Harvest Technology, Ranipool, Sikkim	19	2

S. No.	Colleges	Number of lectures/keynote address/invited talks/chairperson *etc.* delivered by the faculties	Number of guest lecture organized
4.	College of Fisheries, Lembucherra, Tripura	8	8
5.	College of Community Science, Tura, Meghalaya	9	
6.	College of Post Graduate Studies in Agricultural Sciences, Umiam, Meghalaya	44	7
7.	College of Veterinary Sciences & A.H., Selesih, Mizoram	85	12
8.	College of Veterinary Sciences & A.H., Jalukie, Nagaland	20	2
9.	College of Horticulture, Bermiok, Sikkim	11	-
10.	College of Horticutlure, Thenzawl, Mizoram	12	-
11.	College of Food Technology, Lamphelpat, Manipur	5	-
12.	College of Agriculture, Pasighat, Arunachal Pradesh	3	
13.	College of Agriculture, Kyrdemkulai, Meghalaya	12	2

Table. 5.8. Awards and recognition of faculty members

S. No.	Name of the Faculty	Designation	Details of Awards/recognition received
		College of Agriculture, Iroisemba, Manipur	
1.	Dr. S. Romen Singh	Assistant Professor	Mahima Young scientist award, given by Mahima Research Foundation and social welfare, Banaras Hindu University, Vanarasi, U.P. Best popular article award, given by Agri-India Today Publication for the article entitled "Rodent and fungus infestation on low cost hydroponic seed germination technique for citrus cv. Rangpur Lime (*Citrus limonia*)".
2.	Dr. Angad Prasad	Professor	Distinguished Scientist Award for 2021 Offering Institution- Aastha Foundation, Meerut (UP).
3.	Dr. Daya Ram	Assistant Professor	"Certificate of Best Participation" during the workshop on Researchable ideas and methods: Improving competency of social scientist held from 15th to 20th November 2021 under NAHEP-IDP Project
4.	Dr. N. Surbala Devi	Assistant Prof. (Sr. Scale)	Young Scientist Award 2021 on the occasion of 3rd International Conference, 17-18, October, 2021 (GIAFAS-2021) at Dehradun, Uttarakhand, India

S. No.	Name of the Faculty	Designation	Details of Awards/recognition received
	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh		
1.	Dr. T. Shantibala	Associate Professor	SVWS Excellence in Research Award by Samagra Vikas Welfare Society (SVWS), 26th July 2021
			First Poster Award in National Seminar on "Conservation and Commercialization of Citrus Biodiversity in NEH Region", held by Directorate of Research, CAU, Imphal, Manipur during 18-19th February, 2021.
			K.C. Das Memorial Award, by Institution of Engineers, Odisha Centre, Bhubaneswar in 62nd Annual Technical Session on 28th March 2021.
	College of Agricultural Engineering and Post Harvest Technology, Ranipool, Sikkim		
1.	Dr. G. T. Patle,	Assistant Professor	International Teaching Research Excellence Award-2021 in appreciation to teaching and research excellence in Irrigation and Drainage Engineering conferred on 18th December, 2021 by the Centre for Processional Advancement Continuous Education (CPACE), A unit of IMRF Regd with Govt of India NITI Aayog, NGO Darpan, Vijayawada, India.
			Fellow NSF received from Nature Science Foundation, Coimbatore, Tamil Nadu
2.	Dr. Abujam Anuradha Devi	Assistant Professor (Sr. Scale)	Best Participant of Female faculty during Six days Workshop on "Researchable ideas and methods:IMPROVING competency of social scientists during 15th to 20th November, at COA, Imphal organized by NAHEP
3.	Dr. Kharpude Sudhir Narayan	Assistant Professor	International Teaching Excellence Award in Appreciation to the teaching and Research excellence in Renewable Energy Engineering 2021 by CPACE, on 18-12-2021
	College of Fisheries, Lembucherra, Tripura		
1.	Dr.J.Parhi	Assistant Professor (SG)	Best oral presentation in 1st Indian Fisheries Outlook-2022 at ICAR-CIFRI on 22-24th March,2022
			Conferred with Gold Medal for **Dr C. V. Kulkarni young Scientist award** (2017-18) by ICAR-CIFE, Mumbai on 14th September, 2021
2.	Dr.S.S Mahanand	Assistant Professor (Senior Scale)	Best oral presentation in Internatonal Conference on "Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreurship under Changing Climate Scenario" College of Agriculture, Meghalaya during 7-9th December, 2021.
3.	Dr. Mahesh B. Tengli	Assistant professor	Best PhD thesis award from NDRI Karnal
	College of Community Science, Tura, Meghalaya		
1.	Dr. Anupama Mishra	Associate Professor	Awarded **second prize** in Oral presentation in National Seminar on "Agribusiness Potential of North Eastern Region with Special Reference to Tripura", organized by College of Fisheries, Lembucherra, Tripura on 7th and 8th September 2021.

S. No.	Name of the Faculty	Designation	Details of Awards/recognition received
			Received **"Innovation and Technology Award-(2021)"** in International conference on Innovative approaches in applied Sciences and Technology jointly organized by SERS Society and BBAU, Lucknow during 3-5th. Dec, 2021.
	College of Post Graduate Studies in Agricultural Sciences, Umiam, Meghalaya		
1.	Dr. Sanjay Swami	Professor	**SCSI National Fellow Award:** Received in the National Conference of SCSI on Soil and Water Management Technologies for Climate Resilience, Agricultural and Environmental Sustainability during 14-16th December, 2021.
2.	Dr. R. K Tombisana Devi	Professor	Best Poster Award (2021) at International conference on "Integrated agriculture, natural farming, biodiversity conservation and bio-entrepreneurship under changing climate scenario" organized by NAAS Regional chapter-Barapani, Meghalaya, International Union of Organic Agriculture,Shillong and College of Agriculture,Krydemk ulai,Meghalaya during September 7-9th,2021.
			Prof. M. J. Narasimhan Academic Merit Award (2021) at 8th International Conference on Plant Pathology: Retrospect and Prospects, March 23-26, 2022 at SKNAU, Jobner, Rajasthan.
3.	Dr. Pranab Dutta	Associate Professor	**Fellow of the Linnean Society of London**, October 21, 2021.
			Best Oral Presentation award -2021 in National Webiner on Plant Diseases in eastern and North-eastern India: Current dynamics and proposed action plan for their management" Jointly organized by College of Agriculture, Tripura and ICAR-NCIPM, New Delhi during June, 24-25, 2021.
			Best Poster Presentation Award-2021 in Technical Session : Organic Farming in International Conference on "Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario" Organized by NAAS Regional Chapter-Barapani, Meghalaya, International Union of Organic Agriculture, Shillong and College of Agriculture, Kyrdemkulai, Meghalaya during -7-9 December, 2021.
			Outstanding Plant Pathologist Award for the contribution in Plant Pat5hology through Nanotechnology, by DISHA-2021, Dhanbad, Jharkhand.
4.	Dr. Kennedy N.	Assistant Professor	Best Oral paper presentation for paper Morpho-physiological effect of nanoparticles on Eri silkworm, Samia *Cynthia ricini* (Drury). In IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Umiam, Meghalaya.

S. No.	Name of the Faculty	Designation	Details of Awards/recognition received
	College of Veterinary Sciences & A.H., Selesih,Mizoram		
1.	Dr. Kalyan Sarma	Associate Professor	Second Position on poster presentation in 30th National congress of Veterinary Parasitology Reviewer Excellance Award by Indian Journal of Animal Research
2.	Dr. Tridib Kumar Rajkhowa	Professor	Best Veterinary Teacher Award for the year 2021-2022, awarded by the Indian Association of Veterinary Pathologists (IAVP) in XXXVIII Annual conference of IAVP- 2021 & XII Annual meeting of ICVP and International Symposium on "Advances in veterinary pathology for diagnosis and control of emerging and re-emerging diseases of livestock, wild animals and poultry" organized by Rajasthan university of veterinary and animal sciences, Bikaner, Rajasthan during 17th to 19th November, 2021.
	College of Veterinary Sciences & A.H., Jalukie, Nagaland		
1.	Dr. Gunjan Das,	Associate Professor	Best Poster presentation award on the topic **"**Canine atopic dermatitis (CAD) a problem in Aizawl, Mizoram at XVII Annual Conference of Indian Association of Veterinary Public Health Specialists (IAVPHS) on "One Health Concept: Opportunities and Perspectives in Present Scenario" held at Centre for One Health Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab, India, during 28th to 29th May, 2021.
	College of Horticulture, Thenzawl, Mizoram		
1.	Dr. Rojeet Thangjam		Received 2nd place in the 5th IE photo contest organized by Indian Entomologist
2.	Dr. Chingtham Chanbisana	Assistant Professor	2nd position in poster presentation entitled "Comparative Study on the Cost effective Blanching Method for Drying Broccoli" organized by College of Food and Dairy Tech., Chennai, 2021 Young Achiever Award on the occasion of International Conference on New Paradigms for Agriculture, Food and Sustainability Concerns, 26-28th Feb., 2021
3.	Dr.Lalhmingsanga	Assistant Professor	Best Article award entitled "Mulching as a mitigation of agricultural technology in the wake of climate change" by Agriculture & Food: e-Newsletter on 7th March 2022 Young Scientist Award- 2021 by ATDS on the occasion of 5th International Conference (Advances in Smart Agriculture and Biodiversity Conservation for sustainable Development) on 6th March 2022.
4.	Dr. L. Devarishi Sharma	Assistant Professor	1st prize in All India Life Sciences Article Writing Competition conducted by Centre of Excellence in Life Sciences (CELS) on 25th Sep. 2021.
5.	Mr. Rahul Sadhukhan	Assistant Professor	1st prize in All India Life Sciences Article Writing Competition conducted by Centre of Excellence in Life Sciences (CELS) on 25th Sep. 2021.

S. No.	Name of the Faculty	Designation	Details of Awards/recognition received
		College of Food Technology, Lamphelpat, Manipur	
1.	Dr. Ng. Joykumar Singh	Dean	Best Centre Award of AICRP-PHET at JNKV, Jabalpur, sponsored by ICAR, New Delhi Distinguished Service Award (Agril. Engg.) **from Bioved Research** Institute of Agriculture Technology & Sciences Prayagraj-211002
		College of Agriculture, Kyrdemkulai, Meghalaya	
1.	Dr. Sabyasachi Majumdar	Assistant Professor	**Innovative article award** entitled "A retrospective on the status of ginger cultivation in North-Eastern India" which got published in Volume 03 Issue 01 in Agriculture & Food: e-Newsletter in 2021.
2.	Dr. M. Premi Devi	Assistant Professor	**Best Oral Presentation** on 'Impact of gamma irradiation on nutraceutical and functional properties of Kachai lemon – A unique citrus landrace in NEH region of India'. National Seminar on 'Fruit production in Eastern Tropical Region of India', March 24-26, 2022, organized by CHES (ICAR-IIHR), Bhubaneswar and Society for Promotion of Horticulture (ICAR-IIHR), Bengaluru

5.9. MOU Signed/collaboration with other institutes during 2021-22

During the year under report, the university has signed MoU with the following institutes for strengthening the academic, research and extension activities of the University.

1. Manipur Organic Mission Agency (MOMA), Government of Manipur
2. Institute of Bioresources and Sustainable Development, Imphal, Manipur
3. Mizoram University, Aizawl, Mizoram
4. Dhanamanjuri University, Imphal, Manipur
5. Manipur University, Imphal, Manipur
6. National Institute of Technology, Imphal, Manipur
7. North Eastern Regional Institute of Water and Land Management (NERIWALM), Tezpur, Assam
8. ICAR- Central Agroforestry Research Institute, Jhansi, U.P.
9. ICAR- Directorate of Onion and Garlic Research (DOGR), Rajgurunagar, M.P.
10. Directorate of Food Processing, Shillong, Meghalaya

5.10. Institutional Development Plan (IDP NAHEP) during 2021-22

ICAR, New Delhi under National Agricultural Higher education Proect (NAHEP) sanctioned the Institutional development Plan (IDP) in December, 2019 to CAU, Imphal on the project titled "Enhancing Entrepreneurial Competence in Students to Address Emerging Challenges in Agriculture and Allied Sectors". The vision of the project is to develop human resources equipped with knowledge base and capability of utilizing the agricultural resources in a sustained manner for overall wellbeing of society and the environment. The mission of the project is to produce competent agripreneurs with appropriate technical and managerial skills to support sustainable agricultural productivity in the changing scenario.

During 2021-22 under IDP NAHEP, seven numbers of 7 kwp Photovoltaic OnGrid Solar power Plant has been installed and

commissioned successfully in 7 campuses of the University including the headquarter. 1 Wastepaper Recycling Plant is also commissioned successfully in College of Agriculture, Iroishemba, Manipur as part of the environment sustainability plan. 3 business management, 19 communication skills, 19 entrepreneurship, 7 faculty Development programme, 1 leadership development and 11 numbers of environment sustainability trainings were conducted.

5.10.1. Some of the achievements are given below

Activities		Outcome
Target	**Achievement**	
Creation of ambience for enhanced learning process	◆ 7 smart class room at 6 constituent colleges and CAU HQ; ◆ 6 language lab at 6 constituent colleges	◆ Improved e-learning process ◆ Improved communication skills by 30% ◆ Foreign admission by 67%
Identification and appointment of national and international visiting faculty/Guest faculty	◆ 6 nos of guest faculty appointed	◆ Increased in ◆ JRF pass percentage by 55%, ◆ Reputed Institute admission by 77%
Placement of students for international training	◆ 46 students going for 3 months foreign training in April/May, 2022.	◆ Improvement in skill and knowledge in entrepreneurship
Deployment of identified faculty to destinations abroad for training.	◆ 11 faculty members going for 2 weeks to 3 months foreign training in April/May. 2022.	◆ Improvement in scientific knowledge and help in technology development and publication in high rated journals.
Design and implementation of soft skill courses for students	◆ 19 “Communication Skills & Personality Development” ◆ 3 Pilot courses of 2 Japanese language & 1 French Language	◆ Improve personality and communication skills. ◆ Placement in Govt. and private job by 73%
Establishment of technology incubation centre.	◆ 6 incubation center at six constituent colleges established	◆ Motivated and trained students in entrepreneurship development
Design and conduction of entrepreneurial courses for students by industry and leading management institutes	◆ 19 Entrepreneurial seminars/ webinars/trainings including 8 national level and 3 business management training ◆ 1 number of exposure visit to industry/firm	◆ 20% Increased in entrepreneurship ◆ Perception of the students in becoming entrepreneur increased by 25%.
Appoint of external consultant for the digitization	◆ **1 IT Consultant appointed**	◆ Better utilization of university internet bandwidth, digital resources, university wide e-campus
Digital linking of campuses with the headquarters for efficient electronic communication.	◆ Dedicated Internet Leased line of upto 50 Mbps installed in all the 6 colleges	◆ Time and Cost saving in successful conduct of various meetings like academic, council, research council, BOM etc.

Activities		Outcome
Target	Achievement	
	◆ AMS is fully functional in terms of student registration, course registration. ◆ E-Office is being expanded to include all 13 colleges of the university	◆ Timely & efficient completion of academic calendar and examination through virtual mode ◆ Increase in office administration by 30% ◆ Increase efficiency in academic management by 30%
Improvisation of website and access of automation through the improvised website of the university.	◆ New improved website developed and hosted at NIC	◆ Increase in university website visit by 20%

5.10.2. Webinars/Workshop for Students

Webinar/Workshop	Numbers	Total Student Participants
Business Management Skills Training Program	3	593
Communication Skills & Personality Development	19	816
National Training On Entrepreneurship Development	8	1532
Training On Entrepreneurship Development	11	1143
Innovation & Leadership Development	1	220
Environmental Sustainability Plan	11	776

5.10.3. Webinars/Workshop for Faculties

Webinar/Workshop	Numbers	Total Faculty Participants
Faculty Development Programme	7	256

5.10.4. Students foreign training

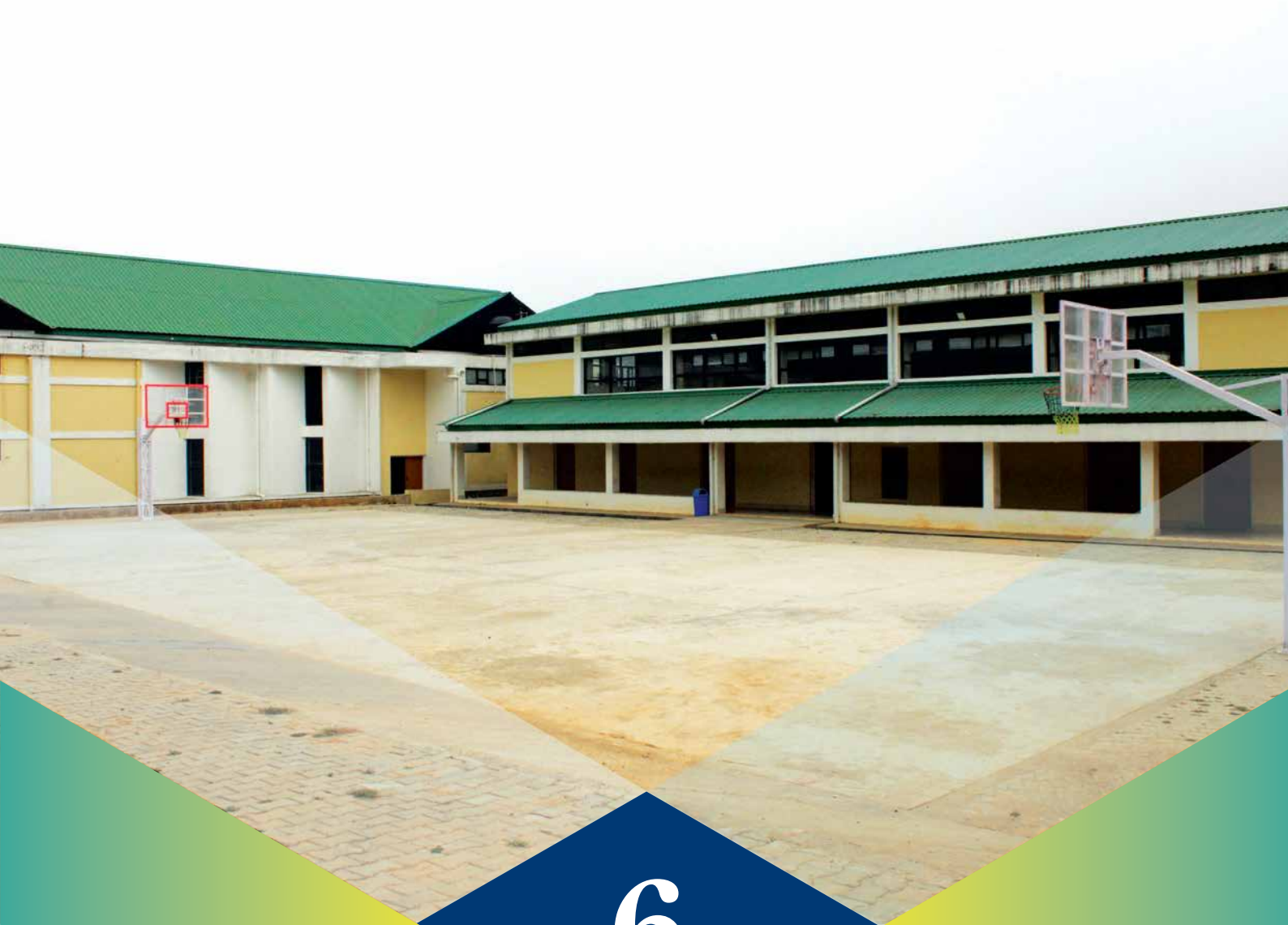
S.No.	College	Host Institute Foreign Training
1	College of Agriculture, Iroisemba, Manipur- 11 Students	International Rice Research Institute (IRRI), Philippines
2	College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	World Vegetable Center, Taiwan
	B.Sc. (Hons) Horticulture - 7 students	
	B.Sc. (Hons) Forestry- 4 students	Centre for International Forestry Research (CIFOR), Bogor, Indonesia
3	College of Agricultural Engineering & Post Harvest Technology, Ranipool, Sikkim	
	B.Tech (Agril. Engineering)- 3 students	Asian Institute of Technology, Bangkok, Thailand
	B.Tech (Food Technology)- 2 students	University Sains Malaysia, Malaysia
4	College of Community Science, Tura, Meghalaya- 4 Students	Thailand Textile Institute, Bangkok

S.No.	College	Host Institute Foreign Training
5	College of Veterinary Sciences & A.H., Selesih, Mizoram- 10 Students	International Training Centre on Pig Husbandry, Phillipines
6	College of Fisheries, Lembucherra, Tripura- 5 students	Asian Institute of Technology, Bangkok,Thailand


Waste paper recycling plant; new paper created from waste paper in the plant


OnGrid Photovoltaic Solar Power plant of 7 kwp

A workshop in progress, Incubation Centre, College of Veterinary Science & Animal Husbandry, Selesih, Aizawl



6

INFRASTRUCTURE DEVELOPMENT

Physical achievement for the year 2021-22

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
1.	(A) Extension of College of Fisheries, Lembucherra, Tripura.	PG Boys' Hostel	Completed and handed over to the College Authority.	
		PG Girls' Hostel	Completed and handed over to the College Authority.	
		Boys' Hostel Extension	Completed and handed over to the College Authority.	
		Library building	Completed and handed over to the College Authority.	
		Feed mill expansion	Completed and handed over to the College Authority.	
		Swimming Pool	Completed and handed over to the College Authority.	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
		Extension of main Admn/Acad building	Completed and handed over to the College Authority.	
	(B) Multi Technology Testing Centre & Vocational Testing Centre	Animal Shed	Completed and handed over to the College Authority.	
		VTC building	Completed and handed over to the College Authority.	
		MTTC building	Completed and handed over to the College Authority.	
2.	(A) Extension of College of Post Graduate Studies, Barapani, Meghalaya.	Expansion of Boys' Hostel	Completed and handed over to the College Authority.	
		Expansion of Girls' Hostel	Completed and handed over to the College Authority.	
		Auditorium	Completed and handed over to the College Authority.	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
		Type IV quarter (Block I & II)	Completed and handed over to the College Authority.	
		Type III quarter	Completed and handed over to the College Authority.	
		Type II quarter	Completed and handed over to the College Authority.	
		Students Utility Centre	Completed and handed over to the College Authority.	
3.	(A) Establishment of new College of Horticulture at Thenzawl, Mizoram	Administrative & Academic block	Construction works in completion stage and expected to be completed in all aspects by 31-5-2022	
		Boys' Hostel	Completed and handed over to the College Authority.	
		Girls' Hostel	Completed and handed over to the College Authority.	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
		Transit accommodation	Completed and handed over to the College Authority.	
		Type –II Quarter	Completed and handed over to the College Authority.	
4.	(A) Establishment of new College of Veterinary Sciences & Animal Husbandry at Jalukie, Nagaland.	Administrative & Academic block	Construction works are in progress. 70% completed	
		Boys' Hostel	Completed and handed over to the College Authority.	
		Girls' Hostel	Completed and handed over to the College Authority.	
		Transit Accommodation	Completed and handed over to the College Authority.	
		Type-II	Completed and handed over to the College Authority.	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
5.	(A) Establishment of new College of Agriculture at Kyrdemkulai, Meghalaya	Administrative & Academic block	Construction works are in progress (90%)	
		Boys' Hostel	Site leveling works completed and foundation works to be started very soon.	
		Girls Hostel	Construction works are in progress (80%)	
		Transit Accommodation	Completed and handed over to the College Authority.	
		Type-II	Site selection and leveling works in progress.	
6.	(A) Extension of College of Veterinary Sciences & Animal Husbandry, Selesih, Mizoram.	PG Boys' Hostel	Completed and handed over to the College Authority.	
		PG Girls' Hostel	Construction works in progress	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
		Pump House	Completed and handed over to the College Authority.	
	(B) Multi Technology Testing Centre & Vocational Training Centre	MTTC building	Completed and ready for handing over.	
		Animal house	Completed and ready for handing over.	
		Animal Slaughter house	Completed and ready for handing over.	
		VTC	Construction work in progress (95%).	
		Fish pond	Completed and ready for handing over.	
7.	(A) Extension of College of Agricultural Engineering & PHT, Ranipool, Sikkim	Dean's Office & Library	Completed and handed over to the College Authority.	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
		Transit House	Completed and handed over to the College Authority.	
		Type II	Completed and handed over to the College Authority.	
		Type IV quarter	Completed and handed over to the College Authority.	
		Girls' Hostel Extension	Completed and handed over to the College Authority.	
		Boys' Hostel Extension	Completed and handed over to the College Authority.	
		Type-II	Completed and handed over to the College Authority.	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
	(B) Multi Technology Testing Centre & Vocational Training Centre	MTTC & VTC building	Completed and handed over to the College Authority.	
		Animal shed	Completed and handed over to the College Authority.	
		VTC Hostel	Completed and handed over to the College Authority.	
8.	(A) Extension of College of Horticulture & Forestry, Pasighat, Arunachal Pradesh	Boys' Hostel	Completed and handed over to the College Authority.	
		Girls' Hostel	Completed and handed over to the College Authority.	
		Type II	Completed and handed over to the College Authority.	
		Type III	Completed and handed over to the College Authority.	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
		Type IV	Completed and handed over to the College Authority.	
		Type V quarter	Completed and handed over to the College Authority.	
		Indoor sports arena	Completed and handed over to the College Authority.	
	(B) Multi Technology Testing Centre & Vocational Training Centre	MTTC	Completed in all respect. Providing of external Electrical and Water supply connections are in progress.	
		VTC hostel	Completed in all respect. Providing of external Electrical and Water supply connections are in progress.	
		Fish pond	Completed and handed over to the College Authority.	
		Animal Shed	In finishing stage. Painting and Electrical works etc., are in progress.	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
9.	(A) Extension of College of Community Science, Tura, Meghalaya	Food Processing Laboratory	Completed and handed over to the College Authority.	
		Nursery including Day Care	Completed and handed over to the College Authority.	
		Library & Dispensary	Completed and handed over to the College Authority.	
		Weaving & spinning	Completed and handed over to the College Authority.	
	(B) Multi Technology Testing Centre & Vocational Training Centre	Multi-disciplinary Labs	Completed and handed over to the College Authority.	
		Hostel for 20 students	Completed and handed over to the College Authority.	
		Fish Pond	Completed and handed over to the College Authority.	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
10.	(A) Establishment of new College of Agriculture, Pasighat, Arunachal Pradesh	Administrative block	Completed in all respect. Providing of external electrification and water supply connection are in progress.	
		Academic block	Completed in all respect. Providing of external electrification and water supply connection are in progress.	
		Boys' Hostel	Completed in all respect. Providing of external electrification and water supply connection are in progress.	
		Girls' Hostel	Completed in all respect. Providing of external electrification and water supply connection are in progress.	
		Type-II Qtr.	Completed in all respect. Providing of external electrification and water supply connection are in progress.	
		Transit	Completed in all respect. Providing of external electrification and water supply connection are in progress.	
11.	(A) Establishment of new College of Horticulture, Bermiok, Sikkim	Administrative building	Construction works in progress	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
		Academic building	Construction works in progress	
		Boys' Hostel	Construction works in progress	
		Girls' Hostel	Construction works in progress	
		Type-II Qtr.	Construction works in progress	
		Transit House	Construction works in progress	
12.	(A) Extension of College of Agriculture, Iroisemba, Manipur	P.G Boys' Hostel	Pile foundation is completed and raft foundation is in progress	
		Boys' Hostel	Tiles flooring, electrification, providing and fixing of doors, painting works, fixing of sanitary items etc. are in progress.	
		Girls' Hostel	Pile foundation & raft foundation are completed and super structure works are in progress.	

S. No.	Name of the College	Name of the buildings	Status of works	Photographs
		Type III	Pile foundation & raft foundation are completed and super structure works are in progress.	
		Type IV	Pile foundation & raft foundation are completed and super structure works are in progress.	
	(B) Multi Technology Testing Centre & Vocational Training Centre	MTTC building	Completed and handed over to the College Authority.	
		Animal Sheds	Completed and handed over to the College Authority.	
		VTC building	Completed and handed over to the College Authority.	
13.	(A) Establishment of new College of Food Technology, Lamphelpat, Manipur	Administrative & Academic Boys' Hostel with Dining Girls' Hostel with Dining Type-II Qtr. Transit House	Tendering works in progress.	

7

FINANCE

A. UNIT-WISE BUDGET ALLOCATION FOR 2021-22

(Rs. in lakh)

S. No.	Name of the Unit	Budget Estimate 2021-22			Total B.E. 2021-22
		SALARY	GENERAL	CAPITAL	
1	CAU (HQ), Imphal	18300.00	605.20	3746.77	22651.97
2	DOI		9.95	100.92	110.87
3	DOR		55.73	5.00	60.73
4	DEE		66.00	67.91	133.91
5	COA, Iroisemba, Manipur		270.47	366.42	636.89
6	COVSC, Selesih, Mizoram		251.36	248.69	500.05
7	COF, Lembuchherra,Tripura		164.87	219.05	383.92
8	COHF, Pasighat, Arubnachal Pradesh		147.25	103.12	250.37
9	COCS, Tura, Meghalaya		144.65	64.84	209.49
10	COAE&PHT, Ranipool, Sikkim		120.95	63.27	184.22
11	COPGS, Barapani, Meghalaya		211.55	127.66	339.21
12	COFT, Lamphelpat, Manipur		67.78	89.74	157.52
13	COA, Pasighat, Arunachal Pradesh		38.85	46.77	85.62
14	COA, Kyrdemkulai, Meghalaya		145.71	95.30	241.01
15	COH, Bermiok, Sikkim		62.14	49.42	111.56
16	COVSC, Jalukie, Nagaland		82.82	69.51	152.33
17	COH, Thenzawl, Mizoram		54.72	35.61	90.33
18	Resource Management Cell				0.00
19	PRMM Cell				0.00
20	Raj Bhasha				0.00
	Total	**18300.00**	**2500.00**	**5500.00**	**26300.00**

B. UNIT-WISE EXPENDITURE INCURRED DURING 2021-22

(Rs. in lakh)

S. No.	Name of the Unit	SALARY	GENERAL	CAPITAL	Total Expenditure during 2021-22
1	CAU (HQ), Imphal	16350.93	528.83	2711.28	19591.04
2	DOI		8.32	9.56	17.88
3	DOR		71.50	5.00	76.50
4	DEE		65.39	68.39	133.78
5	COA, Iroisemba, Manipur		270.24	353.64	623.88
6	COVSC, Selesih, Mizoram		251.36	247.44	498.80
7	COF, Lembuchherra, Tripura		162.99	220.93	383.92
8	COHF, Pasighat, Arunachal Pradesh		147.17	100.27	247.44
9	COCS, Tura, Meghalaya		143.35	24.00	167.35
10	COAE&PHT, Ranipool, Sikkim		120.95	63.24	184.19
11	COPGS, Barapani, Meghalaya		210.29	128.63	338.92
12	COFT, Lamphelpat, Manipur		67.51	84.64	152.15
13	COA, Pasighat, Arunachal Pradesh		35.56	26.70	62.26
14	COA, Kyrdemkulai, Meghalaya		143.05	73.05	216.10
15	COH, Bermiok, Sikkim		62.14	49.42	111.56
16	COVSC, Jalukie,Nagaland		82.81	66.63	149.44
17	COH, Thenzawl, Mizoram		54.62	35.62	90.24
18	Resource Management Cell				0.00
19	PRMM Cell				0.00
20	Raj Bhasha				0.00
	Total	**16350.93**	**2426.08**	**4268.44**	**23045.45**

Statement showing unit-wise Actual Revenue Receipt of the University for the year 2021-22

(Rs. in lakh)

S. No.	Head of Account	Name of the Unit																	Total Revenue (2021-22)
		CAU (HQ)	DI	DR	DEE	COA	COVSc	COF	COHF	COCS	CAE& PHT	COPGS	COFT (Imph.)	COA (Pasi.)	COH (Berm.)	COA (Kyrd.)	COH (Then.)	COVSc (Jalu.)	
1	Academic Receipt	17.22				103.38	54.76	53.43	73.44	16.34	39.99	35.62	22.00	29.07	5.38	9.66	7.66	6.53	474.48
2	Interest on Bank Account	67.27	1.09	0.33		3.87	1.65	3.44	10.24	1.59	0.77	4.62	0.86	2.08	0.18	0.00	0.00	0.00	97.99
3	Sale Proceeds of farm Produce	5.57		8.20	4.12	2.13	29.24	0.41	4.50	0.20	0.31	0.18	0.55	0.00	0.23	0.89	0.00	22.95	79.48
4	Miscellaneous Income*	9.90				3.75	11.71	11.71	22.37	6.05	6.34	8.87		0.07	0.33	0.55	0.08		81.73
5	Institutional / Overhead Charges	36.09		2.35		0.55	0.00	7.26	0.00	0.94	2.50	7.56		0.00	0.00	0.00	0.00		57.25
6	Other Income**					0.66	0.00	6.44	0.80	0.00	2.66	3.06		0.00	0.00	0.22	0.00		13.84
Total amount		**136.05**	**1.09**	**10.88**	**4.12**	**114.34**	**97.36**	**82.69**	**111.35**	**25.12**	**52.57**	**59.91**	**23.41**	**31.22**	**6.12**	**11.32**	**7.74**	**29.48**	**804.77**

Note :-
*Miscellaneous Income includes Income from Guest Houses, Xerox Charges, Licence fee, Water Charges and Electricity Charges from Staff.
**Other Income includes Institutional (Overhead) Charges of the Projects, Application Fee, Registration Fee , Tender Fees and Fees from the students e.g. Migration Fee, Certificate Fees) etc.

8

UNIVERSITY PUBLICATIONS

DURING the reporting year, faculties of constituent colleges of the university have published 964 research literatures comprising of 450 full length research, 57 seminar proceedings, 114 papers presented in seminars, symposia, 83 popular articles ,47 books, 44 book chapters and 169 bulletins/ manuals/pamphlets *etc.* They are listed as under:

List of Scientific Publications

8.1. RESEARCH PAPERS

1. A. Arun Prince Milton, Kasanchi M. Momin, SandeepGhatak, G. BhuvanaPriya, M. Angappan, Samir Das, K. Puro, R.K. Sanjukta, I. Shakuntala, A. Sen , B.K. Kandpal. (2021). Development of a novel polymerase spiral reaction (PSR) assay for rapid and visual detection of Clostridium perfringens in meat. *Heliyon*. 7, e05941.
2. A. Arun Prince Milton,Kasanchi M. Momin, G. Bhuvana Priya, Samir Das, M. Angappan, Arnab Sen, D.K. Sinha, Sandeep Ghatak. (2021). Novel saltatory rolling circle amplification assay for rapid and visualdetection of *Campylobacter jejuni* in chicken meat. *LWT Food Science and Technology*. 149,111807. **NAAS Score/ID – 12.05**
3. A. D. Upadhyay (2021) Measuring Efficiency and Performance Of Fish Farm Business Using Farm Management Techniques. Fisheries and Aquaculture Management (2021) : 421-437 Editors : P. K. Pandey, A. D. Upadhyay and T. G. Choudhury. Today & Tomorrow's Printers and Publishers, New Delhi - 110 002. Pp 421-437. (ISBN 978-81-701968-7-7)
4. A. Deka, M. Talukdar, D.J. Talukdar and K. Sarma (2021). Gross, Histomorphological and Scanning Electronic Microscopic Studies on Gut Associated Lymphoid Tissue of Intestine of Pati Duck (*Anas platyrhynchos domesticus*) of Assam. *Indian Journal of Animal Research* DOI: 10.18805/IJAR.B-4731 **NAAS Score/ID – 6.44/I040**
5. A. Jolly Devi (2021).Value addition in Arecanut for enhancing income among arecanut growers with special reference to Meghalaya. *Journal of Community Mobilization and Sustainable Development,*16(1):39-42 **NAAS Score/ID – 5.67/ J158**
6. A.A.P. Milton, K.M. Momin, G.B. Priya, S. Ghatak, S. Das, P.N. Gandhale, M. Angappanand A. Sen. (2021). Development of novel visual detection methodology for Salmonella in meat using saltatory rolling circle amplification. *Journal of Applied Microbiology*. 1364-5072. **NAAS Score/ID – 9.77/J070**
7. A.A.P. Milton, Kasanchi M. Momin, G. BhuvanaPriya, Samir Das, M. Angappan, Arnab Sen, D.K. Sinha, Sandeep Ghatak. (2021). Development of a novel visual detection technique for Campylobacter jejuniin chicken meat and caecum using polymerase spiral reaction (PSR) with pre-added dye. *Food Control*. 126, 108064. **NAAS Score/ID – 11.55/F040**
8. A.K. Meena, N.Y. Chanu, B.M. Meena, A. Kumar and R. Swaminathan. (2021). Population dynamics of major insect pests on soybean farmscaped with marigold. *Journal of Entomological Research*. 45(3): 470-475. **NAAS Score/ID – 5.89/J191**
9. A.K.Srivastava, Debashish Hota, Shraddha Dahat and Devarishi Sharma (2022). Citrus nutrition: An Indian perspective. *Annals of Plant and Soil Research*, 24(1): 1-15. **NAAS Score/ID – 5.22/A206**
10. Abu Reza Md Islam, Roquia Salam, Nilufa Yeasmin, Mohammad Kamruzzaman, Shamsuddin Shahid, Md Fattah, ASM Uddin, Mohammad Hasan Shahariar, Md Anarul Haque Mondol, Deepak Jhajharia, Kuaanan Techato (2021). Spatiotemporal distribution of drought and its possible associations with ENSO indices in Bangladesh. *Arabian Journal of Geosciences*, 14(23):1-19. **NAAS Score/ID – 7.83/ A278**
11. Acharjee, G., Upadhyay, A.D., Tamuly, A. and Pal, P. (2021). Supply Chain Management of Litchi: A Case Study in Sonitpur District of Assam. *Economic Affairs*, 66(2): 311-317. **NAAS Score/ID – 5.08/E026**
12. Ajaykumara K M, Shakywar RC, Gireesh Chand, Surmina Devi N, Rajeshwari Hiremath, Mukesh Sehgal and Meenakshi Malik (2021). Ecological Engineering as a Pest Management Tool in Horticultural Ecosystems. *International Journal of Agriculture, Environment and Sustainability*, 3(1) 8-16.

13. Akter F, Roychoudhury P, Dutta T K, Subudhi P K, Kumar S, Gali J M, Behera P, Singh Y D. (2021). Isolation and molecular characterization of GP5 glycoprotein gene of Betaarterivirus suid 2 from Mizoram, India. *Virus Diseases*. https://doi.org/10.1007/s13337-021-00735-x. pp:1-9. Published online -20th Aug, 2021. **NAAS :5.95**

14. Allapat Arjun , Chaudhary J. K. , Singh N. Shyamsana , T. C. Tolenkhomba, Kalita Girin and Gali JMR. (2022). Prediction of egg weight from egg quality characteristics by using regression analysis methods in White Leg Horn Chicken. *International Journal of Livestock Research*, 12 (2) :40-48

15. Amarjeet Kumar, Swati, Sneha Adhikari, Anjali Joshi, Love Kumar, Alka Bharati, Birendra Prasad and Anil Kumar. (2021). Heterotic performance of Morpho-Physiological Traits for Heat Tolerance in Bread Wheat (*Triticum aestivum* L). *Biological Forum – An International Journal*, 13(3b): 16-24(2021). **NAAS Score/ID – 5.11/B084**

16. Amarjeet Kumar, Vijay Kumar Singh, Bhagwat Saran, Nadhir Al-Ansari, Vinay Pratap Singh, Sneha Adhikari, Anjali Joshi, Narendra Kumar Singh and Dinesh Kumar Vishwakarma (2022). Development of Novel Hybrid Models for Prediction of Drought- and Stress-Tolerance Indices in Teosinte Introgressed Maize Lines Using Artificial Intelligence Techniques. *Sustainability,* 14, 2287. https://doi.org/10.3390/su14042287 **NAAS Score/ID – 9.25/S096**

17. Angami, T., Wangchu, L., Debnath, P., Sarma, P., Singh, B., Singh, A. K., and Aochen, C. (2021). *Garcinia* L.: a gold mine of future therapeutics. *Genetic Resources and Crop Evolution*, 68(1),11-24. IF-1.52 ISSN 9259864 **NAAS Score/ID – 7.52/G014**

18. Angami, T., Wangchu, L., Debnath, P.Sarma, P., Singh, B., Singh, A.K. and Singh, S et al. (2021). Garcinia L: a gold mine of future therapeutics. *Genetic resource and Crop Evolution An international journal*, DOI10.1007/s10722-020-01057-5(2021). **NAAS Score/ID – 7.52/G014**

19. Anjali Joshi, Sneha Adhikari, Narendra Kumar Singh, Amarjeet Kumar, Jai Prakash Jaiswal, Usha Pant, Rajesh Pratap Singh. (2021). Responses of maize 3 teosinte derived backcross inbred lines (BILs) to maydis leaf blight (MLB) disease. *Euphytica* 217:219 https://doi.org/10.1007/s10681-021-02951-4 **NAAS Score/ID – 7.90/E116**

20. APM Sharma, D Jhajharia, S Gupta, GS Yurembam (2021). Assessment of Meteorological Drought with Application of Standardized Precipitation Evapotranspiration Index (SPEI) for Tripura, Northeast India. *International Journal of Environment and Climate Change* 11(3): 126-135. **NAAS Score/ID – 5.13/I229**

21. APM Sharma, D Jhajharia, S Gupta, GS Yurembam (2022). Multiple indices based agricultural drought assessment in Tripura, Northeast India. *Arabian Journal of Geosciences* 15 (7): 1-13. **NAAS Score/ID – 7.83/A278**

22. Arindam Bhowmik, Gunjan Das, S.K. Behera, Kalyan Sarma, H. Prasad , Chethan G.E., Bedanga Konwar, A.K. Samanta, Mritunjay Kumar, Bikash Debnath. Prasenjit Debnath, Albert Debbarma. (2021). Study of DCAD concentration in pre-partum dairy cows vis-à-vis incidence of milk fever in organized and unorganized dairy cattle farms., *Indian Journal of Animal Research*. ***Accepted*. NAAS Score/ID – 6.44/I040**

23. ArockiasamyArun Prince Milton, Kasanchi M. Momin, Govindarajan Bhuvana Priya, SandeepGhatak, Pradeep N. Gandhale , Madesh Angappan, Samir Das, Arnab Sen. (2021). A novel in situ methodology for visual detection of *Clostridium perfringens* in pork harnessing saltatory rolling circle amplification. *Anaerobe*. 69, 102324 **NAAS Score/ID – 9.33/A156**

24. Bai Koyu, Singh R.J and Singh R (2021). Factor Influencing Behavioural Intention to farmers to use E-Learning Module on Climate Smart Horticulture in Arunachal Pradesh. Indian Journal of Extension Education, 57 (4): 40-43. NAAS Score/ID – 5.95/I061

25. Baiarbor Nongbri, Ram Singh, S.M. Feroze, L. Devarani and L. Hemochandra (2021). Food and Nutritional Security of Farm Households in Meghalaya: A Food Basket Approach Using Temporal and Spatial Analysis, *Indian Journal of Agricultural Economics* 769(2): 292-306. **NAAS Score/ID – 5.30/I029**

26. Baiarbor Nongbri, Ram Singh, S.M. Feroze, L. Devarani and L.Hemochandra (2021) Food and Nutritional Security of Farm Households in Meghalaya: A Food Basket Approach using Temporal and Spatial Analysis. Indian Journal of Agricultural Economics,76 (2): 292-306 NAAS Score/ID – 5.30/I029

27. Barnali N, L. Nabachandra Singh, I. Bhupenchandra, S.K. Chongtham, L.C. Olivia, E. Lamalakshmi Devi, S. Sinyorita, S. Helena Devi, Reaya Chanu, Merinda W. (2021). Effect of different nitrogen management practices on growth, yield and water use efficiency of rice under varying moisture regimes. *Environment Conservation Journal* 22(3):17-30. **NAAS Score/ID – 5.66/E070**

28. Barnali N, L. Nabachandra Singh, Ingudam Bhupenchandra, S.K. Chongtham, L.C. Olivia, E. Lamalakshmi Devi, Soibam Sinyorita, Soibam Helena Devi, Reaya Chanu and Merinda Wangkheimayaum (2021) Effect of differential nitrogen management practices on growth, yield and water use efficiency of rice under varying moisture regimes. *Environment Conservation Journal* 22 (3):17-30. **NAAS Score/ID – 5.66/E070**

29. Basanta S., Raul P., Kalyan S., Hemen D., Lalmuanthanga C., Lallianchhunga M.C. and Chaudhary J.K. (2021): Haemato-Biochemical Profile in glycopyprolate premedicated digs maintained with isoflurane anaesthesis with induction of propofol, ketofol and etomidate. *Haryana Vet*. 61 (SI). 60-63 **NAAS Score/ID – 5.58/T023**

30. Basanta Saikia, Kushal Konwar Sarma, Kalyan Sarma (2021). Effects of Propofol, Ketamine and their Combination (ketofol) as Total Intravenous Anesthesia (TIVA) on Haematological, Serum Biochemical and Hormonal Profile in the Surgical Management of Canine Patients. *Indian Journal of Animal Research* B-4268 **NAAS Score/ID – 6.44/ I040**

31. Bayan H, Sarma KK, Rao GD, Kalita D,Dutta D and Phukan A. (2021). Cardiopulmonary Functions in Dogs under Propofol, Ketamine and Isoflurane Anaesthesia Premedicated with Glycopyrrolate, Dexmedetomidine and Butorphanol*. Indian Journal of Animal Research*. 10.18805/IJAR.B-4430 **NAAS Score/ID – 6.44/I040**

32. Bayan H, Sarma KK, Rao GD, Kalita D,Dutta D and Phukan A. (2021). Effects of Propofol and Ketamine as Induction Agent to Isoflurane and as Continuous Rate Infusion on Haematobiochemical Parameters in Dogs Premedicated with Glycopyrrolate, Dexmedetomidine and Butorphanol. 10.18805/ IJAR.B-4535 **NAAS Score/ID – 6.44/I040**

33. Bayan H, Sarma KK, Roychoudhury P and Deka D. (2022). Immunological Effects of Propofol, Ketamine and Isoflurane in Dexmedetomidine and Butorphanol Premedicated Dogs.*Indian Journal of Animal Research*. 56(2):222-227. **NAAS Score/ID – 6.44/I040**

34. Behera, B. K., Parhi, J., Dehury, B., Rout, A. K., Khatei, A., Devi, A. L., and Mandal, S. C. (2022). Molecular characterization and structural dynamics of Aquaporin1 from walking catfish in lipid bilayers. *International Journal of Biological Macromolecules*, 196: 86-97 **NAAS Score/ID – 12.95/I184**

35. Behera, L.K., Ray, L.I.P., Nayak, M.R., Mehta, A.A. and Patel, S.M. (2020). Carbon sequestration potential of Eucalyptus sp.: A review. e-planet 18(1): 79-84. NAAS Score/ID – 3.76/E001

36. Bharati Lap, Mayank Rai, Wricha Tyagi (2021). Playing with colours: genetics and regulatory mechanisms for anthocyanin pathway in cereals. Biotec. gen. eng. Reviews. 37(1):1-29. NAAS Score/ ID – 10.20

37. Bidyarani Devi Senjam and S. R. Singh (2021). Foliar spray of auxin (NAA, 2, 4-D) and urea on yield and quality of lemon cv. Assam Lemon. *Bangladesh Journal of Botany*, 50(1): 189-194. **NAAS Score/ ID – 6.31/B021**

38. Biswal, A., Srivastava, P.P., Krishna, G. Paul T. and Pal, P. (2021).An Integrated biomarker approach for explaining the potency of exogenous glucose on transportation induced stress in *Labeo rohita* fingerlings. *Scientific Reports* 11: 5713. https://doi.org/10.1038/s41598-021-85311-5 **NAAS Score/ ID – 10.38/S027**

39. Bora Arindom , Bora Princelina , Majumder Surita, Chaudhary Kumar Jitendra, Singh N. Shyamsana , Kalita Girin , Behera Parthasarathi , Mayengbam Prava and Tolenkhomba T. C.(2021). Genetic Polymorphism of Melatonin Receptor (MTNR1A) Gene in Swamp Buffalo of Assam and Manipur, India. *International Journal of Livestock Research*, Vol. 11 (3):119-123

40. Bora P., Bora A., Chaudhary JK., Goswami R., Roychoudhary P., Mayengbam P. and Tolenkhomba T.C.(2021). Polmorphism of prolactin (PRL) gene in native Chicken, "ZO-AR" of Mizoram, India. *International J. of Liv. Res.* 11(3):114 -118

41. Bora P., Bora A., Chaudhary JK., Goswami R., Roychoudhary P., Mayengbam P. and Tolenkhomba T.C. (2021). A brief physiological note on helmeted guinea fowl (*Numida meleagris*) reared in intensive rearing system in Mizoram. *Journal of Entomology and Zoology Studies.* 9 (1): 1821-1823

42. Borah, P and Devarani, L. (2022). Competency of faculty members in online teaching of agricultural graduates during COVID-19 pandemic, Indian Journal of Extension Education. 58(1): 21-25 NAAS Score/ID – 5.95/I061

43. Borah, P and Devarani, L. (2022). Competency of faculty members in Online teaching of agricultural graduates during COVID-19 pandemic, Indian Journal of Extension Education http://doi.org/10.48165/IJEE.2022.58105 NAAS Score/ID – 5.95/I061

44. Borgohain P., Barua P., Das, B., Mahanta J., Saikia B., Dutta, Pranab and Saikia L.R. (2022). Antifungal activity of selected Medicinal plants used by indigenous people of Assam in India to treat Onychomycosis. Journal of Herbs, Spices and Medicinal Plants. doi: 10.1080/10496475.2022.2034701. Impact Factor: 0.909, ISSN No.: 15403580.

