

ANNUAL REPORT

2016-17

**DEPARTMENT OF FLORICULTURE,
MEDICINAL AND AROMATIC PLANTS**



**FACULTY OF HORTICULTURE
UTTAR BANGA KRISHI VISWAVIDYALAYA
PUNDIBARI, COOCHBEHAR, WEST BENGAL
PIN-736165**

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1. Name of the Department/Faculty:

Floriculture, Medicinal and Aromatic Plants / Faculty of Horticulture

2. Year of Establishment of the Department/Faculty: 2001

3. Brief Introduction with Mandate of the Department/Faculty:

The department of Floriculture, Medicinal and Aromatic Plants was established in 1st February, 2001, under the Faculty of Horticulture of Uttar Banga Krishi Viswavidyalaya as an academic department of the University with an eye to cater the courses on the relevant subjects under both UG and PG programmes as well as to conduct need based research on ornamental, medicinal and aromatic plants and transfer of technology to the peasantry of North Bengal region under the jurisdiction of the University. From 2009-10 academic sessions, Ph. D. programme under the department had been started. Commencement of M. Sc. Programme had been done in 2011. The research mandate of the department includes:

- a. Collection, conservation and evaluation of germplasm of ornamental, medicinal and aromatic plants
- b. Development of a herbal garden to represent the regional diversity of herbal and aromatic flora
- c. Development of techniques for raising QPM of ornamental, medicinal and aromatic plants
- d. Standardization of protocol for micropropagation of ornamental, medicinal and aromatic plants
- e. Standardization and/or refinement of agrotechnique of relevant crops suitable to North Bengal region
- f. Standardization of package of practice for organic farming of ornamental, medicinal and aromatic plants
- g. Standardization of post-harvest management practices for ornamental, medicinal and aromatic plants
- h. Value-addition and development of value-chain in ornamental, medicinal and aromatic plants
- i. Extraction of secondary metabolites of ornamental, medicinal and aromatic plants
- j. Application of conventional and non-conventional approaches for improvement of ornamental, medicinal and aromatic plants
- k. Standardization of techniques for protected cultivation of high valued ornamental crops
- l. Appraisal of promotion of cultivation and identification of supply-chain of ornamental, medicinal and aromatic plants

4. List of Academic Programmes:

| SN | Name of the Constituent Deptt./Faculty | Bachelor's Programme | Master's Programme | Ph. D. Programme | Others |
|----|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------|------------|
| 1 | Floriculture, Medicinal and Aromatic Plants | B.Sc. (Hort.) Hons. No separate Bachelor degree programme exists under the department and the department is taking part in the course curriculum of all the Bachelor Degree programmes of the University | M.Sc. (Hort) in Floriculture, Medicinal and Aromatic Plants | Ph.D.(Hort) in Floriculture, Medicinal and Aromatic Plants | NIL |

5. Student Profile in the Department/Faculty:

| Year | Parameters | Numbers | | | |
|---------|------------|------------|----------|--------|-------|
| | | Bachelor's | Master's | Ph. D. | Total |
| 2016-17 | Intake | -- | 3 | - | 3 |
| | Enrolled | -- | 2 | - | 2 |
| | Passed Out | -- | 1 | 1 | 2 |

6. Gender Pattern amongst Students Enrolled in the Department/Faculty:

| Year | Parameters | Numbers | | | |
|---------|------------|------------|----------|--------|-------|
| | | Bachelor's | Master's | Ph. D. | Total |
| 2016-17 | Male | -- | -- | - | Nil |
| | Female | -- | 2 | - | 2 |
| | Total | -- | 2 | - | 2 |

7. Present Faculty Strength in the Department/Faculty:

| SN | Name of the Constituent Faculty/Department | No. of Total Sanctioned | In Position (No. of Faculty based on Designation) | | | |
|-------|---------------------------------------------|-------------------------|------------------------------------------------------------|--------------|-------------|-------|
| | | | Prof. | Assoc. Prof. | Asst. Prof. | Total |
| 1 | Floriculture, Medicinal and Aromatic Plants | 6 | 1 | 1 | 2 | 4 |
| Total | | 6 | 1 | 1 | 2 | 4 |

8. Year-wise Budgetary Support to the Department/Faculty: Financial records are maintained by the Comptroller section of the University

(Rs. in lakh)

| Year | Budget Heads | State Funding | | | Funding support from ICAR | | | | Any other central funding** | Grand Total |
|---------|--------------|---------------|----------|-------|---------------------------|-------|-----|-------------------|-----------------------------|-------------|
| | | Plan | Non-Plan | Total | Education | AICRP | KVK | Other ICAR funds* | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |
| 2016-17 | Salary | | | | | | | | | |
| | Capital | | | | | | | | | |
| | Revenue | | | | | | | | | |

| | | | | | | | | | |
|--|-------|--|--|--|--|--|--|--|--|
| | Total | | | | | | | | |
|--|-------|--|--|--|--|--|--|--|--|

*including Network Project, NICRA, NAIP, Extra Mural, etc

**including DST, DBT, ICMR, RKVY

9. Available Infrastructure in the Department/Faculty:

| SN | Name of the Constituent Faculty/Department | No. of Hostels (along with No. of Rooms) | | | Exam Hall | Museum | Auditorium (Seating Capacity) | Sports Facilities |
|-------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| | | Boys | Girls | International | | | | |
| 1 | Floriculture, Medicinal and Aromatic Plants | Hostel facility is created by the University centrally and provided as per standing rule of the University by the Dean, Students' Welfare | | | Central (No separate facility for the department) | Central (No separate facility for the department) | Central (No separate facility for the department) | Central (No separate facility for the department) |
| Total | -- | -- | | | -- | -- | -- | -- |

10. Year-wise New Civil Works/Repair & Renovation costing in the Department/Faculty: (Rs. in Lakh)

| Year | Name of the Civil Work Undertaken | Location of Civil Work (specify district) | Cost | Work Completed/In Process | % ICAR Share | % State Share |
|---------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|--------------|---------------|
| 2016-17 | Double door facility in the Plant Tissue Culture Laboratory | Department of Floriculture, Medicinal and Aromatic Plants, Faculty of Horticulture, Uttar Banga Krishi Viswavidyalaya, Pundibari, District – CoochBehar, West Bengal, PIN-736165 | 0.35 lakhs | Yes | 100 | - |
| Total | 1 | | 0.35 lakhs | | | |

11. Details of Sports Facilities strengthened in the Department/Faculty: (Rs. in Lakh)

| Year | List of Sports Facility | Location of the facilities (specify district) | Cost |
|---------|---------------------------------------------------|----------------------------------------------------------------------------------------------|------|
| 2016-17 | Central (No separate facility for the department) | Uttar Banga Krishi Viswavidyalaya, Pundibari, District – CoochBehar, West Bengal, PIN-736165 | — |
| Total | -- | -- | -- |

12. Year-wise Equipment purchased/replaced each costing in the Department/Faculty: (Rs. in Lakh)

| Year | Name of the Equipment | Present Location of Equipment | Cost | Present Status (Working/Non Working) |
|---------|-----------------------|-------------------------------|------|--------------------------------------|
| 2016-17 | NIL | N/A | N/A | N/A |
| Total | -- | -- | -- | -- |

Please mention about the impact of equipment purchased on quality of education:

- i. **Imparting practical knowledge to the students.**
- ii. **Helpful for the dissertation work of the M. Sc. And Ph. D. Students.**

The instruments and computer and accessories purchased in previous years are working generating the following impacts –

- i. Conducting practical classes smoothly
- ii. Utilised in the research programmes under the department
- iii. Addition of recent information in instruction

13. No. of Student Beneficiaries availing NTS/RAWE/In Plant Training/Internship in the Department/Faculty:

| Year | No of Students of Beneficiaries | | | | Total |
|---------|---------------------------------|--------------------------------------------------------------------------------------|-------------------|------------|-------|
| | RHWE | NTS | In-plant training | Internship | |
| 2016-17 | 9 | 2 for UG under the Faculty of Horticulture 1 for PG (M. Sc.) under the Department | 9 | N/A | 12 |
| Total | 9 | 3 | 9 | — | 12 |