45. Boro U, Talukdar DJ, Ahmed FA, Lalrintluanga K, Kalita G and Tolenkhomba TC.(2021). Incidence of postpartum anestrus among crossbred cattle in and around Aizawl district of Mizoram. *Journal of Entomology and Zoology Studies.* 9(1): 179-180

46. Boruah S. and Dutta P. (2021). Fungus mediated biogenic synthesis and characterization of chitosan nanoparticles and its combine effect with Trichoderma asperellum against Fusarium oxysporum, Sclerotium rolfsii, and Rhizoctonia solani. Indian Phytopathology, 74: 81-93. ISSN No.: 0367-973X. NAAS: 5.95, JrnID: I109

47. Buda, U., Priyadarshini, M. B., Majumdar, R.K., Mahanand, S.S., Patel, A.B., and Mehta, N.K. (2021). Quality characteristics of fortified silver carp surimi with soluble dietary fiber: Effect of apple pectin and konjac glucomannan. *International Journal of Biological Macromolecules*, 175: 123-130. https://doi.org/10.1016/j.ijbiomac.2021.01.191. **NAAS Score/ID – 12.95/I184**

48. C. Lalhlimpuia., N. Shyamsana Singh., Prava Mayengbam., Ranjana Goswami and T. C. Tolenkhomba. Production Performance of "Zo ar" a Local Chicken of Mizoram in its Home Tract. *International Journal of Livestock Research.* 11 (4): 100-104

49. C.S. Phurailatpam, Lyngdoh N, R Vasudeva, T. S Mehra, Bishwapati Devi Mongjam and Kalkame Ch Momin (2021) Refining tree selection criteria of Tree Bean (*Parkia timoriana* (DC.) Merr.) based on farmer knowledge and consumer preference in Manipur, India, *Forests, Trees and Livelihoods*, DOI: 10.1080/14728028.2021.2018361

50. Ch. Chanbisana and A.K. Banik (2021). Effect of Different Packaging Methods in Storability of Broccoli var. Aishwarya in Refrigerated Condition. *Journal of Crop and Weed*. 17(1):136-142 **NAAS Score/ID – 5.46/J170**

51. Ch. Chanbisana and A.K. Banik (2021). Sensory Analysis on Steeping methods of preservation of broccoli var Sadhana. *International Journal of Engineering Research and Technology*. 10(9):645-649

52. Ch. Chanbisana and A.K. Banik (2022). A Comparative Study on the Interaction Effect of Date of Planting, Variety and Head Diameter on the Post Harvest Quality of Broccoli Stored in Refrigerated Condition. *Asian Journal of Dairy and Food Research*. Online published: 10.18805/ajdfr. DR-1739 **Score/ID – 5.75/A315**

53. Ch. Chanbisana, Lalrinsangpui and Esther Lalruatsangi. (2021). Aonla Candy Preparation from Local variety Available in Thenzawl, Mizoram. *Agriculture Letters*, 2 (10): 26-28

54. Chaithra, S.N., Saikia, B., Konwar, B., Bayan, H., Sarma, K., Lallianchhunga, M.C., Arya, R.S. (2021). Evaluation of Tramadol, Pentazocine Lactate and Meloxicam as Pre-emptive Analgesics for Pain Management in Canine Ovariohysterectomy. *Indian Journal of Animal Research.* DOI: 10.18805/IJAR.B-4516 (1-9). **NAAS Score/ID – 6.44/I040**

55. Chakma B, Serto L, Kharpude SN, Digambar NP and Seveda MS (2021). Life cycle assessment analysis, embodied energy evaluation and economic aspect study of double mirror reflector box type solar cooker for NEH region of Sikkim. *International Journal of Green Energy*, 1-18https://doi.org/10.1080/15435075.2021.1978446. **NAAS Score/ID – 8.46/I26**

56. Chamniugongliu Gonmei , Kalyan Sarma , Parimal Roychoudhury , M. Ayub Ali , Damodar Singh , H. Prasad , FA Ahmed , Rebecca Lalmuanpuii , Nirali Shah , Ningthoujam Suraj Singh and Jitendra Kumar Choudhury (2020). Molecular diagnosis and clinico-hemato-biochemical alterations and oxidant–antioxidant biomarkers in Babesia-infected dogs of Mizoram, India. *J Vector Borne Dis*., 57: 226–233. **NAAS Score/ID – 7.69/J530**

57. Chauhan, A., Mishra, L.K. Singh, RV., and Singh, R. (2021). Analysis of Cultural and Pathogenic Diversity in Bipolaris sorokiniana Causing Spot Blotch of Bread Wheat in North India. *International Research Journal of Pure and Applied Chemistry*, *22*(4), 12-22. NAAS Rating/ID – 5.40/I365

58. Chaupoo, A. S. and Kumar, S. (2021).Influence of organics, inorganic and biofertilizers on growth, quality, yield, soil and plant nutrient status of marigold (*Tagetes erecta* L.) cv. Pusa Narangi Gainda. *Journal of Plant Nutrition*. https://doi.org/10.1080/01904167.2021.2014871 **NAAS Score/ID – 7.71/J440**

59. Chingkham Chanu Malemnganbi and Namita Singh (2021). Standardization of different products by using different level of Moringa leaves powder and

its acceptability. *The Pharma Innovation Journal*. 10(4): 239 – 244 **NAAS Score/ID – 5.23/T050**

60. Chiphang S, Singh R and Feroze S.M (2022). Is organic Rice bean (Vigna umbellata) Farmers Economically better off? An Empirical Analysis. Indian Journal of Ext. Education, 58 (1): 17-20. NAAS Score/ID – 5.95/I061

61. Choudhary OP, Priyanka, Kalita PC, Arya RS, Rajkhowa TK, Doley PJ, Kalita A and Keneisenuo. (2021). Comparative gross anatomical studies on pelvic limb long bones of Crested Serpent eagle (*Spilornis cheela*) and Brown Wood owl (*Strix leptogrammica*). *Indian Journal of Animal Research*. 55(3): 277-282. *DOI: 10.18805/ijar.B-3957*. **NAAS Score/ID – 6.44/I040**

62. Choudhary OP, Priyanka, Kalita PC, Arya RS, Rajkhowa TK, Kalita A, Doley PJ and Keneisenuo. (2021). Morphometric and radiographic characteristics of the skull in Crested Serpent eagle (*Spilornis cheela*) and Brown Wood owl (*Strix leptogrammica*). *Indian Journal of Animal Research*. 55(4): 426-432. *DOI: 10.18805/IJAR.B-3968*. **NAAS Score/ID – 6.44/I040**

63. Choudhary OP, Priyanka, Kalita PC, Dalga S, Kalita A, Doley PJ and Keneisenuo (2022). Morphological studies on the skull bones of Indian Mithun (*Bos frontalis*). *Indian Journal of Animal Research*. 56(1): 40-45. *DOI: 10.18805/IJAR.B-4279.* **NAAS Score/ ID – 6.44/I040**

64. Choudhary OP, Priyanka, Kalita PC, Doley PJ, Kalita A and Keneisenuo (2021). A morphological study on the skull of Dromedary camel (*Camelus dromedaries*). *Explor. Anim. Med. Res.* 11(1): 135-139. *DOI: 10.52635/EAMR/11.1.135-139*. **NAAS Score/ID – 5.85/E169**

65. Choudhary OP, Priyanka, Kalita PC, Gundemir O, Keneisenuo, Kalita A and Doley PJ (2021). Sex wise morphological studies on the skull bones of Indian Mithun (*Bos frontalis*). *Indian Journal of Animal Research*. 55(8): 960-966. *DOI: 10.18805/ IJAR.B-4189.* **NAAS Score/ID – 6.44/I040**

66. Choudhary OP, Priyanka, Kalita PC, Keneisenuo, Konwar B, Doley PJ, Kalita A and Gundemir O. (2021). Applied anatomy of the maxillofacial and mandibular regions of Indian mithun (*Bos frontalis*) and its clinical significance in regional anesthesia. *Indian Journal of Animal Research*. 55(10): 1177-1183. *DOI: 10.18805/IJAR.B-4177*. **NAAS Score/ ID – 6.44/I040**

67. Choudhary OP, Sarkar R, Priyanka, Chethan GE, Doley PJ, Kalita PC and Kalita A. (2021). Preparation of blood samples for electron microscopy: The standard protocol. *Annals of Medicine and Surgery*. 70: 1-4. *DOI: 10.1016/j.amsu.2021.102895*.

68. D Jhajharia, S Gupta, R Mirabbasi, R Kumar, GT Patle (2021). Pan evaporative changes in transboundary Godavari River basin, India. *Theoretical and Applied Climatology* 145 (3): 1503-1520 **NAAS Score/ID – 9.18/T056**

69. Darelli Naveen, Daya Ram, M.Kunjaraj Singh and N. Gopimohan Singh (2021). Comparative study on Adoption of Organic and Inorganic Pesticides by vegetable Growers in Bishnupur District of Manipur, *IJCMAS* 10 (4):800-809

70. Das A. and Dutta Pranab (2021). Antifungal activity of biogenically synthesized silver and gold nanoparticles against sheath blight of rice. Journal of Nanoscience and Nanotechnology. 21 (6): 3547-3555. ISSN: 1533-4880. Doi.: 10.1166/ jnn.2021.18996.

71. Das, A., Roy, A., Mandal, A., Mondal, H A., Hess, D., Kund, P and Das, D. 2021. Inhibition of Bemisiatabaci vectored, GroEL mediated transmission of tomato leaf curl New Delhi virus by garlic leaf lectin (Allium sativum) leaf agglutinin. Virus Research, 300(15)198443. NAAS Score/ID – 9.30/V040

72. Das, D., Bora, N., Deka, C., Lucy, E., Poran, K., Bordoloi, A.D., Nama, D., Chethan, G.E., Deka, D., Roychoudhury, P. and Sarma, K. (2020). Diagnosis and clinical management of haemagalactia in a Holstein Friesian crossbred cow. *The Pharma Innovation Journal*. SP-9(10): 195-197. **NAAS Score/ ID – 5.23/T050**

73. Das, G. and Dutta Pranab (2022). Effect of nanopriming with Zinc oxide and silver nanoparticles on storage of chickpea seeds and management of wilt diseases. Journal of Agricultural Sciences and Technology. 24 (1): 213-26., ISSN No.: 1680-7073. NAAS: 7.10, JrnID: J023

74. Das, H., Samanta, A.K., Kumar, S., Roychoudhury, P., Sarma, K. Akter, F., Subudhi, P.K. and Dutta, T.K. (2021). *In vitro* Antimicrobial, Antibiofilm and Antiquorum Sensing Activity of Indian Rhododendron (*Melastoma malabathricum*) against Clinical Isolates of *Escherichia coli* and *Staphylococcus aureus. Indian Journal of Animal Research*. DOI: 10.18805/IJAR.B-4415**. NAAS Score/ ID – 6.44/I04**0

75. Das, H., Samanta, A.K., Kumar, S., Roychoudhury, P., Sarma, K. Akter, F., Subudhi, P.K. and Dutta, T.K. (2021). Exploration of Antimicrobial, Antibiofilm and Antiquorum Sensing Activity of Himalayan Yellow Raspberry (*Rubus ellipticus*) against Clinical Isolates

of *Escherichia coli* and *Staphylococcus aureus*. *Indian Journal of Animal Research*. DOI: 10.18805/IJAR.B-4514. **NAAS Score/ID – 6.44/I040**

76. Dash R., Jena C., Pramanik K. and Mohapatra P. P. (2021). Vegetable grafting: A noble way to enhance production and quality. *The Pharma Innovation Journal*; 10(8): 1580-158, **NAAS Score/ID – 5.23/T050**

77. Daya Ram, Suparna Dey , M.K. Singh, M. D. Devi and N. O. Singh(2021). Traditional Integrated Farming System: A Profile of Socio- Economic Status of Farmers in Bishnupur District of Manipur, *RJAS* 12 (2):703-707 **NAAS Score/ID – 4.50/R036**

78. Dayakar, B., Xavier, K. M., Ngasotter, S., Layana, P., Balange, A. K., Priyadarshini, B., and Nayak, B. B. (2022). Characterization of spray-dried carotenoprotein powder from Pacific white shrimp (*Litopenaeus vannamei*) shells and head waste extracted using papain: Antioxidant, spectroscopic, and microstructural properties. *LWT.*https://doi.org/10.1016/j.lwt.2022.113188 **NAAS Score/ID – 12.05**

79. Deb L., Devi, R.K.T., Dutta, P., Majumder, D., Thakuria, D., Rajesh, T., and Ningthoujam, K. (2021). Antibacterial ability of Beauveria bassiana (Balsamo) Vuillemin against Xanthomonas oryzae pv.oryzae causing bacterial leaf blight of rice. Biological Forum- An International Forum, 13(4): 210-220 ISSN No.: 0975-1130. NAAS Score/ID – 5.11/B084

80. Deb, L., Devi, R.K.T., Majumder, D., Dutta, P., Thakuria, D., Rajesh, T. and Ningthoujam, K. (2021). Antifungal ability of Beauveria bassiana (Balsamo) Vuillemin against Curvularia lunata causing leaf spot of rice. The Pharma Innovation Journal, 10(4): 298-303.ISSN No.: 2349-8242. NAAS Score/ID – 5.23/T050

81. Deb, Lipa and Dutta, Pranab (2021). Antagonistic potential of Beauveria bassiana (Balsamo) Vuillemin against Pythium myriotylum causing damping off of tomato. Indian Phytopathology, 74(3): 715-728. doi: 10.1007/s42360-021-00372., ISSN No.: 0367-973X. NAAS: 5.95, JrnID: I109

82. Debajyoti Pal, Basanta Saikia, Kalyan Sarma, Bedanga Konwar, M.C. Lallinchhunga, J.K. Choudhary and Rahul Singh Arya (2022). Evaluation of Ketamine Hydrochloride in Combination with Midazolam, Dexmedetomidine and Butorphanol as Balanced Anaesthesia in Cats. . *Indian Journal of Animal Research* doi. 10.18805/IJAR.B-4786 **NAAS Score/ID – 6.44/I040**

83. Debashish Hota, L. Devarishi Sharma, Rajnish Sahu, Shraddha Dahat.(2021). Rhizosphere Hybridization: A Better Alternative for Exploiting Citrus Microbiome. *International Journal of Plant Biotechnology,* 7(2):10-17.

84. Debbarma M. and Dutta Pranab (2021). Pathogenic variability of isolates of Rhizoctonia solani of different agricultural crops. International Journal of Current Microbiology and Applied Sciences, 10(1): 765-776. doi.10.20546/ijcmas.2021.1001.095.

85. Debbarma, M., Rajesh, T. and Tombisana Devi, R.K. (2021) In-vitro efficacy of fungicides against Rhizoctonia solani causing banded leaf and sheath blight of maize. International Journal of Plant and Soil Science, 33(16): 232-236.

86. Debbarma, M., Rajesh, T., Tombisana Devi, R.K., Thakuria, D., Azad Thakur, N.S., Nongthombam, O.D. and Hajong, M. (2021) Morphological characterization of plant growth promoting fungi (PGPF) isolated from maize rhizosphere in Meghalaya. The Pharma Innovation Journal, 10(6): 570-575. NAAS Score/ID – 5.23/T050

87. Debnath S., Bayan, H., Konwar, B., Mayengbam, P. and Sarma K. (2021). Effects of intraperitoneal bupivacaine and bupivacaine-dexmedetomidine for intra-operative and post-operative pain management in dogs. *The Pharma Innovation Journal*. SP-10(12): 2019-2022. **NAAS Score/ID – 5.23/T050**

88. Devi Y.B. and Thakuria D. (2021) Diversity of Multifunctional Phosphorus Solubilizing Bacteria in Acid Soils of Diverse Hill Rice Ecosystems. Journal of the Indian Society of Soil Science, 69 (3):306-318 DOI: 10.5958/0974-0228.2021.00054.2 NAAS Score/ID – 5.31/J572

89. Devi Y.B. and Thakuria D. (2021) Diversity of Multifunctional Phosphorus Solubilizing Bacteria in Acid Soils of Diverse Hill Rice Ecosystems. Journal of the Indian Society of Soil Science, 69 (3):306-318 DOI: 10.5958/0974-0228.2021.00054.2 NAAS Score/ID – 5.31/J572

90. Devi, Puthem Victoria, Noren Singh Konjengbam, N. Janaki Singh, G. D. Harish, Ng TombisanaMeetei, and Devyani Sen. (2021). Assessment of genetic variation in lentil (Lens culinaris Medik.) for its agronomic performance, aluminium tolerance and phosphorus uptake efficiency. Indian J. Genet (81) 3: 431-439. NAAS Score/ID – 6.51/I068

91. Devi, T.R., Das, D., Kayina, A., Konwar, B., Bayan, H., Saikia, B., Talukdar, D., GE, Chethan., Debnath,

P. and Sarma, K.(2020). Successful management of foetal maceration in a bitch. *Journal of Entomology and Zoology Studies*. 8(4): 1198-1200.

92. Devi, T.R., Das, D., Kayina, A., Konwar, B., Saikia, B., Bayan, H., Sarma, K., GE, Chethan., Behera, S.K. and Kayina, A.K. (2020). Surgical management of intestinal foreign body obstruction in a dog. *Journal of Entomology and Zoology Studies*. 8(4): 2317-2320.

93. Devi, T.R., Das, D., Konwar, B., Bayan, H., Saikia, B., Sarma, K., Chethan, G.E., Talukdar, D., Behera, S.K., Kayina, A. and Kayina, A.K. (2020). Diagnosis and management of ammonium urate cystoliths in a bitch. *Journal of Entomology and Zoology Studies*. 8(4): 1141-1144.

94. Dhara, K., Saha, S., Pal, P., Chukwuka, A.V., Panigrahi, A.K., Saha, N.C.and Faggio, C. (2022). Biochemical, physiological (haematological, oxygen-consumption rate) and behavioural effects of mercury exposures on the freshwater snail, *Bellamya bengalensis*. *Comparative Biochemistry and Physiology Part C: Toxicology and Pharmacology*,251:109195, **NAAS Score/ID – 9.23/C126**

95. Dhara,K.,Saha,S.,Chukwuka, A.V.,Pal, P., Saha, N.C.,and Faggio,C(2021).Fluoride sensitivity in freshwater snail, *Bellamya bengalensis* (Lamarck, 1882): An integrative biomarker response assessment of behavioral indices, oxygen consumption, haemocyte and tissue protein levels under environmentally relevant exposure concentrations. *Environmental Toxicology and Pharmacology*: 103789. doi: https://doi.org/10.1016/j.etap.2021.103789 **NAAS Score/ID – 10.86/E103**

96. Dhivya, R.S. and Ray, L.I.P. (2020). Performance of black gram (Vigna mungo L. Hepper) with organic amendments. Indian Journal of Hill Farming 33 (1): 10-18 NAAS Score/ID – 5.04/I073

97. Dhivya, R.S., Ray, L.I.P. and Behera, U.K. (2020). Organic amendments on soil nutrient balance under mid hills of Meghalaya. eplanet 18 (1): 29-38. NAAS Score/ID – 3.76/E001

98. Dhruba Das, Kalyan Sarma, Parimal Roychoudhury, G.E. Chethan, R. Ravindran, Sikdar Jabidur Islam, H. Prasad, J.B. Rajesh, Biswadeep Behera, Farhin Aktar Choudhury (2021). Gross and Histopathological Findings of Naturally Occurring Anaplasma marginale Infection in Cattle. *Indian Journal of Animal Research.* DOI no. 10.18805/IJAR.B-4283 **NAAS Score/ID – 6.44/I040**

99. Dileep Kumar Pandey, Shivani Dobhal, Himansu Kumar De P. Adhiguru. Vimla Devi, T. S. Mehra (2021). Agrobiodiversity in changing shifting cultivation landscapes of the Indian Himalayas: An empirical assessment. *Landscape and Urban Planning*, 220: 104333. **NAAS Score/ID – 12.14/ L012**

100. Dileep Kumar Pandey, Kalkame Ch Momin, Shantanu Kumar Dubey and Poovaragavalu Adhiguru. (2022). Biodiversity in agricultural and food systems of jhum landscape in the West Garo Hills, NorthEastern India. *Food Security* https://doi.org/10.1007/s12571-021-01251-y **NAAS Score/ID – 9.30/F053**

101. Dipika Sarmah and P. P. Dabral (2021). Rare and Endangered Sikkim Himalayan Rhododendron species, *Agriculture Letters* 2(9): ISSN: 2582-6522.

102. Dkhar, D.K., Feroze, S.M., Singh, R and Ray, L.I.P. (2020). Changing Climate and its effect on rice yield in Meghalaya. Pantnagar Journal of Research 18(3): 249-256. NAAS Score/ID – 3.71/P018

103. Dobhal, S., Kumar, A. (2021). Diversity Analysis and Polymorphism Through RAPD Markers in Eucalyptus tereticornis Sm. *International Journal of Biotech Trends and Technology*, 11(3), 23-30 10.14445/22490183/IJBTT- V11I3P604.

104.

Dondiba Kundagar, N. Brajendra Singh, M. Samuel Jeberson, Bireswar Sinha and N. Gopimohan Singh (2021). Genetic Diversity Analysis in Black Gram (*Vigna mungo* L. Hepper). *Int.J.Curr.Microbiol.App. Sci.*10(01): 1321-1328

105. Dondiba Kundagar, N. Brajendra Singh, M. Samuel Jeberson, Bireswar Sinha and N. Gopimohan Singh (2021). Genetic Diversity Analysis in Black Gram (*Vigna mungo* L. Hepper). *Int.J.Curr.Microbiol.App. Sci.* 10(01): 1321-1328 https://doi.org/10.20546/ijcmas.2021.1001.157

106. Dr Angam Raleng Standardization of deep-frying process and their effects on storage stability of pineapple pomace powder-incorporated rice-based extruded product. *Journal of Food Processing and Preservation* DOI: 10.1111/jfpp.13950 **NAAS Score/ ID – 8.19/J242**

107. Droma, D., Kumar, S., Paul, T., Pal, P., Saharan ,N., Kumar, K. and Poojary ,N.(2021).Biomarkers for assessing chronic toxicity of carbamazepine, an anticonvulsants drug on *Pangasianodon hypophthalmus* (Sauvage, 1878). *Environ Toxicol Pharmacol* 19; 87:103691. doi: 10.1016/j.etap.2021.103691. **NAAS Score/ID – 10.86/E103**

108. Dutta, Pranab, Deb, Lipa, Gogoi, J., Mahanta, M., Kumari, A., Yasin, A. and Sharma, A. (2021). "UmTricho" a liquid bioformulation of indigeneous strain of Trichoderma harzianum effectively managed the tikka disease (Cercospora spp.) of groundnut, Arachis hypogea L. under the agroecological condition of Meghalaya. Biological Forum- An International Journal, 13(2): 529-535. ISSN No.: 0975-1130. NAAS Score/ID – 5.11/B084

109. Dutta, Pranab, Gomathy M., Sabarinathan KG, Rajakumar D, Ananth K, Karthiba L, Kalaiselvi P, Pillai MA, Upamanya GK, Boruah S, Deb L., Kumari A, Mahanta M, Heisnam P, Mishra AK (2022). Mechanisms of plant growth promoting rhizobacteria (PGPR) to combat plant diseases for better productivity. Biocell, Status: doi:10.32604/biocell.2022.019291. NAAS: 7.25. JrnID: B038. ISSN No.: 0327-9545.

110. Dutta, Pranab, Kaman, P., Kumari, A., Saikia, B. and Deb, Lipa (2021). Management of Sclerotium rolfsii Sacc. Causing basal rot of pippali, Piper longum Linn. through organic approaches under the agro-ecological condition of Upper Brahmaputra Valley zone of Assam. Indian Phytopathology, doi: 10.1007/s42360-021-00428-x. NAAS: 5.95, JrnID: I109, ISSN No.: 0367-973X.

111. E. Lalruatsangi, T.K. Hazarika, M.Vabeiryureilai, N. Senthil Kumar, R. Lalnungrenga and Lalnunpuia. (2021). Bioactive compounds and antioxidant activity of an endangered *Citrus* species 'Hatkora' (*Citrus macroptera* Mont.) from Mizoram, India. *Fruits.* 76(3): 145-154. **NAAS Score/ID – 6.80/F096**

112. Edwin Luikham, KS Shashidhar and PS Mariam Anal (2022). Influence of mulching on production potential and economic of rainfed rice based cropping system in foot hills of Manipur. *The Pharma Innovation Journal* 11(3): 1129-1132 **NAAS Score/ID – 5.23/T050**

113. Elone Lucy, JB Rajesh, Bedanga Konwar, Rahul Singh Arya, H Prasad, Kalyan Sarma, Ankita Debnath, Dilip Nama, Kaushik Poran Bordoloi and Champak Deka (2022). Clinico-pathological and haemato-biochemical changes associated with immune mediated haemolytic anaemia in dogs. *The Pharma Innovation Journal*, 11(3): 04-06. **NAAS Score/ID – 5.23/T050**

114. Eregowda, C.G., De, U.K., Singh, M., Prasad, H., Sarma, K., Roychoudhury, P., Rajesh, J.B., Patra, M.K. and Behera, S.K. (2020). Assessment of certain biomarkers for predicting survival in response to treatment in dogs naturally infected with canine parvovirus. *Microbial Pathogenesis*, 149, p.104485. **NAAS Score/ID – 9.74/M049**

115. Fatema Akter, Parimal Roychoudhury, Tapan Kumar Dutta, Prasant Kumar Subudhi, Sanjeev Kumar, Jagan Mohanarao Gali, Partha Sarathi Behera and Yengkhom Damodar Singh.(2021). Isolation and molecular characterization of GP5 glycoprotein gene of Betaarterivirus suid 2 from Mizoram, India. *Virus Disease*, DOI: https://doi.org/10.1007/s13337-021-00735-x **NAAS Score/ID – 5.95/V038**

116. Feroze, SM; Baba, SH; Laitonjam, N; Singh, R. and Thangjam, D. (2022). Saffron production depends on rainfall: Empirical evidence from Jammu and Kashmir. SKUAST Journal of Research 23(2): 160-165; ISSN: 0972-1126. Score/ID – 4.17/S005

117. G. N. Gurjar, Vishram Ram, D. Thakuria, A. K. Singh, Lala I. P. Ray and Ram Singh (2021). System economics of rice-based farming systems under rice-fallow lands. The Pharma Innovation Journal, 10(12): 2053-2056. NAAS Score/ID – 5.23/T050

118. Gautam Patra, Subhamoy Ghosh, Chhakchhuak Lalchhandama, Parthasarathi Behera, Sonjoy Kumar Borthakur, Debashish Mohanta, Seikh Sahanawaz Alam, Apurba Debbarma, Papia Biswas. (2021). Molecular detection of *Babesia microti* in laboratory mice from India. *Journal of Vector Borne Diseases* 57(3): 268-273 **NAAS Score/ID – 7.69/J530**

119. Ghosh, A., Dana, S. S., Sharma, A., Sahu, P., Basu, D., and Goswami, Rupak. (2022). Perception of fishers about livelihood developmental interventions by various GOs and NGOs in Indian Sundarbans: A comparative study. *Indian Journal of Fisheries*. 69(1): 146-153. DOI: 10.21077/ijf.2022.69.1.91566-16. **NAAS Score/ID – 6.50/I066**

120. Ghosh, A., Debnath, R., Lahiri, B., Debbarma, S. P., Shil, B. and Pandey, P. K. (2021). Fisheries education for tribal communities: A transect from Tripura. *Journal of Crop and Weed*. 17(2):183-188. DOI: https://doi.org/10.22271/09746315.2021.v17.i2.1469 **NAAS Score/ID – 5.46/J170**

121. Ghosh,R.,Upadhyay, A.D., Roy,A.K and Tiwari,A. (2020). Structural and functional analysis of cytochrome b protein of Indian major carps *Labeo rohita*. *Journal of Entomology and Zoology Studies* ; 8(2): 540

122. Gireesh Chand, R.C. Shakywar and Pushpendra Kumar (2021). Record of Pineapple Marbling Disease in Siang Regions of Arunachal Pradesh. *Ann. Pl. Protec. Sci.* 29 (1): 63-66 doi: 10.5958/0974-0163.2021.00011.2 **NAAS Score/ID – 4.11/A205**

123. Gita, S., Shukla, S.P., Deshmukhe, G., Choudhury, T.G., Saharan, N. and Singh, A.K.(2021). Toxicity evaluation of six textile dyes on growth, metabolism and elemental composition (C, H, N, S) of microalgae *Spirulina platensis*: the environmental consequences. *Bulletin of Environmental Contamination and Toxicology*, 106(2):302-309. **NAAS Score/ID – 8.15/B181**

124. Gita, S., Shukla, S.P., Deshmukhe, G., Singh, A.R., Choudhury, T.G. and Singh, A.K. (2021). Adsorption–biodegradation coupled remediation process for the efficient removal of a textile dye through chemically functionalized sugarcane bagasse. *Water Environment Research*, 93(10): 2223-2236. **NAAS Score/ID – 7.95/W004**

125. Gogoi, J; Singh, Ram; Singh, SB; Feroze, SM; Choudhury, A. Hemochandra, L. And Tyngkan, H. (2022) Utilization Pattern of Bamboo in North Eastern Region of India, Indian Journal of Extension Education,58 (2):115-119 NAAS Score/ID – 5.95/ I061

126. Gogoi, M., Ray, L.I.P., Swami, S., Kant, K. and Meena, N.K. (2020). Performance of potato variety Kufri Megha under different irrigation scheduling and date of planting at North Eastern Indian mid hills. Journal of Environmental Biology 41(6): 1605-1610. (DOI : http://doi.org/10.22438/jeb/41/6/SI-225) NAAS Score/ID – 5.57/J195

127. Gokulraj, S., Bayan, H., Konwar, B., Mayengbam, P and Rajesh J B (2022). A Study on Intra-operative and Post-operative Analgesia with Intraperitoneal Ropivacaine and Dexmedetomidine in Pigs. *Indian Journal of Animal Research*. DOI: 10.18805/ IJAR.B-4785. **NAAS Score/ID – 6.44/I040**

128. Gokulraj, S., Bayan, H., Konwar, B., Mayengbam, P and Rajesh J B. (2022). Haemato-biochemical effects of intraperitoneal ropivacaine and ropivacaine - dexmedetomidine for pain management in pigs undergoing herniorrhaphy. *The Pharma Innovation Journal.* 11(1): 1250-1254. **NAAS Score/ID – 5.23/ T050**

129. Govindarajan Bhuvana Priya, Ravi Kant Agrawal, Arockiasamy Arun Prince Milton, Sanjod Kumar Mendiratta, Bhoj Raj Singh, Deepak Kumar, Madhu Mishra and Ravi Kumar Gandham. (2021). Isothermal amplification assay for visual on-site detection of *Staphylococcus aureus* in Chevon. *Food Biotechnology.*35 (3): 221-236. **NAAS Score/ ID – 7.56/F038**

130. Gupta, R., Sanjay-Swami, Kumar, R., Sharma, P.K. and Jamwal, S. (2022). Impact of row ratio and soil fertility management strategies on performance of wheat + linseed intercropping system. Agricultural Science Digest, DOI: 10.18805/ag.D-5446. ISSN: 0253-150X (Print), 0976-0547 (Online). NAAS Score/ ID – 4.75/A097

131. Gupta, S., Goyal, M. K., and Sarma, A. K. (2021). Assessment of hydroclimatological changes in eastern Himalayan river catchment of northeast India. *Journal of Hydrologic Engineering*, 26(10): 05021027.

132. Gurjar, GN, Vishram Ram, Thakuria, D, A Singh, A.K., Ray, L.I.P.P and Ram Singh. (2021). System economics of rice based farming systems under rice-fallow lands. The Pharma Innovation Journal, 10(12): 2053-2056. NAAS Score/ID – 5.23/T050

133. H Lalrinkima, C Lalchhandama, Siju Susan Jacob, OK Raina, MC Lallianchhunga (2021). Fasciolosis in India: An overview. *Experimental Parasitology* 222(1):108066 **NAAS Score/ID – 8.01/E157**

134. H. Bayan, K. K. Sarma, P. Roychoudhury, Devajani Deka. (2022). Immunological Effects of Propofol, Ketamine and Isoflurane in Dexmedetomidine and Butorphanol Premedicated Dogs. *Indian Journal of Animal Research*. 56 (2): 222-227 **NAAS Score/ ID – 6.44/I040**

135. HA Mondal. (2021). Nodal plant materials of Valerianajatamansi, a higher altitude-specific medicinal plant typically retained the previous lower altitude exposure and modulated above-ground probes. Journal of Crop and Weed, 17(3): 61-69. NAAS Score/ID – 5.46/J170

136. Haji, M.M., Ahmed, F.A., Talukdar, D., Lalrintluanga, K. and Doley, P.J. (2021). Doppler ultrasonographic assessment of maternal and fetal haemodynamics in normal canine pregnancy. *Haryana Vet.* 60(2): 191-194. **NAAS Score/ID – 5.58/T023**

137. Haldhar SM, Thangjam R, Kadam V, Jakhar BL, Loganathan R, Singh KI, Rolania K, Singh S, Dhaka SR and Singh KM. (2021). A review on Entomophagy: Natural food insects for ethnic and tribal communities of North -East India. *Journal of Environmental Biology*, 42: 1425-1432 **NAAS Score/ ID – 5.57/J195**

138. Haldhar, S.M., Singh, K.I. Gupta, M.K. and Devi, A.S. (2021).Morphometric analysis on different species of honeybees in NEH region of India. *Journal of Agriculture and Ecology*, 12: 62-73. **NAAS Score/ ID – 4.36/J026a**

139. Haldhar, S.M., Thangjam, R., Kadam, V., Jakhar, B.L., Loganathan, R., Singh, K.I., Rolania, K., Singh,

S., Dhaka, S.R. and Singh, K.M. (2021). A review on entomophagy: Natural food insects for ethnic and tribal communities of North-East India. *Journal of Environmental Biology*, 42: 1425-1432. **NAAS Score/ ID – 5.57/J195**

140. Haldhar, S.M.,Nidhi, C.N., Singh, K.I. and Devi, A.S. (2021).Honeybees diversity, pollination, entrepreneurship and beekeeping scenario in NEH region of India *Journal of Agriculture and Ecology*, 12: 27-43. **NAAS Score/ID – 4.36/J026a**

141. Haobam Neljosh, R.K.Dilip Singh and BasuLangpoklakpam (2021).Influence material on growth and yield of strawberry under Polyhouse condition .*Int.J.curr.Microbiol. App.Sci.* 10(01):1656-1661.

142. Harish. R. and K. Ningthoujam 2021. Morphological analysis of population samples of termite soldier castes in mid-hills of Meghalaya. Indian Journal of Hill Farming. 34(1). 100-108 NAAS Score/ID – 5.04/ I073

143. Harish. R. and K. Ningthoujam 2021. Morphological analysis of population samples of termite soldier castes in mid-hills of Meghalaya. Indian Journal of Hill Farming. 34(1). 100-108 NAAS Score/ID – 5.04/ I073

144. Hatai, Lakshmi Dhar (2021), Economic and value chain analysis on Cashew nut in Meghalaya: A policy perspective, *Agricultural Economics Research Review*, Vol.34, Conference number, 2021, pp: 220-221 **NAAS Score/ID – 5.84/A090**

145. Hatai, Lakshmi Dhar (2021), Oyster Mushroom Production in Meghalaya- A Potential Venture, *Economic Affairs*, 66 (4): 577-582. **NAAS Score/ID – 5.08/E026**

146. Hatai, Lakshmi Dhar (2021).Costs, Returns and Determinants of Oyster Mushroom Production for Promising Enterprise in West Garo Hills of Meghalaya, *Indian Journal of Agricultural Economics,* Vol.76, No.3., pp.549.

147. Hmar, Z., Rahman, S., Tochhawng, L., Kalita, G. and Tolenkhomba, T. C. (2021). Small-Scale Piglet Producers Perception towards Success Factors in Piglet Production in Mizoram, India. *International Journal of Livestock Research*, 11(7), 33-36. https://dx.doi.org/10.5455/ijlr.20201016072823

148. Hmar, Z., Rahman, S., Tochhawng, L., Kalita, G., & Tolenkhomba, T. C. (2021). Small-Scale Piglet Producers Perception towards Success Factors in Piglet Production in Mizoram, India. *International Journal of Livestock Research*, 11(7), 33-36.

149. Honeysmita Das, A.K. Samanta , Sanjeev Kumar, P. Roychoudhury, Kalyan Sarma , Fatema Akter, P.K. Subudhi, T.K. Dutta (2021). In vitro Antimicrobial, Antibiofilm and Antiquorum Sensing Activity of Indian Rhododendron (*Melastoma malabathricum*) against Clinical Isolates of *Escherichia coli* and *Staphylococcus aureus. Indian Journal of Animal Research* doi.10.18805/IJAR.B-4415. **NAAS Score/ ID – 6.44/I040**

150. Honeysmita Das, A.K. Samanta , Sanjeev Kumar, P. Roychoudhury, Kalyan Sarma , Fatema Akter, P.K. Subudhi, T.K. Dutta (2021). Exploration of Antimicrobial, Antibiofilm and Antiquorum Sensing Activity of the Himalayan Yellow Raspberry (*Rubus ellipticus*) against Clinical Isolates of *Escherichia coli* and *Staphylococcus aureus. Indian Journal of Animal Research* doi. 10.18805/IJAR.B-4514 **NAAS Score/ ID – 6.44/I040**

151. Hussain Shah Mustahid, Borthakur Sushanta, Sarma D, Pathak Mahesh, Moiranangthem Abhinash and Chauhan K Jitendra. (2021). Shah Culture of Calaris magur using Non Conventional Animal Protein Feed: A Case from North East Region of India. Indian Res. J. Ext. Edu. 21 (2&3): 161-165 NAAS Score/ID – 5.11/I111

152. I. Bhupenchandra, Anjali Basumatary, Samiron Dutta, L. Nabachandra Singh, Anup Das, L. Kanta Singh, S. Helena Devi, S. Sinyorita, Ch. Premabati Devi (2021). Direct and residual impact of boron fertilization improves the crop yield, nutrient content, nutrient uptake and nutrient use efficiencies in cauliflower-cowpea-okra sequence in an acidic Inceptisol of North East India. *Journal of Plant Nutrition* https://doi.org/10.1080/01904167.2021. 19945914 **NAAS Score/ID – 7.71/J440**

153. Ingudam Bhupenchandra, Herojit Singh Athokpam, N. Brajendra Singh, L. Nabachandra Singh, Soibam Helena Devi, S.K. Chongtham, Laishram Kanta Singh, Soibam Sinyorita, E. Lamalakshmi Devi, Seema Bhagowati, SS Bora, Amit Kumar, Ch. Premabati Devi and L.C .Olivia. (2021). Leaf color chart (LCC): An instant tool for assessing nitrogen content in plant: A review. *The Pharma Innovation Journal* 10(4): 1100-1104 **NAAS Score/ID – 5.23/T050**

154. IR Chanu, M. Deepa Devi, Daya Ram, N. Okendro Singh and Th. Anupama Devi (2021). Constraints Faced by the CAU-R1 Rice Growers in Adoption of Rice Variety CAU-R1, *IJCMAS* .11 (1):46-49

155. Irungbam, S., Devi, W.M., Monsang, S.J., Kamilya, D. (2021). Effect of feed deprivation on immune-haematological responses and resistance of *Labeo*

rohita (Hamilton, 1822) to *Aeromonas hydrophila* infection. *Indian Journal of Animal Health* 60 (2-Spl):193 – 200. **NAAS Score/ID – 5.25/I037**

156. J.S. Khukhodziinai., M. Ayub Ali., M.C. Lallianchhunga., R. Goswami., T.C. Tolenkhomba and P. Mayengbam.(2021). Supplementation of chromium and vitamin C to alleviate cold stress in white leghorn chicken. *Journal of Entomology and Zoology Studies.* 9 (1): 1295-1298

157. Jeemoni Gogoi, Ram Singh, S. Basanta Singh, S. M. Feroze, Anju Choudhury, L. Hemochandra and Hehlangki Tyngkan (2022). Utilization Pattern of Bamboo in North Eastern Region of India, *Indian Journal of Extension Education* 58(2):115-119 **NAAS Score/ID – 5.95/I061**

158. Jhajharia, D. Gupta, S. Mirabbasi, R., Kumar, R. Patle, G.T. (2021). Pan Evaporative Changes in Trans-boundary Godavari River basin, India. *Theoretical and Applied Climatology*, 1-23. https://doi.org/10.1007/s00704-021-03707-9.1-23. **NAAS Score/ID – 9.18/T056**

159. K. Govindasamy, T. Chutia, M. Rahman, M.K. Kalita and R. Dewry (2021). Economic evaluation of boar semen production unit for smallholder pig production system. *The Journal of Animal & Plant Sciences*, 31(4): 1212-1216. **NAAS Score/ID – 6.49/T035**

160. Kadirvel Govindasam, Mokidur Rahman, Tukheswar Chutia, and L. Anandakumar Singh (2021). Success rate, genetic improvement and economic analysis of artificial insemination delivery models for smallholder pig production systems. *Animal Reproduction Science*, 61(15): 1606-1612. **NAAS Score/ID – 8.15/A179**

161. Kalai S., Roychoudhury P., Dutta T.K., Subudhi P.K., Chakraborty S., Barman N.N. and Sen A. (2021). Multidrug resistant staphylococci isolated from pigs with exudative epidermitis in North eastern Region of India. *Letters in Applied Microbiology*. DOI:doi.org/10.1111/lam.13448; **NAAS Score/ID – 8.86/L015**

162. Kalita A, Kalita PC, Roychoudhary P, Choudhary OP and Doley PJ. (2021). Alteration of lactic acid bacteria profile in piglets after dietary supplementation of probiotics: a comparative study. *Haryana Veterinarians*. 60(1): 137-139. **NAAS Score/ID – 5.58/T023**

163. Kalita A, Talukdar M, Sarma K, Kalita PC, Barman NN, Roychoudhury P, Kalita G, Choudhary OP, Doley PJ, Debroy S, Keneisenuo and Sarkar R. (2022). Lymphocyte subsets in the small intestine of piglets fed with probiotic and zinc: A qualitative and quantitative micro-anatomical study. *Folia Morphologica*. 81(1): 82-90. *DOI: 10.5603/FM.a2020.0148*. Pubmed: 33438190. **NAAS Score/ID – 7.19**

164. Kalita A, Talukdar M, Sarma K, Kalita PC, Gali JM, Tamuli S, Choudhary OP, Doley PJ, Debroy S and Keneisenuo. (2021). Impact of probiotic and zinc on brush-border enzyme and histoenzymatic profile in the small intestine of pre and post-weaned piglets. *Indian Journal of Animal Research*. 55(10): 1192-1199. *DOI: 10.18805/IJAR.B-4211.* **NAAS Score/ID – 6.44/I040**

165. Kalita A, Talukdar M, Sarma K, Kalita PC, Gautam C, Choudhary OP, Doley PJ, Keneisenuo and Sarkar R. (2021). Alterations of small intestinal morphology on villi and crypts after feeding probiotic and zinc in pre and post-weaned piglets. *Indian Journal of Animal Research*. 55(10): 1167-1176. *DOI: 10.18805/IJAR.B-4200.* **NAAS Score/ID – 6.44/I040**

166. Kalita A, Talukdar M, Sarma K, Kalita PC, Roychoudhury P, Kalita G, Choudhary OP, Chaudhary JK, Doley PJ and Debroy S. (2021). Small intestinal mucosal cells in piglets fed with probiotic and zinc: a qualitative and quantitative microanatomical study. *Folia Morphologica*. 80(3): 605-617. *DOI: 10.5603/FM.a2020.0091*. Pubmed: 32789842. **NAAS Score/ID – 7.19**

167. Kalita, J.J., Arya, R.S.,Ravindran,R., Singh, Y.D., Rajkhowa, T.K.,Gali, J M., Samanta, A.K., Ali,M, Choudhary, O.P., Subudhi, P.K., Suohu, S., Kiran, J. and Behera, B. (2021) A study on the pathology of spontaneous aflatoxicosis and local farming practices in broiler chicken farm in Aizawl, Mizoram, India Indian Journal of Animal Health,60(2):231-241. **NAAS Score/ID – 5.25/I037**

168. Kalkame Ch Momin, Sunil Kumar, T. S. Mehra and A. Phurailatpam (2021). Drying and dehydration of native ornamental plants of Arunachal Pradesh and its value addition. *Indian Journal of Traditional Knowledge*. **NAAS Score/ID – 6.76/I100**

169. Kalyan Sarma, Chethan Gollahalli Eregowda, Parimal Roychoudhury, Sonjoy Kumar Borthakur, Vijayakumar Jawalagatti, Hridayesh Prasad, Suvendu Kumar Behera, Neeraj Thakur, Nikitasha Bora and Dhruba Das (2021). A 5Year Prospective Study on Incidence and Clinicopathological Changes Associated with Naturally Occurring Trypanosomosis in Dogs of Mizoram, India. *Acta Parasitologica* https://doi.org/10.1007/s11686-021-00425-0 **NAAS Score/ID – 7.44/A031**