RHWE – Rural Horticultural Work Experience

NTS – National Talent Scholarship

14. Experiential Learning (EL) Module Supported by the Council:

(Rs in lakh)

| Year | Name of College along with location | Name of the EL Modules | Grant Received | No. of Students trained under EL | Product being developed under EL | Revenue earned | Revolving Fund Generated | % Share of income distributed to students |
|---------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------|----------------------------------|------------------------------------------------------------------------------------|----------------|--------------------------|-------------------------------------------|
| 2016-17 | Faculty of Horticulture, Uttar Banga Krishi Viswavidyalaya, Pundibari, District – CoochBehar, West Bengal, PIN-736165 | Commercial nursery management and Commercial Floriculture | Rs. 5000/- for state contingency grant | 9 | Loose Flower, Cut Flowers, Seedlings and saplings of flowers and other ornamentals | Rs. 15127/- | Rs. 10127/- | |

15. Achievements under Niche Area of Excellence (If any):

(Rs. in lakh)

The Department is not involved in the Niche Area of Excellence Programme

| SN | Titles | Duration | Total Budget | No. of Publication (>4.0 NAAS/Thomson & Reuters rated only) | No. of Persons Trained | No. of Student Benefited | No of Patents |
|----|--------|----------|--------------|-------------------------------------------------------------|------------------------|--------------------------|---------------|
| 1 | | | | | | | |
| 2 | | | | | | | |

16. No of Students selected for JRF/SRF/NET (ICAR/ICMR/UGC/CSIR/DBT)/ARS in the Department/Faculty:

| SN | Name of Department/ Faculty | JRF | SRF | NET | ARS | Other Fellowship/Scholarship | Remarks |
|----|---------------------------------------------|-----|-----|-----|-----|----------------------------------|--------------------------------------------------------------------|
| 1 | Floriculture, Medicinal and Aromatic Plants | -- | -- | 1 | -- | University Merit Scholarship - 4 | University Merit Scholarship – Including M.Sc. and Ph.D. programme |
| | Total | — | — | 1 | — | — | |

17. Academic Achievements (M. Sc./Ph. D. Thesis) in the Department/Faculty:

| SN | Name of Department/ Faculty | No. of M.Sc & Ph. D. Thesis | No. of Research Publication with NAAS /Thomson & Reuters rating | | | Major Agencies of Placement | Remarks |
|----|---------------------------------------------|-----------------------------|-----------------------------------------------------------------|---------|-------|-----------------------------|--------------------|
| | | | <5 | 5.0-7.5 | > 7.5 | | |
| 1 | Floriculture, Medicinal and Aromatic Plants | M. Sc. – 1 Ph. D. - 1 | -- | -- | -- | DBT | Research Associate |

18. Placement Cells/Students Placed:

| SN | Name of Department/ Faculty | % UG students got placement |
|----|---------------------------------------------|-----------------------------------------------------------|
| | | 2016-17 |
| 1 | Floriculture, Medicinal and Aromatic Plants | No separate student for UG Programme under the Department |

19. Status of Online Internet connectivity/Wi-Fi facility in the Department/Faculty:

| SN | Name of Deptt. /Faculty | Node number | Remarks |
|----|---------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Floriculture, Medicinal and Aromatic Plants | Nodes-03 Extention points-06 | From one existing node extension points have been distributed to the different part of the department using Cable and 8-port Desktop Switch |

20. Library Strengthening:

A) Status of Funds Disbursed and Facility & Resources Developed Cost Department/Faculty

(Rs. in Lakh)

| Year | Funds Received | List of Digitization Facility & Resources Developed | No. of Faculty & Students availing facilities | Total Cost |
|---------|----------------|-----------------------------------------------------------------|-----------------------------------------------|------------|
| 2016-17 | 35.00 | Full bibliographic database completed and automated circultuion | 550 | 24.78799 |

| | | | | |
|-------|-------|--|-----|----------|
| Total | 35.00 | | 550 | 24.78799 |
|-------|-------|--|-----|----------|

B) Status of No. of Collection (Other than CeRA) & their Cost (Rs. in Lakh)

| Year | Funds Received | No. of Collection (Other than CeRA) & their Cost | | | | | | | | | | | |
|---------|----------------|--------------------------------------------------|------|----------|------|---------|------|------------|------|----------|------|--------------------|------|
| | | Books | Cost | Journals | Cost | e-Books | Cost | e-Journals | Cost | Software | Cost | Database purchased | Cost |
| 2016-17 | 35.00 | 1010 | | 34 | | 20 | | CERA | | LIBSYS | -- | 8 | |
| Total | 35.00 | 1010 | | 34 | | 20 | | | | | | 8 | |

C) Status of Digitization of M. Sc./Ph.D Thesis & upload on e-Granth Portal (No. Only)

| Year | M. Sc. | Ph.D | Total | Uploaded on e-Granth/ KrishiKosh Portal |
|---------|--------|------|-------|-----------------------------------------|
| 2016-17 | 01 | 01 | 02 | 01 |

- i. Is your library member of AgriCat? Yes/No - No
- ii. Which Software used for Library Automation? LIBSYS software
- iii. Total No. of Users in Library Automation Software till date? 1200+
- iv. Is your library connected through all colleges library online? Yes/No (if no please specify the name of college which are not connected online) No

21. Tribal Sub- Plan of ICAR: This programme is executed in the University by the Directorate of Research (Rs. in Lakh)

| Year | Funds received | Physical Facilities created (specify district) | No. of Training Organised | No. of beneficiaries |
|---------|----------------|------------------------------------------------|---------------------------|----------------------|
| 2016-17 | | | | |

Impact of this initiative in four bullets with one good photograph

22. Centre for Advanced Faculty Training (CAFT), (if any) : The department is not having any Centre for Advanced Faculty Training (CAFT). The teachers delivered lectures in the capacity building programmes for the Faculties organised by other establishments of the University.

(Rs. in Lakh)

| Year | Funds received | Subject area of Training | No. of faculty available in each CAFT... | No. of Training Organised | No. of faculty trained |
|---------|----------------|--------------------------|------------------------------------------|---------------------------|------------------------|
| 2016-17 | | | | | |

23. No. of Faculty Members attended Seminars/Symposia/Capacity Building Programme:

| Year | Associate /Assistant /Professor | Topic / duration | Organiser |
|---------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| 2016-17 | Ms. Swathi Kolukunde | Winter School on "Protected cultivation of Commercial Flowers and Vegetables" 05.01.2017-25.01.2017 | College of Horticulture, UHS, Bagalkot |
| 2016-17 | Dr. S. Maitra | Attending and representing the University in the two days Brainstorming Workshop of Coordinators (ELP) of SAUs/ DUs / CUs, organized and | ICAR, New Delhi at NASC Complex |

| Year | Associate /Assistant /Professor | Topic / duration | Organiser |
|---------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| | | October 05-06, 2016 | |
| 2016-17 | Dr. S. Maitra | Acted as a resource person in the <i>Awareness Cum Farmers' Training Programme</i> on - Development of Spices, Medicinal and Aromatic Plants and Its Industries in North Bengal and delivered a lecture on - Importance and Scope of Medicinal Plants in North Bengal on 27.08.2016. 27-28 th August, 2016 | UBKV, Pundibari |
| 2016-17 | Dr. S. Maitra | Acted as a resource person in the <i>State Level Seminar</i> on - Development of Spices, Medicinal and Aromatic Plants and Its Industries in North Bengal and delivered a lecture on - Cultivation of Medicinal and Aromatic Plants in North Bengal on 17.12.2016 16-17, December, 2016 | RRSS, OAZ, UBKV, Manickchak |

24. Curriculum Development& Delivery in the Department/Faculty:

(i). Practical Manuals developed:

(ii). Instructional Material developed: Power Point Presentations of Course Lectures

25. Details of State/National/International/ Award; Best Teacher/Thesis/Paper Awards; any other Honour and recognitions:

Dr. S. Maitra -

- Louis Pasteur Research Award – 2016 offered by International Agency for Standards and Ratings.
- Fellow of Directorate of Floriculture, IASR
- Best Teacher Award (Adarsh Vidya Saraswati Rashtriya Puraskar) offered by Global Management Council, Glacier Journal Research Foundation, Ahmedabad, Gujarat on 5th September, 2016.
- Selected as a member of Technical Expert Cum Screening Committee of WBSMPB

26. Details of Patents/ R&D breakthroughs/New Products/New Processes/Concepts/Varieties/Genetic Stocks /cultural practices/New cropping systems etc Developed: NIL

27. Award won in Agri-Unifest&Agri-Sports: Students participated but did not achieve awardable position

28. List Two Major Constraints Faced by the University for Quality Enhancement:

Frequent power cut and power fluctuation

Severe space crisis in the department stands on the way of development of good analytical laboratory

29. Mention the Most Significant Five Achievements/Impacts:

- Maintenance of germplasm of ornamentals like Bird of Paradise, Orchids, Gerbera, Anthurium, Chrysanthemum and raising of saplings of ornamental plants
- Collection, conservation and maintenance of germplasm of medicinal plants and development of a Herbal Garden and Ad-hoc Project on Asiatic Lily is sponsored by WBDST
- All the Doctoral Degree students are qualified in NET examination
- Teacher selected as a member of technical screening cum monitoring committee of WBSMPB
- Teachers obtained different awards

30. Provide the Five Best Quality Photographs of the Activities Depicting Impact Mentioned in the Report:

Please see ANNEXURE - I

31. List of Top Five Priority Areas Related to Higher Agriculture Education Improvement:

- Organic Farming
- Production of quality planting material
- Post-harvest management and Value Addition
- Quality assessment and development of herbal formulations
- Bioprospecting of medicinal plants

32. SWOT analysis for Education/Research in the Department/Faculty:

Strength:

- Desire of the faculties
- Sincerity of the faculties

Weakness:

- Infrastructural facility
- Not having well equipped laboratory

Opportunity:

- Increase in the importance of floriculture and cultivation of medicinal and aromatic plants throughout the world
- Existence of several agro-climatic bottlenecks leading to increased scope of research on these crops

Threat:

- Increase in the number of students in this subject throughout the country
- Higher initial investment for commercial floriculture

33. Details of faculty attending seminars/symposia (ICAR funds)/capacity building programme:

This information is already presented in point number 23

34. Details of students welfare activities organised/attended:

Activities organised centrally by the University and the teachers of the department actively participated in those programmes

35. Faculty profile/ Teachers Biography with list of all publications:

Please see ANNEXURE-II

36. What are the improvements/enhancements which were achieved by the Department/Faculty::

- New Departments in the existing colleges: No
- New Labs in the existing colleges: Plant Tissue Culture Laboratory
- New Educational programmes: Accepted the Vth Deans Committee recommendations and reorient the academic curriculum accordingly
- New Skill training programmes: Training programmes on Biofarming of Anthurium and Gerbera have been organised and delivered skill developing practical oriented lectures on conservation, propagation, cultivation and post-harvest management of ornamental, medicinal and aromatic plants in the programmes organised by other establishments of the University and other institutions
- New Civil Works/infrastructural facilities: Creation of double door facility in the plant tissue culture laboratory
- Increase in intake of student capacities: Necessary steps have been taken by the University
- Enhancement of input use efficiencies with new implements/machines/formulations: No
- Reduction in cost of cultivation of various crops/products/processes: Yield enhancement studies on Marigold, Gerbera and Gladiolus using conventional and non-conventional agro-inputs have been conducted.
- Yield enhancements of various crops including horticultural fruits and vegetables/Animals/Fishes: No
- Green initiative made i.e., water harvesting/conservation of University farms/Farmer's field: No
- Water retention/harvesting on community land (CPRs): No
- Number of rural rapid appraisal of village/taluka /district: PRAs have been conducted each year during RHWE Programme
- Consultancy to individual farmers/companies/communities: Several times as shown in the biography of the teachers of the department
- Combined impact of all disciplines/technologies on a given habitat/Village/Taluka: Initiation of cultivation of Gladiolus and Marigold in the nearby villages



Production of Marigold under ELP



Maintaining Chrysanthemum germplasm



Production of winter annuals in the instructional farm



Raising of saplings of ornamentals under ELP



BIODATA OF THE TEACHERS OF THE DEPARTMENT

BIO-DATA OF DR. INDRAJIT SARKAR:



Name : **INDRAJIT SARKAR**
 Designation : Associate Professor and Head
 Department : Floriculture, Medicinal and Aromatic Plants
 Institute/University : Uttar Banga Krishi Viswavidyalaya [UBKV]
 Address : Pundibari, CoochBehar
 West Bengal, India, PIN- 736165
 Telephone : +91-3582-270756(O)
 +91-9434814181(M)
 Fax : +91-3582-270157 (O)
 E-mail : indrajitsarkar_kpg@yahoo.co.in

Date of Birth : 01.01.1974
 Sex (M/F) : Male
 Caste : Schedule Caste

Qualifications:

| Examination passed | Board/University | Year of passing | Percentage of marks obtained | Division/Class |
|----------------------------------------------|------------------|-----------------|------------------------------|----------------|
| Madhyamik Pariksha | W.B.B.S.E. | 1991 | 63.11 | 1 st |
| Higher Secondary (10+2) | W.B.C.H.S.E. | 1993 | 71.80 | 1 st |
| B. Sc. (Ag) Hons. | B.C.K.V. | 1997 | 62.38 | 2 nd |
| M. Sc. (Hort.) in Floriculture & Landscaping | B.C.K.V. | 2000 | 73.00 | 1 st |

Academic Research Degree(s):

| Degree | Name of the University | Date of award | Title |
|--------|------------------------|---------------|-------------------------------------------------------------------------|
| Ph. D. | Visva-Bharati | 26.08.2014 | Yield Potentiality of Gladiolus Germplasm, Use of Growth Regulators and |

| | | | |
|--|--|--|------------------------------------------------|
| | | | Organic Production in the Hills of West Bengal |
|--|--|--|------------------------------------------------|

Details of Teaching/ Research/Academic Experience:

| Designation | Employer | Period of service From To | Scale of pay |
|----------------------------|-----------------------|--------------------------------------------------------------|-------------------------------------------------------------------|
| Assistant Professor (Gr-1) | Vice-Chancellor, UBKV | 10.12.2001 to 09.12.2007 | Rs. 8000-13500 (Pre-revised) and 15600-39100; AGP-6000. (Revised) |
| Assistant Professor (Gr-2) | -do- | 10.12.2007 to 29.04.2014 (due for AGP-8000 on 10.12.2012) | 15600-39100; AGP-7000. (Revised) |
| Associate Professor | -do- | From 30.04.2015 till date | 37400-67000 (AGP-9000) (Revised) |

Instructional Activities:

| Sl.No. | Course taught | Undergraduate or Post Graduate | Year |
|--------|------------------------------------------------------------------------------------------------------------------|--------------------------------|------|
| 1. | Production technology of loose flowers | Postgraduate (M. Sc.) | 2014 |
| 2. | Landscaping and ornamental gardening | Postgraduate (M. Sc.) | 2014 |
| 3. | Protected Floriculture | Postgraduate (M. Sc.) | 2014 |
| 4. | Advances in flower production technology | Postgraduate (Ph. D.) | 2014 |
| 5. | Advances in medicinal and aromatic crop production technology | Postgraduate (Ph. D.) | 2014 |
| 6. | Advances in protected and precision floriculture | Postgraduate (Ph. D.) | 2014 |
| 7. | Fundamentals of Horticulture | Undergraduate | 2015 |
| 8. | Ornamental Horticulture | Undergraduate | 2015 |
| 9. | Commercial Floriculture | Undergraduate | 2015 |
| 10. | | | |
| 11. | Medicinal and aromatic crops | Undergraduate | 2015 |
| 12. | Production technology of cut flowers | Postgraduate (M. Sc.) | 2015 |
| 13. | | | |
| 14. | Production Technology of medicinal and aromatic crops | Postgraduate (M. Sc.) | 2015 |
| 15. | Production technology of loose flowers | Postgraduate (M. Sc.) | 2015 |
| 16. | Landscaping and ornamental gardening | Postgraduate (M. Sc.) | 2015 |
| 17. | Protected Floriculture | Postgraduate (M. Sc.) | 2015 |
| 18. | Rural Horticultural Work Experience(coordinator) | Undergraduate | 2015 |
| 19. | Hands on Training programme on Commercial Nursery Management and commercial floriculture for the B. Sc. students | Undergraduate | 2015 |
| 20. | Industrial Training Programme | Undergraduate | 2015 |
| 21. | Commercial Floriculture | Undergraduate | 2016 |
| 22. | Medicinal and aromatic crops | Undergraduate | 2016 |
| 23. | Protected cultivation and post-harvest technology | Undergraduate | 2016 |
| 24. | Rural Horticultural Work Experience | Undergraduate | 2016 |
| 25. | Experiential Learning Programme (Horticulture)-2016-17 [Hands on Training programme on Commercial Nursery | Undergraduate | 2016 |