170. Kammela Seetha Ramaiah, N.Brajendra Singh, M Samuel Jeberson, Masadi Sunil Kumar, L.Nongdrenkhomba Singh and N. Gopimohan Singh (2021). Association studies in elite genotypes of Lentil (*Lens culinaris* M.). *Journal of Food Legumes* 34(4): 290-295 **NAAS Score/ID – 4.85/J239**

171. Karav, S., Ram, V. and Ray, L.I.P. (2020). Critical period for crop-weed competition in groundnut (Arachis hypogaea L.) under mid altitude of Meghalaya. Journal of Crop and Weed 16 (1): 217-222. NAAS Score/ID – 5.46/J170

172. Keneisenuo K, Choudhary OP, Kalita PC, Duro S, Kalita A, Doley PJ, Arya RS, Debroy S and Priyanka P. (2022). A comparative study on the morphology, radiography and computed tomography of the skull bones of barking deer (*Muntiacus muntjak*) and sambar deer (*Rusa unicolor*). *Folia Morphologica*. 81(1): 164-174. *DOI: 10.5603/FM.a2021.0015*. Pubmed: 33577074. **NAAS Score/ID – 7.19**

173. Keneisenuo, Choudhary OP, Kalita PC, Priyanka, Kalita A, Doley PJ and Chaudhary JK (2021). Comparative morphological studies on the skull bones of barking deer (*Muntiacus muntjak*) and sambar deer (*Rusa unicolor*). *Anatomia Histologia Embryologia*. 50: 500-511. https://doi.org/10.1111/ahe.12653 **NAAS Score/ID – 7.13**

174. Keneisezo Kuotsu, Sashitola Ozukum, Reihii John, Laltlankimi, Neithono Kuotsu, Tukheshwar Chutia, Bhumapati Devi and Soya Rungsung (2021). Comparison of milk ELISA with serum ELISA for detecting the sero-prevalence of infectious bovine rhinotracheitis in cattle. *The Pharma Innovation Journal*, SP-10(6): 365-368. **NAAS Score/ID – 5.23/T050**

175. Kenjit Tongbram, Y. Chakrabarty Singh, Daya Ram, N. Gopimohan Singh, Kh. Rishikanta Singh and Oinam Krishnadas Singh (2021). An Economic Analysis of French Bean (*Phaseolus vulgaris* L.) Production in Bishnupur District of Manipur, *AJAEES* 39(8): 33-39 **NAAS Score/ID – 4.86/A308**

176. Khan, M.I.R., Choudhury, T.G., Kamilya, D., Monsang, S.J. and Parhi, J., (2021).Characterization of *Bacillus* spp. isolated from intestine of *Labeo rohita*—Towards identifying novel probiotics for aquaculture. *Aquaculture Research*, 52(2):822-830. **NAAS Score/ID – 8.08/A268**

177. Khan, M.I.R., Kamilya, D., Choudhury, T.G. and Rathore, G. (2022). Dietary administration of a host-gut derived probiotic *Bacillus amyloliquefaciens* COFCAU_P1 modulates immune-biochemical response, immune-related gene expression, and resistance of *Labeo rohita* to *Aeromonas hydrophila* infection. *Aquaculture*, 546:737390. **NAAS Score/ID – 10.24/A263**

178. Khan, M.I.R., Kamilya, D., Choudhury, T.G., Tripathy, P.S. and Rathore, G. (2021). Deciphering the Probiotic Potential of *Bacillus amyloliquefaciens* COFCAU_P1 Isolated from the Intestine of *Labeo rohita* Through In Vitro and Genetic Assessment. *Probiotics and Antimicrobial Proteins*, 13(6):1572-1584. **NAAS Score/ID – 10.61/P154**

179. Kharumnuid, P., Pandey, NK, Devarani, L, Chauhan, J K., Singh, R, Das, B and Marbaniang, EK. (2021) Potato production for nutritional security and doubling farmers' income. Journal of Pharmacognosy and Phytochemistry 10(1): 193-197

180. Khomdram Monika Devi, Edwin Luikham, L Nabachandra Singh, N Surbala Devi and N Gopimohon Singh (2021). Influence of planting geometry and nutrient management on growth, nodulation and yield of dwarf Ricebean (*Vigna umbellata*) under rainfed condition. *The Pharma Innovation Journal* 10(9): 1766-1770 **NAAS Score/ID – 5.23/T050**

181. Konsam Ibetombi Chanu, Ak. Bijaya Devi, U Chaoba Singh, Dr. N Surbala Devi and Shri N Gopimohan Singh (2022). Effect of different levels of nitrogen and spacing on growth and yield of common onion (*Allium cepa* L.) cv. Prema 178 under Manipur condition. *The Pharma Innovation Journal*, 11(4): 1268-1274 **NAAS Score/ID – 5.23/T050**

182. Koyu, B; Singh, RJ and Singh, R. (2021) Designing and evaluating the effect of application of e-learning module of climate-smart horticulture on high-value horticultural crops of Arunachal Pradesh. Indian Research Jr of Extension Education, 21 (4):122-128, 0972-2181 NAAS Score/ID – 5.95/I061

183. Kripa Shankar and S. R. Singh (2021). Studies on the Relationship between Agronomic and Fruit Quality traits of *Passiflora* species found in India's NEH region. *Biological Forum-An International Journal*, 13(3): 107-113. **NAAS Score/ID – 5.11/B084**

184. Kumar N, Sharma KR, Sood M, Mehra TS, Kalkame Ch. Momin and Chandel S. (2021). Value Addition of *Ocimum Basilicum* L. For The Preparation of Traditional Crude Salt and Its Medicinal Uses. *Journal of Plant Development Sciences* 13(6): 403-406. 2021 **NAAS Score/ID – 4.13/J434**

185. Kumar Nishant Chourasia, Milan Kumar Lal, Rahul Kumar Tiwari, Devanshu Dev, Hemant BalasahebKardile, Virupaksh U. Patil, Amarjeet Kumar, GirimallaVanishree, Dharmendra Kumar,

Vinay Bhardwaj, Jitendra Kumar Meena, Vikas Mangal, Rahul Mahadev Shelake, Jae-Yean Kim and Dibyajyoti Pramanik. 2021. Salinity Stress in Potato: Understanding Physiological, Biochemical and Molecular Responses, *Life* (11): 545. https://doi.org/10.3390/life11060545 **NAAS Score/ID – 9.25**

186. Kumar, A; Vinodakumar, S N, Tamuly, B; Gopal Krishna, G; Ashish Rai, A; Aftab A Shabnam, A. A; Jigyasu, D. K; Luikham, R; Hazarika, U; Ahmed, S.A; Singh, S and Kumar,J,S (2021). Assessment of Nutritional Status of the Acidic Soils of Manipur Vanya Sericulture: Levels and Spatial Distributions. *Journal of Soil Salinity and Water Quality:* 13(2): 204-213. **NAAS Score/ID – 4.94/J490**

187. Kumar, S., Dutta, T.K. and Roychoudhury, P. Transboundary Animal Diseases in the Perspective of North East India: A Review. *Indian Journal of Animal Research*. DOI:10.18805/IJAR.B-4402 **NAAS Score/ID – 6.44/I040**

188. Kumar, V., Singh, A.K. and Ray, L.I.P. (2021). Effect of planting pattern and organic nutrient sources on performance of maize in maize-cowpea intercropping system. Journal of AgriSearch, 8(1):01-05. [doi.org/10.21921/jas.v8i01.19554] NAAS Score/ID – 4.71/J013

189. L. Devarishi Sharma and Indira Sarangthem. (2021). Distribution of exchangeable and extractable aluminium in hilly acid soils of Senapati district Manipur. *Journal of Soils and Crops,* 31(1): 44-49. **NAAS Score/ID – 4.50/J494**

190. L. Devarishi Sharma, Indira Sarangthem, Rahul Sadhukhan, Rojeet Thangjam,Y. Herojit Singh, C.G. Sawant, Lalhmingsanga, R. Lalrinfeli (2021). Leaf Analysis in Citrus: Recent Development. *Journal of Agricultural Science and Technology*, 10(2):35-43. https://www.researchgate.net/publication/356086629_Leaf_Analysis_in_Citrus-Recent_Development. **NAAS Score/ID – 7.10/J023**

191. L. Devarishi Sharma, Indira Sarangthem, Rahul Sadhukhan, Rojeet Thangjam. (2021). Management of Nutrient Constraints in Citrus- An Update. *Journal of Crop Science and Technology* 10(2): 32-41.

192. L. Devarishi Sharma, Indira Sarangthem, Rahul Sadhukhan, Y. Herojit Singh, C. G. Sawant and Lalhmingsanga. (2021). Microbes in Fruit Crops-An Analysis. *International Journal of Plant Biotechnology*, 7(2): 1-10.

193. L. Devarishi Sharma, Rahul Sadhukhan and Debashish Hota. (2021). Neutralising Climate Change Through Fruit Crops. *Journal of Crop Science and Technology* 10(3): 28-36.

194. L. Nikita Devi, N. Surbala Devi, Athokpam Herojit Singh, Jamkhogin Lhungdim and N. Gopimohan Singh (2021). Influence of boron and FYM on boron concentration and dry matter yield of of green gram (*Vigna radiata* L.). *The Pharma Innovation Journal*, 10(10): 353-356. **NAAS Score/ID – 5.23/T050**

195. Lalhlimpuia, C., N. Shyamsana Singh, P. Mayengbam, Ranjana Goswami and T.C. Tolenkhomba (2021) Production Performance of 'Zo ar' a Local Chicken of Mizoram in its Home Tract. *International Journal of Livestock Research.* 11(4), 100-104. ttps://dx.doi.org/10.5455/ijlr.20200221092632

196. Lalotra, S., Hemantaranjan, A., Kumar, S. and Sanjay-Swami (2021). Effect of methyl jasmonate and zinc in modulating bio-chemical parameters and antioxidant enzymes activities in chickpea under salinity stress. Journal of Environmental Biology, 42 (2): 492-498. DOI: http://doi.org/10.22438/jeb/42/2(SI)/SI-265. P-ISSN: 0254-8704, e-ISSN: 2394-0379. NAAS Score/ID – 5.57/J195

197. Lalremruata, C., Dutta, T.K., Roychoudhury, P., Kumar, S., Sen, A., Barman, N.N., Subudhi, P.K. (2021). Transmission of Novel Bacterial Pathogens through Pigs Transported from Myanmar to Mizoram. *Indian Journal of Animal Research*. DOI: 10.18805/IJAR.B-4197. **NAAS Score/ID – 6.44/I040**

198. Lalruatfeli, N., Tochhawng, L., Hmar, L., Lalrintluanga, K., & Rahman, S. 2021 Constraints Perceived by the Co-operative Dairy Farmers in Aizawl District of Mizoram. *International Journal of Livestock Research*, 11(6), 87-91.

199. Lipa Deb, R.K. Tombisana Devi, D. Majumder, P. Dutta, D. Thakuria, T. Rajesh and K. Ningthoujam (2021). Antifungal ability of Beauveria bassiana (Balsamo) Vuillemin against Curvularia lunata causing leaf spot of rice. The Pharma Innovation Journal 10(4): 298-303 NAAS Score/ID – 5.23/T050

200. Lipa Deb, R.K. Tombisana Devi, D. Majumder, P. Dutta, D. Thakuria, T. Rajesh and K. Ningthoujam (2021). Antifungal ability of Beauveria bassiana (Balsamo) Vuillemin against Curvularia lunata causing leaf spot of rice. The Pharma Innovation Journal 10(4): 298-303 NAAS Score/ID – 5.23/T050

201. Lipa Deb, R.K. Tombisana Devi, D. Majumder, P. Dutta, D. Thakuria, T. Rajesh and K. Ningthoujam (2021). Antifungal ability of Beauveria bassiana (Balsamo) Vuillemin against Curvularia lunata causing leaf spot of rice. The Pharma Innovation Journal 10(4): 298-303 NAAS Score/ID – 5.23/T050

202. Luwang, A.D., Talukdar, D., Ahmed, F.A., Lalrintluanga, K., Tolenkhomba, T.C. and Singh, N.S. (2021). Effect of Aloe Vera Leaf Powder on Quality of Boar Semen. *Int. J. Ag.*

Env. Biotech., 14(04): 627-630. DOI: 10.30954/0974-1712.04.2021.16 **NAAS Score/ID – 4.54/I168**

203. Lyngdoh, D.D., Singh, A.K., Ray, L.I.P. and Rangappa, K. (2020). Effect of planting pattern of intercropped legumes (Soybean, groundnut and mungbean) on yield and nutrient uptake of legumes from the intercropping system at mid altitude of Meghalaya. Journal of Pharmacognosy and Phytochemistry; 9(2): 2137-2140.

204. M M Kumawat and L Wangchu (2021). First Record of *Aristobia reticulator* (Voet) on Aonla (*Emblica officinalis*) Gaertn. *Indian Journal of Entomology* 83 Online published Ref. No. e20266 DoI No.: 10.5958/0974-8172.2020.00239.4 **NAAS Score/ID – 5.08/I059**

205. M Pachuau., G. Kalita., N K Roy., L. Hmar., R. Goswami., A. K. Samanta., K. Lalrintluanga and H. Lalrinkima (2021). Effect of dietary supplementation of garlic (*Allium sativum*) and ginger (*Zingiber officinale*) on haemato-biochemical parameters of weaner pig. *The Pharma Innovation Journal.*10 (12): 870-873 **NAAS Score/ID – 5.23/T050**

206. M Premi Devi, SabyasachiMajumdar and U. K. Behera, 2021. High Oxygen Emitting Indoor Plants. *COA-K News Bulletin*, 4(1):14-16.

207. M Srilakshmi, D Jhajharia, S Gupta, GS Yurembam, GT Patle (2021). Analysis of spatio-temporal variations and change point detection in pan coefficients in the northeastern region of India. *Theoretical and Applied Climatology*, 1-15. **NAAS Score/ID – 9.18/T056**

208. M. Deepa Devi, H.Yadii and Daya Ram (2021). Training Needs Assessment ofkiwi Growers in Lower Subansiri District of Arunachal Pradesh, India, *RJAS* 12 (2):708-712 **NAAS Score/ID – 4.50/R036**

209. M. Ralte, H. Prasad, J.B. Rajesh, P. Roychoudhury , T.C. Tolenkhomba , L. Ralte , K. Sarma , S.K. Behera And C. Lalmuanthanga (2021). Subclinical mastitis incattle at Aizawl, Mizoram: prevalence, antibiogram and therapeutics. *Haryana Vet.* 60(SI), 21-25. **NAAS Score/ID – 5.58/T023**

210. Majumdar Sabyasachi, 2021, Review of Soil Science – An Introduction. *Soil Science Society of America Journal*, DOI: 10.1002/saj2.20283 (NAAS Rating: 8.31)

211. Majumdar, S., Ali, M. A., Lallianchhunga, M. C., Behera, P., Tolenkhomba, T.C., Singh, N.S. and Mayengbam, P. (2022). Stress and antioxidative status of Zovawk piglets at different intervals of weaning. *Indian Journal of Animal Sciences,* 92 (3): 283–288. **NAAS Score/ID – 6.32/I041**

212. Majumdar, S., Bora, P., Bora, A., Chaudhary, J.K, Singh, N.S., Mayengbam, P. and Tolenkhomba, T.C. (2021). Factor Analysis of Body Measurements of Bulls of Local Cattle of Tripura, India. *Indian Journal of Animal Sciences,* 91 (10): 874–877. **NAAS Score/ ID – 6.32/I041**

213. Majumder S, Ali MA, Lallianchhunga MC, Behera P, Tolenkhomba TC and Mayengbam P. (Scheduled for April, 2022). Stress and antioxidative status of Zovawk piglets at different intervals of weaning. *Indian Journal of Animal Sciences.* **NAAS Score/ ID – 6.32/I041**

214. Manish Pradhan, Jamkhogin Lhungdim, Edwin Luikham, A Herojit Singh, N Okendro Singh and Pawan Kumar (2021). Influence of different application techniques of nitrogen at seedling stage and different topd ressing method on yield of rice (*Oryza sativa* L.), *The Pharma Innovation Journal*, 10(8): 1622-1626. **NAAS Score/ID – 5.23/T050**

215. Marak T. B., Moirangthem, T., Jena, S. and Kadirvel, G. (2021). Moisture sorption characteristics of red cherry pepper (*Capsicum annum var. cerasiforme*) of Sikkim, *Indian Journal of Hill Farming*, 34:46-51. **NAAS Score/ID – 5.04/I073**

216. Marbaniang, EK, Chauhan, JK; Devarani, L; Singh, RJ; Singh R and Hemochandra, L (2021) Knowledge test scale to measure the knowledge level of the village councillor about MGNREGA in Meghalaya. Indian Research Jr of Extension Education, 21 (4): 56-62, 0972-2181 NAAS Score/ID – 5.95/I061

217. Marpa S, Kumar N, Kalkame Ch Momin and Chandel S. (2021). An insight into the diversity, traditional uses and conservation status of orchids in Hengbung, Senapati District, Manipur, India. *Indian Journal of Hill Farming* 34(1):162-172 **NAAS Score/ID – 5.04/I073**

218. Marwein, Y. and Ray, L.I.P. (2021). Variation of Bio-phisco edaphic parameters under organic mulch grown with French bean (Phaseolus vulgaris L.). Indian Journal of Hill Farming 34(1): 154-1160. NAAS Score/ID – 5.04/I073

219. Maurya, A. and Sanjay-Swami (2021). Yield and nutrient uptake of rapeseed (Brassica campestris var. toria) as influenced by phosphorus sources and levels in acidic soils of Meghalaya. Agricultural Science Digest, DOI: 10.18805/ag.D-5420. ISSN: 0253-150X (Print), 0976-0547 (Online). NAAS Score/ ID – 4.75/A097

220. Mayank Kumar and Ajaykumara K M, 2022. Importance of Pesticide Dose in Pest Management. Indian Entomologist, 3(1), 51-52.

221. Mayengbam P, Ali M A, Goswami R, Tolenkhomba T C, Behera P and Kalita G. (2021). A brief physiological note on helmeted guniea fowl (*Numida meleagris*) reared in intensive rearing system in Mizoram. *Journal of Entomology and Zoology Studies.* 9(1): 1821-1823.

222. Md. Ramjan, Chandra Deo, Mohd Talha Ansari1 and M. Chandrakumar Singh (2021). Seed Protein Profiling, an Efficient Method in Diversity Analysis of Pumpkin (*Cucurbita moschata* Duch. Ex. Poir.) from Northeast India. *Chem Sci Rev. Lett*, 9 (33), 171-178. **NAAS Score/ID – 4.75/C071**

223. Md. Ramjan. Deo, C., Wangchu, L., Sarma, P., Singh, A.K., Dobhal, S. (2021). Ethonobotany of indigenous (Traditional vegetable in Adi tribe of east Siang region of Arunachal Pradesh, India. *Environment Conservation Journal*, 22(3):2278-5124. **NASS Score/ID : 5.66/E070**

224. Medhi, B.K., Hazarika, I.H., Hazarika, P.P., Thakuria, R.K. and Sanjay-Swami (2021). Assessment of groundwater arsenic vulnerable zones using Geographic Information System for employing bio-char as soil amendment in irrigated rice ecosystem - A case study from Central Assam. Journal of Environmental Biology, 42 (2): 462-470. DOI: http://doi.org/10.22438/jeb/42/2 (SI)/SI-255. P-ISSN: 0254-8704, e-ISSN: 2394-0379. NAAS Score/ID – 5.57/J195

225. Meena N. K., Singh R and Feroze S. M (2021) Solar and Electric irrigation in Kinnow orchard of Rajasthan: comparative evaluation. Indian journal of Agicultural Sciences 91 (9): 1388-1390. NAAS Score/ID – 6.37/I032

226. Megu, O., Hazarika, BN., Wangchu, L., Sarma, P., Debnath, P., Singh, AK. and Ansri, T (2021). Micronutrient and Growth regulator enhanced the quality of litchi under the foot hill of Arunachal Pradesh: *The Pharma Innovation Journal,* SP-10(8):213-217. **NAAS Score/ID – 5.23/T050**

227. Mehta, N. K., Majumdar, R. K., Pal, D., Priyadarshini., M.B. and Dhar, B. (2021). Screening of fish from retail markets for the presence of formalin and its effect on the quality of fresh catla. *Indian Journal of Animal Health*, 60(2): 244-252. **NAAS Score/ID – 5.25/I037**

228. Mehta, N. K., Rout, B., Balange, A. K., and Nayak, B. B. (2021). Dynamic viscoelastic behaviour, gelling properties of myofibrillar proteins and histological changes in shrimp (*L. vannamei*) muscles during ice storage. *Aquaculture and Fisheries.* https://doi.org/10.1016/j.aaf.2021.08.011, PP-1-8

229. Merenungla Ozukum, JD Raj, Ngangbam Piloo, PH Arunkumar, Siddhartha Singh and Y Prabhabati (2021). Packaging films on quality and shelf-life of Naga King Chilli (Capsicum chinense) under different storage conditions. *The Pharma Innovation Journal* , 10(8): 1177-1182 **NAAS Score/ID – 5.23/T050**

230. Mili, B. and Pandita, S. Effect of dietary supplementation of Vitamin E on the resumption of cyclic ovarian activity in Murrah buffaloes (*Bubalus bubalis*). *Journal of Animal Research* (Accepted). **NAAS Score/ID – 5.43/J049**

231. Mili, B., and Pandita, S. (2021). Changes in hormones of the somatotropic axis associated with postpartum reproductive infections in Murrah buffaloes (*Bubalus bubalis*). *Indian J Dairy Sci* 74(5): 455-457. **NAAS Score/ID – 5.95/I054**

232. Mili, B., and Pandita, S. (2021). Changes in hormones of the somatotropic axis associated with postpartum reproductive infections in Murrah buffaloes (Bubalus bubalis). *Indian J Dairy Sci* 74(5): 455-457. DOI:10.33785/IJDS.2021.v74i05.013 NAAS Score/ID – 5.95/I054

233. Mili, B., Das, K., Madhusoodan, A. P., Kumar, K. Saxena, A. C., and Bag, S (2021) Transdifferentiation of canine mesenchymal stem cells into neuron-like cells by induction with β-mercaptoethanol. *Indian Journal of Animal Sciences* **91** (7): 543–546. **NAAS Score/ID – 6.32/I042**

234. Mog, M., Pandey, P.K., Khatei, A., Parhi, J., Barman, A.S., Acharya, A. and Choudhury, T.G. (2021). Pathophysiological response and IL-1β gene expression of *Labeo rohita* (Hamilton, 1822) fingerlings fed with Oxytetracycline based pharmaceutical diet against *Aeromonas hydrophila* infection. *Aquaculture*, 540:.736716. **NAAS Score/ID – 10.24/A263**

235. Mohanty, U., Majumdar, R. K., Mohanty, B., Mehta, N. K. and Parhi, J. (2021).Influence of the extent of enzymatic hydrolysis on the functional properties of protein hydrolysates from visceral waste of *Labeo rohita*. *Journal of Food Science and Technology*, 58(11):4349-4358. **NAAS Score/ID – 8.70/J248**

236. Mohd Talha Ansari, Pranabjyoti Sarma, A. S. Mailappa, C. Deo, A. K. Singh, L. Wangchu and B. N. Hazarika (2021). Rhizosphere Microbial Population of Pea Genotypes under Different Level of Aluminium. *Int.J.Curr.Microbiol.App.Sci* 10(02): 3023-3029

237. Mohd Talha Ansari, T. Shantibala, Ashutosh Sahi, Amrita Thokchom, Tantalung Tatan Ajaykumar K. M and Ng. Taibangnganbi Chanu (2021). Effect of Ultra-

sonication on Bio indigo Dyeing on Silk. *Biological Forum - An International Journal* 13(3a): 304-308, **NAAS Score/ID – 5.11/B084**

238. Mondal, H A., Paul, B., Gurung, A., Mallick, M. (2021). Factors involved in enhancing host susceptibility towards aphid clonal propagation on leaf foliage of Arabidopsis. Current Science, 121 (8): 1080-1089. NAAS Score/ID – 7.10/C203
239. Mondal, H.A. (2022). An unconventional exploration of axillary buds in Yacon (Smallanthus sonchifolius) for planting material production. Journal of Crop and Weed, 18(1): 01-08. NAAS Score/ID – 5.46/J170
240. Monsang, S.J., Acharaya, A., Khan, M.I.R., Kamilya, D. (2021). *In vitro* effects of *Asparagus racemosus* ethanolic root extract on cellular immune response and immune-related gene expression of *Labeo rohita* (Hamilton, 1822) leucocytes and anti-Aeromonashydrophila activity. *Aquaculture Research*.52 (10): 4724-4734**. NAAS Score/ID – 8.08/A26**8
241. Mridupaban D, Singh R and Feroze S.M (2021) Estimation of milk yield gap and factors associated in local cattle of Meghalaya: Application of ANCOVA model. Indian Journal of Animal Sciences, 91 (5): 406-409. NAAS Score/ID – 6.32/I042
242. N Olivia, R.K. Tombisana Devi, D. Thakuria, T. Rajesh and K. Ningthoujam (2021). Isolation and characterization of Endophytic Bacillus isolated from tomato roots. The Pharma Innovation Journal. 10(10): 2046-2053 NAAS Score/ID – 5.23/T050
243. N Olivia, R.K. Tombisana Devi, D. Thakuria, T. Rajesh and K. Ningthoujam (2021). Isolation and characterization of Endophytic Bacillus isolated from tomato roots. The Pharma Innovation Journal. 10(10): 2046-2053 NAAS Score/ID – 5.23/T050
244. N Olivia, R.K. Tombisana Devi, D. Thakuria, T. Rajesh and K. Ningthoujam 2021. Isolation and characterization of Endophytic Bacillus isolated from tomato roots. The Pharma Innovation Journal. 10(10): 2046-2053 NAAS Score/ID – 5.23/T050
245. N. Bhumapati Devi, Reihii John, C. Veerapandian, Sashitola Ozukum, Keneisezo Kuotsu and Tukheswar Chutia (2021). Dystocia in a goat due to foeto-pelvic disproportion - a case report. *Veterinary Practitioner* 22(2): 95-97
246. N. Brajendra Singh, Joyashree Dey, Herojit Singh Athokpam and J. M. Laishram(2021) Stability Analysis for Fruit Yield and its Components in Tomato (*Solanum lycopersicum* L.) under Acidic Soils of Manipur Valley. *International Journal of Current Microbiology and Applied Sciences*.10(1): 2243-2250
247. N. Brajendra Singh, Joyashree Dey, Herojit Singh Athokpam and J. M. Laishram(2021) Stability Analysis for Fruit Yield and its Components in Tomato (*Solanum lycopersicum* L.) under Acidic Soils of Manipur Valley. *International Journal of Current Microbiology and Applied Sciences*.10(1): 2243-2250 https://doi.org/10.20546/ijcmas.2021.1001.258
248. N. J. Singh, T. Kharkongor and Lala I.P. Ray (2021). Effect of phosphorus levels on soil carbon fractions in acid soil, e-planet 19 (1): 57-62. NAAS Score/ID – 3.76/E001
249. N. Okendro Singh, Ch. Basudha, N. Gopimohan Singh and Surinder Kumar (2021). Modeling Seasonal Growth of *Tor tor* (Hamilton, 1822) in Pond Environment. *Indian Journal of Fishery*, 68(4): 142-145. **NAAS Score/ID – 6.50/I066**
250. N.K. Roy., G. Kalita., L. Hmar., R. Goswami., D.C. Mili., J. R. Bora., S. N. Abedin and Ekramul Hoque(2021). Effect of dietary supplementation of Probiotic on haematological profile of neonatal pig during pre-weaning period. *International Journal of Current Microbiology and Applied Sciences*, 10 (1):1-6
251. Nagar, S. Anshu and Mathur, A. (2022). A comparative study on menstrual experiences of rural and tribal adolescent girls. *The Pharma Innovation Journal*, SP11(3): 297-302 **NAAS Score/ ID – 5.23/T050**
252. Nakeertha Venu, N. Surbala Devi, Athokpam Herojit Singh, K. Nandini Devi, N. Gopimohan Singh and Trishanku Kashyap (2021). Influence of rock phosphate, phosphorous solubilising bacteria and lime on phosphorous content and dry matter yield of green gram (*Vigna radiata* L.). *The Pharma Innovation Journal* 10(9): 1689-1692 **NAAS Score/ ID – 5.23/T050**
253. Nancy Lalruatfeli, Lalhumliana Tochhawng, Lalnuntluangi Hmar, K. Lalrintluanga and Saidur Rahman (2021). Constraints Perceived by the Co-operative Dairy Farmers in Aizawl district of Mizoram. *International Journal of Livestock Research*. 11 (6):87-91 http://www.ijlr.org eISSN: 2277-1964
254. Nashiruddullah, N., Pathak, D.C., Barman, N.N., Ahmed, J.A., Begum, S.S. and Roychoudhury, P. (2021).Natural Infection of Goats with Orf (Contagious ecthyma) and Its Diagnosis. *Indian Journal of Animal Research*.DOI: 10.18805/ IJAR.B-4267.(NAAS Rating-2020-6.44) **NAAS Score/ ID – 6.44/I040**
255. Nath, K. and Kamilya, D. 2021. Biofloc technology: a novel Approach for sustainable aquaculture. In:

Debnath, D. and Yengkokpam, S. (Eds.), Fisheries and Aquaculture in NE India: R & D trends and opportunities, Narendra Publishing House, Delhi, India, pp. 384–397.

256. Nayak, A., Majumdar, R. K., Mehta, N. K., Mohanty, U. and Samantaray, S.(2021). Effect of feeding habits of fish on the characteristics of collagenolytic proteases isolated from the visceral waste. *Journal of Food Science and Technology*, 58(4):1585-1592 **NAAS Score/ID – 8.70/J248**

257. Nganthoibi Chingkham and Namita Singh (2021). Utilization of amaranth grain flour at different products and its acceptability. *The Pharma Innovation Journal*. 10(4): 436 – 443 **NAAS Score/ ID – 5.23/T050**

258. Niangti, W., Singh, Y.J., Upadhyay, A.D., Pal, P., Patel, A.B., Bharati, H., Devi, L.R. (2020). Constraints in fish farming activities as perceived by the fish farmers of Ri- Bhoi and west Garo Hills districts of Meghalaya. *Journal of Entomology and Zoology Studies*: 8(6):12

259. Nikhil K C, Priyadarsini S, Pashupathi M, Ratta B, Saxena M, Ramakrishnan S, Behera P, Kumar A. (2021). Regulatory role of *fnr* gene in growth and tol A gene expression in *Salmonella* Typhimurium. *Indian Journal of Animal Research*. DOI: 10.18805/ IJAR.B-4120. IF: 0.440; **NAAS Score/ID – 6.44/I040**

260. Nikitasha Bora , Samshul Ali , Kalyan Sarma, Parimal Roychoudhury , Chethan G. Eregowda , Hridayesh Prasad , Justus B. Rajesh , G. Jagan Mohanarao , Suvendu K. Behera , Dhruba Das and Bhaskar Choudhury (2021). *Toxocara elephantis* Infection in a Juvenile Asian Elephant and Its Management. *Gajah*, 54: 40-44

261. Nimbolkar P.K., Kurian R.M., Varalakshmi L.R., Upreti K.K., Laxman R.H. and Kalaivanan D. (2021). Mineral nutrient composition in leaf and root tissues of fifteen polyembryonic mango genotypes grown under varying levels of salinity. *J. Hortl. Sci*. 16(2): 164-176. **NAAS Score/ID – 5.08/J282**

262. Nirali Shah, S.K. Behera, C. Gonmei, J.M. Gali, Ankan De, J.K. Chaudhary, H. Prasad, Gunjan Das And Jamlianthang (2021). Hospital Prevalence Of Congestive Heart Failure In Dogs At Aizawl And Its Effect On Hemato-Biochemical And Oxidant-Antioxidant Status. *Haryana Vet.* 60(SI), 10-15 **NAAS Score/ID – 5.23/T050**

263. Nirmalkar, C., Lahiri, B., Ghsoh, A., Pal, P., Baidya, S., Shil, B., and Kurmi, R. K. (2022). Perceived knowledge and attitude of fisheries extension professionals on usage of ICTs in Tripura. *Indian Journal of Extension Education*, 58(2): 58-64. (DOI: http://doi.org/10.48165/IJEE.2022.58211). **NAAS Score/ID – 5.95/I061**

264. Nitish R Prakash, Rajkumar U Zunjare, Vignesh Muthusamy, Mayank Rai, Amit Kumar, Satish K Guleria, Vinay Bhatt, Jeetram Choudhary, Gulab Chand, Sunil K Jaiswal, Jayant S Bhat, Firoz Hossain (2021) A novel quantitative trait loci governs prolificacy in 'Sikkim Primitive' – A unique maize (Zea mays) landrace of North-Eastern Himalaya. Plant Breeding. 140(3):400-408. NAAS Score/ID – 8.54

265. Nongbri, B., Feroze, S. M., Singh, R., and L.I. P. Ray. (2021) Linking drought Intensity with rice yield in Nagaland. Indian Journal of Agricultural Research, 10.18805/IJARe. A-6622. NAAS Score/ ID – 5.20/I031

266. Nongbri, B., Singh, R., Feroze, S.M. and Ray, L.I.P. (2021). Linking drought intensity with rice yield in Nagaland. Indian Journal of Agricultural Research 33 (1): 10-18. NAAS Score/ID – 5.20/I031

267. Nongthombam Olivia Devi, R. K. Tombisana Devi, Manashi Debbarma, Monika Hajong and Sushanti Thokchom.(2022).Effect of endophytic Bacillus and arbuscular mycorrhiza fungi (AMF) against Fusarium wilt of tomato caused by Fusarium oxysporum f. sp. lycopersici. Egyptian Journal of Biological Pest Control.32:1 https://doi:org/10.1186/s41938-021-00499-y NAAS Score/ID – 8.00/E033

268. Oyinti Megu, B.N. Hazarika, L. Wangchu, P. Sarma, Amit Kumar Singh, P. Debnath and ThejangulieAngami (2021). Effect of Plant Growth Regulators and Micronutrients on Vegetative Growth, Flowering and Yield Attributes of Litchi (*Litchi chinensis* Sonn.). *International Journal of Plant and Soil Science* 33(18): 176-181 **NAAS Score/ ID – 5.07/I319**

269. Oyinti Megu, BN Hazarika, L Wangchu, P Sarma, Amit Kumar Singh, P Debnath and Mohd Talha Ansari (2021). Micronutrient and growth regulator enhanced the quality of litchi under the foot hills of Arunachal Pradesh. *The Pharma Innovation Journal*; SP-10(8): 213-217 **NAAS Score/ID – 5.23/T050**

270. P Mayengbam, M Ayub Ali, R Goswami, TC Tolenkhomba, P Behera and G Kalita.(2021). A brief physiological note on helmeted guinea fowl (*Numida meleagris*) reared in intensive rearing system in Mizoram. *Journal of Entomology and Zoology Studies*; 9(1): 1821-1823

271. Pachuau,M., Kalita, G., Roy, N.K., Hmar, L., Goswami, R.,Samanta, A.K., Lalrintluanga,K., and Lalrinkima, H. (2021) Effect of dietary supplementation of garlic

(*Allium sativum*) and ginger (*Zingiber officinale*) on haemato-biochemical parameters of weaner pig . *The Pharma Innovation Journal* 2021; SP-10(12): 870-873. **NAAS Score/ID – 5.23/T050**

272. Pal, D., Saikia, B., Sarma, K., Konwar, B., Lallinchhunga, M.C., Choudhary, J.K. and Arya, R.S. (2022). Evaluation of Ketamine Hydrochloride in Combination with Midazolam, Dexmedetomidine and Butorphanol as Balanced Anaesthesia in Cats. *Indian Journal of Animal Research.* DOI: 10.18805/IJAR.B-4786. **NAAS Score/ID – 6.44/I040**
273. Pal, P. and Upadhyay, A.D. (2020). The potential of fish export from West Bengal: An analysis. *Indian Journal of Hill Farming*. 33 (2): 357 **NAAS Score/ID – 5.04/I073**
274. Pal, P. and Upadhyay,A.D.(2020).Strengthening Community Participation through MGMG in Tripura, *Agriculture World*: 6 (12): 20
275. Panchaal Bhattacharjee, Prashant K. Nimbolkar, Subhash Chander, Shubranil Das. (2022). Advances in Application of Unexploited Plant Bio-regulators for Fruit Production: A Review. *Agricultural Reviews*, 43(1): 46-53 **NAAS Score/ID – 4.63/A096**
276. Pandey, D.K., Adhiguru, P., De, H.K., Upadhyay, A.D and Radhakrishnan, K. (2021).Income inequality among indigenous people dependent on traditional agroforestry system in Indian Himalayas, *Indian Journal of Agricultural Sciences.* 91 (6): 847–51 **NAAS Score/ID – 6.37/I032**
277. Pathak Mahesh , Kennedy N, Sehgal M, Malik Meenakshi, Dutta Pranab, Patidar RK, Sahoo Bimal, Harita Sikha and Kalita Hia. (2021). Integrated Pest Management Approaches for Invasive Pests: Challenges and Opportunities. International Journal of Agriculture, Environment and Sustainability. 3 (1): 26-33
278. Patle, G. T. (2021). Estimation and modelling of infiltration rate of paddy fields in a hilly micro watershed of Sikkim (India). *Agric Eng Int: CIGR Journal* 23 (31): 13-20.
279. Paul, B., Sivasankarreddy, L., Mallick, M., Karmakar, N and Mondal, HA. (2021). Lateral Root from Scion Rescued the Susceptibility to Bacterial Wilt in Grafted Tomato on Wilt Resistant Brinjal Root Stock. Biological Forum–An International Journal. 13(4): 1065-1071. NAAS Score/ID – 5.11/B084
280. Pavan Kumar S.T. Biswajit Lahiri, Rafael Alvarado (2021) Multiple change point estimation of trends in Covid-19 infections and deaths in India as compared with WHO regions.https://doi.org/10.1016/j.spasta.2021.100538. **[NAAS rating: 8.06, JCR Impact Factor: 2.06]**
281. Pavankumar, S. T., Lahiri, B. and Alvarado, R. (2021). Estimation of trends in Covid-19 Infections and Deaths across WHO regions and India: Multiple Change Point Analysis Approach. *Spatial Statistics*. DOI: https://doi.org/10.1016/j.spasta.2021.100538 **NAAS Score/ID – 8.06/S073**
282. Pavankumar, S. T., Lahiri, B. and Alvarado, R. (2021). Estimation of trends in Covid-19 Infections and Deaths across WHO regions and India: Multiple Change Point Analysis Approach. *Spatial Statistics*. DOI: https://doi.org/10.1016/j.spasta.2021.100538 **[NAAS rating: 8.06, JCR Impact Factor: 2.06]**
283. Pheirim, R., Konjengbam, N.S., Mahanta, M. (2021). Molecular Markers for Powdery Mildew in Pea (Pisum sativum L.): A Review. Legume Research. DOI: 10.18805/LR-4740. NAAS Score/ID – 6.59/L014
284. Pradeep kumar, E., Rajesh, T., Tombisana Devi, R.K. and Azad Thakur, N.S. (2021) Evaluation of botanicals and host infectivity of apple Alternaria leaf blotch pathogen. Indian Journal of Hill Farming, 34(1): 147-150. NAAS Score/ID – 5.04/I073
285. Prakash, N. B., Sandhya, T. S., Sandhya, K., MajumdarSabyasachi, Pallavi, T. and Mohsina, A. (2021). Silicon in Soil and Plant Nutrition: A Decade of Research at the University of Agricultural Sciences, Bangalore. *Indian Journal of Fertilisers*. 17(2): 140-154. **NAAS Score/ID – 4.76/I063**
286. Pramanik K., Sahoo J. P., Mohapatra P. P., Acharya L. K. and Jena C. (2021). Insights into the Embryo Rescue - A Modern In-Vitro Crop Improvement Approach in Horticulture. *Plant Cell Biotechnology and Molecular Biology,* 22 (15&16): 20-33 **NAAS Score/ID – 4.88/P100**
287. Premaradhya N., Vishram Ram, Santosh Korav and N. J. Singh (2021). Floristic Composition of Weeds in Paddy Fields of Ri- Bhoi District of Meghalaya. Biological Forum – An International Journal, 13(3): 309-314. NAAS Score/ID – 5.11/B084
288. Priyadarshini, M. B., Balange, A. K., Xavier, K. M., Reddy, R., Nayak, B. B., &Sanath Kumar, H. (2021). The Effect of Lyophilized Coconut Mesocarp—Aqueous and Ethanol Phenolic Extracts on the Gel Quality of Tilapia Surimi. *Journal of Aquatic Food Product Technology*, 30(10): 1330-1343. NAAS Score/ID – 7.77/J084
289. Priyadarshini, M. B., Majumdar, R. K., and Maurya, P. (2022). Effect of vacuum packaging on the shelf life of shrimp analogue prepared from *Pangasionodonhypophthalmus surimi* during refrigerated storage. *Journal of Food Processing and*

Preservation, https://doi.org/10.1111/jfpp.16369 NAAS Score/ID – 8.19/J242

290. Priyanka, P. S and Devarani, L. (2022). Capturing community participation in rural tourism through PRA: A study in Meghalaya, Indian Journal of Extension Education. 58(2): 35-41 NAAS Score/ ID – 5.95/I061
291. Priyanka, P. S and Devarani, L. (2022). Capturing community participation in rural tourism through PRA: A study in Meghalaya, Indian Journal of Extension Education, http://doi.org/10.48165/ IJEE.2022.5820 NAAS Score/ID – 5.95/I061
292. Pushpendra Kumar and Shruti Sethi (2021). Influence of modified atmospheres on shelf life and quality of fresh-cut apples. *Journal of Packaging Technology and Research*, 5:2019-2016.
293. Pushpendra Kumar and Shruti Sethi (2022). Impact of chitosan coating on postharvest quality and storability of fresh plums under supermarket conditions. *Indian Journal of Agricultural Sciences*. 91(12). NAAS Score/ID – 6.37/I032
294. Pushpendra Kumar, Shruti Sethi and Eldho Varghese (2021). Impact of carboxymethyl cellulose coating functionalized with browning inhibitors for maintaining quality attributes of fresh-cut pineapple cubes. *Journal of Food Processing and Preservation*, 00:e16053. NAAS Score/ID – 8.19/J242
295. Pushpendra Kumar, Shruti Sethi and Eldho Varghese (2021). Impact of carboxymethyl cellulose coating functionalized with browning inhibitors for maintaining quality attributes of fresh-cut pineapple cubes. *Journal of Food Processing and Preservation*. DOI: 10.1111/jfpp.16053 NAAS Score/ID – 8.19/J242
296. R. Rewar, G. Kalita, R. Goswami, B. K. Das, D. Talukdar, J. K. Choudhary, S. Kumar and H. Das. (2021). Effect of feeding fermented liquid feed on hemato-biochemical parameters of pre-weaned and post-weaned young pigs of Large White Yorkshire breed .*Journal of Entomology and Zoology Studies*,9(1):479-483
297. R. Thangjam, V. Kadam, RK Borah, DK Saikia, PD Nath and HR Singh. (2021). Diversity of Arthropod Fauna in King Chilli (Capsicum Chinense JACQ.) Ecosystem in Northeast India. The Entomological Society of India, 83(4): 535-541.
298. R.Buragohain and B.N.Saikia. (2021). Effect of fermented liquid feed (FLF) on performance and feed efficiency of Large White Yorkshire (LWY) pigs under tropical climate of North-East India. *Asian Journal of Dairy and Food Research*:doi:10.18805/ajdfr.DR-1791). NAAS Score/ID – 5.75/A315
299. R.C. Shakywar, N. Surmina Devi, P. Raja and Gireesh Chand (2021). Epidemiology and management of late blight of Potato in Foot Hills of Arunachal Pradesh. *Ann. Pl. Protec. Sci.* 29 (3) : 231-235 doi: 10.5958/0974-0163.2021.00050.1 NAAS Score/ID – 4.11/A205
300. R.R. Malemba, L. Wangchu, N. Devachandra, S.K. Pattanaaik, N.D. Bhutia, L. Shantikumar and Md Ramjan. (2021). Effect of media and corm preparation methods on banana macro-propagation, *The Pharma Innovation Journal* 10(10): 131-140. NAAS Score/ID – 5.23/T050
301. Rajavardhan M, Sethi B and Singh R (2021) Studies on pirce spread of potato in Meghalaya: A temporal Analysis. e-planet 19(2): 112-116. NAAS Score/ID – 3.76/E001
302. Rajiv C, S S Roy, Tamreihao K, Kshetri, P, Singh TS, H Sanjita Devi, S K Sharma, M A Ansari, E D Devi, A K Devi, P Langamba,, H N Singh,. R Akoijam, C Tania and C Sonia (2021). Anticarcinogenic and Antioxidant Action of an Edible Aquatic Flora *Jussiaea repens L*. using *in-vitro* **Bioassays and** *in-vivo* **Zebrafish Model,** *Molecules,* 26(8): 2291 NAAS Score – 10.92
303. Rajkhowa T. K., Kiran, J., Hauhnar L., Zodinpui D., Paul, A., Sagolsem, S. (2021).Molecular detection and characterization of African swine fever virus from field outbreaks in domestic pigs, Mizoram, India. *Transboundary and Emerging Diseases*. DOI: 10.1111/tbed.14384. NAAS Score/ID – 11.01/T085
304. Rajkhowa T. K., Lalnunthanga , Hauhnar L., Zodinpui D., Subbiah M. (2021).Molecular detection and characterization of highly pathogenic porcine reproductive and respiratory syndrome virus from a natural outbreak in wild pigs, Mizoram, India. *Transboundary and Emerging Diseases*. DOI: 10.1111/tbed.14296 NAAS Score/ID – 11.01/T085
305. Rajkhowa, T. K., Lalnunthanga, P., Rao, P. L., Subbiah, M., Lalrohlua, B. (2021). Emergence of porcine circovirus 2g (PCV2g) and evidence of PCV2b-2g and PCV2d-2g recombinants in field isolates from unvaccinated pigs in Mizoram, India. *Infection, Genetics and Evolution.* 90(2021)104775. https://doi.org/10.1016/j.meegid.2021.104775. NAAS Score/ID – 9.34/I117
306. Ralte V, Ali MA, Gail J, Tolenkhomba TC and Mayengbam P. (2022) Cold stress elevates HSP70, TLR2 and TLR4 of indigenous chicken *Indian Journal of Animal Sciences* 92(2):187-188. **NAAS Score/ID – 6.32/I041**

307. Ralte, M., Prasad, H., Rajesh, J.B., Roychoudhury, P., Tolenkhomba, T.C., Ralte, L., Sarma, K., Behera, S.K. and Lalmuanthanga, C. (2021). Subclinical mastitis incattle at Aizawl, Mizoram: prevalence, antibiogram and therapeutics. *Haryana Vet.* 60(SI), 21-25. **NAAS Score/ID – 5.58/T023**

308. Ralte, V., M Ayub Ali, Rao, J. M., Tolenkhomba, T.C. and Mayengbam, P. (2022) Cold stress elevates HSP70, TLR2 and TLR4 of indigenous chicken. *Indian Journal of Animal Sciences,* 92 (2): 80 **NAAS Score/ ID – 6.32/I041**

309. Ram Preet Singh, RK Dilip Singh, NG Piloo, N Surbala Devi and N Gopimohan Singh (2021). Effect of skin coatings for prolonging of shelf life of immature mangoes (*Mangifera indica* L.) cv. Konsam heinous of Manipur. *The Pharma Innovation Journal*,10(12): 792-796 **NAAS Score/ID – 5.23/T050**

310. Ram Singh, N. Anand Kumar Singh, L. Geetarani Devi, S.M. Feroze, S. Chiphang and Shiv Kumar (2021). Estimation of Producers' Surplus of Large Cardamom in Arunachal Pradesh: A Value Chain Mapping. Indian Journal of Extension Education, 57(3):41-44. NAAS Score/ID – 5.04/I073

311. Ram Singh, S Passah, N Anandkumar Singh, S M Feroze, Larinsangpuii, A Anuradha Devi, Shiv Kumar, and Abhimanyu Jhahjria (2021). Organic chilli production in the North Eastern Hill Region, India: value chain analysis for doubling farmers' income, *Agricultural Economics Research Review* 34 (2), 243-252. **NAAS Score/ID – 5.84/A090**

312. Ram Singh, S Passah, N Anandkumar Singh, S M Feroze, Larinsangpuii, A Anuradha Devi, Shiv Kumar and Abhimanyu Jhahjria (2021). Organic chilli production in the North Eastern Hill Region, India: value chain analysis for doubling farmers' income. *Agricultural Economics Research Review*, 34 (2): 243-252 **NAAS Score/ID – 5.84/A090**

313. Ram Singh, S. Chiphang, N. Anandkumar Singh, S.M, Feroze, Larinsangpui, A Anuradha Devi, Shiv Kumar (2021). Estimation of Producer's surplus of large cardamom in Sikkim: A value chain mapping. *Indian Journal of Hill Farming*. 34: 257-263. **NAAS Score/ ID – 5.04/I073**

314. Ram Singh, Shiv Kumar, Sukheimon Passah and S M Feroze (2022). Determinants of organic turmeric (*Curcuma longa*) cultivation in hill states of India: A logit approach. *Indian Journal of Agricultural Sciences* 92 (2): 92-96. **NAAS Score/ID – 6.37/I032**

315. Ranjan K. Mohanta, M.S. Mahesh, Suvendu K. Behera, Bijay K. Behera, Tusar R. Sahoo, Sujata Sethy and Dillip R. Sarangi (2022). Nutritional and Therapeutic Management of Ruminal Dysfunction in Dairy Cows Affected with Trypanosomosis. *Indian J. Anim. Nutr.* 2021. 38 (3): 327-329. **NAAS Score/ ID – 5.66/I038**

316. Ranjay K. Singh, Rakesh Bhardwaj, Anamika Singh, Temin Payum, Arvind K. Rai, Anshuman Singh, Lobsang Wangchu and Sanjay Upadhyay (2021) Mainstreaming Local Food Species for Nutritional and Livelihood Security: Insights From Traditional Food Systems of Adi Community of Arunachal Pradesh, India. *Frontiers in Nutrition*, doi: 10.3389/ fnut.2021.590978, page: 1 – 17. **NAAS Score/ID – 12.58/F090a**

317. Reddy P. N, Chodhury A, Singh R, Sethi B, Geetarani Devi L and Hemochandra L (2021) An Economic Anlysis of PM Kisan Scheme in Ri- Bhoi District of Meghalaya State. Economic Affairs, 66(05): 605-609. NAAS Score/ID – 5.08/E026

318. Rewar R., Kalita G, Goswami R., Das B.K, Talukdar D., Choudhary J. K., Kumar S. and Das H.(2021). Effect of feeding fermented liquid feed on haemato-biochemical parameters of pre-weaned and post-weaned young pigs of large white Yorkshire breed. *Journal of Entomology and Zoology Studies* .9(1): 479-483.

319. Rojeet Thangjam, Shubham Rao, Shashidhar Viraktamath and L. Devarishi Sharma (2021). First report of drinking tear and sweat by Lisotrigona bees (Apidae: Meliponini) from India. *Journal of Apicultural Research*, https://doi.org/10.1080/002 18839.2021.1933369. **NAAS Score/ID – 8.58/J056**

320. Rojeet Thangjam, Veronica Kadam, R K Borah, DK Saikia, P D Nath and HR Singh. (2021). Effect of IPM modules on major pests and their natural enemies in King chilli *Capsicum chinense* in Northeast India. *Indian Journal of Entomology*, 83(4): 535-541. https://doi.org/10.5958/0974-8172.2021.00078X. **NAAS Score/ID – 5.08/I059**

321. Roy N.K., Kalita G, Hmar L, Goswami R., Rajkhowa T.K., Sarma K.and Talukdar D. (2021). Mortality pattern of large white Yorkshire pigs in an intensive farm of Mizoram. *Journal of Entomology and Zoology Studies*; 9(1): 2096-2098

322. RR Malemba, L Wangchu, N Devachandra, SK Pattanaaik, ND Bhutia, L Shantikumar and Md Ramjan (2021). Effect of media and corm preparation methods on banana macro-propagation. *The Pharma Innovation Journal*,10(10): 131-140 **NAAS Score/ID – 5.23/T050**

323. Rupali Das, Naresh Kumar Mehta and Subal Kumar Ghos, 2021 (Feb). An overview of dry fish

production and marketing strategy of North East India. Aqua international, pp-34-36.

324. S. Borah and A. Kumar (2021). Instrumental and Sensory analysis of preconditioned cashew nut. *The Pharma Innovation Journal*.11(2): 2580-2586 **NAAS Score/ID – 5.23/T050**

325. S. Borah and N. Borah (2021). Ergonomic Intervention for reduction of drudgery of women farmer involved in vegetable cultivation. *The Pharma Innovation Journal.* SP-10(11): 2552-2557 **NAAS Score/ID – 5.23/T050**

326. S. M. Richu, Singh Ram, Hemochandra L, Rani P.M. N and Singh N. A (2021) Value Chain Analysis of Pork in East Khasi Hills District of Meghalaya. Indian journal of Hill Farming. 34: 210-217. NAAS Score/ ID – 5.04/I073

327. S. Peter Singh, JP Hazarika, E. Y. Chanu, A. Aruna Devi, Singh N. Anandkumar, Naveen Kh. And Horindra Gogoi (2022). Growth instability and sources of output growth of ginger and turmeric: A statewise analysis in North East Region of India. The Pharma Innovation Journal, SP-11 (2):1429-1435. NAAS Score/ID – 5.23/T050

328. S. R. Singh and N. Devachandra (2021). Comparative studies of vegetative propagation of budding and air-layering in carambola (*Averrhoa carambola* L.) under foothills of Arunachal Pradesh. *Indian Journal of Hill Farming* accepted (Special Issue) 34: 264-267. **NAAS Score/ID – 5.04/I073**

329. S.M. Feroze, S.H. Baba, Nivetina Laitonjam, Ram Singh, Deepa Thangjam (2021). Saffron production depends on rainfall: Empirical evidence from Jammu and Kashmir, *SKUAST Journal of Research* 23(2): 160-165. **Score/ID – 4.17/S005**

330. S.N. Chaithra, Basanta Saikia, Bedanga Konwar, Hitesh Bayan, Kalyan Sarma, M.C. Lallianchhunga, Rahul Singh Arya (2021). Evaluation of Tramadol, Pentazocine Lactate and Meloxicam as Pre-emptive Analgesics for Pain Management in Canine Ovariohysterectomy. *Indian Journal of Animal Research* DOI: 10.18805/IJAR.B-4516 **NAAS Score/ ID – 6.44/I040**

331. Sabyasachi Majumdar and Nagabovanalli B. Prakash, 2021, Relationship of properties of rice and sugarcane soils and plant available silicon in Karnataka, South India. *Silicon*, 14: 5647-5660 https://doi.org/10.1007/s12633-021-01350-7 (NAAS Rating: 8.67)

332. Sagolsem S, Singh YD, Rajkhowa TK, Ravindran R, Arya RS, Patra G and Kalita A. (2021). Clinico-pathomorphological studies and diagnosis of caecal coccidiosis in chicken population of Mizoram, India. *Indian Journal of Veterinary Pathology*. 45(1): 53-55. *DOI: 10.5958/0973-970X.2021.00008.0*. **NAAS Score/ID – 5.54/I104**

333. Sagolshem Kalidas Singh, Bora I.P., Thakuria D., Changkija S. Puyam A. and Khwairakpam L. (2021) The comparative soil fertility in traditional and alder-based shifting cultivation of varied fallow lengths in Eastern Indian Himalayas, Soil Science and Plant Nutrition, DOI: 10.1080/00380768.2021.2009741 NAAS Score/ID – 8.39/S057

334. Saha, S., Chukwuka,A.V., Mukherjee, D.,Dhara,K., Pal,P., Saha,N.C.(2022). Physiological (haematological, growth and endocrine) and biochemical biomarker responses in air-breathing catfish, *Clarias batrachus* under long-term Captan® pesticide exposures, *Environmental Toxicology and Pharmacology*,90,2022,103815, https://doi.org/10.1016/j.etap.2022.103815. **NAAS Score/ID – 10.86/E103**

335. Sahoo, M.R., Kuna, A., Devi, Mayengbam Premi, Sowmya, M., and Dasgupta, M. (2021) Fortification of ready–to–eat extruded snacks with tree bean powder: nutritional, antioxidant, essential amino acids, and sensory properties. *J Food Sci Technol.* 59: 2351–2360 https://doi.org/10.1007/s13197-021-05251-w NAAS Score/ID – 8.70/J248

336. Saikia B., Paul R.,Sarma K., Das H., Lalmuanthanga C., Lallianchhunga M.C. and Chaudhary J.K.(2022). Haemato-biochemical profile in glycopyrrolate premedicated dogs maintained with isoflurane anaesthesia with induction of propofol, ketofol and etomidate. *Haryana Vet.,*61(SI):60-63, **NAAS Score/ ID – 5.58/T023**

337. Saikia, B., Sarma, K., Das, H., Lallianchhunga, M.C., Pal, D. and Sonowal, P.J. (2021). Anaesthetic Effects of Propofol, Ketamine and their Combination (Ketofol) asTotal Intravenous Anaesthesia (TIVA) in Pigs. *Indian Journal of Animal Research* (4679):1-5 **NAAS Score/ID – 6.44/I040**

338. Sailo, V. and Sanjay-Swami (2021). Performance of pea (Pisum sativum L.) with residual phosphorus in phytoremediated heavy metal polluted soil of Jaintia Hills, Meghalaya. Journal of Environmental Biology, 42 (2): 428-437. DOI: http://doi.org/10.22438/jeb/42/2 (SI)/SI-249. P-ISSN: 0254-8704, e-ISSN: 2394-0379. NAAS Score/ID – 5.57/J195

339. Salam Dayaprakash Singh, R.K.Dilip Singh, Basu Langpoklakpam and Ranjan Hijam (2021). Effect of IBA concentration and Length of Harwood cutting

on rooting performance of pomegranate (*Punica granatum* L.)cv.Bedana .Int.J. curr. Microbiol.App. Sci (2021)10(01):1540-1547.

340. Samanta, A.K.,Gali, J. M. Rao.,Dutta, T. K.Rajkhowa, T.K, Mandal, G.P. and Patra, A.(2021).Effect of dietary phytobiotic mixture on growth performance, nutrient utilization, and immunity in weaned piglets. *Tropical Animal Health and Production*. DOI:https://doi.org/10.1007/s11250-021-02910-0 NAAS Score/ID – 7.56/T105
341. Samantaray, S., Mehta, N. K., Rout, B., Majumdar, R. K., Sharma, S., Nayak, A., and Pal, P. (2021). Effect of Repeated Freezing-Thawing on Protein Fractions, Textural, and Functional Properties of Few Species of Freshwater Fishes (Indian Major Carps). *Journal of Aquatic Food Product Technology*, 30(1): 31-48. NAAS Score/ID – 7.77/J084
342. Sanjay-Swami (2021). Yield and micro nutrient uptake of rapeseed (Brassica campestris var. toria) under graded doses of rock phosphate and single super phosphate in acidic soils. Biological Forum – An International Journal, 13(3): 466-475. ISSN: 0975-1130 (Print), 2249-3239 (Online). NAAS Score/ID – 5.11/B084
343. Sanjeev Kumar, Arup Kumar Samanta, P. Roychoudhury, Honeysmita Das, Kalyan Sarma, Richa Sarkar, Fatema Akter, P.K. Subudhi, T.K. Dutta (2021). Antimicrobial and Antibiofilm Activities of Methanol Leaf Extract of *Citrus maxima* against Clinical Isolates of Multidrug Resistant *Staphylococcus aureus. Indian Journal of Animal Research* DOI: 10.18805/IJAR.B-4559. NAAS Score/ID – 6.44/I040
344. Sanjeev Kumar, Indira Sarangthem, N. Surbala Devi, K. Nandini Devi and N. Gopimohan Singh (2022) Effect of zinc nutrition on economic productivity of rice (*Oryza sativa*) and soil biological properties. *Indian Journal of Agricultural Sciences* 92 (3): 420–423 NAAS Score/ID – 6.37/I032
345. Sanjit Maiti, Sanchita Garai and S M Feroze 2021 Construction of the psychometric scale using Principal Component Analysis In Sanjit Maiti Sanchita Garai Asif Mohammad K S Kadian (Ed) Psychometric Scale Construction Techniques: Basics to Advances, NDRI, Karnal
346. Sankalp Sharma, Nawab Nashiruddullah, Anil Taku, Parimal Roychoudhury, Jafrin Ara Ahmed. (2021). Identification and comparative phylogeny of sheep and goat pox isolates from Jammu, India. *Indian Journal of Animal Research*, 55(6):710-715. NAAS Score/ID – 6.44/I040
347. SantanuNath, SaifurRahaman, PragatiHazarika, VV Kulkarni, KeshabDebnath, KuldeepKalita and AryabhattaGhosh (2022). A comparative quality evaluation study on traditional and modified Wahanmosdeng (pork vorta): An ethnic pork product of Tripura. *J of Entomology and Zoology Studies*.10(1): 201-211
348. Sarah D. Davey, Gopalakrishnan Ravikumar, Russel M. Morphew et al. In silico characterization of the complete Ly6 protein family in *Fasciola gigantica* supported through transcriptomics of the newly-encysted juveniles, *Mol. Omics* 18: 45-56. DoI: 10.1039/d1mo00254frsc.li/moloics. NAAS Score/ID – 10.21
349. Sarma, K., Kalita, G., Bayan, H., Rahman, S., Tochhawng, L, Laldinpuii N., ., and. Hmar L. (2021) Common Diseases of Livestock, College of Veterinary Sciences & AH, CAU, Selesih, Aizawl, Mizoram. Page 37
350. Satya, M.S.S.C. and Sanjay-Swami (2021). Nutrient uptake by black gram (Vigna mungo L. Hepper) as influenced by phosphorus and boron fertilization in acid Inceptisol of Meghalaya. International Journal of Agricultural and Applied Sciences, 2 (1): 118-122. ISSN: 2582-8053. DOI: https://doi.org/10.52804/ijaas2021.2112.
351. Satya, M.S.S.C. and Sanjay-Swami (2021). Performance of black gram (Vigna mungo L. Hepper) under phosphorus and boron fertilization in acid Inceptisol of Meghalaya. Journal of Environmental Biology, 42 (2): 534-543. DOI: http://doi.org/10.22438/jeb/42/2(SI)/SI-281. P-ISSN: 0254-8704, e-ISSN: 2394-0379. NAAS Score/ID – 5.57/J195
352. Saurav Debnath, Hitesh Bayan, Bedanga Konwar, Prava Mayengbam and Kalyan Sarma (2021). Effects of intraperitoneal bupivacaine and bupivacainedexmedetomidine for intra-operative and postoperative pain management in dogs. *The Pharma Innovation Journal* SP-10(12): 2019-2022. NAAS Score/ID – 5.23/T050
353. SG Magar, Ng. Tombisana Meetei, K Noren Singh, VK Khanna and VK Chowdhury (2021). Genetic variability of Curcuma sp. accessions of North East Hill region of India using ISSR and RAPD markers. The Pharma Innovation Journal SP-10(11): 2781-2787. NAAS Score/ID – 5.23/T050
354. Sharma SS. and Mondal HA. (2022). Optimization of aerial node mediated emergence and field performance in lower altitude of a higher altitude specific endangered medicinal plant,

Valerianajatamansi Jones. Indian J. Genet.and Plant Breeding, 82(1): 81-88. NAAS Score/ID – 6.51/I068

355. Shashidhar Viraktamath*, Ashish Kumar Jha, Shubham Rao, Rojeet Thangjam and Jagruti Roy. (2021). Morphometry of stingless bees (Hymenoptera: Apidae: Meliponini) of the genus Lisotrigona indicates presence of more than one species in India. *Entomon,* 46(2): 95-104. https://doi.org/10.33307/entomon.46i2.595. NAAS Score/ID – 4.69/E067

356. Sheela Kharkwal, Ravindra Malhotra, Basant Kumar Bhinchhar and Khwairakpam Ratika.(2021). An economic evaluation of crop and livestock enterprises in Uttarakhand hills. *Indian Journal of Economics and development*. 17(3): 591- 97. NAAS Score/ID – 5.15/I057

357. Sherpa, T.S., Patle, G. T. and Rao, K.V.R. (2021). Gravity fed micro irrigation system for small landholders and its impact on livelihood– A Review. *International Journal of Environment and Climate Change*, 11 (12): 310-323. NAAS Score/ID – 5.13/I229

358. Shil, B., Lahiri, B., Ghosh, A., Radhakrishnan, K. V. and Pandey, P. K. (2021). The 'Nibble fish', *Garra rufa* (Heckel, 1843), as a potential candidate species for ecotourism in North-East India. *Journal of the Inland Fisheries Society of India*. 53(1&2):3-7. DOI: http://dx.doi.org/10.47780/jifsi.53.1&2.2021.115748 [NAAS rating: 5.71]

359. Siddhartha Singh, Neelam Sharma, Anudeep B. Malannavar, Anila Badiyal, Prem Nath Sharma (2022). Cloning and in silico characterization of cinnamyl alcohol dehydrogenase gene involved in lignification of Tall fescue (*Festuca arundinacea* Schreb.). *Molecular Genetics and Genomics* 297:437–447 NAAS Score/ID – 9.29/M081

360. Siddhartha Singh, Rajan Katoch and Neelam Sharma (2021). Enzymatic and biochemical alterations in relation to lignin deposition at different growth stages of tall fescue. *Crop Science*. 61:1-12 NAAS Score/ID – 8.32/C167

361. Singh CK, Singh D, Taunk J, Chaudhary P, Tomar RSS, Chandra S, Singh D, Pal M, Konjengbam NS, Singh MP, Singh Sengar R and Sarker A (2021) Comparative Inter and Intra Species Transcriptomics Revealed Key Differential Pathways Associated With Aluminium Stress Tolerance in Lentil. Front. Plant Sci. 12:693630. doi: 10.3389/fpls.2021.693630 NAAS Score/ID – 12.63

362. Singh Mahak, Mollier R Talimoa, Sharma, Ponener Nungshitula, Chaudhary J. K., Kumar Rakesh, Rajkhowa DJ and Mishra VK (2021) Effect of sow's parity and semen storage time on reproductive performance of pig after artificial insemination with boar semen, *Indian Journal of Animal Sciences* ISSN: 0367-8318, 91 (12):1027-1030 NAAS Score/ID – 6.32/I041

363. Singh R, Chiphang S and Singh Ajmer (2021) constraint analysis of dairy sector in North Eastern Region: A producers and consumers perspective. Indian Journal of Dairy Science, 74 (3):277-279. NAAS Score/ID – 5.95/I054

364. Singh R, Chiphang S, Singh N. A, Feroze S. M, A. Anuradha Devi and Kumar S (2022) Estimation of Producer's Surplus of Large Cardamom in Sikkim: A Value Chain Mapping. Indian journal of Hill Farming. 34: 257-263. NAAS Score/ID – 5.04/I073

365. Singh R, Kumar S, Passah S and Feroze S. M (2022). Determinants of organic turmeric (Curcuma longa) Cultivation in hill states of India: A logit approach. Indian journal of Agril. Sciences, 92 (3):240-244. NAAS Score/ID – 6.37/I032

366. Singh R, S. Passah, Singh Anadkumar N, Feroze S. M, Larinsangpuii, Devi Anuradha A, Kumar S and Jhajjria Abhimanyu (2021) Organic Chilli production in the North Eastern Hill Region, India: Value chain analysis for doubling farmer's income. Agricultural Economics Research Review, 34 (2), 243-252. NAAS Score/ID – 5.84/A090

367. Singh, D., Chaudhary, P., Taunk, J., Singh, C.K., Singh, D., Tomar, R.S.S., Aski, M., Konjengbam, N.S., Raje, R.S., Singh, S. and Sengar, R.S., (2021). Advances in Fabaceae for Abiotic Stress Resilience: From 'Omics' to Artificial Intelligence. International Journal of Molecular Sciences, 22(19): 10535. NAAS Score/ID – 11.92/I301

368. Singh, K. I., Dilip, R.K., Sanatomba Athokpam and Haldhar, S.M. (2021). A case study of insect pests responsible for mass citrus decline in Manipur and their control remedies. *J Appl. Zool. Res*., 32(2):187-196. NAAS Score/ID – 3.51/J079

369. Singh, K.I., Basar, M. and Haldhar, S.M. (2022). Bio-efficacy of microbial insecticides against cabbage butterfly, *Pieris brassicae* Linn. (Pieridae: Lepidoptera) in NEH region of India. (Manuscript No.: 26655, accepted to publish in the *Journal of Biological Control* NAAS Score/ID – 4.99/J106

370. Singh, K.I., Devi , P.S., Linda, K., Sanatomba Athokpam and Haldhar,S.M. (2021).Laboratory evaluation of new organic products ageist *Plutellaxylostella* Linnaeus, *Pieris brassicae* Linnaeus and *Brevicorynebrassicae* Linnaeus in cabbage. *J*

Appl. Zool. Res., 32(2):166-171. NAAS Score/ID – 3.51/J079

371. Singh, K.I., Devi, K.L., Singh, C.N., Singh, K.J., Sanatomba Athokpam and Haldhar, S.M. (2021). Effect of abiotic factors with productivity link parameters of lac insect, *Kerria manipurensis* in Manipur.*J Appl. Zool. Res*., 32(2):172-179. NAAS Score/ID – 3.51/J079

372. Singh, S. and Sanjay-Swami (2021). Effectiveness of ITKs for sustainable production of horticultural crops in North Lakhimpur district of Assam. Indian Research Journal of Extension Education, 21 (1): 99-102. ISSN: 0976-1071. NAAS Score/ID – 5.11/I111

373. Singson, H. , Ramkrushna G.I.,, Layek, J. , Anup Das, Pandey,R., Verma, B.C., Singh, A.K. and Shivay,. Y.S. (2021). Effect of zinc fertilization on growth, yield and nutrient uptake of rice (Oryza sativa) in Eastern Himalayas. Indian Journal of Agronomy 66 (4): 498-503. NAAS Score/ID – 5.55/I036

374. Singyala Chiphang, Ram Singh and S. M. Feroze (2022). Is Organic Rice bean (*Vigna umbellata*) Farmers Economically better Off? An Empirical Analysis. *Indian Journal of Extension Education* 58(1):17-20. NAAS Score/ID – 5.95/I061

375. Sinha, A., Basu, D., Priyadarshi, P., Ghosh, A., and Sohane, R. (2022). Farm Typology for Targeting Extension Interventions Among Smallholders in Tribal Villages in Jharkhand State of India. *Frontiers in Environmental Science* 10:823338. DOI-10.3389/fenvs.2022.823338 NAAS Score/ID – 10.58/F085a

376. Sinha, A., Basu, D., Priyadarshi, P., Ghosh, A., and Sohane, R. (2022). Farm Typology for Targeting Extension Interventions Among Smallholders in Tribal Villages in Jharkhand State of India. *Frontiers in Environmental Science* 10:823338. DOI-10.3389/fenvs.2022.823338 [JCR IF- 4.581, NAAS- 10.581]

377. SM Haldhar, R. Thangjam, V. Kadam, BL Jakhar, R Loganathan, KI Singh, R. Rolania, S. Singh, SR Dhaka, KM Singh. (2021). A review on entomophagy: Natural food insects for ethnic and tribal communities of North-East. Indian Journal of Environmental Biology, 42(6): 1425-143 NAAS Score/ID – 5.57/J195

378. Sneha Adhikari, Anjali Joshi, Amarjeet Kumar, Narendra Kumar Singh, Jai Prakash Jaiswal, Anand Singh Jeena, Usha Pant (2021) Identification of QTLs for yield and contributing traits in Maize-Teosinte derived BILs under diseased-stressed and control conditions.*Genetika*,53(3): 951-972. NAAS Score/ID – 6.76/G021

379. Sneha Adhikari, Anjali Joshi, Amarjeet Kumar, Narendra Kumar Singh, Jai Prakash Jaiswal, Anand Singh Jeena, Rajesh Pratap Singh, Dinesh Pandey (2021) Identification of QTL for Banded Leaf and Sheath blight in teosinte derived maize population. *Agricultural Research, http:/doi.org/10.1007/s40003-021-00567-7* NAAS Score/ID – 5.95/A094

380. Sneha Adhikari, Anjali Joshi, Amarjeet Kumar, Narendra Kumar Singh, Jai Prakash Jaiswal, Anand Singh Jeena (2021) Revealing the genetic diversity of teosinte introgressed maize population by morphometric traits and microsatellite markers. *Journal of Plant Biochemistry and Biotechnology*, https://doi.org/10.1007/s13562-021-00710-z(0123456789().,-volV)(0123456789().,-volV) NAAS Score/ID – 7.18/J432

381. Sneha Adhikari. Anjali Joshi. Amarjeet Kumar, Narendra Kumar Singh (2021).Diversification of maize (*Zea mays* L.) through teosinte (*Zea mays* subsp. *Parviglumis* Iltis and Doebley) allelic introgression. *Genet Resour Crop Evol*., https://doi.org/10.1007/s10722-021-01170-z(0123456789().,-volV)(01) NAAS Score/ID – 7.52/G014

382. Sofia Devi Yanglem, Vishram Ram, Krishnappa Rangappa, Premaradhya and Nishant Deshmukh (2021). Effects of seed priming on root- shoot behaviour and stress tolerance of pea (*Pisum sativum* L.). Bangladesh Journal of Botany. 50(2): 199-208. DOI: https://doi.org/10.3329/bjb.v50i2.54074 NAAS Score/ID – 5.57/J195

383. Songthat William Haokip, Barun Singh, L. Wangchu, P. Debnath, P. Sarma, Ng. Piloo, T.S. Mehra and KH. Anush Sheikh. (2022). Significance of Organic and Inorganic nutrients application on Fruit and Quality of Lemon cv. Assam Lemon under the foothills of Arunachal Pradesh. *The Pharma Innovation Journal*. 11(3): 881-884 NAAS Score/ID – 5.23/T050

384. Stina, K., Devarani, L and Sarkar, A. (2021) Retrospection of the Performance of Swarnjayanti Gram Swarozgar Yojana (SGSY) to Counteract Poverty. Agriways. 9 (1): 33-38. NAAS Score/ID – 3.05/A109

385. Stina, K., Devarani, L, Sarkar, A., Singh, R and Singh, R. J. (2021). Perceived Constraints Affecting the Desired Performance of MGNREGA and Strategies for Improvement. International Journal of Social Sciences. 10(02): 127-132 NAAS Score/ID – 4.38/I344

386. Suantak, L, T; Puzrai, K. C. and Dutta, Pranab (2021) Development of Interspecies and Intergeneric

Protoplasm fusant of Trichoderma spp. and Metarhizium anisopliae and their Efficacy against Rhizoctonia solani and Colletotrichum capsica. Biological Forum – An International Journal 13(3a): 58-65.ISSN No.: 0975-1130. NAAS Score/ID – 5.11/ B084

387. Sultanpuri A, Dhiman SR, Gupta YC, Sharma P, Kashyap B, Basoli M, Kalkame Ch Momin. 2021. Scheduling of Planting Dates for Maximum Profitability in Carnation (L.) *Indian Journal of Ecology* 48(5):1521-1528 NAAS Score/ID – 5.79/I056
388. Sunil RM, Singh, R, Hemochandra, L; Rani, PMN, Singh, NA and Sivasankaran, S. (2021) Pig farming in East Khasi Hills District of Meghalaya: An Analysis of Resource use Efficiency. Economic Affair 66(3): 521-526 NAAS Score/ID – 5.08/E026
389. Surjobala, N., Mandal, S. C., Patel, A. B., Parhi, J., and Pandey, P. K. (2021). Effect of graded protein levels on the growth, survival and body composition of juvenile *Osteobrama belangeri* using semi purified diet. *Indian Journal of Animal Research*, 55(7):810-817 NAAS Score/ID – 6.44/I040
390. T. S. Sherpa, G. T. Patle and K.V.R. Rao (2021). Gravity fed micro irrigation system for small landholders and its impact on livelihood– A Review. *International Journal of Environment and Climate Change*, 11 (12): 310-323 NAAS Score/ID – 5.13/ I229
391. T. Shantibala, Tantulung Tatan, Mohd Talha Ansari, N. Surmina Devi and Gusheinzed Waikhom (2021). Multiple Facets of Edible Insect Utility as Nutrient Power Pack and Economic Empower Bank. *Biological Forum – An International Journal* 13(3): 643-647 NAAS Score/ID – 5.11/B084
392. T.K. Hazarika, C. Lalhriatpuia, RodyNgurthankhumi, Esther Lalruatsangi, H. Lalhmachhuani. (2021). Edible Coatings in Extending the Shelf Life of Fruits: A Review. *Indian Journal of Agricultural Research*. 5725. NAAS Score/ID – 5.20/I031
393. Talukdar, D., Sarma, K., Konwar, B., Talukdar, P. and Deka, A. (2022). Clinico-pathological Alterations of Pyometra in Cat. *Indian Journal of Animal Research*. DOI: 10.18805/ IJAR.B-4723 NAAS Score/ID – 6.44/ I040
394. Tamang, B. and Sanjay-Swami (2021). Temporal availability of phosphorus and sulphur in acid Inceptisol as influenced by graded application of P and S under black gram (Vigna mungo L. Hepper) production. Legume Research: An International Journal, 44 (5): 608-612. Print ISSN: 0250-5371 / Online ISSN: 0976-0571, DOI: 10.18805/LR-4127. NAAS Score/ID – 6.59/L014
395. Temjenmenla, B, Puzari KC., Bhattacharyya, a., Nath, PD and Dutta, Pranab (2022) Characterization of twenty isolates of Beauveria bassiana and study their bio-efficacy against Nodostoma subcontatum, Biological Forum- An International Journal, 14(1): 1389-1401. NAAS: 5.11, JrnID: B084, ISSN No.: 0975-1130. NAAS Score/ID – 5.11/B084
396. Temjennungsang, Samanta, A.K., Ali M.A., Das B.K. and Kalita G. (2021). Effect of feeding palm oil sludge as partial replacement of maize in growing finishing pigs on the growth performance, nutrient digestibility and blood profiles. *Journal of Oil Palm Research.* 33 (2) : 335-346 **NAAS Score/ID – 8.06/ J396**
397. Tengli, M.B; Sivakumar, P.S; Paul, P and Kesava, H.K (2021). Sweet potato biofortification priority index – a strategic tool for scaling up of biofortified varieties. *Current science,* 121 (7):950-957. **NAAS Score/ID – 7.10/C203**
398. Tolenkhomba, T.C., P. Mayengbam and B.R. Yadav (2021). Effect of αS1-casein variants on milk production traits in Sahiwal cattle. *International Journal of Livestock Research*. 11(5): 6-10. https://dx.doi.org/10.5455/ijlr.202 1022 2123720
399. Trishanku Kashyap, Herojit Singh Athokpam, N Surbala Devi, K Nandini Devi and N Gopimohan Singh (2021). Critical limits of phosphorus in relation to the growth and dry matter yield of green gram (*Vigna radiata* L.) in acid soils of Kakching District. *The Pharma Innovation Journal* 10(6): 29-34 **NAAS Score/ID – 5.23/T050**
400. Trishanku Kashyap, Herojit Singh Athokpam, N Surbala Devi, Nakeertha Venu, K Nandini Devi and N Gopimohan Singh (2021) Forms and status of phosphorus in acid soils of Kakching district, Manipur (India). *The Pharma Innovation Journal* 2021; SP-10(9): 407-410 **NAAS Score/ID – 5.23/ T050**
401. Tyngkan H., S. B. Singh, Singh R, B. Nongbri, D. R. Lyngkhoi and G. Gogoi (2021). A comparative analysis of Pre and post watershed Development Programme; a case study of Umngoh watershed in Ri -Bhoi District, Meghalaya. Indian Journal of Economics and Development, 17 (3): 584-590. NAAS Score/ID – 5.15/I005
402. Tyngkan H., Singh, S. B., Singh, R., Lyngkhoi, D.R., Nongbri, B., Gogoi, J., and Boopathi, R.A. (2022). An economic analysis of Soil Conservation in Meghalaya. Economic Affairs, 67 (01): 01-06. NAAS Score/ID – 5.08/E026

403. Vikash Kumar Jalaj, N Brajendra Singh, Samuel Jeberson, Th. Renuka Devi, Sakthivel G, Bireswar Sinha and N Okendro Singh. (2021). Diallel analysis of yield and its important components in wheat (*Triticum aestivum* L). *International Journal of Chemical Studies* : 9(1): 987-990

404. Vikash Kumar, Chandra Deo, Pranabjyoti Sarma, Lobsang Wangchu, Prankanu Debnath, Amit Kumar Singh and Bhupendra Nath Hazarika (2021). Yield and economics of okra seed production influenced by growth regulators and micronutrients. *International Journal of Current Microbiology and Applied Sciences.* **10**(01):3280-3286.

405. Wangkheirakpam Ramdas Singh., Anshuk Sharma., Hijam Shila Devi., Anjali Bhatia., Madhuribahen Ratishkumar Patel., Dinesh Kumar (2022) Irariin improves cutaneous healing in streptozotocin-induced diabetic rats. *Journal of Tissue Viability*. 31(1):197-206. **NAAS Score/ID – 9.37**

406. Yousra O. Osman, Angad Prasad, M.Deepa Devi, Krishna P. Chaudhary and Narendra K. Soni, (2021). Profile of Girls Students Studying in Higher Agricultural Education, *AJAEES*.39(11): 128-137 **NAAS Score/ID – 4.86/A308**

407. Zothanpuii Hmar, Saidur Rahman2, Lalhumliana Tochhawng, Girin Kalita and T. C. Tolenkhomba. (2021). Small-Scale Piglet Producers Perception towards Success Factors in Piglet Production in Mizoram, India. *International Journal of Livestock Research*, 11 (7) :33-36

8.2. Conference/ Symposium Proceedings:

1. Singh K.I, Devi P.S and Haldhar S.M.2021. Role of indigenous plant products in the sustainable management of major insect pests of cabbage under Imphal valley agro-ecological situations. *Abstracts: National Conference on Priorities in Crop Protection for Sustainable Agriculture* organised by CAU, Imphal during 16-18 March 2021. Pp: 212-213.

2. Sen S, Karam N, Singh KI and Haldhar SM.2021. Efficacy of some microbial insecticides on larval mortality of diamondback moth (Plutellaxylostella L.). *Abstracts: National Conference on Priorities in Crop Protection for Sustainable Agriculture* organised by CAU, Imphal during 16-18 March 2021. Pp: 88.

3. Singh, K.I. and Singh, R.K.D.2021. A case study of insect pests responsible for mass citrus decline in Manipur and their control remedies.*SOUVENIR CUM ABSTRACTS BOOK, National Seminar on Conservation and Commercialization of Citrus Biodiversity in NEH Region* organised by CAU, Imphal during 18-19 February. Pp: 175-184.

4. Seveda MS (2021). Development of Solar PV Water Pumping System for Irrigation in NEH Region of India. 55th Annual Convention of Indian Society of Agricultural Engineers (ISAE) on Challenges and Technological Solutions for Ensuring Food, Water and Energy Security and International Symposium on Emerging Trends in Agricultural Engineering Education, Research and Extension on November 23-25, 2021 at Gyan Bhawan, Patna, Bihar

5. Hatai, L. D, S. N. Mishra and B. N. Hazarika (2021), Revitalizing horticulture for nutrition and livelihood security of marginal and small farmers of Odisha- An overview, Souvenir of 29th Annual Conference of Agricultural Economics Research Association (AERA), India, Odisha Chapter, pp. 23-27.

6. Ajaykumara K. M., Denisha Rajkhowa, Shantibala, T., Shakywar, R. C., Surmina Devi, N. Raja P., Mukesh Sehgal, Meenakshi Malik and Subhash Chander, 2021. Demonstration of Bio-Intensive Integrated Pest Management (BIPM) in Mustard at East Siang, Arunachal Pradesh. Abstract & Extended Summary of National Webinar on Integrated Pest Management: Opportunities and Challenges, ICAR-NCIPM/HRD/ABST.-1/TRIPURA, pp: 70-74.

7. T. Shantibala (2021) Career opportunities in Entomological Sciences through Insect as food Resources. *National e conference on Carrier Opportunity in Entomological Science, 28th -29th June, 2021*, Veer Kunwar Singh College of Agriculture, Dumraon, Buxur, Bihar Agricultural University, Sabour, Bhagalpur, India, pp-75-80.

8. Mandal, S. C., Pal, P., Meheta, N. K., Upadhyay, A. D., Singh, S., Nayek, V., Singh , Y. j. (2021) Souvenir cum Book of Abstracts for the National Seminar on "Agribusiness Potential in North Eastern Region with Special Reference to Tripura"

9. Mishra, A. (2021) Antimicrobial activity assessment of some medicinal plants of Meghalaya for textile finishing.International Conference on Innovative Approaches in Applied Sciences and Technologies organized by Babasaheb Bhimrao Ambedkar University, Central University Lucknow from 3rd to 5th December, 2021pp 157.

10. Konjengbam, N. S. and Reddy, J. N. (2022). Improvement of locally adapted rice variety CAU-R1 and Shahsarang against BLB through Marker Assisted Backcrossing. In Book of Abstract pp.38-39. [Oral Presentation in Zonal Symposium

of Indian Phytopathological Society held on 6-7th March, 2022 at CPGS-AS].

11. James M, Urmila Maibam, Lokeshkumar K, Wricha Tyagi, Mayank Rai (2021) Genetic dissection of blast resistance and yield parameters in diallele mating derived rice hybrids. Global rice conference 2021. Pp: 5, 24 to 27 September, 2021, Aduthurai, Tamil Nadu.
12. Magudeeswari P, Shanmugam A, James M, Wricha Tyagi, Mayank Rai (2021) Parental selection based on favourable alleles forleaf blast resistance, low phosphorous tolerance and yield related genes for breeding rice under low land acidic soil condition. XV Agricultural Science Congress. Pp: 651, 13-15 November 2021, Banaras Hindu University, Varanasi, Uttar Pradesh.
13. James M, Magudeeswari P, Abhilash Behera, Wricha Tyagi, Mayank Rai (2021) Diallele Analysis and Heterosis Estimation in Landrace Derived Hybrids of North Eastern Hill. XV Agricultural Science Congress. Pp: 652, 13-15 November 2021, Banaras Hindu University, Varanasi, Uttar Pradesh.
14. Dutta, Pranab, Kaushik, H., Kumari, A., Gomathy, M., Heisnam, P. and Deb, Lipa (2020). ZnO nanoparticles: its synthesis, characterisation and use as a potential anti-pathogenic plant health material Under Session 4: Innovative and future technologies for plant disease management in Symposium of Indian Phytopathological Society (North East Zone) on Plant Disease Management: Experiences and Aspirations, Dated: 07-08 December, 2020, Pp. 71.
15. Dutta P., Kumari A., Mahanta M., Deb L. and Devi R.K.T. (2021). Souvenir cum Abstracts Book published during Indian Phytopathological Society (North East Zone) Zonal Symposium on Current Trends in Plant Disease management for Sustainable Crop Production and Livelihood Security dated March 10-11, 2022 organized by Indian Phytopathological Society New Delhi and College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya.
16. Rajesh, T., Nandeesha, S.V., Madhan, N., Tombisana Devi, R.K., Ningthoujam, K., Azad Thakur, N.S., Singh, N.B. and Gary Suting, E.. (2021). Cultivation of shiitake mushroom ((*Lentinula edodes* (Berk.) Pegler) in Meghalaya - A success story. Published in International Conference on "Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario", pp. 297-298. Held at College of Agriculture, CAU (I), Kyrdemkulai, Meghalaya, India during 7-9th December 2021.
17. Nandeesha. S. V., Rajesh. T., Tombisana Devi. R. K. and Azad Thakur. N. S. (2022). Standardization of Shiitake Mushroom (*Lentinula edodes* (Berk.) Pegler) Spawn Production Technology in Meghalaya. Published in Zonal Symposium on "Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security", pp. 55-56. Held at College of Post Graduate Studies in Agricultural Sciences, CAU (I), Umiam, Meghalaya, India during 10-11th March 2022.
18. Nandeesha. S. V., Rajesh. T., Tombisana Devi. R. K. and Azad Thakur. N. S. (2022). Standardization of Shiitake Mushroom (*Lentinula edodes* (Berk.) Pegler) Cultivation in Meghalaya. Published in Zonal Symposium on "Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security", pp. 56-57. Held at College of Post Graduate Studies in Agricultural Sciences, CAU (I), Umiam, Meghalaya, India during 10-11th March 2022.
19. Nandeesha. S. V., Rajesh. T., Devi. R. K. T., Thakur. N. S. A., Singh. N. B. and Satyanarayana, M. S. V. (2022). Standardization of Shiitake Mushroom (*Lentinula edodes* (Berk.) Pegler) Production Technology in Meghalaya. Published in Zonal Symposium on "Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security", pp. 57-58. Held at College of Post Graduate Studies in Agricultural Sciences, CAU (I), Umiam, Meghalaya, India during 10-11th March 2022.
20. International Conference on "Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-entrepreneurship under Changing climate Scenario" Organized by NAAS Regional Chapter-Barapani, International Union of Organic Agriculture (IUOA), Shillong and College of Agriculture (CAU-Imphal) Kyrdemkullai, Meghalaya during 7-9th December 2021 and presented a paper (Oral presentation) entitled "Hydraulic performance of gravity-fed drip irrigation system- A case study in Meghalaya"; (By: Lala I.P. Ray) (Page No. 303-305)
21. National Seminar on "Climate Smart Agriculture for Enhancing Farm Profitability" at OUAT, Bhubaneswar, Odisha, India during 28th to 29th January-2020; Organized by Odisha chapter, Indian Society of Agronomy, Department of Agronomy, Odisha University of Agriculture and Technology, Bhubaneswar, Odisha, India (oral presentation) a paper entitled "Performance of Orchard crop under Gravity-fed Drip irrigation system in North Eastern

India"; (By: Lala I.P. Ray) Published in Souvenir and Extended Summary (Page No. 233-235)

22. Ray, L.I.P., Singh, A.K. and Sethy, B. 2021. Harvesting of Dew under Mid Hills of Meghalaya. Abstract Book on 30th National Web Conference on "Soil and Water Management Technologies for Climate Resilience, Agricultural and Environmental Sustainability" during 14-16th December, 2021 at Bhubaneswar, Odisha, India (Page No.77).
23. Shirisha, K., Ray, L.I.P. and Parida, P.K. 2021. Improving the Water Productivity of Lentil Cultivars under the Influence of Organic Mulching in Mid Hills of Meghalaya. Abstract Book on 30th National Web Conference on "Soil and Water Management Technologies for Climate Resilience, Agricultural and Environmental Sustainability" during 14-16th December, 2021 at Bhubaneswar, Odisha, India (Page No.21).
24. Parida, P.K., Ray, L.I.P. and Shirisha, K. 2021. Performance of Garden Pea under Organic Mulches Abstract Book on 30th National Web Conference on "Soil and Water Management Technologies for Climate Resilience, Agricultural and Environmental Sustainability" during 14-16th December, 2021 at Bhubaneswar, Odisha, India (Page No.73).
25. Panda, S and A Singh, A. K. 2021. Effect of INM on productivity of groundnut (*Arachis hypogaea* L.) in acid Inceptisol of Meghalaya. Fifth International Agronomy Congress on "Agri Innovations to Combat Food and Nutrition Challenges.23–27 November, 2021. Hyderabad
26. Sanjay-Swami (2021). Developing agriculturally vibrant and self reliant (AVSR) NEH. In: Souvenir, CAU Regional Agri-Fair 2020-21, March 08-10, Imphal, 2021: 38-43.
27. Rajkhowa T. K., (2021). Molecular epidemiology of African swine fever from field outbreaks in pig population of the North eastern region of India. Compendium of XXXVIII Annual conference of IAVP-2021 & XII Annual meeting of ICVP and International Symposium on " Advances in veterinary pathology for diagnosis and control of emerging and re-emerging diseases of livestock , wild animals and poultry", p62-72.
28. R. Buragohain (2021). Phyto-nutritional and medicinal values of tree leaves and potentiality as alternative roughages for dairy animals in Mizoram, India. 3rd international conference on 'Global initiative in agricultural, forestry and applied sciences for food security, environmental safety and sustainable development' organised by Agricultural and Environmental Technology Development Society (AETDS), Uttarakhand, India and held at Shri Guru Ram Rai University, Dehradun, Uttarakhand, India on 17-18 Oct., 2021.
29. Indira Sarangthem, L. Devarishi Sharma and S M Haldhar. (2021). Organic source as a technological option for soil carbon sequestration. International Web Conference on Global Initiatives for Sustainable Agriculture and Allied Sciences, 13-15 December 2021 organised by Astha Foundation, Meerut U.P. India.Pg. 19-20.
30. Ch. Chanbisana (2021). Scope of Value Addition of Bamboo Shoot: An Important Forest Produce for Doubling Income of Tribal Community of Mizoram. National Seminar on Agribusiness Potential of North Eastern region with Special Reference to Tripura. Page 1-6, 8-9th Sept., 2021, Tripura
31. Ch. Chanbisana (2022). Study on Preservation of Broccoli by steeping Methods.International Conference on Food Research development and Applications. Page. 56. 15th Feb., Sri Lanka.
32. M. Premi Devi and U.K. Behera, 2021, Utilising local resources for self-sustainable strawberry (*Fragaria x ananassa*) farming for marginal farmers in the mid-hills of Meghalaya. International Conference "Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, at COA, CAU-I, Kyrdemkulai
33. M. Premi Devi, U.K. Behera, G. Bhuvana Priya and L.S. Singh. 2021, Application of local organic formulations in orchid cultivation for a self-sustaining rural bio-entrepreneurship in Meghalaya. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, at COA, CAU-I, Kyrdemkulai
34. Priya, G.B., Devi, M.P., Behera, U.K. 2021. Doubling the farmers income by accelerating transfer of technology through Farm Development Card. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario. pp 229. 07-09, College of Agriculture, CAU-I, Kyrdemkulai
35. Priyadarshani P Mohapatra and U K Behera. 2021. Evaluation of brinjal varieties for Meghalaya Situations, 1st International Conference "Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under

Changing Climate Scenario" 7-9 December 2021

36. Sabyasachi Majumdar, Samborlang, K. Wanning and U. K. Behera., Effect of lime and poultry manure on growth and yield of upland paddy (Oryza Sativa L.) in acid soils under hill ecology of Meghalaya. Proceedings of 5th International Agronomy Congress, 23-27 November, 2021, India, pp. 1233-1234.
37. Sabyasachi Majumdar, Samborlang, K. Wanning and U. K. Behera., Influence of liming for enhancing upland rice productivity in acid soils of Meghalaya. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, India, pp. 31-33.
38. Samborlang, K. Wanning, Sabyasachi Majumdar and U. K. Behera., Evaluation of rice cultivar in acid soils under rainfed upland condition of Meghalaya. Proceedings of 5th International Agronomy Congress, 23-27 November, 2021, pp. 1223-1224.
39. Samborlang, K. Wanning, Sabyasachi Majumdar and U. K. Behera., Performance of upland rice cultivars in acid soils under hill ecology of Meghalaya. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, India, pp. 339-341.
40. U.K. Behera, M. Premi Devi, H. G. Kencharaddi, SabyasachiMajumdar, R. Padamini and Bhuvana Priya., 2021, Natural farming systems model can be an economically viable option for livelihood security of farmers in north eastern hill region. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, at COA, CAU-I, Kyrdemkulai, pp. 43-45.
41. Leichombam Sophia, Parathasarathi Choudhury, Nongthombam Jotish and Konsam Victor Singh. Rainfall-Runoff Modelling for an Ungauged Watershed Using GIUH Approach. International Conference on Sustainable Water Resources Management (SWARM 2020). June 19-21. IIT Guwahati. (Accepted for publication in the Springer Nature book series "Advances in Sustainability Science and Technology")

8.3. Abstract Presented and Published

1. *In Vitro* Regeneration Ability Of Tuberose (*Polianthes Tuberosa* L.*)*.Abhinash Moirangthem, Soumen Maitra, Punabati Heisnam and M. Biswapati Devi. 3rd International Conference Global Initiatives in Agricultural, Forestry and Applied Sciences organized by Agricultural & Environmental Technology Development Society (AETDS), U.S. Nagar, UK, India, October 17-18, 2021.
2. Integrated based nitrogen on the growth, yield, quality and economics of aromatic rice and their residual result on succeeding lentil under rice-lentil crop sequence. Punabati Heisnam, Abhinash Moirangthem, Priyanka Irungbam, Ph. Arunkumar Singh, Bapsila Loitongbam and Asish Singha Roy. 3rd International Conference Global Initiatives in Agricultural, Forestry and Applied Sciences organized by Agricultural & Environmental Technology Development Society (AETDS), U.S. Nagar, UK, India, October 17-18, 2021.
3. N. Surbala Devi and T. sanahanbi Devi (2021). Effect of organic manures and urea on available nitrogen and yield of rice. Souvenir and conference book of the 3rd International Conference, 17-18, October, 2021 (GIAFAS-2021) at Dehradun, Uttarakhand, India Pp. 239
4. N. Surbala Devi, Akhil Dev Tamalam, Laishram Nikita Devi and Nakeertha Venu. (2021). Phosphorus Transformation in a *Fluvaquentic Humaquepts* Soil Applied with Rock Phosphate, Phosphorus Solubilizing Bacteria and Farm Yard Manure. Abstract book of the 2nd International Web-Conference of Academy of Natural Resource Conservation and Management, India, October 29-30, 2021, pp 203.
5. *Trichoderma harzianum:* A potential organo-based biocontrol agent for pea cultivation. P. Heisnam, P. Dutta, A. Moirangthem, N.S. Devi, P. Irungbam, Ch. V. Devi and B.N. Hazarika. IPS Zonal Symposium (NEZ) Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security organized by Indian Phytopathological Society (NEZ), College of Post Graduate Studies in Agricultural Sciences, CAU (1), Umiam, Meghalaya, January 6-7, 2022
6. G T Patle (2021). IoT based automated irrigation management technique for climate smart agriculture. Paper presented and abstract published in International E- Conference on Water Source Sustainability 2021 organized by the Indian Water Resources Society (IWRS) and Department WRD&M, IIT Roorkee, Uttarakhand during 18-20, June 2021.
7. G T Patle, KVR Rao, T. S. Sherpa and P. P. Dabral (2021). Development of IoT based smart irrigation system for small farmers of Sikkim. Paper presented and abstract published in Souvenir of 55th Annual

Convention of ISAE and International Symposium organized at Patna, Bihar, India during November 23-25, 2021.