| | | | |
|-----|---------------------------------------------------------------------------|-----------------------|------|
| | Management and commercial floriculture for the B. Sc. Students] | | |
| 26. | Industrial Training Programme | Undergraduate | 2016 |
| 27. | Production technology of loose flowers | Postgraduate (M. Sc.) | 2016 |
| 28. | Landscaping and ornamental gardening | Postgraduate (M. Sc.) | 2016 |
| 29. | Production technology of cut flowers | Postgraduate (M. Sc.) | 2016 |
| 30. | Production Technology of medicinal and aromatic crops | Postgraduate (M. Sc.) | 2016 |
| 31. | Protected Floriculture | Postgraduate (M. Sc.) | 2016 |
| 32. | Production technology of loose flowers | Postgraduate (M. Sc.) | 2017 |
| 33. | Landscaping and ornamental gardening | Postgraduate (M. Sc.) | 2017 |
| 34. | Medicinal and aromatic crops | Undergraduate | 2017 |
| 35. | Commercial Floriculture | Undergraduate | 2017 |
| 36. | Production technology of spices, medicinal, aromatic and plantation crops | Undergraduate | 2017 |

Research activities:

- Collection and Maintenance of Different Ornamental shrubs, herbs and house plants.
- Collection, Maintenance and Evaluation of different hybride of orchids.
- Collection, Maintenance and Evaluation of different wild species of orchids.
- Collection, Maintenance and Evaluation of different varieties of Anthurium.
- Collection, Maintenance and Evaluation of different varieties of Gerbera.
- Collection, Maintenance and Evaluation of different varieties of Alstroemeria.
- Collection, Maintenance and Evaluation of different varieties of gladiolus.
- Collection, Maintenance and Evaluation of different varieties of chrysanthemum.
- Standardization of drying techniques and value addition of flowers and other ornamentals.
- Standardization of organic farming techniques for flower crops for Terai region of West Bengal specially Marigold and Tuberose.
- Collection, Maintenance and Evaluation of different varieties of Tuberose.

Popularization of new technologies:

| Title of Technology | Methods adopted | Impact assessment | Individual/ Collaborative |
|---------------------------------------------------|---------------------------------------------|-------------------|---------------------------|
| Organic Cultivation practices in Orchids | Training-theory and practical demonstration | Satisfactory | Individual |
| Organic Cultivation practices in <i>Anthurium</i> | Training-theory and practical demonstration | Satisfactory | Individual |
| Integrated nutrient management in Orchids | Practical demonstration | Satisfactory | Individual |
| Integrated nutrient management in Carnation | Training-theory and practical demonstration | Satisfactory | Individual |

| | | | |
|--------------------------------------------------------------------------------|---------------------------------------------|--------------|------------|
| Integrated nutrient management in <i>Anthurium</i> | Practical demonstration | Satisfactory | Individual |
| Standardization of vegetative propagation techniques in <i>Anthurium</i> | Training-theory and practical demonstration | Satisfactory | Individual |
| Standardization of slow release fertilizers in perennial flowering crops | Training-theory and practical demonstration | Satisfactory | Individual |
| Standardization of chemicals on weed control in gladiolus | Training-theory and practical demonstration | Satisfactory | Individual |
| Post harvest Technology for flowers and value addition as Flower's arrangement | Training-theory and practical demonstration | Satisfactory | Individual |

Collaborative extension programmes:

| Title of Technology | Methods adopted | Impact assessment | Individual/ Collaborative |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------|----------------------------------|
| “Post harvest technology of flowers/cut flowers” held at KVK Darjeeling sponsored by D.R.D. cell, rural development department, Darjeeling, DGHC from 21.03.2005 to 30.03.2005. | Skilled Training | Satisfactory | Collaborative |
| “Flower arrangement for unemployed farm women to upgrade their socio-economic condition by self employment” held at Darjeeling KVK on 07.06.2006. | Training-Theory and practical | Satisfactory | Collaborative |
| “Floriculture-an ideal enterprise for economic development of hills” held at Darjeeling KVK on 10.03.2010 during technology week 2010 from 8 th – 12 th . | Training | Satisfactory | Collaborative |

| | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------|---------------|
| “Anthurium cultivation” on 22.04.2010 in the programme of training of extension functionaries under a NGO working in the Kalimpong hills. | Training | Satisfactory | Collaborative |
| “ Post Harvest Technology for Flowers and Value Addition as Flower’s Arrangement” at Darjeeling KVK on 09.01.2014. | Training-Theory and practical | Satisfactory | Collaborative |
| “ Post Harvest Management and Value Addition of Flowers using preservatives as vase arrangement” at Darjeeling KVK on 16.01.2014. | Training-Theory and practical | Satisfactory | Collaborative |

Radio Talks/TV shows:

| Title | Date |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Participated as specialist in Annadata programme entitled “Decorative varieties of Orchids” telecasted by ETV | 16.09.2004 |
| Participated as specialist in Annadata programme entitled “Propagation of Orchid” telecasted by ETV | 17.09.2004 |
| Participated as specialist in Annadata programme entitled “Different diseases of Orchid” telecasted by ETV | 18.09.2004 |
| Participated as an expert in the Doordarshan, Jalpaiguri programme titled “Orchid production” | 28.05.2005 |
| Participated as an expert on live phone-in programme of Doordarshan, Jalpaiguri on the topic of “ Uttarbange phool-o-Fal Chaser Sambhabana Katota” | 26.02.2009 |
| Participated as an expert in the Doordarshan, Jalpaiguri programme titled “Paharey Anthurium Chaas” | 05.01.2010 |
| Participated as an expert on live phone-in programme of Akashbani, Siliguri on the topic of Uttarbange phool Chaser Sambhabana . | 12.06.2015 |

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| Participated as an expert on live phone-in programme of Akashbani, Siliguri on the topic of Uttarbange banigik vitite phool Chaser Sambhabana abong chas padhati. | 10.11.2016 |
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Awards:

1. Best paper Award in the theme area 'Hi-tech Floriculture' on the occasion of National Symposium on Recent Trends and Future Strategies in Ornamental Horticulture, 1-4th Dec'2004 at U.A.S., Dharwad.
2. ROC Best Paper Award, 2005 for the paper entitled "Variability studies in chrysanthemum grown over two environments". *Res. On crops* 6(3):514-516(2005).