8. Ajaykumara K.M., Toge Riba, Shantibala T, Surmina Devi N, Shakywar R.C., Denisha Rajkhowa and P. Raja (2021). Front Line Demonstration on Integrated Pest Management in Brinjal. Book of extended summaries of National Webinar on Integrated Pest Management: A Paradigm Shift, August 27
9. Ajaykumara K. M., Toge Riba, Denisha Rajkhowa, Shantibala T., Surmina Devi N, Shakywar R. and P. Raja (2021). Integrated Pest Management of Rice in East Siang, Arunachal Pradesh. Book of extended summaries of National Webinar on Integrated Pest Management: A Paradigm Shift, August 27
10. Ajaykumara K. M., Toge Riba1, Denisha Rajkhowa, Shantibala T., Surmina Devi N, Shakywar R. and P. Raja.(2021) Integrated pest management of rice in East Siang, Arunachal Pradesh. Theme: IPM - A key to sustainable agriculture: past, present and future. *National Webinar on Integrated Pest Management: A Paradigm Shift*, August 27-28, 2021, Book of Extended Summaries, ICAR-National Research Centre for Integrated Pest Management (NCIPM), pp-16.
11. Ajaykumara K.M., Shantibala T and Denisha Rajkhowa (2021). Bio-Intensive Integrated Pest Management of Maize Fall Armyworm *Spodoptera frugiperda*. Book of extended summaries of National Webinar on Integrated Pest Management: A Paradigm Shift, August 27-28, 2021, pp-79-80.
12. Ajaykumara K.M., Shantibala T and Denisha Rajkhowa (2021). Bio-Intensive Integrated Pest Management Of Maize Fall Armyworm *Spodoptera Frugiperda.* Theme: Ipm Approaches For Invasive Pest Management. *National Webinar on Integrated Pest Management: A Paradigm Shift*, August 27-28, 2021, Book of Extended Summaries, ICAR-National Research Centre for Integrated Pest Management (NCIPM), pp-79-80.
13. Ajaykumara K.M., Toge Riba, Shakywar R.C., Shantibala T, Surmina Devi N, Denisha Rajkhowa and P. Raja (2021). Front Line Demonstration on Integrated Pest Management in Cabbage. Book of extended summaries of National Webinar on Integrated Pest Management: A Paradigm Shift, August 27
14. Ajaykumara K.M., Toge Riba, Surmina Devi N., Shakywar R.C, Shantibala T, Denisha Rajkhowa and P. Raja (2021). Front Line Demonstration on Integrated Pest Management in Tomato. Book of extended summaries of National Webinar on Integrated Pest Management: A Paradigm Shift, August 27
15. Ajaykumara K.M., Toge Riba1, Shakywar R.C., Shantibala T, Surmina Devi N, Denisha Rajkhowa and P. Raja (2021). FRONT LINE DEMONSTRATION ON INTEGRATED PEST MANAGEMENT IN CABBAGE. THEME: BIO-INTENSIVE IPM. *National Webinar on Integrated Pest Management: A Paradigm Shift*, August 27-28, 2021, Book of Extended Summaries, ICAR-National Research Centre for Integrated Pest Management (NCIPM), pp-40.
16. Ajaykumara K.M., Toge Riba1, Shantibala T, Surmina Devi N, Shakywar R.C., Denisha Rajkhowa and P. Raja (2021). Front Line Demonstration On Integrated Pest Management In Brinjal. Theme: Bio-Intensive Ipm. *National Webinar on Integrated Pest Management: A Paradigm Shift*, August 27-28, 2021, Book of Extended Summaries, ICAR-National Research Centre for Integrated Pest Management (NCIPM), pp-39-40.
17. Ajaykumara K.M., Toge Riba1, Surmina Devi N., Shakywar R.C, Shantibala T, Denisha Rajkhowa and P. Raja (2021). Front Line Demonstration On Integrated Pest Management In Tomato. Theme: Bio-Intensive Ipm. *National Webinar on Integrated Pest Management: A Paradigm Shift*, August 27-28, 2021, Book of Extended Summaries, ICAR-National Research Centre for Integrated Pest Management (NCIPM), pp-38.
18. Hatai, Lakshmi Dhar (2021), Economic and value chain analysis on Cashew nut in Meghalaya: A policy perspective, *Agricultural Economics Research Review*, Vol.34, Conference number, 2021, pp: 220-221 **NAAS Score/ID – 5.84/A090**
19. Hatai, Lakshmi Dhar (2021).Costs, Returns and Determinants of Oyster Mushroom Production for Promising Enterprise in West Garo Hills of Meghalaya, *Indian Journal of Agricultural Economics,* Vol.76, No.3., pp.549.
20. Pushpendra Kumar, Gireesh Chand and Devideen Yadav (2021). Preservation of minimally processed litchi arils using different solutions. 3rd International Conference (Hybrid Mode) on Food, Agriculture and Innovations 'Icfai-2021'. 24-26th December, 2021, Holiday Home, Ranchi, Jharkhand
21. Raja P. (2021). Arunachal Pradesh potential source of rhizobacteria for enhancing seed quality of citrus saplings and vegetables 2021 souvenir cum abstract book National seminar on conservation and commercialization of citrus biodiversity in NEH

region Pub: Directorate of research, CAU, Imphal pp205

22. Surmina N, Shantibal T, Shakywar R.C. Raja P, Hazarika B.N. (2021). Exposure to deadly threaten diseases and pest in citrus cultivation under Arunachal Pradesh souvenir cum abstract book National seminar on conservation and commercialization of citrus biodiversity in NEH region Pub: Directorate of research, CAU, Imphal pp214
23. Surmina N, Shantibal T, Shakywar R.C. Raja P, Hazarika B.N. (2021). Epedemiology and management of premature fruit drop of citrus in North east region souvenir cum abstract book National seminar on conservation and commercialization of citrus biodiversity in NEH region Pub: Directorate of Research, CAU, Imphal. pp215
24. Bhattacharjee,P and Datta, M.K. (2021), "Need of improvement of resource management and marketing of fishes of Rudrasagar lake (a-RAMSAR site), Tripura, India" MAFHP-23 , Oral Paper presentation in the National Seminar on Agribusiness Potential of NE region special reference to Tripura at College of Fisheries during 8-9 September 2021.
25. Datta, M.K and Majumder, S. (2021). "Status of Fish Venders (Hawkers), a member in domestic fish marketing channel at Agartala, Tripura, India" IPSM-10, Oral paper National Seminar on Agribusiness Potential of NE region special reference to Tripura" at College of Fisheries during 8-9 September 2021
26. Datta, M.K, Paul, P and Deb, S. (2021). "Economic profitability of Biofloc Fish Farming in Tripura- A case study" MAFHP-21, Oral Paper presentation in the National Seminar on Agribusiness Potential of NE region special reference to Tripura" at College of Fisheries during 8-9 September 2021
27. Khan, M.I.R., Choudhury, T.G., Kamilya, D. (2021). Elucidating the Probiotic Potential of Autochthonous BacillusAmyloliquefaciens through In Vitro and Genetic Assessment. 6th National Youth Convention2021NYC-AQC-O5
28. Paul, R. P and Ghosh, A. (2021). Agribusiness Opportunities for Fermented Dry Fishes in Tripura. Souvenir of National Seminar on Agribusiness Potential in North Eastern Region with Special Reference to Tripura during 8-10 September, 2021, organized by College of Fisheries, Central Agricultural University (Imphal), Lembucherra, p. 90.
29. Radhakrishnan, K.V., Tenali, D.R and Dann, L. (2021). "Fish based Agro-business in North East India: emerging opportunities, Oral Paper presentation in the National Seminar on Agribusiness Potential of NE region special reference to Tripura at College of Fisheries during 8-9 September 2021
30. Sangma, T. J. T., Lahiri, B., Suresh, C. P., War, E., and Rapunga, F. H. (2021) Traditional value addition practices and utilization of jackfruit (*Artocarpus heterophyllus* Lam.) in Garo Hills of Meghalaya, India: An inventory. In: Abstract published in International e-Conference on 'Post Harvest Disease Management and Value Addition of Horticultural Crops', during August 18-20, 2021 at ICAR-IARI, New Delhi, India.
31. Singh, Y. J., Ghosh, A., Upadhyay, A. D., Lahiri, B., Pal, P., and Bharati, H. (2021) Reinventing digital marketing through affiliate marketing. In: Abstract published in National Conference on 'Agribusiness Potential in North Eastern Region with Special Reference to Tripura', organised by College of Fisheries, Central Agricultural University (Imphal) in association with the Indian Society of Agricultural Marketing (ISAM), Hyderabad and North East Society for Fisheries & Aquaculture (NE,SFA), Agartala, held at College of Fisheries, CAU (Imphal), Lembucherra, Tripura during September 8-9,2021.
32. Tenali, D.R., Datta, M.K and Dann, L. (2021). "Fish marketing traits of Andhra pradesh and Tripura in present scenario" MAFHP-22 , Oral Paper presentation in the National Seminar on Agribusiness Potential of NE region special reference to Tripura at College of Fisheries during 8-9 September 2021
33. Tripathi, H.H and Mehta, N. K. (2021). Nutritional and Functional Analysis of edible muscle of freshwater snail, *Bellamya bengalensis. In: Conference: Agribusiness Potential in North Eastern Region with Special Reference to Tripura* at College of Fisheries, Central Agricultural university, Agartala, India on 8-9th September 2021.pp-70
34. Mishra, A. (2021) Antimicrobial activity assessment of some medicinal plants of Meghalaya for textile finishing.International Conference on Innovative Approaches in Applied Sciences and Technologies organized by Babasaheb Bhimrao Ambedkar University, Central University Lucknow from 3rd to 5th December, 2021 pp.85.
35. Mishra, A. and Sangma, W.S.N (2021).Banana crops a potential source of value added textile products for NE Agro enterprises. National Seminar on

"Agribusiness Potential of North Eastern Region with Special Reference to Tripura", organized by College of Fisheries, Lembucherra, Tripura on 7th and 8th September 2021. P.91

36. Borah, P and Devarani, L. (2021). Exploring competency and constraints of faculty members in online teaching of agricultural undergraduates: A study in North-East India during COVID-19 Pandemic, 2nd National Conference (Online) onTransformation of Agricultural Extension - Strategies for Effective Reformation (TAESERE) p-16, 22-23 December, 2021, ANGRAU, S. V. Agricultural College, Tirupati

37. Rajasekhar, D., Naveen Kumar, K.L., and Sen, D. (2022). Identification of yield contributing parameters for improving grain yield in a set of near homozygous maize lines developed from landraces of North East Hill Region of India. 1st International Symposium on Cereals for Food Security and Climate Resilience. pp. 53-54,18-20 January, Karnal.

38. R.K Tombisana and SushantiThokchom.(2022). Antagonistic potential of endophytic bacteria associated with different cultivars of Brassica juncea against leaf blight pathogen Alternaria brassicae.IPS 8th International Conference, SKNAU, Jobner-Jaipur, 23-26 March, 2022.

39. K.Patel, R.K.T. Devi, A.R. Singh, K.Ningthoujam and V.Kadam .(2022). Isolation of endophytic bacteria associated with different leguminous crops and their antagonistic potential against Fusarium oxysporum.IPS Zonal Symposium (NEZ),CPGS-AS, Umiam, 10-11 March,2022.

40. K.Patel, R.K.T. Devi, A.R. Singh, K.Ningthoujam and V.Kadam. (2022). Isolation, Identification of Antagonistic Endophytic Bacterial strains obtained from Chickpea and their in vitro evaluation against Fusarium oxysporum. IPS 8th International Conference, SKNAU, Jobner-Jaipur, 23-26 March, 2022.

41. Kailash Patel, R.K.Tombisana,A.Ratankumar Singh, SushantiThokchom,Christina Thokchom, LanglentombiAngom.(2022).Comparative evaluation of endophytic bacteria and chemical fungicides for antagonistic potential against Fusarium Wilt of Chickpea. National Conference on Mycology and Mankind: Marching ahead in New era, March 8-10, 2022, ICAR-RC for NEH Region,Umiam.

42. L.R Singh, S.Thokchom and R.K.Tombisana Devi.(2022).Current scenario on production of Biopesticides in India.IPS Zonal Symposium(NEZ),CPGS-AS, Umiam, 10-11 March,2022.

43.. Nandeesha S.V,T. Rajesh, R.K.Tombisana Devi and N.S.Azad Thakur.(2022). Standardization of Shiitake Mushroom Spawn production technology in Meghalaya.IPS Zonal Symposium (NEZ),CPGS-AS, Umiam, 10-11 March,2022.

44. R.Challam,R.K.T Devi,L.S.Singh,K.Ningthoujam,R.K Patidar.(2022). Evaluation of antagonistic potential of bacterial endophytes and rhizospheric bacteria against black rot of cabbage.IPS Zonal Symposium(NEZ),CPGS-AS, Umiam, 10-11 March,2022

45. ManickkamV, Sakthi Priya P,T. Rajesh, R.K.TombisanaDevi,Kennedy N and D.Thakuria. (2022). Plant tolerance to pathogens, recent developments and pathways ahead.. IPS Zonal Symposium(NEZ),CPGS-AS, Umiam, 10-11 March,2022

46. RibaToge, Shakywar RC, Pathak Mahesh, Sehgal Mukesh and Malik Meenakshi. 2021. Insect Pests, Diseases and Natural Enemies Dynamics in Rainfed Rice Ecosystem of East Siang district, Arunachal Pradesh and their Integrated Management. In Book of Extended Summaries. National Webinar on Integrated Pest Management: A Paradigm Shift, Organized by ICAR-National Research Institute for Integrated Pest Management, New Delhi, August 27-28, 2021. pp. 16-17.

47. Kumari Chanchila, Shekhar Sudhanshu, Kumar Manish, Ranjan Rupesh, Pathak Mahesh, Sehgal Mukesh and Malik Meenakshi. Constraints in Adoption of Integrated Pest Management Technology in Upland Rice under Rainfed Rice Ecosystem of Northern Chotanagpur Plateau of Jharkhand. In Book of Extended Summaries. National Webinar on Integrated Pest Management: A Paradigm Shift, Organized by ICAR-National Research Institute for Integrated Pest Management, New Delhi, August 27-28, 2021. pp. 18-19.

48. RibaToge, Shakywar RC, Pathak Mahesh, Sehgal Mukesh and Malik Meenakshi. 2021. Validation and Promotion of IPM in Okra and Brinjal in East Siang district of Arunachal Pradesh. In Book of Extended Summaries. National Webinar on Integrated Pest Management: A Paradigm Shift, Organized by ICAR-National Research Institute for Integrated Pest Management, New Delhi, August 27-28, 2021. pp. 26-27.

49. Dutta Pranab, Sehgal M, Pathak M, Patidar RK, Deb Lipa, Mahanta M, Gogoi J, Kumari A, Yasin A and Sharma A. 2021. Validation and Promotion

of IPM in Okra and Brinjal in East Siang district of Arunachal Pradesh. In Book of Extended Summaries. National Webinar on Integrated Pest Management: A Paradigm Shift, Organized by ICAR-National Research Institute for Integrated Pest Management, New Delhi, August 27-28, 2021. pp. 32.

50. Malik Meenakshi, Sehgal Mukesh, Pathak Mahesh, Lalfakawma C, Vanlalhmuliana H, Dey Utpal ,ChakorboratyArendhu and Singh RV. 2021. Information and Communication Tools: Wider Prospects of IPM Dissemination. In Book of Extended Summaries. National Webinar on Integrated Pest Management: A Paradigm Shift, Organized by ICAR-National Research Institute for Integrated Pest Management, New Delhi, August 27-28, 2021. pp. 45-46.
51. Pathak Mahesh, Kennedy N, Sehgal Mukesh , Malik Meenakshi , Dutta Pranab, Patidar RK, Sahoo Bimal, HaritaSikha and KalitaHia. 2021. In Book of Extended Summaries. National Webinar on Integrated Pest Management: A Paradigm Shift, Organized by ICAR-National Research Institute for Integrated Pest Management, New Delhi, August 27-28, 2021. pp. 75-76.
52. Shakti Priya P, Manickkam V, Rajesh T, Dutta P, Pathak M and Patidar RK. 2022. Vector borne plant pathogens: interaction with hemipteran insects and plants. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 31.
53. Kalita H, Haritha S, Sahoo BK, Pathak M, Patidar RK, Kennedy N and Dutta P. 2022. Morpho-physiological effect of nanoparticles on Eri silkworm, Samia Cynthia ricini (Drury). In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 44.
54. Sahoo BK, Haritha S, Kalita H, Pathak M, Patidar RK, Kennedy N and Dutta P. 2022.Synergistic effect of Insecticides and Metarhiziumanisopliae (Metchnikoff Sorokin) on sucking pests of Rice. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 45.
55. Malik M, Sehgal M, Pathak M, Dutta Pranab, Lafakawma C, Vanlalhmuliana H, Dey U and Chakorboraty A. 2022. Decision support system: an effective and efficient tool of knowledge dissemination in Indian Agriculture. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 45-46.
56. Gogoi J, Mahanta M, Deb L, Sudarshan KR, Kumara A, Dutta P, Pathak M and Patidar RK. 2022. Nano biological and conventional approaches for management of pest and disease complex of Okra in the agro-ecological conditions of Meghalaya. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 53.
57. Haritha S, Sahoo BK, Kalita H, Pathak M, Patidar RK, Kennedy N and Dutta P. 2022. Combined action of chemical insecticides and entomopathogenic fungi in the management of Fall armyworm, Spodoptera frugiperda (J.E. Smith) (Lepidoptera: Noctuidae) of Maize. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 61.
58. Malik M, Sehgal M, Pathak M, Dutta P, Dey U and Chakorboraty A. 2022. Web Tools: A mechanized and futuristic approach in the management of important insect-pests in NE Region. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological

Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 64.

59. Malik M, Sehgal M, Pathak M, Dutta Pranab, Lafakawma C and Vanlalhmuliana H. 2022. Knowledge about the pest management strategies to improve the socio-economic profile of Chawnhu and Thingkah villages of district Lawngtlai. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 64-65.
60. Malik M, Sehgal M, Pathak M, Dutta Pranab, Lafakawma C, Vanlalhmuliana H and Dey U. 2022. Opportunities for the poor and tribal women farmers of the selected villages of Siaha district. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 65-66.
61. Reddy DS, Satyanarayana MSV, K Ningthoujam, Pathak M, Patidar RK and Singh LS. 2022. Role of Hormones: A New Alternative in Pest Control. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 88.
62. Pathak Mahesh, RibaToge, Shakywar RC, Patidar RK, Sehgal Mukesh and Malik Meenakshi. 2022. Biointensive pest management in rice at East Siang, Arunachal Pradesh. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 92-93
63. Pathak Mahesh, RibaToge, Shakywar RC, Patidar RK, Sehgal Mukesh and Malik Meenakshi. 2022. Biointensive pest management in brinjal at East Siang, Arunachal Pradesh. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 93-94.
64. Pathak Mahesh, RibaToge, Shakywar RC, Patidar RK, Sehgal Mukesh and Malik Meenakshi. 2022. Biointensive pest management in Tomato at East Siang, Arunachal Pradesh. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 94.
65. Pathak Mahesh, RibaToge, Shakywar RC, Patidar RK, Sehgal Mukesh and Malik Meenakshi. 2022. Biointensive pest management in Cabbage at East Siang, Arunachal Pradesh. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 94-95.
66. Deb L., Dutta Pranab and Devi R.K.T. (2022). Exploring plant disease antagonistic behaviour of fungal entomopathogen Beauveria bassiana (Balsamo) vuillemin against Rhizoctonia solani Kuhn causing sheath blight disease of rice. Abstracts and Souvenir in 8th International Conference (Hybrid Mode) on Plant Pathology: Retrospect and Prospects at Sri Karan Narendra Agricultural University, Jobner-Jaipur, Rajasthan during March 23-26, 2022. Pp. 11.
67. Kumari A. and Dutta Pranab (2022). Synthesis of green engineered copper nano-formulation and its use as a component of IDM for management of leaf blight of turmeric (Curcuma longa L.). Abstracts and Souvenir in 8th International Conference (Hybrid Mode) on Plant Pathology: Retrospect and Prospects at Sri Karan Narendra Agricultural University, Jobner-Jaipur, Rajasthan during March 23-26, 2022. Pp. 21.
68. Dutta, Pranab (2022). Multifaceted role Trichoderma spp. in plant health management in acid soil

of North Eastern Region of India. Souvenir and Abstracts in National Conference (Virtual) on Mycology and mankind: Marching ahead in the new era during March 8-10, 2022. Pp. 23.

69. Sudharshan K.R., Devnath H. and Dutta Pranab (2022). Essential oil effectively suppresses the grey mold of tomato caused by Botrytis cinerea. Souvenir and Abstracts in National Conference (Virtual) on Mycology and mankind: Marching ahead in the new era during March 8-10, 2022. Pp. 30.

70. Kumari A., Dutta Pranab, Das, A., Barman N.N. and Das B.C. (2022). Green synthesis of silver nanoparticles and assessment of its antimicrobial activity against Rhizoctonia solani and toxicity against biocontrol agents and mammalian cells. Souvenir and Abstracts in National Conference (Virtual) on Mycology and mankind: Marching ahead in the new era during March 8-10, 2022. Pp. 34.

71. Deb, L., Dutta P. and Devi, R.K.T. (2022). Endophytic association of Beauveria bassiana in rice is governed by inbuild enzymatic secretion abilities and presence of virulent genes. Souvenir and Abstracts in National Conference (Virtual) on Mycology and mankind: Marching ahead in the new era during March 8-10, 2022. Pp. 48.

72. Sharma A. and Dutta Pranab (2021). Phyto-synthesized silver and silica nanocomposite can effectively manage Rhizoctonia solani Kuhn causing sheath blight of rice. Souvenir and Abstracts in National Conference (Virtual) on Mycology and mankind: Marching ahead in the new era during March 8-10, 2022. Pp. 96.

73. Yasin A. and Dutta Pranab (2021). Management of brown spot of rice using green engineered nano-zinc loaded PGPR bioactive formulation. Souvenir and Abstracts in National Conference (Virtual) on Mycology and mankind: Marching ahead in the new era during March 8-10, 2022. Pp. 98.

74. Deb L., Devi R.K.T., Dutta, P. and Thakuria D. (2021). Antimicrobial abilities of Beauveria bassiana (Balsamo) Vuillemin against Rhizoctonia solani Kuhn causing sheath blight of rice. IPS Zonal Symposium on Current Trends in Plant Disease management for Sustainable Crop Production and Livelihood Security dated March 10-11, 2022.

75. Deb L., Dutta, P. and Devi, R.K.T. (2021). An entomogenous fungi Beauveria bassiana (Balsamo) Vuillemin as plant growth promoting (PGP) bio stimulant in rice, Oryza sativa Linn. Presented as poster presentation in International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario during December 7-9, 2021.

76. Mahanta, M., Dutta, P., Gogoi, J. and Deb, L. (2021). Management of leaf spot disease of turmeric, Curcuma longa L. caused by Colletotrichum spp. with Trichoderma based bioformulation UmTricho. Presented as poster presentation in International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario during December 7-9, 2021.

77. Gogoi, J., Deb, L., Mahanta, M., Singh, N.K. and Dutta, P. (2021). Biointensive management of disease complex of lentil, Lens culinaris with UmTricho, a liquid bioformulation of native strains of Trichoderma harzianum. Published in Abstract book at National Webinar on "Plant Diseases in Eastern and Northeastern India: Current Dynamics and Proposed Action Plan for Their Management" held on June 24-25, 2021 organized by Department of Plant Pathology and AICRP on Pigeon pea, College of Agriculture, Tripura in association with ICAR-National Bureau of Agricultural Insect Resources, Bengaluru. Pp. 27.

78. Deb, L., Gogoi, J., Mahanta, M., Kumari, A., Yasin, A., Sarmah, A. and Dutta, P. (2021). Management of tikka disease (Cercospora spp.) of groundnut, Arachis hypogea L. by native strains Um Tricho a liquid bioformulation of indigeneous strains of Trichoderma harzianum Rifai. Published in Abstract book at National Webinar on "Plant Diseases in Eastern and Northeastern India: Current Dynamics and Proposed Action Plan for Their Management" held on June 24-25, 2021 organized by Department of Plant Pathology and AICRP on Pigeon pea, College of Agriculture, Tripura in association with ICAR-National Bureau of Agricultural Insect Resources, Bengaluru. Pp. 31.

79. Sharma, A., Yasin, A., Mahanta, M., Deb, L., Gogoi, J. and Dutta, P. (2021). Compatibility of Meatrhiziumanisopliae with pesticides used in tea ecosystem. Published in Abstract book at National Webinar on "Plant Diseases in Eastern and Northeastern India: Current Dynamics and Proposed Action Plan for Their Management" held on June 24-25, 2021 organized by Department of Plant Pathology and AICRP on Pigeon pea, College of Agriculture, Tripura in association with ICAR-National Bureau of Agricultural Insect Resources, Bengaluru. Pp. 38.

80. Yasin, A., Mahanta, M., Kumari, A., Sarmah, A., Deb, L., Gogoi, J. and Dutta, P. (2021). In vitro efficacy of fungicides and biocontrol agents against leaf blight of cardamom, Amomum subulatumRoxb. Published in Abstract book at National Webinar on "Plant Diseases in Eastern and Northeastern India: Current Dynamics and Proposed Action Plan for Their Management" held on June 24-25, 2021 organized by Department of Plant Pathology and AICRP on Pigeon pea, College of Agriculture, Tripura in association with ICAR-National Bureau of Agricultural Insect Resources, Bengaluru. Pp. 54.

81. Mahanta, M., Deb, L., Gogoi, J., Kumari, A., Sharma, A. and Yasin, A., Singh, R. and Dutta, P. (2021). Biointensive management of leaf spot disease of turmeric, Curcuma longa caused by Colletotrichum spp. Published in Abstract book at National Webinar on "Plant Diseases in Eastern and Northeastern India: Current Dynamics and Proposed Action Plan for Their Management" held on June 24-25, 2021 organized by Department of Plant Pathology and AICRP on Pigeon pea, College of Agriculture, Tripura in association with ICAR-National Bureau of Agricultural Insect Resources, Bengaluru. Pp. 51.

82. Heisnam, P., Moirangthem, A., Singh, Y.D., Irungbam, P., Mahanta, M., Gogoi, J., Deb, L., Hazarika, B.N., and Dutta, P. (2021). UmTricho: A potential Trichoderma harzianum based plant health materials for cultivation of pea in organic environment. In: Souvenir and Abstracts Book, National conference on "Priorities in crop protection for Sustainable Agriculture" held on 16th-18th March 2021 organized by CAU, Imphal and ICAR-NBAIR, Bengaluru at CoA, CAU (Imphal), Manipur.

83. Dutta, Pranab (2021). Bio-intensive integrated pest management approaches: An experience in NER at the National webinar on "Integrated pest Management: A Paradigm Shift" dated August 27th-28th, 2021 organized by ICAR-NCIPM, New Delhi.

84. Deb, Lipa, Dutta, P., Debbarma, M. and Devi, R.K. Tombisana (2021). Entomopathogenic fungi showed both antagonistic activity and plant growth promotion activity. Sixth National Conference on "Biological Control: Innovative Approaches for Green India" held on 3th-5th March 2021 organized by ICAR-NBAIR, Bengaluru. Pp. 88.

85. Mahanta, M., Rajesh, T., Devi, R.K.T., and Dutta, Pranab (2021). Incidence of leaf spot disease of turmeric in Meghalaya and assay of bacterial biocontrol agent agent the causal agents Colletotrichum gloeosporioides. National conference on "Priorities in crop protection for Sustainable Agriculture" held on 16th-18th March 2021 organized by CAU, Imphal and ICAR-NBAIR, Bengaluru at CoA, CAU (Imphal), Manipur.

86. Dutta, Pranab (2021). Trichoderma: A potential arsenal for management of soil borne plant pathogens. National conference on "Priorities in crop protection for Sustainable Agriculture" held on 16th-18th March 2021 organized by CAU, Imphal and ICAR-NBAIR, Bengaluru at CoA, CAU (Imphal), Manipur.

87. Dutta, Pranab, Kumari, A., Mahanta, M., Kaman, P. and Saoud, B. (2021). Organic management of basal rot of Pippali, Piper longum Linn. caused by Sclerotium rolfsiiSacc. Sixth National Conference on "Biological Control: Innovative Approaches for Green India" held on 3th-5th March 2021 organized by ICAR-NBAIR, Bengaluru. Pp. 113.

88. Dutta, Pranab, Sauntak, T. L. and Puzari, K. C. (2021). Enhancement of potentiality of biocontrol agent through protoplast fusion. Sixth National Conference on "Biological Control: Innovative Approaches for Green India" held on 3th-5th March 2021 organized by ICAR-NBAIR, Bengaluru. Pp. 99.

89. Dutta Pranab (2021). Synthesis and characterization of ZnO nanoparticles and its exploitation for management of soil borne plant pathogens. National conference on "Priorities in crop protection for Sustainable Agriculture" held on 16th-18th March 2021 organized by CAU, Imphal and ICAR-NBAIR, Bengaluru at CoA, CAU (Imphal), Manipur.

90. Kumari A. and Dutta Pranab (2021). Biogenic synthesis of silver nanoparticles, their characterization and study on its effect against sheath blight and BLB of rice, mammalian cell line and beneficial microbes. National conference on "Priorities in crop protection for Sustainable Agriculture" held on 16th-18th March 2021 organized by CAU, Imphal and ICAR-NBAIR, Bengaluru at CoA, CAU (Imphal), Manipur.

91. Pathak Mahesh, Kennedy N, Sehgal Mukesh , Malik Meenakshi , Dutta Pranab, Patidar RK, Sahoo Bimal, HaritaSikha and KalitaHia. 2021. In Book of Extended Summaries. National Webinar on Integrated Pest Management: A Paradigm Shift, Organized by ICAR-National Research Institute for Integrated Pest Management, New Delhi, August 27-28, 2021. pp. 75-76.

92. Kalita H, Haritha S, Sahoo BK, Pathak M, Patidar RK, Kennedy N and Dutta P. 2022. Morpho-physiological effect of nanoparticles on Eri silkworm, Samia Cynthia ricini (Drury). In Souvenir & Abstracts of

IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 44.

93. Sahoo BK, Haritha S, Kalita H, Pathak M, Patidar RK, Kennedy N and Dutta P. 2022. Synergistic effect of Insecticides and Metarhiziumanisopliae (Metchnikoff Sorokin) on sucking pests of Rice. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 45.

94. Haritha S, Sahoo BK, Kalita H, Pathak M, Patidar RK, Kennedy N and Dutta P. 2022. Combined action of chemical insecticides and entomopathogenic fungi in the management of Fall armyworm, Spodoptera frugiperda (J.E. Smith) (Lepidoptera: Noctuidae) of Maize. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 61.

95. Reddy DS, Satyanarayana MSV, K Ningthoujam, Pathak M, Patidar RK and Singh LS. 2022. Role of Hormones: A New Alternative in Pest Control. In Souvenir & Abstracts of IPS Zonal Symposium (NEZ) on Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security, March 7-8, 2022, organized by Indian Phytopathological Society, New Delhi & College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya. pp. 88.

96. Parida, P.K., Ray, L.I.P. and Sirisha, K. 2021. Blackgram performance under pre-monsoon season at Meghalaya. Extended Summaries: International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, India (Page No. 76).

97. Sharma, P.M. and Ray, L.I.P. 2021. Performance of Black Rice under organic and inorganic nitrogen management practices in Mid Hill of Meghalaya. Extended Summaries: International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, India (Page No. 303).

98. Sanjay-Swami (2021). Biochar potential for enhancing tomato productivity and improving soil acidity indices in acid Inceptisol of Meghalaya, India. In: Sustainable Agriculture and Eco-Tourism, Abstract Book of 1st Indonesia Chapter Asian PGPR International Conference, (eds.) Suriani, N.L., Antonius, S. and Reddy, M.S., Udayana University and Asian PGPR Society, 28-30 August, 2021, Udayana University, Bali, Indonesia. p. 136.

99. Sanjay-Swami (2021). Integrated farming for food and nutritional security. In: Recent Advances in Agriculture, Engineering & Biotechnology for Food Security, Souvenir-cum-Abstract Book of International Conference, Mahima Research Foundation and Social Welfare, 25-26 September, 2021, BHU, Varanasi, India. p. 8.

100. Patgiri, P. and Sanjay-Swami (2021). Estimating potentially available phosphorus pools in acidic soils under organic farming. In: Recent Advances in Agriculture, Engineering & Biotechnology for Food Security, Souvenir-cum-Abstract Book of International Conference, Mahima Research Foundation and Social Welfare, 25-26 September, 2021, BHU, Varanasi, India. p. 63.

101. Yumnam, V., Sanjay-Swami, Deka, T., Patgiri, P. and Singh, S. (2021). Performance of Lakadong turmeric under integrated nutrient management. In: Recent Advances in Agriculture, Engineering & Biotechnology for Food Security, Souvenir-cum-Abstract Book of International Conference, Mahima Research Foundation and Social Welfare, 25-26 September, 2021, BHU, Varanasi, India. p. 63.

102. Deka, T., Sanjay-Swami, Yumnam, V., Patgiri, P. and Singh, S. (2021). Organic cultivation of black turmeric in Meghalaya. In: Recent Advances in Agriculture, Engineering & Biotechnology for Food Security, Souvenir-cum-Abstract Book of International Conference, Mahima Research Foundation and Social Welfare, 25-26 September, 2021, BHU, Varanasi, India. p. 64.

103. Satya, M.S.S.C., and Sanjay-Swami (2021). Nano-fertilizers for enhancing nutrient use efficiency and crop productivity. In: Recent Advances in Agriculture, Engineering & Biotechnology for Food Security, Souvenir-cum-Abstract Book of International Conference, Mahima Research

Foundation and Social Welfare, 25-26 September, 2021, BHU, Varanasi, India. p. 64.

104. Singh, S., Sanjay-Swami, Singh, T.D., Patgiri, P. Deka, T. and Yumnam, V. (2021). Managing potassium paradox through potassium solubilizing rhizobacteria. In: Recent Advances in Agriculture, Engineering & Biotechnology for Food Security, Souvenir-cum-Abstract Book of International Conference, Mahima Research Foundation and Social Welfare, 25-26 September, 2021, BHU, Varanasi, India. p. 65.

105. Patgiri, P. and Sanjay-Swami (2021). New protocol for estimating potentially available phosphorus in organically managed acidic soils. In: Global Initiatives in Agricultural, Forestry and Applied Sciences for Food Security, Environmental Safety and Sustainable Development, Souvenir-cum-Abstract Book, Volume 2, Agricultural & Environmental Technology Development Society (AETDS), U.S. Nagar, UK, 17 to 18 October 2021, Shri Guru Ram Rai University, Dehradun, U.K., India, p. 63.

106. Patgiri, P., Sanjay-Swami and Singh, S. (2021). A novel approach for phosphorus (P) estimation in organically managed acidic soils. In: Soil and Water Management Technologies for Climate Resilience, Agricultural and Environmental Sustainability, Abstract Book of 30th National Web Conference (eds.) Brahmanand, P.S., Adhikary, P.P., Panigrahi, B., Arora, S., Sahu, A.P., Kohli, A. and Sanjay-Swami, 14-16 December, 2021, Soil Conservation Society of India (SCSI), New Delhi, India, p. 105.

107. Kumar, S., Lalotra, S., Sanjay-Swami, Dahiphale, A.V., Kumar, V. and Parihar, R.K. (2021). Managing soil resources of hill agriculture: Prevention of erosion. In: Managing Hill Resources and Diversities for Zero Hunger and Climate Resilience, Abstract e-book of the 2nd Asian Web Conference (eds.) Sanjay-Swami, Arora, S., Bhan, S., Singh, S.B. and Mishra, A., 12-13 February, 2021, Soil Conservation Society of India, New Delhi, p. 35.

108. Lalotra, S., Kumar, S. and Sanjay-Swami (2021). Brassinosteroids: An abiotic stress mitigation option in horticultural crops. In: Managing Hill Resources and Diversities for Zero Hunger and Climate Resilience, Abstract e-book of the 2nd Asian Web Conference (eds.) Sanjay-Swami, Arora, S., Bhan, S., Singh, S.B. and Mishra, A., 12-13 February, 2021, Soil Conservation Society of India, New Delhi, p. 142.

109. Raj, V.A., Sanjay-Swami, Patgiri, P., Satya, M.S.S.C. and Singh, S. (2021). Seasonal dynamics of soil microbial biomass carbon (SMBC) in different land uses in Ri-Bhoi district of Meghalaya, India. In: Managing Hill Resources and Diversities for Zero Hunger and Climate Resilience, Abstract e-book of the 2nd Asian Web Conference (eds.) Sanjay-Swami, Arora, S., Bhan, S., Singh, S.B. and Mishra, A., 12-13 February, 2021, Soil Conservation Society of India, New Delhi, p. 151.

110. Patgiri, P. and Sanjay-Swami (2021). Dependence of boron fractions on soil physico-chemical properties under hill conditions. In: Managing Hill Resources and Diversities for Zero Hunger and Climate Resilience, Abstract e-book of the 2nd Asian Web Conference (eds.) Sanjay-Swami, Arora, S., Bhan, S., Singh, S.B. and Mishra, A., 12-13 February, 2021, Soil Conservation Society of India, New Delhi, p. 187.

111. Sanjay-Swami (2021). Integrated farming systems for enhancing tribal farmers' income in North-Eastern Hill Region of India. In: Natural Resource Conservation and Management, Souvenir-cum-Abstract Book of National Web Seminar of Academy of Natural Resource Conservation and Management, Lucknow, India, (eds.) Singh, Y.P., Srivastava, T.K., Arora, S. and Singh, A.K., 20-22 March, 2021, p. 70.

112. Patgiri, P., Sanjay-Swami, and Singh, S. (2021). Estimating potentially available phosphorus pools in acidic soils under organic farming. In: Smart Agriculture for Resource Conservation and Ecological Stability, Abstract Book of the 2nd International Web-Conference of Academy of Natural Resource Conservation and Management, Lucknow, India, (eds.) Sharma, V., Kohli, A., Manhas, S., Sharma, D., Pareek, N.K., Arora, S. and Singh, A.K., 29-31 October, 2021, p. 195.

113. Oyem Taki, Thakuria D., Rai M., Hazarika S (2021) Phosphorus uptake efficiency of rice genotypes with or without QTL Pup1 loci in response to fertilization regimes under low P acid soil. In: National Seminar on Developments in Soil Science: 2021. Indian Society of Soil Science 85th Annual Convention November 16-19, 2021 Visva-Bharati (Central University), Sriniketan, West Bengal.

114. Narang Ampi, Thakuria D., Das A., Hazarika S. (2021) Soil quality under ecologically intensified Apatani rice-fish farming on hilly terraces of Eastern Indian Himalayas. n: National Seminar on Developments in Soil Science: 2021. Indian Society of Soil Science 85th Annual Convention November 16-19, 2021 Visva-Bharati (Central University), Sriniketan, West Bengal.

115. Das A., Thakuria D. and Narang Ampi (2021) Soil biological pools and quality under ecologically

intensified Apatani rice-fish farming on hilly terraces of Eastern Indian Himalayas. n: National Seminar on Developments in Soil Science: 2021. Indian Society of Soil Science 85th Annual Convention November 16-19, 2021 Visva-Bharati (Central University), Sriniketan, West Bengal.

116. Devi Y.B., Thakuria D. and Meetei T.T. (2021) Isolation and screening of phosphate solubilizing bacteria from acid soisl of different rice fields of North East India. n: National Seminar on Developments in Soil Science: 2021. Indian Society of Soil Science 85th Annual Convention November 16-19, 2021 Visva-Bharati (Central University), Sriniketan, West Bengal.

117. Narang Ampi, Thakuria D. and Das A. (2022) Soil quality under ecologically intensified Apatani rice-fish farming on hilly terraces of Eastern Indian Himalayas. Accepted abstract in the International Symposium on Climate-Resilient Agri-Environmnetal Systems. ISCRAES 2022 during August 28-31, 2022, Dublin, Ireland

118. Ankan De, Jagan Mohanarao Gali, Mohammad Ayub Ali, Tapan Kumar Dutta, Parthasarathi Behera. (2021). Comparative analysis of species-independent serum pre-fractionation strategies revealed cost-effective methods to reduce proteome complexity. 5th Annual convention of Society of Veterinary Biochemists and Biotechnologists of India held on 24th-25th March, 2021. Pp-73.

119. Akter F, Roychoudhury P, Dutta T K, Subudhi PK, Gali JM, Behera P, Singh Y D. Expression of major immunogenic GlycoproteinGP5 of Betaarterivirus SUID 2(PRRSV2) in prokaryotic system and detection by SDS-PAGE and Western Blotting. (2021). First conference of world society of virology on "Tackling global viral epidemics Conference 2021" held from 16-18 June.

120. R. Buragohain (2021). Phyto-nutritional and medicinal values of tree leaves and potentiality as alternative roughages for dairy animals in Mizoram, India. 3rd international conference on 'Global initiative in agricultural, forestry and applied sciences for food security, environmental safety and sustainable development' organised by Agricultural and Environmental Technology Development Society (AETDS), Uttarakhand, India and held at Shri Guru Ram Rai University, Dehradun, Uttarakhand, India on 17-18 Oct., 2021.

121. Dipika Sarmah, Tapas Mandal and Nirmal Mandal (2022) An efficient plant regeneration and genetic fidelity assessment of in vitro derived plants of Phalaenopsis. National Symposium on ornamental and edible Horticulture, page: 47, 21st -22nd February, 2022, organized by department of floriculture and landscaping, faculty of Horticulture, Bidhan Chandra Krishi Viswavidylaya, West Bengal.

122. Ch. Chanbisana and A.K. Banik (2021). Studying the Effectiveness of Post Harvest chemical Treatments on Storability of Broccoli var. Aishwarya in Room Condition. International Conference on Global Approaches inNatural Resource Management for Climate Smart Agriculture During Pandemic Era of COVID-19. Page 62, 26-28th Feb., Meerut.

123. Ch. Chanbisana and Lalrinfeli. (2021).Advances in Edible cCoatings and Film for Fresh Fruits and vegetables. International Conference on New Paradigms for Agriculture, Food and Sustainability Concerns. Page44. 26-28th Feb., Raichur.

124. Ch. Chanbisana, Lalrinsangpui and Esther Lalruatsangi. (2021). Valorisation of processed products of Citrus macroptera for doubling income of tribal community of Mizoram. International e-Conference on Post Harvest Disease Management and Value Addition of Horticultural Crops. Page.186. 18th-20th Aug., 2021, New Delhi

125. Ch. Chanbisana. (2021). Value Addition of Citrus Waste from Processing Industries in NEH region. International Conference on Emerging Technologies in Food Processing. Page-43.25-26th March, 2021, West Bengal

126. Ch. Chanbisana.(2021). Scope of Value Addition of Bamboo Shoot : An Important Forest Produce for Doubling Income of Tribal Community of Mizoram. National Seminar on Agribusiness Potential of North Eastern region with Special Reference to Tripura. Page 1-6, 8-9th Sept., 2021, Tripura

127. Chingtham Chanbisana, Lalrinsangpuii and Esther Lalruatsangi, 2021. Valorisation of processed products of Citrus macroptera for doubling income of tribal community of Mizoram. International e-conference on Psotharvest disease management and value addition of horticultural crops. 186 pp. 18-20 th August, 2021. ICAR-IARI, New Delhi

128. Esther Lalruatsangi, T.K Hazarika and M. Vabeiryureilai. 2021. Physical and biochemical studies of Citrus macroptera Mont.- an endangered Citrus species from Mizoram, India. National Online Training Programme on 'Conservation, Management and Utilization of Horticultural Genetic Resources for Livelihood and nutritional security'. 110 pp. 22-26 th November, 2021. ICAR-IIHR, Bengaluru, Karnataka.

129. Indira Sarangthem, L. Devarishi Sharma and S M Haldhar. (2021). Organic source as a technological

option for soil carbon sequestration. International Web Conference on Global Initiatives for Sustainable Agriculture and Allied Sciences, 13-15 December 2021 organised by Astha Foundation, Meerut U.P. India. Pg. 19-20.

130. Chand, G. (2021). Integrated disease management on spices. In: Regional Seminar on Boosting farmer's income through Spice cultivation in Arunachal Pradesh, from 22-23 March, 2021 held at CHF, Pasighat.

131. Chand, G., R. C. Shakywar and Kumar, P. (2021). Prevalence of Fruit Decays on Khasi Mandarin in Siang Region of Arunachal Pradesh. In: National e- Conference on Plant Health and food security: Challenges and opportunities, from 25-27 March, 2021 held at IARI, New Delhi.

132. Amit A. Shahane, Ramkrishna G.I. and Umakanta Behera (2021) Modulating input portfolio and resource management practices for organic cotton system in North East hilly region of India- an overview of potential, constraints and prospects. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, India

133. Amit A. Shahane and Umakant Behera (2021) Response of pea to sub-optimal, optimal and over fertilization through Pongamia (*Pongamiaglabra*) and poultry manure in acid soils of Meghalaya. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, India

134. M. Premi Devi and U.K. Behera, 2021, Self-sustainable, eco-conscious and low-cost strawberry farming model using local resources for marginal farmers in mid-hills of Ri-Bhoi district, Meghalaya. The 9th Indian Horticulture Congress - 2021 on Horticultural for Health, Livelihoods and Economy, November 18-21, 2021, at CSAUAT, Kanpur, U.P. Pg.180.

135. M. Premi Devi and U.K. Behera, 2021, utilising local resources for self-sustainable strawberry (*Fragaria x ananassa*) farming for marginal farmers in the mid-hills of Meghalaya. International Conference "Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, at COA, CAU-I, Kyrdemkulai

136. M. Premi Devi, U.K. Behera, G. Bhuvana Priya and L.S. Singh. 2021, Application of local organic formulations in orchid cultivation for a self-sustaining rural bio-entrepreneurship in Meghalaya. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, at COA, CAU-I, Kyrdemkulai

137. Priya, G.B., Devi, M.P., Behera, U.K. 2021. Doubling the farmers income by accelerating transfer of technology through Farm Development Card. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario. pp 229. 07-09, College of Agriculture, CAU-I, Kyrdemkulai.

138. Priyadarshani P Mohapatra and U K Behera. 2021. Evaluation of brinjal varieties for Meghalaya Situations, 1st International Conference "Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario" 7-9 December 2021

139. Sabyasachi Majumdar, Samborlang, K. Wanning and U. K. Behera., Effect of lime and poultry manure on growth and yield of upland paddy (Oryza Sativa L.) in acid soils under hill ecology of Meghalaya. Proceedings of 5th International Agronomy Congress, 23-27 November, 2021, India, pp. 1233-1234.

140. Sabyasachi Majumdar, Samborlang, K. Wanning and U. K. Behera., Influence of liming for enhancing upland rice productivity in acid soils of Meghalaya. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, India, pp. 31-33.

141. Samborlang, K. Wanning, Sabyasachi Majumdar and U. K. Behera., Evaluation of rice cultivar in acid soils under rainfed upland condition of Meghalaya. Proceedings of 5th International Agronomy Congress, 23-27 November, 2021, pp. 1223-1224.

142. Samborlang, K. Wanning, Sabyasachi Majumdar and U. K. Behera., Performance of upland rice cultivars in acid soils under hill ecology of Meghalaya. International Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, India, pp. 339-341.

143. U.K. Behera, M. Premi Devi, H. G. Kencharaddi, Sabyasachi Majumdar, R. Padamini and Bhuvana Priya., 2021, Natural farming systems model can be an economically viable option for livelihood security of farmers in north eastern hill region. International

Conference on Integrated Agriculture, Natural Farming, Biodiversity Conservation and Rural Bio-Entrepreneurship under Changing Climate Scenario, December 7-9, 2021, at COA, CAU-I, Kyrdemkulai, pp. 43-45.

144. Chutia T., John R., Devi N.B., Kuotsu N., Laltlankimi., Ozukum S., Kuotsu K., Das G., Veerapandian C. and Jayathangaraj M.G, December 2021, Cesarean Section for management of dystocia in a sow., International Symposium on "Novel Knowledge, innovative Practices and Research in Theriogenology"., December 27th to 29th , 2021

145. Chutia T., John R., Kuotsu K., Das C.. Verapandian C. and Jayathangaraj M.G. December 2021, Successful management of paraphimosis in a young bull., International Symposium on "Novel Knowledge, Innovative Practices and Research in Theriogenology"., December 27th to 29th , 2021.

146. N. Suraj Singh, Gunjan Das, Chamniugongliu Gonmei (2021). Canine atopic dermatitis (CAD) a problem in Aizawl, Mizoram at XVII Annual Conference of Indian Association of Veterinary Public Health Specialists (IAVPHS) on *"One Health Concept: Opportunities and Perspectives in Present Scenario"* held at Centre for One Health Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab, India, during 28th to 29th May' 2021**.**

147. Ralte L and Sangwan A.K. 2021. Morphological characterization of maggots causing traumatic myiasis In pigs from Nagaland .30th National Congress of Veterinary Parasitology. Pg. 218. 14th – 16th December 2021.

148. Sangwan A.K., Ralte L., Kuotsu N. Epao V. 2021. Canine ocular thelaziosis from North East India. 30th National Congress of Veterinary Parasitology. Pg. 49. 14th – 16th December 2021.

8.4. Popular Articles

1. Anal Mariam Ps. (2021).To fight Covid-19 grows oxygen enriching beautiful plants at home. The Sangai Express 15th May, 2021 pp 4. (E-paper published)

   https://www.thesangaiexpress.com/Encyc/2021/5/15/Dr-Ps-Mariam-AnalIn-the-world-nine-out-of-ten-people-breathe-unhealthy-air-Air-pollution-is-now.html

2. Kripa Shankar, S. R. Singh, B.N..Hazarika, L. Wangchu and Barun Singh (2021). Cultivated passiflora species in north east region of India. Indian Horticulture, Sept-oct (issue): 50-51.

3. L. Hemanta and S. R. Singh (2021). Sustainable flower production using effective microorganism (EM) and Jeevamrutha. Agri-India Today Publication. Vol 1 (Issue 1) January: 118-121.

4. L. Hemanta, M. P. Devi, A. Sarkar, C. S. Maiti, P. Alila and S. R. Singh (2021). Growing citrus as a bonsai. (Author by). Agri-India Today Publication. Vol 1 (Issue IV) April: 41-43.

5. R.K.Dilip Singh, S. Romen Singh and M. Chanchan (2021). Scope and importance of indigenous underutilized fruit crops in Manipur, North East India. Agri-India Today Publication. Vol 1 (Issue 12): 10-14.

6. S. R. Singh, L. Hemanta and Y. somi Singh (2021). Rambutan (*Adi* litchi/ Jungle litchi) -An underexploited fruit crop in Arunachal Pradesh. Agri-India Today Publication. Vol 1 (Issue V) May: 21-23.

7. S. R. Singh, N. Devachandra, P.K Nimbolkar, Barun Singh and L. Wangchu (2021). Rodent and fungus infestation on low cost hydroponic seed germination technique for citrus cv. Rangpur Lime (*Citrus limonia*). Agri-India Today Publication. Vol 1 (Issue IV) April: 47-49.

8. S. R. Singh, Ng.Piloo, Pushparani Senjam and L. Hemanta (2021).Need of awareness programme to control Loranthus weed – *A factor for declining Khasi Mandarin in Arunachal Pradesh, North East India*. Agri-India Today Publication. Vol 1 (Issue 2) February: 10-13.

9. S. Romen Singh, A.K. Phurailatpam and Bidyarani Devi Senjam (2021). Scope of karonda (Christ's thorn), a semi wild fruit crop in North East India. Agri-India Today Publication. Vol 1 (Issue 7) August 2021: 19-21.

10. S.R.Singh, S. Indira Devi, Bidyarani Senjam and L. Hemanta (2021). Burmese grape-an important aesthetic value underutilized fruit crop in Arunachal Pradesh, North East India. Agri-India Today Publication. Vol 1 (Issue 1) January: 43-45.

11. Mishra, LK, (2021), Nutraceutical properties of vegetables in fighting human diseases: a special reference to cancer and liver diseases, Journal of Plant Science Research, 28(2), 61-64.

12. Mishra, LK, (2021), Improved nutrition – A tool for resilience in COVID – 19 pandemic, The Sangai Express

13. Ajay kumara K. M., Denisha Rajkhowa, Shantibala, T., Shakywar, R. C., Surmina Devi, N.Raja P. , Mukesh Sehgal, Meenakshi Malik and Subhash Chander

2021. Demonstration of Bio-Intensive Integrated Pest Management (BIPM) in Mustard at East Siang, Arunachal Pradesh. Integrated Pest Management: Opportunities and Challenges, ICAR-National Research Centre for Integrated Pest Management, New Delhi (NCIPM), pp 70-74 .

14. Ajaykumara K M., Denisha Rajkhowa, T. Shantibala, Premaradhya N. and Meenakshi Malik, 2021. Application of Insect Traps for Pest Management in Agriculture. NESA, May.
15. Mayank Kumar and Ajaykumara K M, 2022. Importance of Pesticide Dose in Pest Management. Indian Entomologist, 3(1), 51-52.
16. N Surmina Devi, P. Raja, R.C.Shakywar and Nangsol D.B (2021). Recent Approaches of Disease Management Practices of Nutritionally Approved Plant. In Nutrition Garden for Healthy Family. (B. N. Hazarika Nangsol D. Bhutia Pranabjyoti Sarma L. Geetarani Devi). CHF, CAU, Pasighat. PP-148-152: ISBN: 978-81-947589-6-9
17. Pushpendra Kumar, Shruti Sethi and Swarajya Laxmi Nayak (2021). Enzymatic browning and its control in fresh-cut apple. Indian Horticulture. 66, 1.
18. Rupali Das, Naresh Kumar Mehta and Subal Kumar Ghos, 2021 (Feb). An overview of dry fish production and marketing strategy of North East India. Aqua international, pp-34-36.
19. Ghosh, A. (2021). "Artificial Motivation: An Illusion". Compendium of 15-day long Motivational Talk Series, organized by Directorate of Instruction, CAU (Imphal).
20. Ramnuj Chakraborty, Pradyut Biswas, Anil Datt Upadhyay and Satbhishisa Sarkar (2021) Vibrant Fishery Sector in NEH against Covid-19 Lockdown. Souvenir, CAU Regional Agri Fair 2020-21. Pp 48-51.
21. Mahesh B. Tengli, Pampi Paul, P. S. Sivakumar and Muttanna (2022). Farm Business School: Transforming Smallholder Farmer Into AFarmerentrepreneur.*AGRIALLIS,*4(1):1-6.
22. Narmada Hidangmayum. 2021. Youth and Agripreneurship in North East Region of India, *Imphal Times, Volume 7(763)page 2.*
23. Shakywar RC, Tomar KS and Pathak M. 2022. Black tip (Koeli) of mango and its management. The Sangai Express. pp. 04.
24. Dhivya, R.S., Ray, L.I.P. and Jolyne, M. 2019. Performance of Black gram (Vigna mung L. Hepper) with organic amendments. Published by: Director of Research, CAU Research News Letter 8(2), July-December 2019, pp 32-33. (ISSN No. 2319-3042)
25. Sanjay-Swami (2021). Bamboo drip irrigation: Coupling tradition and innovation for wider applicability. In: Soil and Water Conservation Today, 16 (4): 06-07. ISSN: 0975-4059.
26. Sanjay-Swami (2021). Ridge-to-valley treatment of hilly terrains for efficient soil and water conservation. In: Soil and Water Conservation Today, 16 (3): 04-06. ISSN: 0975-4059.
27. Sanjay-Swami, Deka, T., Yumnam, V. and Patgiri, P. (2021). Black turmeric (Curcuma caesiaRoxb.): An endangered high value medicinal plant. In: Just Agriculture: e-Magazine, 02 (2): 12-15. ISSN: 2582-8223.
28. Sanjay-Swami (2021). Leaf colour chart for synchronizing nitrogen supply with actual crop demand in paddy. In: Just Agriculture: Multidisciplinary e-Newsletter, 01 (12): 01-06. e-ISSN: 2582-8223.
29. Sanjay-Swami (2021). Vermiremediation of soil pollutants: An innovative approach for Converting 'Wasteland' into 'Wonderland'. In: Soil and Water Conservation Today, 16 (2): 06-07. ISSN: 0975-4059.
30. Sanjay-Swami (2021). A strategy for the integrated management of land, water and living resources in NEH region. In: Soil and Water Conservation Today, 16 (1): 02-03. ISSN: 0975-4059.
31. Sanjay-Swami (2021). Vermiremediation Technology for Converting 'Wasteland' into 'Wonderland'. In: Just Agriculture: Multidisciplinary e-Newsletter, 01 (9): 01-04. e-ISSN: 2582-8223.
32. Sanjay-Swami (2021). Bamboo drip irrigation: Traditional way of irrigating crops in Meghalaya. In: Just Agriculture: e-Magazine, 01 (8): 18-21.
33. Sanjay-Swami (2021). Pecan Nut: A Unique Nutritious Nut of Poonch. In: Just Agriculture: Multidisciplinary e-Newsletter, 01 (8): 01-04. e-ISSN: 2582-8223.
34. Sanjay-Swami (2021). How to identify Aluminium (Al) toxicity in acid soils. In: Agrospheres, 02 (3): 03-05. ISSN (E): 2582-7022.
35. Dr. Lallawmzuali Ralte, Dr. Lalnuntluangi Hmar and Dr. Lalhumliana Tochhawng (2021) World Food Day Pualin aw. *The Aizawl Post.* Vol XX. No.241page 5
36. Dr. Joy Lalmuanpuia. (2021). World Rabies day: "Rabies: Facts, not Fear"". *Newslink*; September 28; Page No: 02
37. Dr. Joy Lalmuanpuia. (2021). World Egg day "Eggs for all: Nature perfect package". *Newslink*; October 08; Page No: 02

38. Abhishek Paul, Santu Mondal and Ekramul Hoque. July,2021. Micro-livestoc for livelihoods-A new outlook for the North Eastern Hilly states of India. *INDIAN FARMING* .71(07)

39. P. C. Kalita (2021). A Case Study of Papillomatosis in a Bull. The NE Veterinarians Vol (XX), No-1: April, 2020 to March, 2021

40. Dipika Sarmah (2021). Boost your oxygen level at home by growing indoor plants. Sikkim Express, 1st August, pp. 05.

41. Diganggana Talukdar (2021). Chirkey and Foorkey: The dangerous viral diseases of Large cardamom in Sikkim. Sikkim Express, 25th July, pp.05.

42. Dipika Sarmah and P. P. Dabral (2021). Rare and Endangered Sikkim Himalayan Rhododendron species, *Agriculture Letters* 2(9): ISSN: 2582-6522.

43. Dipika Sarmah, Kankana Deka, Gayatri Khangjrakpam, M. Premi Devi and L.K. Lily Devi (2022). Floriculture in North Eastern Region. Souvenir, Regional Agri Fair, Assam Agricultural University, pp-34-42.

44. B.Vanlalneihi (27th September, 2021). Branding chilli?: Perspective and prospects from the North East . *NewsLink*, No.210, Vol.XXIII

45. B.Vanlalneihi Pumpkin disease outbreak- Mizoram Scenerio (2021). *Huan Enkawltu* Vol-XXXI Issue No.2, Department of Horticulture, Govt. of Mizoram

46. Ch. Chanbisana, Esther Lalruatsangi, Lalrinsangpui and R. Lalrinfeli. (2022). A Survey on the Uses and Future Scope of *Citrus macroptera* in the North East States of India. *Agriculture Letters*. In Press.

47. Ch. Chanbisana, Lalrinsangpui and Esther Lalruatsangi. (2021). Aonla Candy Preparation from Local variety Available in Thenzawl, Mizoram. *Agriculture Letters*, 2 (10): 26-28

48. L.Geetarani Devi, Baiarbor Nongbri and Singyala Chiphang (2022). " Private Partnership and Agriculture" *Agricultural Marketing in India Reforms for a Liberal and Competitive System*

49. Dipika Sarmah, K. Deka, G. Khangjarakpam, **M. Premi Devi** and K. Lily Devi 2022. *Floriculture in North-Eastern Region.* Souvenir, Regional Agriculture Fair, 2022, AAU, Jorhat, pg 34-42

50. Extension bulletin on Vertical Farming CAU/CoA(K)/EB 04

51. G. BhuvanaPriya, M. Angappan and A. Arun Prince Milton. 2021. Biosecurity threats and management strategies in poultry production. *Poultry vision Magazine,* 01:15-17

52. Integrated farming systems model Indian Farming (Nov-Dec 2021)

53. M Premi Devi, SabyasachiMajumdar and U. K. Behera, 2021. High Oxygen Emitting Indoor Plants. *COA-K News Bulletin*, 4(1):14-16.

54. SabyasachiMajumdar, Samborlang, K. Wanning and Pritam Chakraborty, 2021. A retrospective on the status of ginger cultivation in North-Eastern India. *Agriculture and Food E-Newsletter*, 3(1): 315-317.

55. Das, G and Mili B. Role played by veterinarians during Corona Virus pandemic. *Nagaland Post,* Vol. XXXI No. 331, Page No. 6 (4th Nov 2021).

56. Devi G. and Devi. K.M. Rabies: A fatal disease of dogs and human. Nagaland Post" (28th Sep., 2021)

57. Dr. Neithono Kuotsu and Dr. Raghubir Singh.2021. Measly pork: Consumption and health effects. Morung Express.

58. Dr. Neithono Kuotsu, Dr. Raghubir Singh and Dr. Shyamananda Mukherjee.2021. Zoonotic Parasitic Diseases in Northeast: A Public Health Concern. Pashudhan Praharee.

59. Gunjan Das and Sashitola Ozukum. (2021). Milk fever and its economic impact. *ePashupalan,* (https://epashupalan.com/11239/animal-disease/milk-fever-and-its-economic-impact/).

60. Mili B and Das G. Impact of climate change on livestock production. *Nagaland Post,*Vol. XXXII No. 19, Page No. 6 (20th Dec 2021).

61. Mili B and Das G. Strategies for augmenting livestock production. Nagaland Post,Vol. XXXI No. 332, Page No. 6 (5th Nov 2021).

62. Mili, B and *Boro* P. 2022. Genetic resources of pigs in India. pashudhan praharee https://www.pashudhanpraharee.com/genetic-resources-of-pigs-in-india

63. Samares Kumar Das. 2021. A father remembered. The Statesman, 30 June: 6.

64. Samares Kumar Das. 2021. A village remembered. Science, 7 August: eLetters.

65. Samares Kumar Das. 2021. Akhon r Takon (Now and then). Anandabazar Patrika, 9 September: 4.

66. Samares Kumar Das. 2021. Helping people help themselves escape poverty. Science, 29 July: eLetters.

67. Samares Kumar Das. 2021. Neither temple nor toilet, the developing world needs opportunity. Science, 2 August: eLetters.

68. Samares Kumar Das. 2021. Panchayat Byabastha (Panchayati Raj System). Anandabazar Patrika, 2

November: 4.

69. Samares Kumar Das. 2021. Plan for social development. The Statesman, 30 August: 6.
70. Samares Kumar Das. 2021. The diffusion of microfinance: On the utility of "diffusion model". Science, 13 August: eLetters.
71. Samares Kumar Das. 2021. Thought for people. The Statesman, 17 June: 6.
72. Samares Kumar Das. 2021. Whither India's new Education Policy? Science, 20 July: eLetters.
73. Samares Kumar Das. 2022. Animal rights and welfare. The Statesman, 23 February: 6.
74. Samares Kumar Das. 2022. Man is not the Supreme Being. The Statesman, 27 February: 6.
75. Samares Kumar Das. 2022. Two great losses. The Statesman, 20 January: 6.
76. Singh W. R and Rungsung S., "Vigilance on Adverse Drug Reactions (ARDs)", *Nagaland Post,* Vol. XXXII No. 66, Page No. 6 (Feb. 2022)
77. Pineapple harvester in Farmer's Handbook on Food Processing Technologies
78. Punyakishore Maibam. 2021. Health benefits and value addition of *Rhus chinensis* (Heimang). College of Food Technology.(Page no.14-17)

8.5. Books Published

1. Ak. Bijaya Devi, Ng.Piloo and S.Sunitha (2021). Cultivation Practices of Tuber Crops (In English & Manipuri).Published by AICRP on Tuber Crops, CAU, Imphal Centre.
2. Ak.Bijaya Devi, Ng.Piloo and K.James Singh (2021). Tuber Crops and their prospects in North Eastern States. Published by AICRP on Tuber Crops, CAU, Imphal Centre. (sponsored by ICAR-CTCRI, Thiruvananthapuram, Kerala)
3. K. P. Chaudhary J.K. Chaudhary, L. Hmar, Ranjit Sharma and Daya Ram. 2021-22. Entrepreneurship in Livestock and Fisheries. Published By: Brillion Publishing 22 B/5 Groud Floor, Desh Bandhu Gupta Road, Karol Bagh New Delhi-110005
4. Seveda MS, Digambar NP and Kharpude SN (2021). Book on Advances in Renewable Energy Engineering, Narendra Publishing House, Delhi, ISBN: 978-93-91063-93-1, Pages: 396.
5. Seveda MS, Narale P D and Kharpude SN (2021). Bienergy Engineering, CRC Press, Taylor & Francis Group, England, UK.
6. Ch. Madhusudan Rao, KC Patra, D Jhajharia, S Kumari (Editors). 2021. Advanced Modelling and Innovations in Water Resources Engineering. Published by Springer, the Netherlands, pp. 1-792. ISBN 978-981-16-4628-7; https://doi.org/10.1007/978-981-16-4629-4;
7. Anumala Vivek; Phurailatpam Arunkumar and Sarma Pranabjyoti (2021). Fruits and Vegetables as Nutraceutical (Nature's Medicine) (ISBN: 978-93-90611-18-8)
8. Dr. Ch. Victoria Devi, Dr. A.S. Mailappa, Prof. B.N.Hazarika, Dr.P. Raja, Dr. N. Surmina Devi and Dr. Punabati Heisnam. (2021). Shifting values and new innovations in urban agriculture during the covid-19 crisis. College of Horticulture and Forestry, Central Agricultural University, Pasighat, Arunachal Pradesh.
9. Dr. Punabati Heisnam, Dr. Y. Disco Singh, Prof. B.N.Hazarika, Dr. A.S. Mailappa and M. Bishwapati Devi. (2021). Agri-Horti Entrepreneurship for Socio-Economic Development. College of Horticulture and Forestry, Central Agricultural University, Pasighat, Arunachal Pradesh.
10. Dr. Y. Disco Singh, Dr. Punabati Heisnam, Prof. B.N.Hazarika and Dr. A.S. Mailappa. (2021). Agripreneurship Development and Practices. College of Horticulture and Forestry, Central Agricultural University, Pasighat, Arunachal Pradesh.
11. Dr.A.S.Mailappa (2021). Soil Fertility and Plant Nutrition Manual. Brillion Publishing, New Delhi.
12. Dr.A.S.Mailappa and B.N.Hazarika. (2021). Agri Start-Ups And Agribusiness: Innovation for Fostering The Future of Agriculture. Brillion Publishing, New Delhi.
13. Hazarika, B.N.; Bhutia, Nangsol D; Sarma Pranabjyoti and Devi, Geetarani L. (2021). Nutrition Garden for Healthy Family (ISBN: 978-81-947589-6-9)
14. S.M.Hussain, B.N.Hazarika and Dr.A.S.Mailappa. (2021). College of Horticulture and Forestry, Central Agricultural University, Pasighat, Arunachal Pradesh.
15. Sarma, Pranabjyoti; Hazarika, B.N.; Debnath, P.; Deo Chandra; Anal Ps. Mariam; Kumar, Anil and Singh, Disco Y. (2021). Spices Production in Northeast India.(ISBN: 978-81-955225-3-8)
16. Shakywar, R.C. and Kumar Sunil (2021). Diseases of Ornamental Crops and their Management. Jaya Publishing House, Publisher and Distributors, Rohini Delhi-110089 (INDIA). ISBN No. 9789391063566. Pages 259.
17. Mandal, S. C, Pal, P., Mehta,N.K.,Upadhyay,A.D., Nayek,V., and Singh,Y.J.(2021). Souvenir cum Book of Abstracts for the National Seminar on "Agribusiness Potential in North Eastern Region with

Special Reference to Tripura held at the College of Fisheries, Agartala on 8th and 9th September 2021. pp-1-152.

18. Muttanna, Mahesh B. Tengli, Pampi Paul and Mahantesh Shirur (2021). Comprehensive Question Bank on Agricultural Extension Education. New Delhi, AkiNik Publishers, https://doi.org/10.22271/ed.book.1409
19. Pandey, P. K., & Parhi, J. (2021). Advances in Fisheries Biotechnology. Published by Springer, Singapore DOI https://doi.org/10.1007/978-981-16-3215-0. ISBN number 978-981-16-3214-3
20. Pandey, P. K., Upadhyay, A. D. and Choudhury, T. G. (Eds).(2021). Fisheries and Aquaculture Management. Today & Tomorrow's Printers and Publishers, New Delhi - 110 002. ISNB 13: 9788170196877. Total Page – 465.
21. Pandey, P.K., Choudhury, T.G. and Priyadarshini, M.B. (Eds).(2021). Model Question Bank 'A to Z of Fisheries (2nd Edition)'. Narendra Publishing House, Delhi (India). (ISBN: 978-93-90309-67-2), Total Page-500.
22. Pandey, P.K., .Upadhyay, A..D and Choudhury,T.G.(2021). Fisheries and Aquaculture Management" Today and Tomorrow Printers and Publishers, New Delhi. Pp. 465. ISBN 10-81-7019-687-3
23. R.K.Saha; A.D. Upadhyay; Y. Jackie Singh and P.Pal .(2021).Achievers in Fisheries: Stories of NE Region. College of Fisheries, Central Agricultural University, Lembucherra Tripura, pp 62.(ISBN:978-81-924530-8-8)
24. Saha, R.K., Upadhyay, A.D., Singh, Y.J and Pal, P.(2021). Achievers in Fisheries: Stories from NE Region. Pub.: Dean, CoF, CAU, Imphal, pp.66.
25. Upadhyay,A.D.,Roy,A.K and Pandey,P.K.(2021). Fisheries and Aquaculture Economics CRC Press Taylor and Francis Group, Oxfordshire OX14 4RN United Kingdom pp 364, ISBN 9781032005935.
26. M. Victoria Devi, Devarani L & Singh R J. (2021) Utilization of ICTs by Rural Youth of Manipur State in NE India. LAP Lambert Academic: 1-101.
27. Deepak Bhagat & Singh R. (2021)Vulnerability to food and Nutrition Insecurity under Mountain Specificities, 1st Edition. New Delhi Publishers.
28. Hemochandra L (2021) Basic Statistics, 1st Edition, Mahi Publication. ISSN: 978-93-90651-83-2
29. Patidar RK, Dutta P, Shakywar RC and Pathak M. 2021. Bee Keeping A Venture for Entrepreneurship. Biotica, pp. 108. (ISBN No. 9788194773979).
30. Sehgal Mukesh, Malik Meenakshi, Chander Subhash, Dey Utpal, Sarkar Shatabhisa, Chakraborty Ardhendu, Deka Shikha, Kakoti RK, Lalfakawma C, Vanlalhmuliana H, Rachael C, Das Pradip, Jagre Akhilesh Kumar, Shivakoti Indra Prasad, Pathak Mahesh, Kumar Adesh, Roy Nishi and Narasimhamurthy. 2021. 100 Inspiring Tribal IPM Farmers: An experience. ICAR-National Research Centre for Integrated Pest Management, New Delhi. pp.103.
31. Dutta, Pranab and Chakravorty, A (2021) Current trends in plant health management" (Eds. Dutta, P and Chakravorty, A), ISBN no. 978894773955, Published by Biotica, Tripura, India.
32. Dutta Pranab (2021) Manual on diagnosis and detection of plant diseases. Eds. Dutta, P, Publ by Biotica publishers, Tripura, ISBN: 978-81-947739-6-2.
33. Sehgal, M; Pathak, M, Malik M; Chander, S , Dutta, P and Patidar, R K (2021) Ka jingpynikumno ban ialehpyrshahia ki mradkiba nep bniatkum ki khnai, risang bad ki rabitlymba ki dur (Khasi) (Pictorial Guide for Rodent Management) ICAR-NCIPM/ tsp-neh/PIC-Guide/2021-22/4. Published by ; ICAR- National Research Centre for Integrated Pest Management. pp 1-36.
34. Patidar, RK, Dutta, P, Shakyawar, R and Pathak, M (2021) Bee keeping: A Venture foe Entrepreneurship. (Eds. Patidar et al.,) Published by Biotica in Association with Society for Biotic and Environmental research, Tripura, India, Tripura, ISBN: 9-788194-77979.pp.108.
35. Bahadur, A; Dutta, P; Awasthi, DP (2021) Diseases of fruit crops and their Integrated Management (eds. Bahadur et al.,)Published by NIPA, New Delhi, ISBN: 9789390175901, pp. 302.
36. Bahadur, A; and Dutta, P (2021) Diseases of vegetable crops and their management. (Eds. Bahadur and Dutta), Published by NIPA, New Delhi, ISBN: 9789390591091, pp360.
37. Goyal, M.R. and Ray, L.I.P. 2022. Fertigation Technologies in Micro-irrigation Requirements, Efficiency, and Crop Performance. (Series: Vol-10: Innovations and Challenges in Micro Irrigation). Academic Press, CRC press-a Taylor and Francis group. 342 pages. [ISBN No. 978-1-77188-943-8(hbk); 978-1-77463-789-0(pbk); 978-1-00308-413-6(ebk)]
38. Sanjay-Swami and Hasan, W. (2022). Advances in Climate-Smart Agriculture, Vital Biotech Publication, Kota, India. pp. 270. ISBN: 978-93-92953-19-4.

39. Sanjay-Swami (2022). Advancing Innovations in Sustainable Agriculture, Vol. I, Vital Biotech Publication, Kota, India. pp. 291. ISBN: 978-93-92953-01-9.
40. Sanjay-Swami and Singh, S. (2022). Agro-technological Options for Resource Conservation and Management, Biotech Books, New Delhi, India. pp. viii+187. ISBN: 978-81-7622-516-8.
41. Sanjay-Swami (2022). Managing Hill Resources and Diversities for Sustainable Farming, Biotech Books, New Delhi, India. pp. viii+203. ISBN: 978-81-7622-515-1.
42. Kumar, A., Singh, J., Nigam, R., Sanjay-Swami, Agarwal, Y.K. and Lal, H. (2022). Integrated Farming Systems and Sustainable Agriculture, Biotech Books, New Delhi, India. pp. ix+264. ISBN: 978-81-7622-506-3.
43. Nigam, R., Singh, J., Sanjay-Swami, Husain, M., Kumar, H. and Jatav, R. (2022). Practices and Techniques of Climate Smart Agriculture, Biotech Books, New Delhi, India. pp. viii+227. ISBN: 978-81-7622-506-9.
44. Sanjay-Swami and Singh, S. (2021). Sustainable Agriculture: Recent Advances, Biotech Books, New Delhi, India. pp. xi+350. ISBN: 978-81-7622-493-2.
45. Sanjay-Swami, Arora, S., Singh, S. and Satyanarayana, M.S.V. (2021). Covid-19 Impact on Agriculture and Precision Farming, Gene-Tech Books, New Delhi, India. pp. viii+183. ISBN: 978-81-89729-55-4.
46. Sanjay-Swami, Arora, S., Sharma, V., Kohli, A. and Singh, S. (2021). Crop Diversification and Soil Health Management for Sustainable Development, Gene-Tech Books, New Delhi, India. pp. ix+217. ISBN: 978-81-89729-56-1.
47. Sanjay-Swami, Arora, S., Kohli, A., Singh, A.K. and Borah, N. (2021). Resource Management and Biodiversity Conservation to Achieve Sustainable Development Goals, Gene-Tech Books, New Delhi, India. pp. ix+254. ISBN: 978-81-89729-54-7.
48. Hasan, W., Naz, H., Chanyal, P.C., Sanjay-Swami, and Singh, H. (2021). Climate Smart Agriculture, Biotech Books, New Delhi, India. pp. 431. ISBN: 978-81-7622-474-1.
49. Sanjay-Swami, Hasan, W., Chanyal, P.C., Singh, H. and Naz, H. (2021). Climate Change and Its Impact on Agriculture, Biotech Books, New Delhi, India. pp. 360. ISBN: 978-81-7622-473-4.
50. Hasan, W., Sanjay-Swami, Singh, H., Chanyal, P.C. and Paswan, A.K. (2021). Organic Farming, Gene-Tech Books, New Delhi, India. pp. 258. ISBN: 978-81-89729-53-0.
51. Chaudhary K.P., Chaudhary J. K., Hmar L., Sharma Ranjit, Ram Daya (2022) "Entrepreneurship in Livestock and Fisheries". [ISBN-978-93-92725-34-0, e-ISBN-978-93-92725-39-5]. Brillion Publishing, New Delhi.
52. J.B. Rajesh, Kalyan Sarma, G.E. 2020. Chethan. Animal Health Worker. J. B. Rajesh, ISBN: 978-93-5426-098-8.
53. J.B. Rajesh, Kalyan Sarma, G.E. Chethan. 2020. Handbook on domestic cat. Scholars' Press, ISBN: 978-613-8-92777-8.
54. Kalyan Sarma, J.B. Rajesh, G.E. Chethan, S.K. Behera. 2020. A practical manual on veterinary medicine. International Books and Periodicals Supply Service, ISBN: 978-93-88892-65-0.
55. V VKulkarni, P.S.Girish, S B Barbuddhe, B M Naveena, M. Muthukumar, 2021, Analytical Techniques in Meat Science (ISBN 9789390309191) Jaya Publishing House,Delhi,263 pages
56. Gunjan Das and Dr. M.G. Jayathangaraj, Clinico-Pathological Techniques for Animal Disease Diagnosis, Edn-1st, LAP PAMBERT Academic Publishing **(ISBN No. 978-620-4-74596-1**), (2022).

8.6. Book Chapter Published

1. M.Chanchan and J.K. Hori. (2022) Organic Production of Turmeric. *Advance Innovation in Sustainable Agriculture*. VOL-1 ISBN: 978-93-92953-01-9
2. Piloo, Ng. (2021). Recent Advances in Processing and Value Addition of Jackfruit. In: Recent Advances in Processing of Fruits and Vegetables, A K Pandey, Ghan Shyam Abrol, Amit Kumar Singh and Gaurav Sharma (Eds.). Published by the Dean, College of Horticulture and Forestry, Rani Lakshmi Bai Central Agricultural University, Jhansi – 284 003, P.N.95-99. (August, 2021)
3. S. R. Singh, S. Indira Devi, Pushparani Senjam, Bidyarani Devi Senjam and Y. Somi Singh (2021). Present scenario of Khasi Mandarin in Arunachal Pradesh, North East India. Mahima publication, Banarasi Hindu University, Vanarasi, U.P., India. ISBN: 978-81-943375-4-6. Page No. 276-283
4. S. R.Singh, N. Devachandra, P.k.Nimbolkar, B. Singh, L. Wangchu and B.N.Hazarika (2021). Burmese grape-aesthetic value underutilized fruit crop of Arunachal Pradesh. In-Nutrition garden for healthy family. Published by Dean, CHF, CAU, Pasighat and funded by ICAR-ATARI Zone-VII, Meghalaya.

5. Sanjit Maiti, Sanchita Garai and S M Feroze 2021 Construction of the psychometric scale using Principal Component Analysis In Sanjit Maiti Sanchita Garai Asif Mohammad K S Kadian (Ed) Psychometric Scale Construction Techniques: Basics to Advances, NDRI, Karnal

6. Y. Somi Singh, Unity Pachiang and S. R. Singh (2021). Integrated nutrient management in fruit crops. Mahima publication, Banarasi Hindu University, Vanarasi, U.P., India. ISBN: 978-81-943375-4-6. Page No. 229-237.

7. CM Rao, P Modi, D Jhajharia (2021). Water Quality Analysis at Mancherial, Jagdalpur and Konta Using Non-parametric Methods. Advanced Modelling and Innovations in Water Resources Engineering, Springer, the Netherlands, pp. 609-619.

   DOI: 10.1007/978-981-16-4629-4_42

8. GS Yurembam, D Jhajharia (2021). Socioeconomic Importance of Renewable Energy Sources and Their Impacts on the Environment. Renewable Energy and Green Technology: Principles and Practices, 175-182. CRC Press.

9. Narale P D, Kharpude SN and Seveda MS (2021). Biogas Production, Utilization and Entrepreneurship Opportunities InSeveda MS, Digambar NP and Kharpude SN. Bienergy Engineering, CRC Press, Taylor & Francis Group, England, UK

10. Seveda MS, Digambar NP and Kharpude SN (2021). Solar PV Water Pumping Technology. In book by Seveda et al. (2021) on Advances in Renewable Energy Engineering, Narendra Publishing House, Delhi, ISBN: 978-93-91063-93-1, pp: 93-110.

11. A. K. Alice, P. Sarma, N. Rinaldi, T. Yatung, N.D. Bhutia and A. Shadap. 2021. Potential Tree Spices for North-East India. Eds. P. Sarma, B.N. Hazarika, P. Debnath, C. Deo, Ps. M. Anal, A. Kumar and Y. Disco Singh, Department of Vegetable Science, College of Horticulture and Forestry, Pasighat, Arunachal Pradesh. Pp. 141. ISBN: 978-81-955225-3-8

12. A. Shadap, S.D, Warade, N.D. Bhutia, T. Yatung and A.K. Alice. 2021. Black pepper: A remunerative crop for multiple cropping. Eds. P. Sarma, B.N. Hazarika, P. Debnath, C. Deo, Ps. M. Anal, A. Kumar and Y. Disco Singh, Department of Vegetable Science, College of Horticulture and Forestry, Pasighat, Arunachal Pradesh. Pp. 31. ISBN: 978-81-955225-3-8

13. Bhargav Veluru, Kalkame Momin and Amit Baran Sharangi. 2021. Future Research Strategies: Historical Perspectives In: Aromatic Plants: The technology, human, welfare and beyond. Ed. Amit Baran Sharangi, Nova Science Publishers, New York. Pp. 357-364. ISBN: 978-1-56319-322-0

14. C. Deo, S. Semba, Ps. Mariam Anal, P. Sarma, T. Yatung, A. Shadap and N.D. Bhutia. 2021. Production Technology of Chilli. Eds. P. Sarma, B.N. Hazarika, P. Debnath, C. Deo, Ps. M. Anal, A. Kumar and Y. Disco Singh, Department of Vegetable Science, College of Horticulture and Forestry, Pasighat, Arunachal Pradesh. Pp. 42. ISBN: 978-81-955225-3-8

15. Chandrakumar Singh Mayanglambam, Amit Kumar Singh, Siddhartha Singh, TaibangnganbiChanuNgathem, ShantikumarLukram, Disco Singh Yengkhom, Mahesh kumar, and T. Angami (2021). Transgenic plant in phytoremediation: Biotechnological approach. In nano biotechnological advancements, edited by Reetikasingh et al 2021.Nova Science Publishers, Inc, New York, USA. ISBN: 978-1-53619-975-8, pp 101-126.

16. Esther, L., Mailappa, A.S., Chingtham, C. and Lalrinsangpuii. 2021. Horticultural Technologies for Startups. In *Agri Start-Ups and Agribusiness - Innovation for Fostering the Future of Agriculture* (Mailappa, A.S. and Hazarika, B.N., Eds), Brillion Publishing, New Delhi, pp. 187-194, ISBN : 978-93-92725-00-5.

17. Hazarika, B.N., Mailappa, A.S. and Geetarani Devi, L. 2021. Horticulture in the North East India-Challenges and Opportunities. In *Agri Start-Ups and Agribusiness - Innovation for Fostering the Future of Agriculture* (Mailappa, A.S. and Hazarika, B.N., Eds), Brillion Publishing, New Delhi, pp. 13-28, ISBN : 978-93-92725-00-5.

18. Helen Soibam and Ayam Victor Singh.2021. Pre-cooling Systems in Reducing Field Heat. Postharvest Management of Horticultural Crops by Surajit Mitra. pg.110-121. ISBN: 978-93-90611-11-9. *Published by:*JAYA PUBLISHING HOUSE,Delhi-110089 (INDIA)

19. Kalkame Ch. Momin and N. Surmina Devi. 2022. Conservation and sustainable utilization of threatened medicinal plants of North East India In: Medicinal Plants- Bioprospecting and Pharmacognosy. Eds. AB Sarangi and KV Peter. CRC Press, Taylor and Francis, Apple Academic Press. Pp. 255- 272 ISBN: 978-1-77463-845-3

20. Kalkame Momin, N. Surmina Devi, Shivani Dobhal, Asielavo John, Arwankie Shadap and Nancy Lego. 2021. The agro technology of some aromatic crops In: Aromatic Plants: The technology, human, welfare and beyond. Ed. Amit Baran Sharangi, Nova Science

Publishers, New York. Pp. 83-144. ISBN: 978-1-56319-322-0

21. Mailappa, A.S. 2021. Agribusiness Incubation Scheme : A game changer for securing livelihood in Agriculture and Allied Sectors. In *Agripreneurship Development and Practices* (Disco Singh, Y., Punabati Heisnam, Hazarika, B.N. and Mailappa, A.S. (Eds), College of horticulture and Forestry, CAU, Pasighat, Arunachal Pradesh, pp 93-98, ISBN:978-81-94758-98-3.
22. Mailappa, A.S. 2021. Funding Support for development of Food and Agro-based Enterprises. In *Shifting values and new innovations in urban agriculture during the covid-19 crisis* (Ch.Victoria Devi, Mailappa, A.S., Hazarika, B.N., Raja, P., Surmina Devi, N. and Punabati Heisnam, Eds), College of Horticulture and Forestry, CAU, Pasighat, Arunachal Pradesh, pp. 91 - 122, ISBN : 978-81-94758-95-2.
23. Mailappa, A.S. 2021. Major Schemes and Programmes of Government of India development of Food and Agro Based Enterprises. In *Agri Start-Ups and Agribusiness - Innovation for Fostering the Future of Agriculture* (Mailappa, A.S. and Hazarika, B.N., Eds), Brillion Publishing, New Delhi, pp. 93-108, ISBN : 978-93-92725-00-5.
24. Mailappa, A.S. 2021. Nutrient Management in Fish Rearing. In *Fish Rearing and Management* (Hussain, S.M., Hazarika, B.N. and Mailappa, A.S. (Eds), College of horticulture and Forestry and KVK , East Siang, CAU, Pasighat, Arunachal Pradesh, pp 87-90, ISBN:978-81-94758-90-7.
25. Mailappa, A.S. 2021. Promotion of Agripreneurship Development and Startup Ecosystem in North East India through RKVY-RAFTAAR Agribusiness Incubation Scheme . In *Agri Start-Ups and Agribusiness - Innovation for Fostering the Future of Agriculture* (Mailappa, A.S. and Hazarika, B.N., Eds), Brillion Publishing, New Delhi, pp. 87-92, ISBN : 978-93-92725-00-5.
26. Mailappa, A.S. 2021. Vermicomposting Technology - An Emerging Entrepreneurship Opportunity for Socio Economic Development. In *Agri-Horti Entrepreneurship for Socio-Economic Development* (Punabati Heisnam, Disco Singh, Y., Hazarika, B.N., Mailappa, A.S. and Bishwapati Devi, M. (Eds), College of horticulture and Forestry, CAU, Pasighat, Arunachal Pradesh, pp 118-124, ISBN:978-81-94758-97-6.
27. Mailappa, A.S. and Hazarika, B.N. 2021. Agriculture and Allied Sector Industries in the North East India – A bird's Eye view. In *Agri Start-Ups and Agribusiness - Innovation for Fostering the Future of Agriculture* (Mailappa, A.S. and Hazarika, B.N., Eds), Brillion Publishing, New Delhi, pp. 1-12, ISBN : 978-93-92725- 00-5.
28. N Surmina Devi, P.Raja, R.C.Shakywar and Nangsol D.B 2021. Recent Approaches of Disease Management Practices of Nutritionally Approved Plant 2021 edits in Nutrition Garden for Healthy Family B.N.Hazarika, Nangsol D. Bhutia, P.Sarma and L.Geetarani Devi. ISBN: 978-81-947589-6-9.
29. N. Surmina Devi, Pranab Dutta, P. Raja, R.C. Shakywar and Salma Begum (2021). Diseases of pineapple (*Ananas comosus* L. Mer.) and their Integrated Management. In Diseases of Fruits Crops and their Management. (Ed. Amar Bahadur, Pranab Dutta and D. P. Awasthi). New India Publishing Agency, Pitam Pura, New Delhi. Page. 207-219. International Standard Book Number: ISBN 10: 9390175909 / ISBN 13: 9789390175901
30. N. Surmina Devi, R.C. Shakywar, P. Raja and Salma Begum (2021). Diseases of potato (*Solanum tuberosum* L.) and their Integrated Management. In Diseases of Vegetable Crops and their Management. (Ed. Amar Bahadur and Pranab Dutta). New India Publishing Agency, Pitam Pura, New Delhi. Page. 01-24. International Standard Book Number-13: 978-93-90591-09-1.
31. N.D. Bhutia and A. Shadap. 2021. Cultivation of Bulb crops. Eds. B.N. Hazarika, Nangsol D.Bhutia, Pranabjyoti Sarma and L. Geetarani Devi, College of Horticulture and Forestry, Pasighat, Arunachal Pradesh. Pp. 80-85. ISBN: 978-81-947589-6-9
32. N.D. Bhutia, A. Shadap, T. Yatung, C. Deo, P. Sarma, Ps. Mariam Anal, A.K. Alice and S.D. Warade. 2021. Cultivation technology of Large Cardamom. Eds. P. Sarma, B.N. Hazarika, P. Debnath, C. Deo, Ps. M. Anal, A. Kumar and Y. Disco Singh, Department of Vegetable Science, College of Horticulture and Forestry, Pasighat, Arunachal Pradesh. Pp. 15. ISBN: 978-81-955225-3-8
33. Nancy Lego, Arwankie Shadap and Kalkame Momin. 2021. Essential Oils and the methods of extraction In: Aromatic Plants: The technology, human, welfare and beyond. Ed. Amit Baran Sharangi, Nova Science Publishers, New York. Pp. 145-168. ISBN: 978-1-56319-322-0
34. Nancy Lego, Arwankie Shadap and Kalkame Momin. 2021. Essential Oils and the methods of extraction In: Aromatic Plants: The technology, human, welfare and beyond. Ed. Amit Baran Sharangi, Nova Science

Publishers, New York. Pp. 145-168. ISBN: 978-1-56319-322-0

35. Nancy Lego, Kalkame Momin and Amit Baran Sharangi. 2021. Aromatic Plants and Aroma: Historical Perspectives In: Aromatic Plants: The technology, human, welfare and beyond. Ed. Amit Baran Sharangi, Nova Science Publishers, New York. Pp. 1-8. ISBN: 978-1-56319-322-0

36. P. K. Nimbolkar. 2022. Post-Harvest Management of Fruit Crops. 'In': Agri Start ups and Agribusiness. Authors A. S. Mailappa and B. N. Hazarika

37. Pavankumar, G., Shah, M.H., Navya, V.B., Bandyopadhyay, S.K., Punabati, H., Mailappa, A.S. and Priyanka, I. 2021. Rice-Fish farming : A system for maximising yield per unit area. In *Fish Rearing and Management* (Hussain, S.M., Hazarika, B.N. and Mailappa, A.S. (Eds), College of horticulture and Forestry and KVK , East Siang, CAU, Pasighat, Arunachal Pradesh, pp 71-81, ISBN:978-81-94758-90-7.