Research publications:

| Sl. No. | Name of the Journal with volume & page number | Title of the Publication | Author | Year of Publication | NAAS Rating/ Impact Factor |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------------|----------------------------|
| 1. | <i>Proceedings of National Symposium on Commercial Floriculture in India, 22-24th January, 2000, B.C.K.V., Mohanpur, West Bengal. Pp. 112-116.</i> | Effect of different holding solutions on vasselife of Rose (cv. Etiole De France) | Mandal, M.K., Roychowdhury, N. and Sarkar, I. | 2000 | - |
| 2. | <i>Indian Biologist. 35(2): 9-13.</i> | Effect of growth regulators on growth and flowering of <i>Gerbera jamesoni</i> L. cv. Constance. | Nayak, D., Mandal, T., Sarkar, I. and Roychowdhury, N. | 2003 | - |
| 3. | <i>J. Interacad. 7(3): 269-272.</i> | Effect of Pinching methods on growth, development and flower production of Carnation cv. 'chabaud Mixed' under open condition. | Sarkar, I. , Maitra, Soumen and Roychowdhury, Nilimesh. | 2003 | - |
| 4. | <i>Environment and ecology. 21(3): 696-698.</i> | Effect of Nitrogen and Phosphorus on growth and flowering of carnation, cv. Chabaud Mixed under Open condition. | Sarkar, I. and Roychowdhury, Nilimesh | 2003 | 2.1 |
| 5. | <i>Journal of Ornamental Horticulture 7(3-4):230-</i> | Performance of gerbera under protected condition in hilly region of West | Sarkar, I. and Ghimiray, T.S. | 2004 | - |

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|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------|------------|
| | 234. | Bengal. | | | |
| 6. | <i>Res. On Crops</i> . 6 (3): 514-516. | Variability studies in Chrysanthemum grown over two environments. | Ghimiray, T. S., Sarkar, I. and Roy, A. | 2005 | 6.2 |
| 7. | Abstract paper published in ' <i>National Symposium on Sustainable Production and Export of Horticultural Crops</i> ' held at dept. of Floriculture and landscaping, Faculty of Horticulture, B.C.K.V, December, 2-4, pp-8. | Evaluation of some varieties of <i>Anthurium</i> in Eastern Himalayan Regions of West Bengal . | Sarkar, I. and Roy, A. | 2005 | - |
| 8. | Abstract paper published in ' <i>National Symposium on Sustainable Production and Export of Horticultural Crops</i> ' held at dept. of Floriculture and landscaping, Faculty of Horticulture, B.C.K.V, December, 2-4, pp-62. | Studies on the incidence of pests of carnation and reaction of different germplasms. | Pal, S. and Sarkar, I. | 2005 | - |
| 9. | <i>The Hort. J.</i> 19 (1): 41-43. | Effect of different rooting media on rooting of carnation (<i>Dianthus caryophyllus</i> L.) cuttings cv. Chabaud Super Mix. Under the plains of West Bengal. | Maitra, S., Sarkar, I. and Roychowdhury, N. | 2006 | 2.5 |
| 10. | Abstract paper published in ' <i>National Symposium on ornamental bulbous Crops</i> ' held at SVBPUA & T, Meerut, U.P. December, 5-6, pp-63. | Comparison of performance of gladiolus cultivars under polyhouse and open condition. | Sarkar, I. and Maitra, S. | 2005 | - |
| 11. | <i>Insect Environment</i> , 15 (1): 17-18. | Record of Common Rose Butterfly, <i>Pachliopta aristolochiae</i> (Fab.) on Medicinal Plant, <i>Aristolochia indica</i> L. in Terai region of West Bengal. | Pal, S., Maitra, S. and Sarkar, I. | 2009 | 2.9 |
| 12. | <i>The Journal of Plant Protection Sciences</i> , 1 (1): 98-101. | Pests infesting ornamental plants in hilly region of West | Pal, S. and Sarkar, I. | 2009 | - |

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|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------|---|
| | | Bengal. | | | |
| 13. | Abstract paper published in <i>National conference on Floriculture for Livelihood and Profitability</i> held at dept. of Floriculture and landscaping, I.A.R.I., New Delhi-12, March,16-19, pp-134-135. | Studies on performance of standard carnation varieties under protected condition. | Sarkar,I. and Roy,A. | 2009 | - |
| 14. | <i>Journal of Ornamental Horticulture</i> , 13(2): 127-132. | Studies on the pest incidence and varietal reaction of spray type carnation under mid-hill conditions of Kalimpong, West Bengal. | Pal, S. and Sarkar, I. | 2010 | - |
| 15. | Abstract paper published in '3 rd International Seed Conference and Fair 2012, February, 8-10. Pp-63. | Planting material production behavior of three different cultivars of gladiolus (<i>Gladiolus</i> sp.). using bio-resource technology in the hilly tract of West Bengal. | Sarkar,I. , Maitra,S. and Chakravorty,S. | 2012 | - |
| 16. | Abstract paper published in ' <i>International Conference on Glo-Cal Crisis and Environment Governance in North-Eastern Region of India</i> , ,November11-13. Pp-156-157. | Evaluation of gladiolus cultivars with respect to flowering attributes in Darjeeling Hills of West Bengal. | Sarkar,I. , Maitra,S. and Chakravorty,S. | 2013 | - |
| 17. | Abstract paper published in ' <i>National Seminar on Agriculture and Bio-Security in Changing Scenario</i> , February,1-3. Pp-9. | Efficacy of bio-resources for corms and cormlet production of three different cultivars of gladiolus (<i>Gladiolus</i> sp.) in the Hilly region of West Bengal. | Sarkar,I. , Chakravorty,S. and Maitra,S. | 2014 | - |

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|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------|---|
| 18. | <i>Journal of Agriculture and Technology</i> , 1(1):80-85 | Varietal Performance on Important Floral Attributes of 15 Indigenous and Exotic Varieties of Gladiolus in North Eastern Himalayan Region. | Sarkar,I. and Chakraborty,S. | 2014 | - |
| 19. | Abstract paper published in ' <i>National Seminar on Adaptation and Mitigation Strategies of Climate Change for Sustainable Livelihood</i> , March, 5-7. Pp-9 -10. | Evaluation of Anthurium (<i>Anthurium andraeanum</i> Lind.) | Sarkar,I., Chakravorty,S. and Maitra,S. | 2014 | - |
| 20. | Abstract paper published in ' <i>International Conference on Horticulture for Nutritional Livelihood and Environmental security in Hills: opportunity and challenges</i> , May, 22-24. Pp-B-43. | Effect of Plant Growth Regulators on corm and cormlet production of Three different cultivars of gladiolus (<i>Gladiolus sp.</i>) in the hilly region of West Bengal. | Sarkar,I., Chakravorty,S. and Maitra,S. | 2014 | - |
| 21. | Abstract paper published in ' <i>International Conference on Horticulture for Nutritional Livelihood and Environmental security in Hills: opportunity and challenges</i> , May, 22-24. Pp-C-4-5. | Underutilized Crops of Darjeeling Himalaya: A Reappraisal. | Mukherjee, D.,Roy, A.,Sharma,B.R., Ghimeray,T.S., Gurung, S., Pal, S., Sarkar, I. Chakravorty,S. and Baskey, S. | 2014 | - |
| 22. | Abstract paper published in ' <i>International Conference on</i> | Evaluation of Different Herbicides for protection of | Mukherjee, D. and | 2014 | - |

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|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------|-------------|
| | <i>Horticulture for Nutritional Livelihood and Environmental security in Hills: opportunity and challenges</i> , May, 22-24. Pp-D-11-12. | Gladiolus Crop from Weeds under Mid Hill Condition | Sarkar, I. | | |
| 23. | Abstract paper published in <i>'International Conference on Horticulture for Nutritional Livelihood and Environmental security in Hills: opportunity and challenges</i> , May, 22-24. Pp-F-13. | Effect of different organic potting media on growth, development and flowering of Anthurium (<i>Anthurium andraeanum</i> Lind.) cv. Nitta | Maitra, S. Roychowdhury, N. and Sarkar, I | 2014 | - |
| 24. | Indian Journal of Agricultural Research. Accepted of full paper for publication. | Evaluation of gladiolus cultivars with respect to flowering attributes in Darjeeling hills of West Bengal. | Sarkar,I, Chakravorty,S. and Maitra,S. | 2014 | 3.86 |
| 25. | Pest management in Horticultural Ecosystem | Varietal reaction of carnation to bud borer, Helicoverpa armigera(Hubner) in relation to plant characters. | Pal, S., I. Sarkar, H. Chatterjee and S. K. Senapati | 2015 | - |
| 26. | International Journal of Agricultural science and research | Performance of standard carnation(<i>Dianthus caryophyllus</i>) under low cost polyhouse condition in hilly region of West Bengal. | Sarkar, I. and S. Sharma | 2016 | - |
| 27. | International Journal of Environment, Ecology, Family and Urban Studies | Comparison of performance of gladiolus cultivation under polyhouse and open conditions | Sarkar, I. and S. Sharma | 2016 | - |
| 28. | Eco. Env. & Cons. | Varietal performance and choice of exotic and indigenous varieties in North Eastern Himalayan region | Sarkar, I. , S. Chakraborty and S. Maitra | 2016 | - |