38. Pranabjyoti Sarma, N.D. Bhutia, B.N. Hazarika, A. Shadap and C. Deo. 2021. Vegetables: An integral component of Nutrition Garden for supplying balanced diet of family. Eds. B.N. Hazarika, Nangsol D.Bhutia, Pranabjyoti Sarma and L. Geetarani Devi, College of Horticulture and Forestry, Pasighat, Arunachal Pradesh. Pp. 10-21. ISBN: 978-81-947589-6-9

39. R. C. Shakywar, N Surmina Devi, Brij Mohan Singh and M. Pathak, (2021). Diseases of Apple (*Malus domestica*) and their Integrated Management. In Diseases of Fruits Crops and their Management. (Ed. Amar Bahadur, Pranab Dutta and D. P. Awasthi). New India Publishing Agency, Pitam Pura, New Delhi. Page. 91-117. International Standard Book Number-13: ISBN 10: 9390175909/ ISBN 13: 9789390175901

40. S. L. Chawla, Kalkame Ch. Momin, R. D. Pawar, Kiran Kumari, and Sudha Patil. 2021. Traditional Bulbous Plants In: Floriculture and Ornamental Plants, Handbooks of Crop Diversity: Conservation and Use of Plant Genetic Resources. Eds. 2021 S. K. Datta and Y. C. Gupta. Pp. 4-39. https://doi.org/10.1007/978-981-15-1554-5_11-1 ISBN no. 978-9811535192

41. S.K.Pattanaaik. (2021). Water and nutrient management in Cucumber and Red Cabbage under Poly house conditions, Book on nutrition garden for healthy family, College of Horticulture and Forestry, ISBN-978-81-947589, pp. 156-163.

42. S.R. Dhiman, Puja Sharma, Bharati Kashyap, Arshi Sultanpuri, Kalkame Ch. Momin and Pratibha Chauhan.2021. Carnation In: Flower Production and Gardening. Eds. Yadav PK and Singh RP. New India Publishing Agency, New Delhi. Pp. 193-212 ISBN: 978-93-90591-21-3

43. Shah, M.H., Mailappa, A.S., Riba, T., and Hazarika, B.N. 2021. Rice-Fish farming : A system for maximising yield per unit area. In *Fish Rearing and Management* (Hussain, S.M., Hazarika, B.N. and Mailappa, A.S. (Eds), College of horticulture and Forestry and KVK , East Siang, CAU, Pasighat, Arunachal Pradesh, pp 31-39, ISBN:978-81-94758-90-7.

44. Shah, M.H., Riba, T., Mailappa, A.S. and Neeta, L. 2021. Integrated farming system : A sustainable livelihood option for farming community of Arunachal Pradesh. In *Fish Rearing and Management* (Hussain, S.M., Hazarika, B.N. and Mailappa, A.S. (Eds), College of horticulture and Forestry and KVK , East Siang, CAU, Pasighat, Arunachal Pradesh, pp 17-24, ISBN:978-81-94758-90-7.

45. Shivani Dobhal, Kalkame Ch. Momin and B.N. Hazarika. 2021. Micro-irrigation and water quality uses in nutrition garden. In: Nutrition Garden for Healthy Family. Eds. B.N. Hazarika, Nangsol D. Bhutia, Pranabjyoti Sarma and L. Geetarani Devi, College of Horticulture and Forestry, Pasighat, Arunachal Pradesh. Pp. 113-118. ISBN: 978-81-947589-6-9

T. Yatung, K.M. Ajaykumara, A.K. Alice, N.D. Bhutia, A. Shadap and S.D. Warade. 2021. Organic package of Practices for Ginger and Turmeric. Eds. P. Sarma, B.N. Hazarika, P. Debnath, C. Deo, Ps. M. Anal, A. Kumar and Y. Disco Singh, Department of Vegetable Science, College of Horticulture and Forestry, Pasighat, Arunachal Pradesh. Pp. 78. ISBN: 978-81-955225-3-8

46. V. Bhargav, B. Parvathi, T. Yatung, Kalkame Ch. Momin and Sunil Kumar. 2021. Kniphofia In: Commercial Flowers, Vol. 2. Eds. C. Aswath, T K Bose, Reeta Bhatia, K Dutta, R Kumar and TN Saha. Daya Publishing House, New Delhi. ISBN:9789-3904-35296.

47. A. D. Upadhyay (2021) Measuring Efficiency and Performance Of Fish Farm Business Using Farm Management Techniques. Fisheries and Aquaculture Management (2021) : 421-437 Editors : P. K. Pandey, A. D. Upadhyay and T. G. Choudhury. Today & Tomorrow's Printers and Publishers, New Delhi - 110

002. Pp 421-437. (ISBN 978-81-701968-7-7)

48. A.D. Upadhyay (2021) MCQ on Fisheries Cooperatives, Financing and Marketing Management, Book chapter 8.3 In: Pandey, P.K., Choudhury, T.G.and M.B. Priyadarshini (Eds). 2021. Model Question Bank 'A to Z of Fisheries' (2nd Edition). Narendra Publishing House, Delhi (India). Pp 417-426. (ISBN: 9789390309665)
49. A.D. Upadhyay (2021) MCQ on Fisheries Economics, Book chapter 8.2 " In: Pandey, P.K., Choudhury, T.G.and M.B. Priyadarshini (Eds). 2021. Model Question Bank 'A to Z of Fisheries' (2nd Edition). Narendra Publishing House, Delhi (India). Pp 407-416. (ISBN: 9789390309665)
50. A.D. Upadhyay (2021) MCQ on Information and Communication Technology, Book chapter 8.6 In: Pandey, P.K., Choudhury, T.G.and M.B. Priyadarshini (Eds). 2021. Model Question Bank 'A to Z of Fisheries' (2nd Edition). Narendra Publishing House, Delhi (India). Pp 451-456 (ISBN: 9789390309665)
51. Choudhury T.G. 2021. Common Management Problems in Aquaculture and their Preventive Measures. In: Pandey, P. K., Upadhyay, A. D. and Choudhury, T. G. (Eds) 2021. Fisheries and Aquaculture Management. Today & Tomorrow's Printers and Publishers, New Delhi - 110 002. ISNB 13: 9788170196877. p257-266.
52. Choudhury T.G. 2021. Fish Immunology. In: Pandey, P. K. and Choudhury, T. G. (Eds). Model Question Bank 'A to Z of Fisheries' 2nd Edition. Narendra Publishing House, Delhi (India). (ISBN: 978-93-90309-67-2), pp. 200-206
53. Choudhury T.G. 2021. Fundamentals of Microbiology. In: Pandey, P. K. and Choudhury, T. G. (Eds). Model Question Bank 'A to Z of Fisheries' 2nd Edition. Narendra Publishing House, Delhi (India). (ISBN: 978-93-90309-67-2), pp. 207-220
54. Choudhury T.G. 2021. In: Pandey, P. K. and Choudhury, T. G. (Eds). Model Question Bank 'A to Z of Fisheries' 2nd Edition. Narendra Publishing House, Delhi (India). (ISBN: 978-93-90309-67-2), pp. 240-249
55. Choudhury T.G. 2021. Limnology, In: Pandey, P. K. and Choudhury, T. G. (Eds). Model Question Bank 'A to Z of Fisheries' 2nd Edition. Narendra Publishing House, Delhi (India). (ISBN: 978-93-90309-67-2), pp. 235-239
56. Choudhury T.G. 2021. Microbial and parasitic diseases of fish and shellfish. In: Pandey, P. K. and Choudhury, T. G. (Eds). Model Question Bank 'A to Z of Fisheries' 2nd Edition. Narendra Publishing House, Delhi (India). (ISBN: 978-93-90309-67-2), pp. 165-172
57. Kamilya D., Devi W.M. 2022. Bacillus probiotics and bioremediation: An aquaculture perspective. In: Islam M.T., Rahman M., Pandey P. (Eds.), Bacilli in Agrobiotechnology. Bacilli in Climate Resilient Agriculture and Bioprospecting. Springer, Cham., pp 335-347.
58. Khan, M., Raja, I. and Choudhury, T.G., 2021. Biotechnological Approaches in Fish Health Management. In Biotechnological Advances in Aquaculture Health Management (pp. 1-24). Springer, Singapore.
59. Khan, M., Raja, I. and Choudhury, T.G., 2021. Bacteriophage Therapy in Aquaculture: An Overview. Advances in Fisheries Biotechnology, pp.337-361.
60. Khatei, A., Sahoo, D., Parhi, J., Pandey, P.K. (2021). Indigenous Germplasm as Valued Genetic Resources. In: Pandey, P.K., Parhi, J. (eds) Advances in Fisheries Biotechnology. Springer, Singapore. https://doi.org/10.1007/978-981-16-3215-0_2
61. Khatei, A., Tripathy, P.S., Parhi, J. (2021). Molecular Markers in Aquaculture. In: Pandey, P.K., Parhi, J. (eds) Advances in Fisheries Biotechnology. Springer, Singapore. https://doi.org/10.1007/978-981-16-3215-0_11
62. Laltlanmawia, C. Khan, M.I.R, Choudhury, T.G.and Saha, H. 2021. Fish Diseases and Their Management. In: Debnath, D. and Yengkokpam, S. (Eds.) Fisheries and Aquaculture in NE India: R & D Trends and Opportunities. ISBN: 978-93-90309-13-9. p271-291.
63. Mehta. N. K., 2021. Fish by product and waste utilization. *In:* Model Question Bank 'A To Z Of Fisheries' (2nd Edition): Editor- Pandey P.K., Choudhury, T.G. & Priyadarshini, M.B., Narendra Publishing House, New Delhi. ISBN :9789390309672
64. Mehta. N. K., 2021. Post Harvest Management and Transportation of Fish to the Markets. In: *Fisheries and Aquaculture Management* (Pandey, P.K., Upadhyay, A.D. and Choudhury, T.G. eds.). Today & Tomorrow's Printers and Publishers, New Delhi. ISBN: 10: 81-7019-687-3. Pp 373-379.
65. Mrinal Kanti Datta and Ansuman Panda *(2021)* Ichthy of aunal diversity in Northeast India and its conservation status *In.* Fisheries and Aquaculture in NE India: R & D Trends and Opportunities, Narendra Publishing House, Delhi- 110085, PP 67-96
66. Mrinal Kanti Datta, Deisaulungbe Pame and Dipesh Debnath, (2021) Breeding and culture of *Barbonymus gonionotus, In.* Fisheries and

Aquaculture in NE India:R & D Trends and Opportunities, Narendra Publishing House, Delhi-110085 PP 195-202

67. Naresh Kumar Mehta, 2022. Transportation of fish , In: Course manual of winter school on recent advances in fish processing and fish waste management (Editor SS Mahanand) (07/01/2020 to 27/01/2020). Published by Dean, CAU-COF, Lembucherra, Pp:111-114.
68. Nath, K. and Kamilya, D. 2021. Biofloc technology: a novel Approach for sustainable aquaculture. In: Debnath, D. and Yengkokpam, S. (Eds.), Fisheries and Aquaculture in NE India: R & D trends and opportunities, Narendra Publishing House, Delhi, India, pp. 384–397.
69. Pal, P. (2021). Book Chapter on "Application of ICT in Fisheries" In: Pandey, P.K., A.D. Upadhyay and Choudhury, T.G. (Eds). 2021. Fisheries and Aquaculture Management'. Today and tomorrow's Printers and Publishers, New Delhi (India). (ISBN: 10: 81-7019-687-3)
70. Singh, S.K., Meitei, M.M., Choudhary, T.G.,Soibam, N., Biswas, P. and Waikhom, G., 2022. Bacterial diseases in cultured fishes: an update of advances in control measures. In Bacterial Fish Diseases (pp. 307-335). Academic Press. Elsevier
71. Tripathy, P.S., Khatei, A., Parhi, J. (2021). Omics in Aquaculture. In: Pandey, P.K., Parhi, J. (eds) Advances in Fisheries Biotechnology. Springer, Singapore. https://doi.org/10.1007/978-981-16-3215-0_5
72. Tripathy, P.S., Parhi, J., Mandal, S.C. (2021). Steroids and Its Receptors in Fish Reproduction. In: Sundaray, J.K., Rather, M.A., Kumar, S., Agarwal, D. (eds) Recent updates in molecular Endocrinology and Reproductive Physiology of Fish. Springer, Singapore. https://doi.org/10.1007/978-981-15-8369-8_4
73. Narmada Hidangmayum and M.C. Arunkumar. (2022). Behavioural Problem among Institutionalized Orphan Children in Manipur. In Mental Health Psycho-Social, Cognitive, Developmental and Interdisciplinary Approach, New Delhi, Global Vision Publishing House.
74. B. Nongbri, Singh R and S.M. Feroze (2021). State of Rice for food and Nutritional Security in Meghalaya, Deepak Bhagat & Singh R. Vulnerability to food and Nutrition Insecurity under Mountain Specificities, 1st Edition. New Delhi Publishers.
75. Singyala Chiphang, Ram Singh and S.M. Feroze (2021). Drivers of livelihood security for the farm households in North Eastern Hill Region of India: Application of ordered logistic regression. Deepak Bhagat & Singh R. Vulnerability to food and Nutrition Insecurity under Mountain Specificities: Unique challenges and Niche opportunities, 1st Edition. New Delhi, New Delhi Publishers.
76. L. Geetarani Devi, BaiarborNongbri and SingyalaChiphang (2022). Public Private Partnership and Agriculture. David Chella Baskar &Shalendra. Agricultural Marketing in India, Reforms for a liberal and competitive system. Hyderabad, MANAGE. Pg: 51-59.
77. Mercy Nesa Rani, P., Thangkhiew, P.L. (2022). An Overview of Different Approaches for Ternary Reversible Logic Circuits Synthesis Using Ternary Reversible Gates with Special Reference to Virtual Reality. In: Verma, J.K., Paul, S. (eds) Advances in Augmented Reality and Virtual Reality. Studies in Computational Intelligence, vol 998. Springer, Singapore. https://doi.org/10.1007/978-981-16-7220-0_6
78. Nyoni, N and Devarani, L. (2021). Addressing nutritional insecurity in north east hill region of India through Agricultural Extension and Advisory Service System In: Bhagat, D and Singh, (Eds.) Vulnerability to Food and Nutrition Insecurity under Mountain Specificities: Unique Challenges and Niche Opportunities. pp: 202-214. New Delhi Publishers.
79. Konjengbam, N. S., Mahanta, M., and Lyngdoh, A. A. (2021). Rice Cultivation-A Way of Life for the People of North Eastern Hill Region of India. In Rice. IntechOpen.
80. Mayurakshee Mahanta, S.K. Noren, Sushree Panda and Andrean Lyngdoh. (2021). Aluminium Toxicity Stress and its Mitigation for Improving Crop Production in Acidic Soils. In Sustainable Agriculture: Recent Advances. Pp 189-211. Biotech Books.
81. Nongthongbam Olivia Devi, ManashiDebbarma and R.K. Tombisana Devi. Diseases of Cabbage and their integrated management. (2021).In: Diseases of vegetable crops and their integrated management. pp:119-140.Pub: New India Publishing Agency, PitamPura, New Delhi, ISBN: 9789390591091.
82. Patidar Raghubir Kumar, Pranab Dutta, Mahesh Pathak and Lipa Deb. 2021. Diseases of Okra (*Abelmoschus esculentus* L.) and Their Integrated Management. In Diseases of Vegetable Crops and Their Integrated Management (Eds. Amar Bahadur & Pranab Dutta). pp. 101-118. (ISBN:

9789390591091).

83. Pranab Dutta, Pathak Mahesh, Sehgal Mukesh, Malik Meenakshi and Acharya Licon Kr. 2021. Validation and Promotion of IPM in Rice and Vegetables Crops in Tribal Regions of Meghalaya In (Sehgal Mukesh, Acharya Licon, Malik Meenakshi and Chander Subhash Eds.) Impact of the Tribal Sub- Plan Scheme in improving the socio-economic status the tribal farmers with special focus on integrated pest management in different Tribal regions of India. ICAR-National Research Centre for Integrated Pest Management, New Delhi. pp. 58.

84. Shakywar RC, Devi Surmina N, Singh Brij Mohan and Pathak M. 2021. Diseases of Apple (*Malus domestica*) and Their Integrated Management. In Diseases of Fruit Crops and their Integrated Management (Eds. Amar Bahadur, Pranab Dutta & D.P. Awasthi). pp. 90-117. (ISBN: 9789390175901).

85. Bahadur, A and Dutta, Pranab (2022) *Trichoderma* spp: Their impact in crops disease management, in: *Trichoderma*, Eds. Fernando Cezar Juliatti Published by Intech Open, London, DOI: 10.5772/intechopen.101846. pp 1-21.

86. Gomathy M., Sabarinathan K.G., Subramanian K.S., Ananthi K., Kalaiyarasi V. and Dutta Pranab (2021). Rhizosphere: Niche for microbial rejuvenation and biodegradation of pollutanta. In: Microbial rejuvenation in polluted environment (Vol-1) Eds. Panpatte, G.D. and Jhala, Y.K.. Publ. by Springer. Doi: 10.1007/978-981-15-7447-4_1.

87. Dutta P., Singh, N.B. and Deb L. (2021). Biological control of nursery diseases of forest crops: An eco-friendly arsenal for plant health management. In: Dutta, P. and Chakraborthy A. Current trends in plant health management. Pub. by Biotica, Pp. 174-218.

88. Gogoi, J., Dutta, P. and Deb, L. (2021). Curative potential of primary and secondary plant metabolites against coronavirus: special emphasis on severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In: Sustainable agriculture- Recent advances, Eds. Swami, Sanjay and Singh, S. Publ. by Biotech books.

89. Debbarma, M., Dutta, P. and Deb, L. (2021). Diseases of tomato (*Lycopersicon esculentum*) and their integrated management. In: Diseases of vegetable crops and their integrated management, Eds. Bahadur, Amar and Dutta, Pranab. Publ. by NIPA Press, New Delhi, India, ISBN 9789390591091. Pp. 25-48.

90. Patidar, R.K., Dutta, P., Pathak, M. and Deb, L. (2021). Diseases of okra (Abelmoschus esculentum L.) and their integrated management. In: Diseases of vegetable crops and their integrated management, Eds. Bahadur, Amar and Dutta, Pranab. Publ. by NIPA Press, New Delhi, India, ISBN 9789390591091. Pp. 101-118.

91. Deb, L., Dutta, P. and Debbarma, M. (2021). Diseases of Citrus (Citrus spp.) and their integrated management. In: Diseases of fruit crops and their integrated management, Eds. Bahadur, Amar, Dutta, Pranab and Awasthi, D.P. Publ. by NIPA Press, New Delhi, India, ISBN 9789390175901. Pp. 13-42.

92. Dutta, Pranab, Kumari, J., Deb, L. and Bahadur, A. (2021). Diseases of Phalsa fruit (Grewasubinaequalis D. C.) and their integrated management. In: Diseases of fruit crops and their integrated management, Eds. Bahadur, Amar, Dutta, Pranab and Awasthi, D.P. Publ. by NIPA Press, New Delhi, India, ISBN 9789390175901. Pp. 291-302.

93. Dutta, Pranab, Deb, Lipa and Kumari, A. (2021). Pest management in organic farming: Options and challenges. Publ. by Biotica. In: Nair, N. and Guha, A. (Eds.) Integrated pest management strategies for sustainable agriculture. New Delhi Publishers. Pp. 54-75.

94. R. Thangjam and V. Kadam. (2020). Utilization of edible insects in North-East India in Biocontrol and Utilization of Insects for North-East India, DEE, CAU, Imphal. (ISBN: 978-81-938878-3-5) pp. 233-239

95. Patidar RK, Dutta P, Kadam V, Pathak M and Tombisana RK. (2020). Mass culturing technique of entomopathogenic nematodes in Biocontrol and Utilization of Insects for North-East India, DEE, CAU, Imphal.(ISBN: 978-81-938878-3-5) pp. 233-239.

96. Pathak M, Patidar RK, Dutta P, Patil J, Kadam V, Kennedy N and Tombisana RK. (2020). Development of entrepreneurship through mass production of bio-control agents in Biocontrol and Utilization of Insects for North-East India, DEE, CAU, Imphal. (ISBN:978-81-938878-3-5) pp. 172-78.

97. Sethi, A., Sahoo, N., Panigrahi, B., Dash, B. and Ray, L.I.P. 2021. Performance of Sunflower with Different Irrigation Methods: The Coastal Plain Zone of Eastern India. (Chapter-6). Edited book Name: Fertigation Technologies in Micro Irrigation Requirements, Efficiency, and Crop Performance. Edited By: Megh R. Goyal and Lala I.P. Ray. Apple Academic Press, CRC press-a Taylor and Francis group, 336 p. (ISBN: 9781771889438) pp 249-268.

98. Sanjay-Swami (2022). Integrating biofertilizers in nutrient supply system: An option towards climate-smart agriculture. In: Advances in Climate-Smart Agriculture, (eds.) Sanjay-Swami and Hasan, W., Vital Biotech Publication, Kota, India. pp. 197-225. ISBN: 978-93-92953-19-4.

99. Singh, T.D. and Sanjay-Swami (2022). Vermiremediation of heavy metal polluted soils. In: Advancing Innovations in Sustainable Agriculture, Vol. I, (ed.) Sanjay-Swami, Vital Biotech Publication, Kota, India. pp. 44-60. ISBN: 978-93-92953-01-9.

100. Dutta, M., Hazarika, P.P., Medhi, B.K. and Sanjay-Swami (2022). Advances in improving phosphorus availability in cropping systems. In: Advancing Innovations in Sustainable Agriculture, Vol. I, (ed.) Sanjay-Swami, Vital Biotech Publication, Kota, India. pp. 30-43. ISBN: 978-93-92953-01-9.

101. Sanjay-Swami (2022). Rural bioentrepreneurship opportunities: North Eastern Regional perspective. In: Agro-technological Options for Resource Conservation and Management, (eds.) Sanjay-Swami and Singh, S., Biotech Books, New Delhi, India. pp. 161-184. ISBN: 978-81-7622-516-8.

102. Sanjay-Swami, Singh, S. and Patgiri, P. (2022). Organic farming in India: Problems and prospects. In: Managing Hill Resources and Diversities for Sustainable Farming, (ed.) Sanjay-Swami, Biotech Books, New Delhi, India. pp. 77-84. ISBN: 978-81-7622-515-1.

103. Sanjay-Swami, Singh, T.D., Singh, S. and Patgiri, P. (2021). Vermiremediation: An innovative approach for cleaning up the chemically polluted soils. In: Global Initiatives in Agricultural, Forestry and Applied Science for Food Security, Environmental Safety and Sustainable Development, Souvenir-cum-Abstract Book, Volume 1, (eds.) Hasan, W., Singh, C.P., Srivastava, A.K., Rawat, U.S., Sanjay-Swami, et al., Agricultural & Environmental Technology Development Society (AETDS), US Nagar, UK, India. pp. 10-16. ISBN: 978-93-5419-016-2.

104. Indu-Swami and Sanjay-Swami (2021). Women as the key player in environmental sustainability. In: Environment and Unsustainable Human Life, Vol. VII, (eds.) Khan, M.Z.A. and Verma, S.K., VL Media Solutions, New Delhi, India. pp. 203-221. ISBN: 978-93-91308-54-4.

105. Sanjay-Swami (2021). Vermiremediation: Earthworms assisted cleaning up of chemically polluted soils. In: Recent Advances in Agriculture, Engineering and Biotechnology for Food Security (ed.) Rao, R.K., Mahima Publications, Varanasi, India. pp. 73-76. ISBN: 978-81-953029-4-9.

106. Sanjay-Swami (2021). Biofertilizers: Source of climate resilience to soil fertility and crop productivity. In: Climate Change Management through Agro-Technological Approaches (eds.) Sharma, J.P. and Vikas, V., Jaya Publishing House, New Delhi, India. pp. 119-146. ISBN: 978-93-90309-70-2.

107. Raj, V.A., Sanjay-Swami, Patgiri, P., Singh, S. and Satya, M.S.C.C. (2021). Conservation agriculture: A new paradigm farming for 21st century. In: Sustainable Agriculture: Recent Advances, (eds.) Sanjay-Swami and Singh, S., Biotech Books, New Delhi, India. pp. 99-110. ISBN: 978-81-7622-493-2.

108. Sanjay-Swami, Singh, S., Patgiri, P., Raj, V.A. and Singh, T.D. (2021). Ecological sustainability in agricultural production intensification: NER perspective. In: Sustainable Agriculture: Recent Advances, (eds.) Sanjay-Swami and Singh, S., Biotech Books, New Delhi, India. pp. 1-20. ISBN: 978-81-7622-493-2.

109. Patgiri, P., Sanjay-Swami, Singh, S. and Raj, V.A. (2021). Precision agriculture and climate smart agriculture: Towards a superior and sustainable future of the sector. In: Covid-19 Impact on Agriculture and Precision Farming, (eds.) Sanjay-Swami, Arora, S., Singh, S. and Satyanarayana, M.S.V., Gene-Tech Books, New Delhi, India, pp. 65-82. ISBN: 978-81-89729-55-4.

110. Singh, S., Sanjay-Swami, Maurya, R. and Patgiri, P. (2021). Application of nanoscience in rhizosphere studies and smart delivery systems. In: Crop Diversification and Soil Health Management for Sustainable Development, (eds.) Sanjay-Swami, Arora, S., Sharma, V., Kohli, A. and Singh, S., Gene-Tech Books, New Delhi, India, pp. 159-168. ISBN: 978-81-89729-56-1.

111. Parihar, R.K., Kumar, S., Kumar, V. and Sanjay-Swami (2021). Factors affecting infiltration and its management strategies. In: Resource Management and Biodiversity Conservation to Achieve Sustainable Development Goals, (eds.) Sanjay-Swami, Arora, S., Kohli, A., Singh, A.K. and Borah, N., Gene-Tech Books, New Delhi, India, pp. 121-126. ISBN: 978-81-89729-54-7.

112. Lalotra, S., Hemantaranjan, A., Kumar, S., Sanjay-Swami and Dahiphale, A.V. (2021). Jasmonate and zinc: A booming tools in plant defense mechanisms. In: Resource Management and Biodiversity Conservation to Achieve Sustainable Development Goals, (eds.) Sanjay-Swami, Arora, S., Kohli, A.,

Singh, A.K. and Borah, N., Gene-Tech Books, New Delhi, India, pp. 97-102. ISBN: 978-81-89729-54-7.

113. Kumar, S., Dahiphale, A.V., Lalotra, S., Parihar, R.K., Kumar, V. and Sanjay-Swami (2021). Strategies to up-scaling fodder production for sustainable livestock production. In: Resource Management and Biodiversity Conservation to Achieve Sustainable Development Goals, (eds.) Sanjay-Swami, Arora, S., Kohli, A., Singh, A.K. and Borah, N., Gene-Tech Books, New Delhi, India, pp. 47-56. ISBN: 978-81-89729-54-7.

114. Sanjay-Swami, Singh, S., Yadav, O.S. and Gupta, R. (2021). Managing soil acidity through locally available farm resources during Covid-19 scenario. In: Reforms in Agriculture and Rural Development under Covid-19 Pandemic, (ed.) S.P. Singh, Shree Krishna Publishers, Agra, UP, India. pp. 69-80. ISBN: 978-81-946901-8-4.

115. Sanjay-Swami, Singh, S., Satya, M.S.S.C., Patgiri, P. and Raj, V.A. (2021). Combating shortage of chemical fertilizers in the Covid-19 lockdown scenario through on-farm nutrient resources. In: Reforms in Agriculture and Rural Development under Covid-19 Pandemic, (ed.) S.P. Singh, Shree Krishna Publishers, Agra, UP, India. pp. 53-61. ISBN: 978-81-946901-8-4.

116. Gupta, R., Ahmad, G., Sanjay-Swami and Khanday, A.S. (2021). Biofortification: An emerging approach to boost soil, plant and human health during Covid-19 scenario. In: Reforms in Agriculture and Rural Development under Covid-19 Pandemic, (ed.) S.P. Singh, Shree Krishna Publishers, Agra, UP, India. pp. 21-37. ISBN: 978-81-946901-8-4.

117. Gurjar, G.N., Sanjay-Swami, Singh, S., Sheshma, M.K. and Sharma, R.L. (2021). Green infrastructure: Solution against climate change. In: Climate Change and Its Impact on Agriculture, (eds.) Sanjay-Swami, Hasan, W., Chanyal, P.C., Singh, H. and Naz, H., Biotech Books, New Delhi, India. pp. 217-222. ISBN: 978-81-7622-473-4.

118. Gogoi, M., Sanjay-Swami, Devi, K.P. and Kant, K. (2021). More crop per drop: Micro-irrigation techniques for resource conservation of water. In: Climate Change and Its Impact on Agriculture, (eds.) Sanjay-Swami, Hasan, W., Chanyal, P.C., Singh, H. and Naz, H., Biotech Books, New Delhi, India. pp. 173-188. ISBN: 978-81-7622-473-4.

119. Gurjar, G.N., Sanjay-Swami, Singh, S., Sheshma, M.K. and Sharma, R.L. (2021). World-wide water calamity and food retreat under climate change. In: Climate Change and Its Impact on Agriculture, (eds.) Sanjay-Swami, Hasan, W., Chanyal, P.C., Singh, H. and Naz, H., Biotech Books, New Delhi, India. pp. 159-171. ISBN: 978-81-7622-473-4.

120. Gurjar, G.N., Sanjay-Swami, Sheshma, M.K., Sharma, R.L., Singh, S. and Barik, S. (2021). Ground water: The way out of fresh water under climate change. In: Climate Change and Its Impact on Agriculture, (eds.) Sanjay-Swami, Hasan, W., Chanyal, P.C., Singh, H. and Naz, H., Biotech Books, New Delhi, India. pp. 121-131. ISBN: 978-81-7622-473-4.

121. Gurjar, G.N., Sanjay-Swami, Singh, S., Sheshma, M.K. and Sharma, R.L. (2021). Natural resources of India: Water at a glance. In: Climate Change and Its Impact on Agriculture, (eds.) Sanjay-Swami, Hasan, W., Chanyal, P.C., Singh, H. and Naz, H., Biotech Books, New Delhi, India. pp. 105-112. ISBN: 978-81-7622-473-4.

122. Sanjay-Swami (2021). Ecosystem approach: Key for sustainable agriculture in North Eastern Region of India. In: Organic Farming, (eds.) Hasan, W., Sanjay-Swami, Singh, H., Chanyal, P.C. and Paswan, A.K., Gene-Tech Books, New Delhi, India. pp. 83-93. ISBN: 978-81-89729-53-0.

123. Yadav, O.S., Sanjay-Swami, Sowjanya, T.V. and Satya, M.S.S.C. (2021). Recent developments in biochar as an effective tool for sustainable agriculture. In: Organic Farming, (eds.) Hasan, W., Sanjay-Swami, Singh, H., Chanyal, P.C. and Paswan, A.K., Gene-Tech Books, New Delhi, India. pp. 41-57. ISBN: 978-81-89729-53-0.

124. Sanjay-Swami, Gurjar, G.N., Singh, S., Patgiri, P. and Raj, V.A. (2021). Organic farming: An eco-friendly sustainable production system. In: Organic Farming, (eds.) Hasan, W., Sanjay-Swami, Singh, H., Chanyal, P.C. and Paswan, A.K., Gene-Tech Books, New Delhi, India. pp. 01-22. ISBN: 978-81-89729-53-0.

125. Abhishek Paul and J.K. Chaudhary. 2022. Key Steps in Livestock Business Innovation and Start-up. Entrepreneurship in Livestock and Fisheries ISBN: 978-93-92725-34-0

126. Alapatt Arjun, Sharma Rohit, and Chaudhary J.K. (2021) Livestock supply chain in India: Current Scenario, prospects & challenges: Methods to improve India's milk and meat supply chains. *Entrepreneurship in Livestock and Fisheries* p-41-51 [ISBN-978-93-92725-34-0, e-ISBN-978-93-92725-39-5].

127. Chaudhary J.K., and Chaudhary K.P. (2021) "Role of Statistics in Food Security and Rural Development Perspective" Extension approaches and strategies for rural transformation. p-185-193, Biotech books

[ISBN 978-81-7622-492-5].

128. J.K. Chaudhary, Abhishek Paul, Rohit Sharma and Arjun Alapatt. 2022.Smart Livestock Farming: Potential of Digitalization.2022. Entrepreneurship in Livestock and Fisheries ISBN: 978-93-92725-34-0 e-ISBN: 978-93-92725-39-5 Pages: 332

129. M.Rout and S.K. Behera (2022). Anthrax: A Disease of Significance in Veterinary and Medical Science. In: Emerging bacterial zoonotic diseases, VITAL BIOTECH PUBLICATION, Kota, Rajasthan, India, pp. 101-110.

130. P. C. Kalita (2022). Challenges in Livestock Entrepreneurship. Entrepreneurship in Livestock and Fisheries, pages 23-30 ISBN: 978-93-92725-34-0 Brillion Publishing

131. Rahman, S. and Gupta , J. (2021). Extension Strategies for Sustainable Dairy Development. *In:* K.P. Chaudhary, Angad Prasad and Daya Ram Extension Approaches and Strategies for Rural Transformation. Biotech Books, Darya Ganj, New Delhi. (ISBN-978-81-7622-492-5). 159-164

132. Sharma Rohit, Alapatt Arjun and Chaudhary J.K. (2021) Role of Market Led Extension and Marketing Channels in Livestock Entrepreneurship. *Entrepreneurship in Livestock and Fisheries* p-31-40 [ISBN-978-93-92725-34-0, e-ISBN-978-93-92725-39-5].

133. Diganggana Talukdar and Y. Rupert Anand (2021) "An insight to Some Important Diseases of Large Cardamom in Sikkim and its Organic management Strategies", under the main book – Plant Health Management- An Insight of Conventional and Modern Approaches", ISBN No- 978-93-5473-043-6, Immortal Publications.

134. Diganggana Talukdar (2021). Diseases of Broccoli (*Brassica oleraceavar itialica*L.) and Their Integrated Management, under the book - Diseases of Vegetable Crops and Their Integrated Management by Dutta and Bahadur. ISBN: 9789390591091, New India publishing agency, New Delhi 88, India.

135. Sujata Upadhayay, Yamuna Pandey and K D Bhutia (2021). Elaeocarpus sikkimensis Mast. (Elaeocarpaceae), under the book Perenial Underutilized Horticultural species of India. Narendra publishing house, New Delhi, India

136. Sujata Upadhayay, Yamuna Pandey and K D Bhutia (2021). Spondias axillaries Roxb (Anacardiaceae), under the book Perenial Underutilized Horticultural species of India. Narendra publishing house, New Delhi, India.

137. "Spices: Good Source of Livelihood and Income in Mizoram" In: (Eds) Deepak Bhagat and Ram Singh, Vulnerability to Food and Nutrition Insecurity under Mountain Specificities: Unique Challenges and Niche Opportunities, ISBN 978-93-91012-36-6

138. "Food Security in Mizoram under Climate Change Scenario: A Social Perspective" In: (Eds) Deepak Bhagat and Ram Singh, Vulnerability to Food and Nutrition Insecurity under Mountain Specificities: Unique Challenges and Niche Opportunities, ISBN 978-93-91012-36-6

139. Abhik Patra, Hanuman Singh Jatav, Kiran Kumar Mohapatra, Arnab Kundu, Satish Kumar Singh, Vipin Kumar, Laimayum Devarishi Sharma and Mohsina Anju.(2021). Plant soil interactions in a changing world: a climate change perspective. Frontiers in Plant Soil Interaction Molecular Insights into Plant Adaptation. Elsevier Publication. Pg 1-22. Available from: https://www.researchgate.net/publication/349733815_Plant-soil_interactions_in_a_changing_world_a_climate_change_perspective [accessed Apr 09 2022].

140. Esther Lalruatsangi, A.S Mailappa, Chingtham Chanbisana and Dr. Lalrinsangpuii. "Horticultural Technologies for Startups" In: (Eds) A.S. Mailappa and B.N. Hazarika, Agri start-ups and agribusiness innovation for fostering the future of Agriculture, ISBN 978-93-92725-00-5

141. L. Devarishi Sharma, Indira Sarangthem, Rojeet Thangjam,Rahul Sadhukhan, Nivedita Oinam, Birjeet Yanglem, Laikhuram Banarjee,Hrangbung Jurist Anal, and Hanuman Singh Jatav. Sewage Sludge and Its Health Risk Assessment: Opportunities and Challenges. Springer Nature Switzerland AG 2022 Pg. 205-226. Available from: https://www.researchgate.net/publication/356556047_Sewage_Sludge_and_Its_Health_Risk_Assessment_Opportunities_and_Challenges [accessed Apr 09 2022]. https://doi.org/10.1007/978-3-030-85226-9

142. Rahul Sadhukhan, Hanuman Singh Jatav, Suman Sen, Laimayum Devarishi Sharma, Vishnu D. Rajput, Rojeet Thangjam, Anoop Kumar Devedee, Satish Kumar Singh, Andrey Gorovtsov, Sourav Choudhury, and Kiranmay Patra *(2021) Biological nitrification inhibition for sustainable crop production*. Plant Perspectives to Global Climate changes developing Climate-Resilient plants. Elsevier. Available from: https://www.researchgate.net/ publication/351934825_Biological_nitrification_inhibition_for_sustainable_crop_production [accessed Apr 09 2022].

143. Rahul Sadhukhan, L. Devarishi Sharma, Suman Sen, Snehashis Karmakar, Koushik Banerjee and Kirtiranjan Bara.(2021). Enhancing the Productivity of Field Crops through Nano-Fertilizer. Agricultural Development in Asia: Potential Use of Nano-Materials and Nano-Technology Intechopen. Pg. 1-13. DOI: http://dx.doi.org/10.5772/intechopen.101146 Available from: https://www.researchgate.net/publication/356595956_Enhancing_the_Productivity_of_Field_Crops_through_Nano-Fertilizer [accessed Apr 09 2022].

144. Ravindra Kumar Rekwar, Abhik Patra, Hanuman Singh Jatav,Satish Kumar Singh, Kiran Kumar Mohapatra, Arnab Kundu,Asik Dutta, Ankita Trivedi, Laimayum Devarishi Sharma,Mohsina Anjum, Ajin S. Anil, and Sanjib Kumar Sahoo. (2021). Ecological aspects of the soil-water-plant-atmosphere system. PLANT PERSPECTIVES TO GLOBAL CLIMATECHANGES Developing Climate-Resilient Plants. Elsevier Publication. Pg 279-298. *(1) (PDF) Ecological aspects of the soil-water- plant-atmosphere system*. Available from:=https://www.researchgate.net/publication/352057225_ Ecological_aspects_of_the_soil-water-_plant-atmosphere_system [accessed Apr 09 2022].

145. Mayanglambam Chandrakumar Singh, AthikhoKayia Alice, NaoremBidyaleimaChanu, NgathemTaibangnganbiChanu, Aatish Kumar Sahu, Amit Kumar Singh, Siddhartha Singh, Lukram Shantikumar, Yengkhom Disco Singh, Mahesh Kumar, Thejangulie Angami. (2021). Transgenic plantsin phytoremediation: A biotechnological approach. In: Reetika Singh et al. (Eds.) nano-biotechnological advancements in environmental issues applications and challenges. Nova Science Publishers, Inc. (ISBN: 978-1-53619-975-8). 101-125.

146. L. Geetarani Devi, Baiarbor Nongbri and Singyala Chiphang (2022). Private Partnership and Agriculture. Agricultural Marketing in India Reforms for a Liberal and Competitive System.National Institute of Agricultural Extension Management (MANAGE), Hydrabad (ISBN: 978-93-91668-56-3)

147. Alpana Paul, Babulal Choudhary, Sabyasachi Majumdar and Kavita Rani., (2021), Nanotechnology application in soil and crop management. In: "Crop Management under stress conditions", Jangir, C. K., Kavita Rani and Parashar, A. (eds)., Akinik Publications, New Delhi, India, pp. 221-260. ISBN: 978-93-91216-22-1. DOI: https://doi.org/10.22271/ed.book.1235

148. Arockiasamy Arun Prince Milton, Govindarajan Bhuvana Priya, Kasanchi M. Momin, Madesh Angappan, Sandeep Ghatak, and Porteen Kannan. 2021. Food-borne pathogenic anaerobes. 'In': Juan Charlos Contrerars-Esquivel, Laxmikant S. Badwaik, PorteenKannan, A.K. Haghi.Food product optimization for quality and safety control: Process, Monitoring and Standards. CRC Press, Taylor and Francis group. 31-52.

149. Arockiasamy Arun Prince Milton, Govindarajan Bhuvana Priya, Madesh Angappan, Sandeep Ghatak, and Vivek Joshi. 2021.Cross talk between bacteria and host immune system with special emphasis on foodborne pathogens. 'In': D. Dhanasekaran, Dhiraj Paul, N. Amaresan, A. Sankaranarayanan, Yogesh S. Shouche. Microbiome Host interactions. CRC Press, Taylor and Francis group. 191.

150. Arockiasamy Arun Prince Milton, Govindarajan Bhuvana Priya, Madesh Angappan, Kasanchi M. Momin, Sandeep Ghatak, and Porteen Kannan. 2021. Campylobacteriosis: Emerging Foodborne Zoonosis.'In': Juan Charlos Contrerars-Esquivel, Laxmikant S. Badwaik, PorteenKannan, A.K. Haghi. Food product optimization for quality and safety control: Process, Monitoring and Standards. CRC Press, Taylor and Francis group. 165-188

151. Pramanik K., Mohapatra P. P., Acharya L. K. and Jena C. 2021. Pests and Disease Management in Kitchen Garden: An Organic Approach. In Current Trends in Plant Health Management, edited by Pranab Dutta and Ardhendu Chakraborty, BIOTICA, Tripura, ISBN: 978-81-947739-5-5, pp. 113-124 (November 2021)

152. Dr. Lalsangpuii, Clinical Biochemistry and its interpretation for disease diagnosis, 2022, Clinico-Pathological Techniques for Animal Disease Diagnosis Pg.37-49, LAP LAMBERT Academic Publishing ISBN: 978-620-4-74596-1

153. Gunjan Das and M.G. Jayathangaraj (2022). Characterization of Enteric pathogens of veterinary importance vis-a-vis antimicrobial profiling. Rajkumari Mandakini Devi. Clinico-Pathological techniques for animal disease diagnosis. LAP LAMBERT Academic publishing

154. Mili, B., Pandita, S., Bharath Kumar B.S. and Parmer, M. (2021). Assessment of the Changes in Hormones of Somatotropic Axis during Transition Period in Murrah Buffaloes (*Bubalus bubalis)* Supplemented with Vitamin E. In: Research Aspects in Agriculture and Veterinary Science Vol. 1, 1st Edi (Eds) Rusu Teodor. BP International, India & United Kingdom. pp-20-25.

155. Ralte L. Sangwan A.K. 2022. Diagnosis of haemoparasitic diseases in livestock and pets by

blood examination. Clinico Pathological Techniques for Animal Disease Diagnosis. Jalukie, Nagaland. Lambert Academic Publishing. Pg. 24-31.

156. Ralte L. Sangwan A.K. 2022. Diagnosis of Important Parasitic Diseases in Livestock and Poultry by Faecal Examination. Clinico Pathological Techniques for Animal Disease Diagnosis. Jalukie, Nagaland. Lambert Academic Publishing. Pg. 6-16.
157. Tukheswar Chutia and N. B. Devi (2022). Vaginal cytology in bitch for determination of breeding time. In: Gunjan Das and M.G. Jayathangaraj. Clinico-pathological techniques for animal disease diagnosis. Republic of Moldova Europe, LAP Lambert Academic Publishing. ISBN: 978-620-4-74596-1
158. Sarangi P K, Ng. Joykumar and Singh T A (2019) pineapple as potential crop resources: perspective and value addition. Food bioresourses and ethnic foods of Manipur northeast India. Empyreal publishing house, India. ISBN Number is 978-81-944069-0-7, Page 83-91.
159. Sarangi P K, Ng. Joykumar and Singh T A (2019) value addition of wild edible plants (WEPs) for sustainable utilization and socioeconomic development of rural areas of Manipur, india. Food bioresourses and ethnic foods of Manipur northeast India. Empyreal publishing house, India.ISBN Number is 978-81-944069-0-7, Page 92-99.
160. Sophia, L., and Bhattacharjya, R. K. (2020). A GA Based Iterative Model for Identification of Unknown Groundwater Pollution Sources Considering Noisy Data. In: Nature-Inspired Methods for Metaheuristics Optimization (pp. 303-321). Springer, Switzerland, Cham.

8.7. Technical Bulletins / training manuals etc. Published

1. Ak.Bijaya Devi, Ng.Piloo and G.Suja (2021). U-mangragi organic production (In Manipuri). Published by AICRP on Tuber Crops, CAU, Imphal Centre
2. Ak.Bijaya Devi and Ng.Piloo (2021). U-mangragi value addition (In Manipuri).Published by AICRP on Tuber Crops, CAU, Imphal Centre
3. Ak.Bijaya Devi, Ng.Piloo and G.Suja (2021). Haa-gi organic production (In Manipuri).Published by AICRP on Tuber Crops, CAU, Imphal Centre
4. Ak.Bijaya Devi, Ng.Piloo and G.Suja (2021). Pan-gi organic production (In Manipuri).Published by AICRP on Tuber Crops, CAU, Imphal Centre
5. A.k. Bijaya Devi, S. Romen Singh, M. Chanchan and K. James Singh (2021). Manual on Horticultural Crops Volume-I. Published by Department of Horticulture, COA, CAU, Imphal.
6. Ajaykumara K. M., L. Wangchu, B. N. Hazarika T. Shantibala, Meenakshi Malik, Mukesh Sehgal and Subhash Chander, 2021. Awareness on Stem borer *Aristobia reticultor* (Voet) (Cerambycidae: Coleoptera). ICAR-NCIPM/NEH/2020-21/Technical bulletin-3.
7. Ajaykumara K. M., Toge Riba, Denisha Rajkhowa, Meenakshi Malik, Mukesh Sehgal and Subhash Chander, 2021. Integrated Pest Management of Invasive Fall Armyworm *Spodoptera frugiperda* J E Smith (Lepidoptera: Noctuidae) in Maize. ICAR-NCIPM/NEH/2020-21/Technical bulletin-1.
8. Ajaykumara K. M., Toge Riba, T. Shantibala, Meenakshi Malik, Mukesh Sehgal and Subhash Chander, 2021. Management of Paddy Hoppers in Arunachal Pradesh. ICAR-NCIPM/NEH/2020-21/ Technical bulletin-2.
9. E-Manual: Study Material: "Farm Management, Production and Resource Economics", CHF/CAU/ IDP-NAHEP/E-MANUAL2021/6, pp. 112
10. E-Manual: Study Material: "Green house types, design and construction", CHF/CAU/IDP-NAHEP/E-MANUAL2021/4, pp. 44.
11. E-Manual: Study Material: A practical manual on "Economics and Marketing", CHF/CAU/IDP-NAHEP/ E-MANUAL2021/5, pp. 101
12. E-Manal: Study Material: A practical manual on "Principles of Hydrology, soil and water conservation", CHF/CAU/IDP-NAHEP/E-MANUAL2021/3, pp. 98.
13. Kalkame Ch. Momin, Sunil Kumar, Veluru Bhargav, Arunkumar Ph., Kh. Lily Devi, Amit Kumar Singh and B.N. Hazarika.2022. Production and Propagation Techniques for quality seed and planting material of floricultural crops, CHF, CAU, Pasighat. *Extension Bulletin 03/22*
14. Teaching cum practical Manual(2022)- "Project Management", CAU, Imphal, Manipur, pp.100
15. M.K.Datta(2021)"Introduction of Three tier fish farming model om upland hiill slope of Ne India" training Manual entitled "Fish Pond design and construction of Carp Hatchery"(P 54-64),College of Fisheries, CAU, Imphal, manipur
16. Sivakumar, P.S., Tengli, M.B., Laxminarayana, K., Kesava Kumar, H., Ashok Chhetri, Naik., V.S., and Vijay Kumar (2022). Scaling-up of Nutrition-Sensitive

Horticultural Interventions to combat Hidden Hunger. Thiruvananthapuram: ICAR-Central Tuber Crops Research Institute.