Book Chapters/Technical Bulletin/Popular article/ Manuals:

| Item | Year | Details | Publisher | Pages |
|--------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------|
| Book Chapters | 2005 | Sarkar, I., Ghimiray, T.S. and Roy, A. (2005). Evaluation of Chrysanthemum varieties under naturally ventilated low cost poly house and open field condition. In: <i>stress Biology</i> (eds. U. Chakraborty and B. Chakraborty) . | Narosa Publishing House, New Delhi, India. | 181-185. |
| Book Chapters | 2011 | Sarkar, I. (2011). Organic Floriculture. In: <i>Organic Practices in hill agriculture</i> (eds. Dhiman Mukherjee and Amar Roy) | Directorate of Research, Uttar Banga Krishi Viswavidyalaya, Pundibari, Cooch Behar, West Bengal. | 93-103. |
| Technical Bulletin | 2009 | Sarkar, I., Mondal, T., Naveen Kumar, P., Rajiv Kumar, Mishra, Sanyat, Mishra, R.L.and Singh, K.P.(2009).Temperate Orchids. | AICRP on Floriculture, Technical Bulletin No. 28, IARI, New Delhi. | 01- 77. |
| Popular article | 2006 | Sarkar, Indrajit (2006). Unnata Prathay Anthurium ar chas paddhati In: Uttar Bange Baniji bhittite ful chas. | Faculty of Horticulture. UBKV & KVK, Cooch behar. | 29-35. |

National Seminar/Symposium/Workshop attended:

| Sl. No. | Seminar/ Symposium/ Workshop/ Training (Mention category) | Year | Organizing Institute | Title of the Seminar/ Symposium/ Workshop/ Training | Duration | Remarks |
|---------|-----------------------------------------------------------|------|---------------------------------------------|--------------------------------------------------------|-----------------------------|--------------------------------|
| 1. | Symposium | 2000 | Department of floriculture and Landscaping, | National symposium on Commercial Floriculture in India | 22-24 th January | Attended and presented a paper |

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|-----------|------------|------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------|
| | | | B.C.K.V., Mohanpur, West Bengal | | | |
| 2. | Workshop | 2003 | Univ. of Agricultural Sciences, Bangalore, | xvi group meeting of AICRP on Floriculture | 17-18 th July' | Attended and presented the works done |
| 3. | Symposium | 2004 | Department of Botany, Univ. of North Bengal, Darjeeling, West Bengal | National Symposium on Current Perspective In Stress Biology | 6-8 th February | Attended and presented a paper |
| 4. | Symposium | 2004 | Department of Horticulture, U.A.S., Dharwad, Karnataka | National Symposium on Recent Trends and Future Strategies in Ornamental Horticulture | 1-4 th December | Attended and presented a paper |
| 5. | Workshop | 2005 | Department of Floriculture and Landscaping, Dr. Y.S. Parmar Univ. of Horticulture and Forestry, Nauni, Solan, H.P | XVII Annual group meeting | 12-14 th July | Attended and presented the Research Activities of the AICRP on Floriculture of Kalimpong Centre, |
| 6. | Conference | 2009 | IARI, Pusa, New Delhi | National Conference on Floriculture for livelihood and profitability held on, at | 16-19 th March | Participated and presented a research paper |
| 7. | Workshop | 2009 | Dr. B.P. Pal Auditorium, I.A.R.I., Pusa, New Delhi | XIX group meeting of AICRP on Floriculture | 10-12 th December | Attended and presented the research activities of the AICRP on floriculture of Kalimpong Centre |
| 8. | Workshop | 2011 | CTRR, Rajahmundry, A.P. | XXI group meeting of AICRP on Floriculture | 4-6 th November | Attended and presented the research activities |

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|-----|------------|------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------|
| 9. | Workshop | 2013 | YASHDA, Raj Bhawan Complex, Pune | XXI I group meeting of AICRP on Floriculture | 29-31 st January | Attended and presented the research activities of the AICRP on floriculture of Kalimpong Centre |
| 10. | Seminar | 2014 | Visva-Bharati, Sriniketan, Bolpure, West Bengal | National Seminar on Agriculture and Bio-Security in Changing Scenario | 1 st – 3 rd February | Participated and presented a paper |
| 11. | Workshop | 2014 | PAU, Ludhiana | XXIII group meeting of AICRP on Floriculture | 25-27 th February | Attended and presented the research activities of the AICRP on Floriculture of Kalimpong Centre |
| 12. | Conference | 2014 | U.B.K.V., Pundibari, Coochbehar | National Seminar on Adaptation and Mitigation Strategies of Climate Change for Sustainable Livelihood | 5 th -7 th March | Participated and presented papers |

International Seminar/Symposium/Workshop attended:

| Sl. No. | Seminar/Symposium/Workshop/Training (Mention category) | Year | Organizing Institute | Title of the Seminar/Symposium/Workshop/Training | Duration | Remarks |
|---------|--------------------------------------------------------|------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------|
| 1. | International Conference | 2013 | Assam University, Silchar, Assam | International Conference on Glo-cal and Environmental Governance in North-Eastern Region of India | 11 th -13 th , November | Participated and presented a paper |
| 2. | International Conference | 2014 | U.B.K.V.(Hill Campus),Kalimp ong, Darjeeling, West Bengal, | International Conference | 22 th -24 th ,May | Participated as an organizing member and presented papers |

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| | | | India | | | |
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Special qualification or experience:

1. Participated in the training on 'Flower arrangement' held at the Agri-Horticultural society of India, Kolkata from 01.07.99 to 03.07.99.
2. Participated in the training on 'Flower arrangement' held at the Agri-Horticultural society of India, Kolkata from 07.02.2000 to 09.02.2000.
3. Participated in the winter school on "Commercial exploitation of underutilized medicinal and aromatic plants" from 1-21st October, 2004 at the Department of Horticulture, RCA, M.P.U.A.T., Udaipur, Rajasthan.
4. Participated in the short course on "Greenhouse technology for growing horticultural crops" from 1-10th December, 2005 at Indo-Israel project, IARI, New Delhi.
5. Participated in the training programme on "DUS (Distinctness, Uniformity and Stability) testing of Ornamentals (chrysanthemum, orchid and roses) under preparation for plant varieties protection and DUS Testing through ICAR-SAU System" from 13-16th Feb, 2006 at the Division of Floriculture and Landscaping, IARI, New Delhi.
6. Participated in the summer school on "Indian exports under WTO regime-opportunities, challenges and strategies" from 3-23rd November, 2006 at the Department of Agricultural Economics, College of Agriculture, U.A.S., Dharwad.
7. Participated in the ICAR Short Course on "Landscaping and Interior Plantscaping" held at the Department of Pomology and Floriculture, College of Horticulture, KAU, from 11th to 20th October, 2010.
8. Participated in the ICAR sponsored Summer School on "Current trends in Commercial Floriculture" held at Department of Floriculture and Landscaping, Dr. Y.S. Parmar Univ. of Horticulture and Forestry, Nauni, Solan, H.P. from 1st to 21st July, 2011.

Date: 31.03.2017

Place:U.B.K.V., Pundibari

Indrajit sarkar

BIODATA OF MS. SWATHI KOLUKUNDE:

Name: Swathi Kolukunde

Email: kswathi006@gmail.com

Personal Profile

- Name : Swathi Kolukunde
- Father's Name : Shiva Kumar K.
- Date of Birth : 25.12.1987
- Sex : Female
- Contact Address : Dept. Of Floriculture, Medicinal and Aromatic Plants
F/Horticulture, Uttar Banga Krishi Viswavidyalaya
Pundibari, Cooch Behar-736165
- Contact Number : +91-827687196
- Email Id : kswathi006@gmail.com
- Permanent Address : H.No. 5-5-2, Nehru Gunj, Tandur, Ranga Reddy (Dist.)
Pin- 501141, Telangana

Educational Qualification (Higher Secondary onwards)

| Sl. No. | Name of Board/ University | Degree Awarded | Year | Award / Prize / Certificate |
|---------|---------------------------------------------------|--------------------------------------------------------------|------|-----------------------------|
| 1 | Bidhan Chandra Krishi Viswavidyalaya | Pursuing Ph. D. | - | |
| 2. | University of Agricultural Sciences, Bangalore | M. Sc.(Hort.) in Floriculture & Landscape Gardening | 2011 | 9.02/10 |
| 3 | Agricultural college, Aswaraopet, ANGRAU | B.Sc. (Hort.) | 2009 | 8.15/10 |
| 4 | Board of Intermediate Education, A.P. | Intermediate | 2005 | 92.7% |

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|---|-------------------------------------------------|------------------|------|-------|
| 5 | Board of Secondary Education, Andhra Pradesh | Secondary School | 2003 | 88.5% |
|---|-------------------------------------------------|------------------|------|-------|

Academic Experience

| S.No | Name of the Institute | Particulars | From | To |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------|------------|
| 1 | Acharya N.G. Ranga Agricultural University | Senior Research Fellow under AICRP on Integrated Farming Systems | 12-9-2011 | 18-09-2012 |
| 2 | Uttar Banga Krishi Vishwavidyalaya Dept. of Floriculture, Medicinal and Aromatic Plants, Faculty of Horticulture, Pundibari, Cooch Behar, West Bengal, 736165 | Assistant Professor | 26.02.2015 | Continuing |

Course Instructor

| S.No. | Classes | Subject |
|--------------|-------------------------|----------------------------------------------------------------------|
| 1 | Under graduation | FAM-101, FAM-201, FAM-301, FAM-351, FAM-352, VSC-203, VSC-352 |
| 2 | Post graduation | FAM-502, FAM-503, FAM-552, FAM-601, FAM-603, FAM-552 |

Publications:

1. **Swathi, K**, Tejaswini, R. Jayanthi and K.V. Jaya Prasad (2012). Influence of pollen load for the development of inbred lines in petunia. Journal of Ornamental Horticulture. 15 (1&2): 7-13.

2. **Swathi, K**, Tejaswini and K.V. Jaya Prasad. (2013). An efficient selfing technique for inbred development – A prerequisite for hybrid production in petunia. Journal of Applied Horticulture. 15(2): 110-113.
3. **K. Swathi**, and Tejaswini. (2013). Effect of pollen source for on maximizing hybrid seed production: case study in petunia. Crop Research. 45(1,2&3): 244-247.
4. **Swathi Kolukunde**, Anitha, M. and SaiduluYelguri. (2014). Aromatherapy – An Alternative Medicine ToModren Era. In National Conference on Modern Approaches To the Conservation of Medicinal Plants, 2014. PP: 141-146.
5. M. Anitha, **K. Swathi**, and A. Himabindu. (2014). Indian Traditional Medicines. In National Conference on Modern Approaches to the Conservation of Medicinal Plants, 2014. PP: 182-185.
6. **Swathi, K.**, DipikaSarmah, AyandipBiswas and Tapas Mandal. (2014). Effect of micronutrients on growth and flowering of Gerbera cv. Rosaline under the plains of West Bengal. Environment and Ecology. 4(B):
7. Dipika Sarmah, **Swathi Kolukunde** and Tapas Mandal. (2014). Evaluation of gerbera varieties for growth and flowering under polyhouse in the plains of West Bengal. International Journal of Scientific Research. 3(12): 54-55.
8. B. Shailaja, Ipsita Mishra, Srihima Gampala, Vikram Jeet Singh and **Swathi. K** (2014). Panchagavya- an ecofriendly insecticide and organic growth promoter of plants. International Journal of Advanced Research. 2 (11): 22-26.
9. R. Sadhukhan, **K. Swathi**, D. Sharma and T. Mandal (2015). Effect of Different gamma rays on survivability and rooting ability in chrysanthemum (Chrysanthemum morifolium Ramat.). Journal of crop and weed. 11(1): 62-65.
10. Aparna Tripathy, Tapas Mandal, Kalyan Charaborti and **K. Swathi**. (2016). Plant growth retardant mediated changes in growth, development and flowering of pot mum cv. Royal Purple. Bioinfolet. 13(3): 501-503.
11. SoumenMaitra, **Swathi K** and Indrajit Sarkar (2016). Essential Oils: A value-addition for improvisation of commercial Floriculture in India. J. Agric. Technol., 3(1):7-14.
12. **Swathi, K.** and Tejaswini. (2016). Evaluation of inbred lines of petunia to seed setting ability-an identification of self- incompatible line. Progressive Research. 11(Special V) - 3521-3522.

Seminars/ Symposium/ Conferences attended: 09

Details of seminars/symposium/Workshop attended

| Sl. No | Name of the programme | Organized by | Date and Duration |
|--------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------|
| 1. | 4 th International conference on Landscape and Urban Horticulture | BCKV, ISHS and Society for the Advancement of Horticulture, Kolkata | 12-14 September, 2013 3 Days |
| 2. | National seminar on Protected cultivation of horticultural crops and value addition | Department of Horticulture, Allahabad school of agriculture, allahabad | 29-30 November, 2013 2 Days |

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| 3. | National conference on Adaptation and Mitigation Strategies of Climate Change for Sustainable Livelihood | Cooch Behar Association for Cultivation of Agricultural Sciences, UBKV, W.Bengal | 5-7 March, 2014 3 Days |
| 4. | National symposium on Sustainable Agriculture for Food and Nutritional Security in East and North East India: Prospects and Future | Association for plant breeding and improvement, Institute of agricultural science, University of Calcutta & WAST | 1 st March, 2014 1 Day |
| 5. | International Conference on Horticulture for Nutritional, Livelihood and Environmental Security in Hills: Opportunity and Challenges | Uttar BangaKrishiViswavidyalaya, Kalimpong | May 22-24, 2014 3 Days |
| 6. | A Two Day National Conference On Modern Approaches To the Conservation of Medicinal Plants | Department of Botany, Andhra Loyola Collenge, Vijayawada, Andhra Pradesh | January, 27-28, 2014 2 Days |
| 7. | National conference on Environmental issues and food security in India | Foundation for science and environment | Aug, 10, 2014 1 Day |
| 8. | International seminar on Integrated Agriculture & Allied Research: Prioitizing future potentials for secure livelihoods | Crop and weed science society, BCKV, Mohanpur | Nov, 6-9, 2014 4 days |
| 9. | National conference on Bioresources Management for sustenance of ecosystem and livelihood | Cooch Behar Association for Cultivation of Agricultural Sciences, UBKV, W.Bengal | Nov, 26-29, 2015 4 days |

Attended Summer/Winter School

- Attended Winter School on “Protected cultivation of Commercial flowers and Vegetables” at College of Horticulture, UHS, Bagalkot from 05.01.2017-25.01.2017.

Present research area:

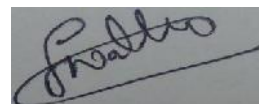
- Crop improvement with special reference to hybridization and mutation breeding of ornamentals.
- Standardization of agro-techniques of ornamentals.
- Value added product development in flowers.
- Co-PI of project entitled “Standardization of Agrotechnology and Mass multiplication of production of quality seedlings of *Woodfordia fruticosa*, *Sida cordifolia* and *Desmodium gangeticum*” funded by NMPB, AYUSH.

Declaration:

I hereby declare that the above said information is proofread and correctly describes as per best of my knowledge.