17. Tengli, Mahesh & Chhetri, Ashok & Naik, Vinodakumar& Sarkar, Shatabisha&Luwangleima, Maisnam. (2021). Banana Chips Business: A Guide for Self Help Groups. College of Fisheries, Tripura. P-16. DOI-10.13140/RG.2.2.14643.14887.
18. Tengli, Mahesh & Chhetri, Ashok. (2021). Commercial Production of Dragon Fruit. College of Fisheries, Tripura. P-9. DOI- 10.13140/RG.2.2.24709.47841.
19. Sehgal Mukesh, Pathak Mahesh, Malik Meenakshi, Chander Subhash, Dutta Pranab and Patidar Raghubir Kumar. 2021. Pictorial Guide for Rodent Management (English). ICAR-National Research Institute for Integrated Pest Management, New Delhi. pp. 33.
20. Sehgal Mukesh, Pathak Mahesh, Malik Meenakshi, Chander Subhash, Dutta Pranab and Patidar Raghubir Kumar. 2021. Ka jingpynikumno ban ialehpyrshahia ki mradkiba nep bniatkum ki khnai, risang bad ki rabitlymba ki dur (Khasi) [Pictorial Guide for Rodent Management (Khasi)]. ICAR-National Research Centre for Integrated Pest Management, New Delhi. pp. 33.
21. Dutta P, Pathak M, Patidar RK, Gogoi J, Deb L, Mahanta M and Sehgal M. 2021. Pocket Book on Nutritional and Physiological Disorders of Tomato. School of Crop Protection, College of Post Graduate Studies in Agricultural Sciences, CAU, Umiam, Meghalaya. p. 12.
22. Dutta, P., Gogoi, J., Sehgal, M., Chander, S., Devi, R.K.T., Patidar, R.K., Pathak, M., Deb, L., Mahanta, M., Kumari, A., Gowda, S., Yasin, A. and Sharma, A. (2022). Protection Brief 01. Publ. by School of Crop Protection, College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal), Umiam, Meghalaya funded by ICAR-NCIPM, New Delhi.
23. Dutta, P., Pathak, M., Patidar, R.K., Sehgal, M., Mallik, M., Mahanta, M., Gogoi, J., Kumari, A., Deb, L., and Gowda, S. (2022). Sying- Ka Rukom Rep Sying Ha. Publ. by: School of Crop Protection, CPGSAS, CAU (I), Umiam, Meghalaya. Under ICAR-National Centre for Integrated Pest Management funded project, New Delhi.
24. Dutta, P., Patidar, R.K., Pathak, M., Sehgal, M., Mallik, M., Mahanta, M., Kumari, A., Deb, L., Gogoi, J. and Gowda, S. (2022). Shynrai- Ka Rukom Rep Shynrai. Publ. by: School of Crop Protection, CPGSAS, CAU (I), Umiam, Meghalaya. Under ICAR-National Centre for Integrated Pest Management funded project, New Delhi.
25. Dutta Pranab (2021). Information bulletin on liquid bioformulations of CPGSAS, and method of application. Pub. by School of Crop Protection, CPGSAS, CAU (I), Umiam, Meghalaya. Under ICAR-National Bureau of Agriculturally Insect Resources funded project.
26. Sanjay-Swami (2021). Rural bio-entrepreneurship opportunities in North Eastern Region of India. CPGS-AS Extension Bulletin No. 2020-21/07, School of Natural Resource Management, College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University, Umiam-793 103, Meghalaya.
27. Altogether, the following 23 handouts on Agronomy on Terrace Rice Cultivation and Better Jhum authored by Prof. Dwipendra Thakuria and published by UN-FAO, India Office, New Delhi under IFAD-FOCUS Project for Technology support to Farmers of Nagaland and Mizoram.
28. Jhum Crop Combination in Mizoram
29. Jhum Crop Combination in Nagaland
30. Strategies for Better Jhum
31. Nutrient Management in Jhum Fields
32. Nutrient Management in Terrace Fields
33. Seedling Root-Dip Technique for Phosphorus Management in Terrace Cultivation
34. Biofortified Enriched Composting (BEC) Technology
35. Biofertilizers
36. Non-Chemical Pest and Disease Management
37. Rice-Fish Farming
38. Soil Nutrient Management – Azolla Cultivation
39. Soil Testing
40. Cultivation Practices of Linseed
41. Cultivation Practices of Sesamum
42. Strategies for Multiple Cropping in Jhum Fields
43. Food Forest in Jhum Incorporating Local Indigenous Wild Edible Plants
44. Clover Green Manuring in Terrace Cultivation
45. Kitchen Gardening
46. Seed Preservation Methods for Farmers
47. Storage Insect Pest Management – Paddy, Maize and Tubers
48. Weed Management in Jhum
49. Nursery Management in Paddy

50. Integrated Pest Management

51. FAO (2021) Training Manual on Agronomy of Better Jhum and Terrace Rice Cultivation (TRC) under Fostering Climate Resilient Upland Farming Systems in the Northeast (FOCUS), Govt. of Nagaland. Funded by International Fund for Agricultural Development (IFAD), pp. 108. Lead author: Prof. DwipendraThakuria at the capacity of UN-FAO National Consultant on Agronomy on TRC and Better Jhum.

52. FAO (2021) Training Manual on Agronomy of Better Jhum and Terrace Rice Cultivation (TRC) under Fostering Climate Resilient Upland Farming Systems in the Northeast (FOCUS), Govt. of Mizoram. Funded by International Fund for Agricultural Development (IFAD), pp. 112. Lead author: Prof. DwipendraThakuria at the capacity of UN-FAO National Consultant on Agronomy on TRC and Better Jhum.

53. Dr. H. Lalrinkima, Dr. Saidur Rahman, Dr. Lalhumliana Tochhawng, Dr. K. Lalawmpuii and Dr. lalnuntluangi Hmar (2022). Mizorama Rulhut leh a kaihhnawih natna tlangpui. CVSc &AH, CAU, Selesih, Aizawl, Mizoram-796014. Pages: 24 nos

54. Dr. H. Lalrinkima, Dr. Saidur Rahman, Dr. Lalhumliana Tochhawng, Dr. K. Lalawmpuii and Dr. lalnuntluangi Hmar (2022). Common parasitic diseases of livestock and poultry in Mizoram. CVSc &AH, CAU, Selesih, Aizawl, Mizoram-796014. Pages: 22 nos

55. Dr. T.K. Dutta. S.K. Behera, P. Roychoudhury, R.S. Arya, J.M. Gali, P. Behera, J.K. Chaudhary and H. Lalrinkima (2021). Emerging, re-imerging and transboundary animal diseases in India: recent advances in diagnosis and control strategies. Published by CVSC and AH, Aizawl, Mizoram, CAU, 141 pages (Training manual).

56. Joy Lalmuanpuia*, S. Rahman, Lalhumliana Tochhawng, G. Jennifer. Lallawmkimi and Lalnuntluangi Hmar. (2022). Zoonotic Diseases (English). CVSc &AH, CAU, Selesih, Aizawl, Mizoram-796014. Pages: 28 nos

57. Kalyan Sarma and Jitendra Kumar Chadhuray (2021). Internsheep manual (As per VCI MSVE regulation,2016), ISBN no. 978-93-5566-221-7, Published by CAU

58. Lalmuanpuia, J. Rahman, S., Tochhawng, L., Lallawmkimi, G.J, Hmar, L, (2022). Zoonotic Diseases (English). College of Veterinary Sciences & AH, CAU, Selesih, Aizawl, Mizoram. Page-28

59. Lalmuanpuia, J. Rahman, S., Tochhawng, L., Lallawmkimi, G.J, Hmar, L, (2022). Zoonotic Diseases (Mizo). College of Veterinary Sciences & AH, CAU, Selesih, Aizawl, Mizoram. Page-19

60. Lalrinkima, H., Rahman, S., Tochhawng, L., Lalawmpuii, K, Hmar, L, (2022). Mizoram Rulhut Leh A Kaihnawih Natna rlangpuii. College of Veterinary Sciences & AH, CAU, Selesih, Aizawl, Mizoram. Page-24

61. Lalrinkima, H., Rahman, S., Tochhawng, L., Lalawmpuii, K, Hmar, L, (2022). Common Parasitic Diseases of Livestocck and Poulty in Mizoram. College of Veterinary Sciences & AH, CAU, Selesih, Aizawl, Mizoram. Page-22

62. Sarma, K., Kalita, G., Bayan, H., Rahman, S., Tochhawng, L, Laldinpuii N., ., and. Hmar L. (2021) Common Diseases of Livestock, College of Veterinary Sciences & AH, CAU, Selesih, Aizawl, Mizoram. Page 37

63. Talukdar, D., Lalrintluang, K., Ahmed, F.A., Rahman, S., Tochhawng, L., Hmar, L. (2022). Certain aspects of Swine Reproduction. College of Veterinary Sciences & AH, CAU, Selesih, Aizawl, Mizoram. Page-30

64. Talukdar, D., Lalrintluang, K., Ahmed, F.A., Rahman, S., Tochhawng, L., Hmar, L. (2022). Certain aspects of Cattle Reproduction. College of Veterinary Sciences & AH, CAU, Selesih, Aizawl, Mizoram. Page-24

65. Traing manual entitled “Common Anatomical Disorders in Joints of Domestic Animals and its Management” organized by Dept. of Veterinary Anatomy and Histology, College of Veterinary Sciences and AH, Central Agricultural University, Selesih, Aizawl, Mizoram from 11th to 15th January, 2022.

66. Training manual on “Recent Advances in Diagnosis, Prevention and Control of Viral Swine Diseases with Special Reference to African Swine Fever (ASF)”.

67. Dr. Dipika Sarmah (2021). Nursery production and management of horticultural crops for enhancing farmers income (CAU/COH/Bermiok/2021/Leaflet T16) -Training leaflet

68. Dr. Dipika Sarmah (2022) Cultivation of Chrysanthemum Under Sikkim condition (CAU/COH/Bermiok/2022/Leaflet- 17) – Leaflet

69. Dr. Dipika Sarmah (2022) Dry flower production (CAU/COH/Bermiok/2022/ Leaflet-16) – Leaflet

70. Dr. Sapam Rajesh Kumar Singh (2022) Seed and planting material production on horticultural crops (CAU/COH/Bermiok/2022/Leaflet T19)- Training leaflet

71. Dr. Yamuna Pandey (2021) Cultivation practices of Large cardamom (CAU/COH/Bermiok/2021/Leaflet T17)– Training leaflet

84. Gunjan Das (2021). "Scientific management practices for livestock & poultry and preparation of milk and meat products", CoVSc. & A.H, Jalukie, Nagaland. pp. 1-71.

85. Revised Manual on Veterinary Clinical Practices I: VCP-I course (0+1) has been prepared as per the MSVE 2016 regulations.

86. Revised Manual on Veterinary Laboratory Diagnosis of VCP-II course (0+6) has been prepared as per the MSVE 2016 regulations.

87. Training manual on "Use of advanced diagnostic techniques for animal disease investigation' chapters on ELISA and PCR.

88. Tukheswar Chutia (2022). Reproductive Management and Artificial Insemination in Pigs. College of Veterinary Sciences and A.H., CAU, Jalukie, Nagaland. Pages: 48.

89. Tukheswar Chutia and C. Veerapandian (2022). Artificial Insemination in Pigs. College of Veterinary Sciences and A.H., CAU, Jalukie, Nagaland. Pages: 37.

90. Dr Angam Raleng, Dr Ng Joykumar Singh, Shri H Dayanidhi. (Jan, 2021). Processing Technology packages for important crops of Manipur.College of Food Technology, CAU, Imphal, Manipur. 25 Pages.

91. Dr Angam Raleng, Dr Ng Joykumar Singh, Shri H Dayanidhi. Dr Monibala, Dr L. Sophia. (Feb, 2021). Food Atlas of Manipur. The famous 108 Dishes. College of Food Technology, CAU, Imphal, Manipur. 40 Pages.

92. Machinery inputs for post-harvest management and value addition of fruits in Manipur by Ng. Joykumar Singh, P.K. Sarangi and P.T. Sharma Manual on Processing And Value Addition Of Underutilized Fruits Of Manipur Under Scheduled Caste Sub Plan (SCSP) 15-17 March 2021 sponsored by ICAR-Central Institute of Post-Harvest Engineering and Technology, Ludhiana,Punjab and College of Food Technology, CAU, Imphal, Manipur, 2021

9

VISITORS

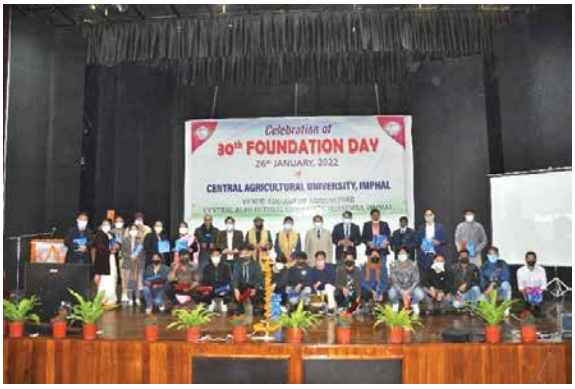
VISITORS AT CAU, IMPHAL

College of Agriculture, Iroishemba, Manipur

S. No.	Visitors' Name	Designation	Organisation/ address	Purpose of Visit	Date of Visit
1.	Dr. R. K. Ranjan Singh	Member of Parliament (Inner Manipur)	Government of India	Agriculturally Vibrant & Self Reliant (AVSR) NEH Region - Community Empowerment through Technology Products	09.06.21
2.	Sushri Shobha Karandlaje	Hon'ble Minister of State for Agriculture & Farmers' Welfare, GOI	Government of India	Showcasing of Technology Products & Interface: Scientists-Farmers/ FPOs/ Agripreneurs	27.10.21
3.	Dr. Lorho S. Pfoze,	Member of Parliament (Outer Manipur)	Government of India	30th foundation day of Central Agricultural University	26.01.22

Hon'ble MP (Inner Manipur), Dr. RK Ranjan Singh attending the programme of Agriculturally Vibrant & Self Reliant (AVSR) NEH Region - Community Empowerment through Technology Products at College of Agriculture, Iroisemba

Visit of the Hon'ble Minister of State for Agriculture & Farmer's Welfare, Sushri Sobha Karandlaje during the Showcasing of Technology Products & Interface: Scientists-Farmers/ FPOs/ Agripreneurs



Visit of the Hon'ble MP (Outer Manipur), Dr. Lorho S Pfoze to attend the 30th Foundation Day of CAU at College of Agriculture, Iroisemba

College of Horticulture & Forestry, Pasighat, Arunachal Pradesh

S. No.	Visitors' Name	Designation	Organisation/ address	Purpose of Visit	Date of Visit
1.	Dr Shambhu Kumar	NGS	Kisan Morcha	To meet Progressive farmers	23.01.22
2.	Sri Tage Taki	Honble Minister of Agri and Allied, Govt. of Arunachal Pradesh	Itanagar	To meet Progressive farmers of Arunachal Pradesh	18.02.22
3.	Smt. Aishwarya Sharma,	IPS	Ccommandant, 5th IRBN Pasighat, Arunachal Pradesh	Chief guest of 22nd College foundation day of CHF	07.03.22

Dr Shambhu Kumar and other Dignitaries Hon'ble Minister Agri. and Allied, Govt. of A.P.

Smt. Aishwarya Sharma, Celebrations of College Foundation day

College of Fisheries, Lembucherra, Tripura

S. No.	Visitors' Name	Designation	Organisation/ Address	Date of Visit
1.	Prof. Ganga Prasad Prasain,	Vice- chancellor,	Tripura University, Agartala	29.06.21 & 08.09.2021
2.	Mr.M.K Jamatia	Minister tribal welfare & Fishery	Govt. of Tripura	08.09.21
3.	Shri R.M Gopal	Genral Manager	NABARD	16.07.21
4.	Dr. Arunadoy Saha	Ex. VC	Tripura University	03.10.21
5.	Dr. A.K Tripathy	Director	ICAR-ATARI,Zone-VI	16.10.21
6.	Sushri Shobha Karandlaje	Hon'ble Minister of State for Agriculture & Farmers Welfare	Govt. of India	28.10.21
7.	Shri. Mevar Kumar Jamatia	Hon'ble Minister of Fisheries	Government of Tripura	
8.	Shri.Krishnadhan Das	Hon'ble MLA	Tripura Legislative Assembly	
9.	Shri.Narendra Singh Tomar	Hon'ble Union Minister of Agriculture & Farmers' Welfare	Govt.of India	
10.	Shri.Biplab Kumar Deb,	Hon'ble Chief Minister of Tripura		
11.	Shri.Pranajit Singha Roy	Hon'ble Minister of Agriculture & Farmer's Welfare,	Govt. of Tripura	
12.	Deepa D Nair,	Secretary of Fisheries Department of Fisheries	Govt. of Tripura	02.12.21
13.	Mr.Dilip Kumar Chakma	Director of Fisheries	Govt.of Tripura	03.03.22
14.	Mevar kumar Jamatia	Hon'ble Minister of Fisheries	Govt. of Tripura	26.03.21
15.	Smt.Pratima Bhowmik	Hon'ble Minister of State for social Justice and empowerment	Government of India	26.03.22
16.	Shri.Krishnadhan Das	Member of Legislative Assembly	Govt. of Tripura	
17.	Chandish R.Ballal	Director	ICAR- NBAIR	02.03.22

Inauguration of new Library block By Shri Narendra Singh Tomar, Hon'ble Union Minister of Agriculture & Farmers' Welfare, Govt. of India; Shri Biplab Kumar Deb, Hon'ble Chief Minister of Tripura, Shri Pranajit Singha Roy, Hon'ble Minister of Agriculture & Farmers' Welfare, Govt. of Tripura

Inauguration of National Seminar on "Agribusiness Potential in North Eastern Region with Special Reference to Tripura" by Shri Mevar Kumar Kumar Jmataia, Minister of Fisheries,Tribal Welfare and commerce, Govt. of Tripura

Inauguration of newly opened swimming pool By Hon'ble Minister of State for Ariculture & Farmers Welfare, Govt. of India, Sushri Shobha Karandlaje

Visit of Fish Museum By Shri Narendra Singh Tomar, Hon'ble Union Minister of Agriculture & Farmers' Welfare, Govt. of India; Shri Biplab Kumar Deb, Hon'ble Chief Minister of Tripura

College of Agricultural Engineering & P.H.T., Ranipool, Sikkim

S. No.	Visitors' Name	Designation	Organisation/ Address	Purpose of Visit	Date of Visit
1.	Shri D. Sathiyan	IFS, Secretary Spices Board	Govt. of India, Gangtok Sikkim	To Attend the programme of MSME	07.09.21
2.	Shri. Y T. Lepcha	Hon'ble MLA	Govt. Of Sikkim	Chief guest for the celebration of "World Soil Day and awareness programme on Soil Health Clinic"	05.12.21
3.	Shri Balwan Singh	DIG	SHO, SSB, Gangtok	College visit	11.01.22
4.	Shri. H.K. Sharma	Commissioner cum secretary	C& I Department, Government of Sikkim	To attend MSME programme	10.02.22

S. No.	Visitors' Name	Designation	Organisation/ Address	Purpose of Visit	Date of Visit
5.	Shri. M. Ravikumar, IFS	Director	MSME, C& I Department, Government of Sikkim	To attend MSME programme	10.02.22
6.	Dr. B. M Chettri	Director (Animal Husbandry	Govt of Sikkim	Inaugural function of training programme	01.03.22
7.	Mr. Lok Nath Sharma	Hon'ble Minister	Govt. of Sikkim	Chief guest for "Technology and Machinery Demonstration Mela-2022"	23.03.22
8.	Mr. Tilak Gajmer	Director	Deptt. Of Agriculture, Govt. of Sikkim	Technology and Machinery Demonstration Mela-2022	23.03.22

College of Veterinary Sciences & A.H., Selesih, Aizawl

S. No.	Visitors' Name	Designation	Organisation/ address	Purpose of Visit	Date of Visit
1	Dr. SB Barbuddhe	Director	NRC Meat, Hyderabad	Organized Training	17.02.22

College of Community Science, Tura, Meghalaya

S. No.	Visitors' Name	Designation	Organisation / Address	Purpose of Visit	Date of Visit
1.	Sh Conrad K Sangma,	Hon'ble Chief Minister of Meghalaya	Chief Minister of Meghalaya	Interaction with Nano Entrepreneurs	21.06.21
2.	Sh. Ram Singh	Deputy Commisioner	West Garo Hills, Meghalaya	Interaction with Nano Entrepreneurs	21.06.21
3.	Dr. S. Basanta Singh	Director of Instructions	CAU, Imphal	Official	04.08.21
4.	Dr. Mamocha Singh	Registrar	CAU, Imphal	Official	04.08.21
5.	Shri Alok Kumar Singh	Deputy Inspector General	Border Security Force, Tura	Chief Guest at Inaugural Function, Alumni Meet, CCS Tura	26.03.22

College of Post Graduate Studies in Agricultural Sciences, Umiam, Meghalaya

S. No.	Visitors' Name	Designation	Organisation/ Address	Purpose of Visit	Date of Visit
1.	Shri. Narendra Singh Tomar	Hon'ble Union Minister of Agriculture & Farmers Welfare	Government of India	Inauguration of CPGS-ASAuditorium, Tree Plantation, Interaction meet with FPOS, agri exporters and Entrepreneurs of North Eastern States	04.10.21
2.	Shri. Banteidor Lyngdoh	Hon'ble Minister for Agriculture and Horticulture	Department of Agriculture, Secretariat, Shillong	Inauguration of CPGS-AS, Umiam Auditorium, Tree Plantation, Interaction meet with FPOS, agri exporters and Entrepreneurs of North Eastern States	04.10.21

S. No.	Visitors' Name	Designation	Organisation/ Address	Purpose of Visit	Date of Visit
3.	Dr. U.N. Saikia	Retd Director of Post Graduate Studies and Former HoD, Plant Pathology	AAU, Jorhat	Two days zonal symposium on "Current Trends in Plant Disease Management for Sustainable Crop Production and Livelihood Security" under Indian Phytopathological Society (North Eastern Zone) at North Eastern Police Academy, Umsaw, Meghalaya.	10.03.22 & 11.03.22

Distribution of seeds to the farmers at Student Utility Centre at CPGSAS by Hon'ble Minister

Inauguration of College Auditorium, CPGSAS, CAU (I), Umiam

College of Veterinary Sciences & A.H., Jalukie, Nagaland

S. No.	Visitors' Name	Designation	Organisation/Address	Purpose of Visit	Date of Visit
1.	Dr. Bhudi Lama	Director	Dept. of Animal Husbandry and Veterinary Services. Govt. of Nagaland	Inauguration of three days skill development prgrammes on "Artificial Insemination in Pigs" for the VFA of Nagaland.	14.02.2022
2.	Dr. M. H. Khan	Director	ICAR-National Research Centre on Mithun, Medziphema, Dimapur, Nagaland	Inauguration of three days skill development prgrammes on "Ration Balancing and Feeding Management of Livestock "for the Veterinary Officers/ Farmers Managers	24.02.2022

College of Horticulture, Thenzawl

S. No.	Visitors' Name	Designation	Organisation/address	Purpose of Visit	Date of Visit
1.	NABARD Team	Chief Manager and team	NABARD, Mizoram Regional offic	Bi- monthly structured meeting	25.03.22
2.	Govt. Lunglei College	HOD, Faculty and students of Botany Department	Govt. Lunglei College, Mizoram	Educational tour	29.03.22

College of Agriculture, Kyrdemkulai, Meghalaya

S. No.	Dignitary	Designation	Organisation/address	Purpose of Visit	Date of visit
1.	Dr. V.K. Gupta	Director	NRC on Pig, Rani, Assam	FIE 2021	06.04.21
2.	Mr. A.K. Sarangi	General Manager	NABARD, Shillong	FIE 2021	06.04.21
3.	Dr. K.B. Sahkhar	Director	Directorate of Animal Husbandry and Veterinary	FIE 2021	06.04.21
4.	Dr. M. Mohapatra	Director	General, IMD, New Delhi (Virtual)	FIE 2021	07.04.21
5.	Dr. Shakeel Ahmed	Principal Secretary	Dept. of Agriculture, Govt. Meghalaya	FIE 2021	08.04.21
6.	Dr S. Ayyapan	Hon'ble Chancellor	Central Agricultural University, Imphal	College visit cum Lecture delivered for NAAS Regional chapter Barapani	20.09.21
7.	Mrs. N. Guite	General Manager	NABARD, Shillong, Meghalaya	Interface Meeting and Guest of Honour, ICCOAK 2021	23.09.21 and 09.12.21
8.	Dr. S.V. Ngachan,	Former Director	ICAR RC for NEH Region, Umiam	Faculty Review Meeting	22.12.21
9.	Dr. P.K. Ghosh	Honbl' Director and Vice Chancellor	ICAR-National Institute of Biotic Stress Management, Raipur, Chandigarh	NAAS lecture series 2	28.10.21
10.	Dr. K.M. Bujar Baruah	Former Vice Chancellor	Assam Agricultural University, Jorhat	ICCOAK, 2021	07.12.21-09.12.21
11.	Dr. M. Premjit Singh,	Former Vice Chancellor,	CAU, Imphal	ICCOAK, 2021	07.12.21-09.12.21
12.	Dr. D.B. Shakiwar,	Director,	NINFET, West Bengal	ICCOAK, 2021	07.12.21-09.12.21
13.	Mr. Mohan Mohini Mishra	Secretary	BKS, New Delhi.	ICCOAK, 2021	07.12.21-09.12.21
14.	Mr. Jason Sawkmie Mawlong	MLA	Umsning constituency, Ri-Bhoi district, Meghalaya	ICCOAK 2021	09.12.21
15.	Smt. Rebecca V. Suchiang	IAS, Chief Secretary	Government of Meghalaya	Chief Guest, 7th Foundation Day	24.02.22
16.	Dr. Arun Kumar Sarma	Director General	NECTAR, New Delhi	Guest of Honour, 7th Foundation Day	24.02.22

APPENDIX

Board of Management

The list of members of the Board of Management is given below:

Dr. Anupam Mishra
Vice-Chancellor
Ex-Officio Chairman under sub-clause (i)

1. **Shri Sanjay Garg**
   Addl. Secretary (DARE) & Secretay (ICAR)
   Krishi Bhawan, New Delhi – 110 001
   Tel. No. 011 -23384450
   Email: secy.icar@nic.in
   Member under sub-clause (xiv)

2. **Dr. O.P. Chaudhary**
   Joint Secretary (NLM)
   Deptt. Of Ani-Hus, Diarying & Fisheries
   Ministry of Agriculture & Farmers' Welfare
   Govt. of India, Krishi Bhawan, New Delhi – 110 001
   Tel. No. 011-23387804(O)
   Email:jsdiary-ahd@nic.in/ jspfdadf@gmail.com/
   jspf-dadf@nic.in
   Member under sub-clause (xiii)

3. **Principal Secretary (Agri & Hort)**
   Deptt. of Agri,
   Govt. of Tripura, Agartala – 799001
   Ph. No.: 0381-2416036
   Email: drgsgayyangar@gmail.com
   Member under sub-clause (ii)

4. **Shri Mimum Tayeng**
   Secy. (Hort.), State Civil Secretariat,
   Block No.4, 4th Floor, Room No.7
   Govt. of Arunachal Pradesh, Itanagar
   Ph.No. 0360-2212396
   Email: wilin01@gmail.com
   Member under sub-clause (ii)

5. **Principal Secretary**
   Veterinary and Animal Husbandry Services
   Manipur Secretariat, Imphal (W) – 795 001
   Member under sub-clause (ii)

6. **Dr. Arvind Pathak**
   Ex VC, Navsari Agricultural University
   Navsari, Gujarat – 396450 (#06355398221)
   E-mail : arpathak1949@gmail.com
   Member under sub-clause (iii)

7. **Dr. V.S. Tomar**
   Ex Vice-Chancellor, JNKVV
   Krishinagar, Adhartal, Jabalpur – 482 004, M.P
   Mob.No. 9425155585
   Email: vijays1946@gmail.com
   Member under sub-clause (iii)

8. **Dr. K.R. Dhiman**
   Former Vice-Chancellor
   Dr. YSPUH&F, Nauni,
   Solan – 173 230, Himachal Pradesh
   E-mail: krishandhiman@rediffmail.com
   Mob. No. 9418203800
   Member under sub-clause (iii)

9. **Dr. Ravindra Kumar Jaiswal**
   President & Head of Operations Poultry IB Group
   Rajnandgaon – 491 441 (CG), India
   Mob.No. 9826123869
   Email: drjaiswal@ibgroup.co.in
   Member under sub-clause (iv)

10. **Deputy director General (Edn.)**
ICAR, Krishi Anusandhan Bhawan,
Pusa, New Delhi – 12
Email: ddgedn@icar.org.in / ddgedn@gmail.com
Ex-Officio Member under sub-clause (v)

11. **The Secretary**
North Eastern Council, Shillong, Meghalaya – 793003
Email: secy-nec-meg@nic.in / sect-nec-meg@nic.in
Ex-Officio Member under sub-clause (vi)

12. **Diector of Research**
Cental Agricultual University, Imphal
Email: drcau@yahoo.co.in / dorcau@gmail.com
Member under sub-clause (vii)

13. **Dean**
College of Agriculture, Imphal, Manipur
Email: dean_collegeagri@yahoo.co.in
Member under sub-clause (vii)

14. **Smt. Tika Khannal**
W/o Shri Nanda Kumar Sharma
Vill.-Saureni, Assam Linzey, Gangtok
East Sikkim – 737135, Sikkim
Mob.: 7908849343
Email: tikakhana146@gmail.com
Member under sub-clause (viii)

15. **Ms. Watila Longkumer**
H.No.282, Indisen Village, Diphu Road
Dimapur, Nagaland
Mob.: 9436260013
Email: wala19longkumer@gmail.com
Member under sub-clause (viii)

16. **Ms. Vanlalpianpuii**
District Road, Farm Veng, Lunglei – 796 701
Mob.: 9436147041 / 8259950961
Email:pypyralte25@gmail.com
Member under sub-clause (x)

17. **Dr. Neelam Patel**
Sr. Adviser (Agriculture)
NITI Aayog, NITI Aayog Bhawan
National Institution for Transforming India, GOI
Parliament Street, New Delhi – 110 001
Email: neelam.patel@gov.in
Ex-Officio Member under sub-clause (xi)

18. **Dr. A.K. Joshi, IFS**
PCCF & Head of Forest Force (PCCF & HoFF)
Forest Department, Govt. of Manipur, Imphal
Mob.: 7217665949
Email: pccf-mn@nic.in
Member under sub-clause (xii)

19. **Dr. Suresh Kumar Malhotra**
Horticulture Commissioner
Ministry of Agriculture & Farmers' Welfare
Govt. of India, Krishi Bhawan, New Delhi – 110 001
E-mail : agricommissioner@gmail.com
Member under sub-clause (xiii)

Dr. K. Mamocha Singh
Registrar, Central Agricultural University, Imphal.
Email: registrar.cau@gov.in, regcau@gmail.com
Ex-Officio Secretary under sub-clause (xv)

Academic Council

The list of the members of the Academic Council of the University is as under:

Dr. Anupam Mishra
Vice-Chancellor,
Central Agricultural University, Imphal
Ex-officio Chairman Under sub-clause (i)

Members

1. **Dean**
   College of Agriculture
   Iroisemba, Imphal, Manipur
   Member under sub-clause (ii)

2. **Dean**
   College of Horticulture & Forestry
   Pasighat, Arunachal Pradesh
   Member under sub-clause (ii)

3. **Dean**
   College of Veterinary Sciences & A.H.
   Selesih, Aizawl, Mizoram
   Member under sub-clause (ii)

4. **Dean**
   College of Fisheries
   Lembucherra, Agartala, Tripura
   Member under sub-clause (ii)

5. **Dean**
   College of Community Science
   Tura, West Garo Hills, Meghalya
   Member under sub-clause (ii)

6. **Dean**
   College of Agril. Engineering & P.H. Technology, Marchak, Gangtok, Sikkim
   Member under sub-clause (ii)

7. **Dean**
   College of Post-graduate Studies in Agricultural Sciences, Barapani, Meghalaya
   Member under sub-clause (ii)

8. **Dean**
   College of Agriculture
   Pasighat, Arunachal Pradesh
   Member under sub-clause (ii)

9. **Dean**
   College of Agriculture
   Kyrdemkulai, Meghalaya
   Member under sub-clause (ii)

10. **Dean**
    College of Food Technology
    Imphal, Manipur
    Member under sub-clause (ii)

11. **Dean**
    College of Horticulture
    Bermiok, South Sikkim
    Member under sub-clause (ii)

12. **Dean**
    College of Horticulture
    Thenzawl, Mizoram
    Member under sub-clause (ii)

13. **Dean**
    College of Veterinary Sciences & A.H.
    Jalukie, Nagaland
    Member under sub-clause (ii)

14. **Director of Instruction**
    Central Agricultural University, Imphal
    Member under sub-clause (v)

15. **Director of Research**
Central Agricultural University, Imphal
Member under sub-clause (iii)

16. **Director of Extension Education**
Central Agricultural University, Imphal
Member under sub-clause (iv)

17. **Librarian**
College of Veterinary Sciences & A.H.
Selesih, Aizawl, Mizoram
Member under sub-clause (vi)

18. **Dr. Gaya Prasad**
Ex-Vice-Chancellor,
Sardar Vallabhai Patel University of Agriculture & Technology, Meerut
(Mobile No. 7988397904),
E-mail: gprasad1986@gmail.com
Member under sub clause (vii)

19. **Dr. V.S. Tomar**
Ex-Vice-Chancellor,
Jawaharlal Nehru Krishi Viswavidyalaya, Krishinagar, Adhartal, Jabalpur-482004, Madhya Pradesh (Mobile No. 9425155585),
E-mail: vijays1946@gmail.com
Member under sub-clause (vii)

20. **Head**
Department of Basic Science and Humanities College of Agriculture, Imphal, Manipur
Member under sub-clause (viii)

21. **Head**
Department of Animal Breeding & Genetics
Veterinary Sciences & A.H.
Selesih, Aizawl, Mizoram
Member under sub-clause (viii)

22. **Head**
Deparment of Fisheries Extension Economics & Social Sciences
College of Fisheries, Lembucherra, Tripura
Member under sub-clause (viii)

23. **Head**
Deparment of Floriculture & Landscape Architecture,
College of Horticulture & Forestry, Pasighat, Arunachal Pradesh
Member under sub-clause (viii)

24. **Head**
Deparment of Irrigation & Drainage Engineering, College of Agril. Engg. & PHT, Ranipool, Sikkim
Member under sub-clause (viii)

25. **Head**
Deparment of Family Resource Management, College of Community Science, Tura, Meghalaya
Member under sub-clause (viii)

26. **Chairman**
School of Natural Resource Management
College of Post Graduate Studies in Agril. Sc.
Barapani, Meghalaya
Member under sub-clause (viii)

27. **Nominee of North-Eastern Council,**
Shillong, Meghalaya
Member under sub-clause (ix)

Dr. K. Mamocha Singh.
Registrar, Central Agricultural University, Imphal, Manipur.
Ex-officio Secretary Under sub-clause (x)

Research Council

The members of the Research Council of the University are as follows:

Dr. Anupam Mishra
Vice-Chancellor,
Central Agricultural University,
Imphal. Manipur.
Ex-officio Chairman Under sub-clause (i)

Members

1. **Director**
   Directorate of Instruction
   Central Agricultural University, Imphal
   Ex-officio Member under sub-clause (iii)

2. **Director**
   Directorate of Extension Education
   Central Agricultural University, Imphal
   Ex-officio Member under sub-clause (ii)

3. **Dean,**
   College of Agriculture
   Iroisemba, Imphal
   Ex-officio Member under sub-clause (iv)

4. **Dean**
   College of Horticulture & Forestry
   Pasighat, Arunachal Pradesh
   Ex-officio Member under sub-clause (iv)

5. **Dean**
   College of Veterinary Sciences & A.H.
   Aizawl, Mizoram
   Ex-officio Member under sub-clause (iv)

6. **Dean**
   College of Fisheries
   Lembucherra, Tripura
   Ex-officio Member under sub-clause (iv)

7. **Dean**
   College of Community Science
   Tura, Meghalaya
   Ex-officio Member under sub-clause (iv)

8. **Dean**
   College of Agril. Engg. & P.H.T.
   Gangtok, Sikkim
   Ex-officio Member under sub-clause (iv)

9. **Dean**
   College of Post Graduate Studies in Agricultural. Sciences
   Barapani, Meghalaya
   Ex-officio Member under sub-clause (iv)

10. **Dean**
    College of Veterinary Sciences & A.H.
    Jalukie, Nagaland
    Ex-officio Member under sub-clause (iv)

11. **Dean**
    College of Agriculture
    Pasighat, Arunachal Pradesh
    Ex-officio Member under sub-clause (iv)

12. **Dean**
    College of Horticulture
    Bermiok, South Sikkim
    Ex-officio Member under sub-clause (iv)

13. **Dean**
College of Agriculture
Kyrdemkulai, Meghalaya
Ex-officio Member under sub-clause (iv)

14. **Dean**
College of Food Technology
Imphal, Manipur
Ex-officio Member under sub-clause (iv)

15. **Dean**
College of Horticulture
Thenzawl, Mizoram
Ex-officio Member under sub-clause (iv)

16. **Director**
Directorate of Agriculture, Government of Manipur, Imphal
Nominee under sub-clause (v)

17. **Director**
Directorate of Horticulture, Government of Arunachal Pradesh, Itanagar
Nominee under sub-clause (v)

18. **Director**
Directorate of Fisheries,
Government of Tripura, Agartala
Nominee under sub-clause (v)

19. **Director**
Directorate of Animal Husbandry & Veterinary, Government of Mizoram, Aizawl
Nominee under sub-clause (v)

20. **Addl. Principal Chief Conservator of Forests (R &T)**
Govt. of Meghalaya, Shillong
Nominee under sub-clause (v)

Ex-Officio Member Secretary
Dr. S. Basanta Singh
Director of Research
Central Agricultural University, Imphal. Manipur.

21. **Director**
Directorate of Food Security & Agriculture Development, Government of Sikkim
Gangtok
Nominee under sub-clause (v)

22. **Research Co-ordinator & Member Secretary,**
College Research Advisory Committee (CRAC) of all constituent colleges (Agriculture, Veterinary Sc. & A.H., Fisheries, Horticulture & Forestry, Community Sc., PG Studies & Agricultural Engg. & PHT)
Nominee under sub-clause (vi)

23. **Dr. S.V. Ngachan**
Ex-Director, ICAR Research Complex, NEH Region, Umiam, Meghalaya
E-mail : svngachan1@gmail.com
Member under sub-clause (vii)

24. **Dr. P.P. Shastri**
Ex-Dean, College of Agriculture
RVSKM, MIG-18, Deendayalpuram
Khandwa (MP) 450001
E-mail : shastry.pps@gmail.com
Member under sub-clause (vii)

25. **Director**
ICAR Research Complex for NEH Region
Umiam, Meghalaya Special Invitee

26. **Joint Director of ICAR Research Council for NE Region**
(Arunachal Pradesh, Manipur, Mizoram, Nagaland, Sikkim & Tripura)
Co-opted Members
Ex-officio Member Secretary
Dr. S. Basanta Singh.
Director of Research,
Central Agricultural University,
Imphal. Manipur.

Extension Education Council

The members of the Extension Education Council of the University are hereunder:

***Ex-Officio* Chairman**
Dr. Anupam Mishra
Vice-Chancellor, Central Agricultural University, Imphal. Manipur.

Members

1. **Director of Research**
   Central Agricultural University,Imphal
   Ex-Officio Member under sub-clause (ii)
2. **Director of Instruction**
   Central Agricultural University, Imphal
   Ex-Officio Member under sub-clause (iii)
3. **Dean**
   College of Agriculture
   Iroisemba, Imphal, Manipur
   Member under sub-clause (iv)
4. **Dean**
   College of Horticulture & Forestry
   Pasighat, Arunachal Pradesh
   Member under sub-clause (ii)
5. **Dean**
   College of Veterinary Sciences & A.H.
   Selesih, Aizawl, Mizoram
   Member under sub-clause (iv)
6. **Dean**
   College of Fisheries
   Lembucherra, Agartala, Tripura
   Member under sub-clause (iv)
7. **Dean**
   College of Community Science
   Tura, Meghalya
   Member under sub-clause (iv)
8. **Dean**
   College of Agril. Engineering & P.H.T.
   Ranipool, Gangtok, Sikkim
   Member under sub-clause (iv)
9. **Dean**
   College of Post-graduate Studies in Agril. Sc., Barapani, Meghalaya
   Member under sub-clause (iv)
10. **Dean**
    College of Veterinary Sciences & A.H.
    Jalukie, Peren District, Nagaland
    Ex-Officio Member under sub-clause (iv)
11. **Dean**
    College of Agriculture
    Pasighat, Arunachal Pradesh
    Ex-officio Member under sub-clause (iv)
12. **Dean**
    College of Horticulture
    Bermiok, South Sikkim
    Ex-officio Member under sub-clause (iv)
13. **Dean**
    College of Agriculture
    Kyrdemkulai, Meghalaya
    Ex-officio Member under sub-clause (iv)
14. **Dean**
    College of Food Technology
    Imphal, Manipur
    Ex-officio Member under sub-clause (iv)
15. **Dean**
    College of Horticulture
    Thenzawl, Mizoram
    Ex-officio Member under sub-clause (iv)
16. **Director**
    Directorate of Agriculture
    Krishi Bhavan, D-Sector, Naharlahun
    Arunachal Pradesh-791110
    E-mail: krishiarun06@yahoo.co.in
    Member under sub-clause (v)
17. **Director of Horticulture & Soil Conservation**
    Directorate of Horticulture & Soil Conservation Sanjenthong, Imphal, Manipur
    E-mail: Manipur-tm@nic.in
    Member under sub-clause (v)

18. **Director of Fisheries**
Directorate of Fisheries
New Capital Complex, Khatla, Aizawl, Mizoram
E-mail: dir.fish-mz@gov.in
Member under sub-clause (v)

19. **Director of Animal Husbandry & Veterinary**
Directorate of Animal Husbandry & Veterinary
Above Accountant General Office, Kohima, Nagaland
E-mail: dirvety-ng@nic.in
Member under sub-clause (v)

20. **Director of Skill Development**
Skill Development Department
Sokaythang, East Sikkim
E-mail: sdedsikkim@gmail.com
Member under sub-clause (v)

21. **Chief Conservator of Forests, Research & Planning**
Office of the Principal Chief Conservator of Forests
& Hoff, Lower Lachumiere, Shillong
Member under sub-clause (v)

22. **Director of Rural Development**
Rural Development Department
Civil Secretariat, Agartala
E-mail: jsrd-tr@nic.in
Member under sub-clause (v)

23. **Mr. Leichombam Amumacha Singh**
LeimaramMamangLeikai
Bishnupur, Manipur
Member under sub-clause (vi)

24. **Mr. Bishwajit Datta**
West Bhuban Ban, AMC Ward No. 2
Agartala, Tripura
Member under sub-clause (vi)

25. **Mr. Robin Pradhan**
Village Tarpin, Sub-Division-Rongly,
East Sikkim
E-mail:robinpradhan7175@gmail.com
Member under sub-clause (vi)

26. **Shri Wcfstar D. Shira**
Village-Rongbilbanggre, Block-Gambegrc
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Member under sub-clause (vi)

27. **Mr. Talem Tasung**
Boying Village, East Siang, Arunachal Pradesh
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28. **Mr. Datui Zeliang**
N. Samlungbe Co-op Society, Puilwa Village
Peren District, Nagaland
Member under sub-clause (vi)

29. **Smt. Lalringsangi**
Durtlang Branch, Durtlang,
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30. **Dr. P. Das**
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31. **Dr. J.P. Sharma**
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***Ex-officio* Secretary**
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Director of Extension Education
Central Agricultural University, Imphal. Manipur.

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The members of the Finance Committee of the University are given below:

***Ex-officio* Chairman**
Dr. Anupam Mishra
Vice-Chancellor, Central Agricultural University, Imphal

Members

1. **Financial Advisor**
   Department of Agricultural Research and Education Government of India
   Krishi Bhavan, New Delhi - 110001

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   Rahuri, Maharashtra-413 722

3. **Dr. M.B. Chetti**
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4. **Dr. U.S. Gautam**
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5. **Shri. Chiranjit Chaliha**
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6. **Comptroller**
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7. **Prof. Vanlalchhawna**
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   Tanhril, Aizawl-796004, Mizoram

***Ex-officio* Member Secretary**
Shri M.C. Jublani
Comptroller, Central Agricultural University, Imphal. Manipur.

Statutory Officers

The list of Statutory Officers of the university is cited underneath:

Chancellor
Dr. S. Ayyappan
Central Agricultural University, Imphal Manipur

Vice-Chancellor
Dr. Anupam Mishra
Central Agricultural University, Imphal, Manipur

Director of Instruction
Dr. S. Basanta Singh
Central Agricultural University, Imphal, Manipur

Director of Research
Dr. S. Basanta Singh
Central Agricultural University, Imphal, Manipur

Director of Extension Education
Dr. Ph. Ranjit Sharma
Central Agricultural University, Imphal, Manipur

Registrar
Dr. K. Mamocha Singh.
Central Agricultural University, Imphal, Manipur

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Shri M. C. Jublani (I/C)
Central Agricultural University, Imphal, Manipur

Dean
Dr. Indira Sarangthem
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Dean
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College of Food Technology, Imphal, Manipur

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College of Horticulture, Thenzawl, Mizoram

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College of Fisheries, Lembuchera, Agartala, Tripura

Dean
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College of Horticulture & Forestry, Pasighat, Arunachal Pradesh

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College of Agriculture, Pasighat, Arunachal Pradesh

Dean
Dr. (Ms.) Puspita Das (I/C)
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Dean
Dr. P.P. Dabral
College of Agricultural Engineering & Post Harvest Technology, Ranipool, Gangtok, Sikkim

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