Date:27-03-2017

Place: Pundibari



Signature of the candidate

BIO-DATA OF DR. S. MAITRA:

Name : **SOUMEN MAITRA**
 Designation : Professor
 Department : Floriculture, Medicinal and Aromatic Plants
 Institute/University : Uttar Banga Krishi Viswavidyalaya [UBKV]
 [NORTH BENGAL AGRICULTURE UNIVERSITY]
 Address : Pundibari, CoochBehar
 West Bengal, India, PIN- 736165
 Telephone : +91-3582-270756(O)
 +91-94333-65907 (M)
 Fax : +91-3582-270157 (O)
 E-mail : soumenmaitra@rediffmail.com
soummaitra@gmail.com
soumenmaitra@yahoo.co.in
 Date of Birth : 29.09.1971
 Sex (M/F) : Male
 Passport no. : J 3258798
 Caste : General

**ACADEMIC QUALIFICATION**

| Degree | Year | Institution | Marks obtained | Subject |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------|
| Ph.D. (Hort.) | 2003 | Bidhan Chandra Krishi Viswavidyalaya Mohanpur, Nadia, West Bengal PIN-741252, India | 82.80% | Floriculture and Landscaping |
| Thesis title : Studies on <i>In-Vitro</i> Propagation of Ornamentals, Cultural Management and Post-Harvest Life of Carnation (<i>Dianthus caryophyllus</i> L.) and Anthurium (<i>Anthurium andraeanum</i> Lind.) | | | | |
| M.Sc.(Ag.)in Horticulture | 1997 | Do | 80.24% | Floriculture and Landscaping |
| Dissertation title : Effect of Time and Depth of Planting on Growth, Development, Flowering, Corm and Cormlet Production of Gladiolus cv. Sylvia & Influence of Different Chemicals on Vase-life of Gladiolus | | | | |
| B.Sc.(Ag.)Hons. | 1994 | Do | 72.62% | Horticulture and Agril. Entomology as elective subjects |

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|-------------------------|------|-------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------|
| Higher Secondary (10+2) | 1989 | West Bengal Council of Higher Secondary Education West Bengal, India | 70.60% | Bengali, English, Physics, Chemistry, Mathematics, Biology |
| Secondary | 1987 | West Bengal Board of Secondary Education West Bengal, India | 77.33% | Bengali, English, Physical Science, Life Science, Mathematics, History, Geography, Work Education |

POSITION AND EMPLOYMENT (Starting with the most recent employment)

| Sl No. | Institution Place | Position | From (Date) | To (date) |
|--------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 1. | Uttar Banga Krishi Viswavidyalaya Pundibari, CoochBehar West Bengal, India PIN- 736165 | Professor Department of Floriculture, Medicinal and Aromatic Plants Faculty of Horticulture | 05.01.2017 | Continuing |
| 2. | Uttar Banga Krishi Viswavidyalaya Pundibari, CoochBehar West Bengal, India PIN- 736165 | Associate Professor Department of Floriculture, Medicinal and Aromatic Plants Faculty of Horticulture | 20.05.2014 | 05.01.2017 |
| 3. | Uttar Banga Krishi Viswavidyalaya Pundibari, CoochBehar West Bengal, India PIN- 736165 | Lecturer (Sr.) [Assistant Professor (Sr.)] Department of Floriculture, Medicinal and Aromatic Plants Faculty of Horticulture | 10.12.2005 | 20.05.2014 |
| 4. | Uttar Banga Krishi Viswavidyalaya Pundibari, CoochBehar West Bengal, India PIN- 736165 | Lecturer (Assistant Professor) Department of Floriculture, Medicinal and Aromatic Plants Faculty of Horticulture | 10.12.2001 | 09.12.2005 |

*Performed the duty of the Head of the Department from 11.12.2001 to 23 .03. 2008 and 19.05.2012 to 18.05.2016

INTERNATIONAL EXPOSURE

- Participated in the 3rd International Course on **GeneBank Management and Biodiversity Conservation** at International Agricultural Research and Training Center (**UTAEM**) from **18-22 August, 2014** organised by UTAEM and AARI and sponsored by Ministry of Food Agriculture and Livestock, **Republic of Turkey at Izmir**, Republic of Turkey.
- Participated in the 3 months international training programme on **Genome Resource Conservation (Horticulture)** at **Cornell University, Ithaca, New York, USA** from **9th April, 2013 to 10th July, 2013** sponsored by National Agricultural Innovation Project, Indian Council of Agricultural Research, Government of India.
- Participated in the International Training Workshop on **Crop Seed Production Technology** from **June 21 - July10, 2012** organized by Hubei Provincial Seed Group Company Ltd., Sponsored by Ministry of Science and Technology (MOST), China at Hubei, P. R. of China at Hubei.

- Participated in the International Training Workshop on **Breeding Technology of Horticultural Crops** from **September 13-26, 2010** organized by Institute of Vegetable and Flowers, Chinese Academy of Agricultural Sciences, sponsored by MOST, China at Beijing, P. R. of China
- Act as an International peer reviewer of the submitted projects of GEORGIA NATIONAL SCIENCE FOUNDATION, STATE SCIENCE GRANTS COMPETITION 2009, Tbilisi 2009 invited by GEORGIA NATIONAL SCIENCE FOUNDATION, and evaluated two project proposals.
- Represented the University and attended the International Workshop on Investing on a Sustainable Flower Agriculture and Trade (ISFAT) organized by Indian Chambers of Commerce at Park, Kolkata on 4.12.2008
- Attended the 4th International Conference on Landscape and Urban Horticulture : Impact of Landscape Horticulture on Development of Urban Economy with Green Environment organized by International Society for Horticultural Science at Science City, Kolkata on 12-14th September, 2013, **as Organizer** and presented (poster) a paper entitled Diversity in potting media for organic vegetables and flowers among urban household – a case study in CoochBehar city of West Bengal

HONORS/AWARDS/RECOGNITION

- Louis Pasteur Research Award – 2016 offered by International Agency for Standards and Ratings.
- Fellow of Directorate of Floriculture, IASR
- Best Teacher Award (Adarsh Vidya Saraswati Rashtriya Puraskar) offered by Global Management Council, Glacier Journal Research Foundation, Ahmedabad, Gujarat on 5th September, 2016.
- Outstanding Scientist Award for the contribution and achievement in the field of Floriculture offered by Centre for Advanced Research and Design, Venus International Foundation on the occasion of VIFRA – 2015 on 19.12.2015 at Chennai, Tamil Nadu, India
- Selected as external member of Board of Studies of the Department of Floriculture and Landscaping, Faculty of Horticulture, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal from 13.08.2015.
- Indo-Nepal Friendship Award for recognition of sterling merit, excellent performance and outstanding contribution for the progress of the nation and worldwide on the occasion of Indo-Nepal Friendship Summit for - Indo-Nepal Friendship & Economic Co-operation at Kathmandu, Nepal on 2nd August, 2014 by the Economic and Human Resource Development Association
- Best Poster Award - National seminar on adaptation and mitigation strategies of climate change for sustainable livelihood on March -5-7, 2014, organized by COBACAS at Uttar Banga Krishi Viswavidyalaya, Pundibari, Coochbehar, West Bengal, India.
- Indo-Asia Achievers Award for Social / Public Services presented on the occasion of Globalization of Indian Industries and World Peace at Bangkok, Thailand on 15.02.2014 by Indian Organization for Commerce and Industry
- Indira Gandhi Excellence Award offered by International Business Council on 21.12.2013
- Distinguished scientist award in the National Level Conference on Biodiversity: Threats and Conservation through Traditional and Biotechnological Approaches organized by Dumdum Motijheel College and sponsored by UGC, CSIR and DST, Govt. of West Bengal on 4-6 February, 2012
- Selected as an expert member of the monitoring team of the West Bengal State Medicinal Plants Board for evaluation/ field verification/ monitoring of ongoing projects in West Bengal assisted by National Medicinal Plants Board from 06.02.2006 and evaluated several project works
- Act as an International peer reviewer of the submitted projects of GEORGIA NATIONAL SCIENCE FOUNDATION, STATE SCIENCE GRANTS COMPETITION 2009, Tbilisi 2009 invited by GEORGIA NATIONAL SCIENCE FOUNDATION, and evaluated two project proposals.
- National Eligibility Test (NET) in FLORICULTURE in 2001 conducted by Agricultural Scientist Recruitment Board (ASRB)

- National Eligibility Test (NET) in HORTICULTURE in 1997 conducted by Agricultural Scientist Recruitment Board (ASRB)
- Junior Fellowship in HORTICULTURE in 1994 conducted by Indian Council of Agricultural Research (ICAR)

INSTRUCTIONAL ACTIVITIES

TEACHING EXPERIENCE:

Since December, 2001, I have actively participated in various courses under UG and PG programme of the University. Upto the flag end of 2007, I was the solitary teacher in the department, catering all the courses offered by the department. Presently, I am associated to the UG and PG courses on floriculture, protected cultivation, nursery management, medicinal and aromatic plants in the University.

Teaching of Students of Other Institutes

- Guest Lecturer for PG courses (Production Technology of cut flowers, Post-harvest technologies of fruit, vegetable and ornamental crops) at the Department of CIHAB, Visva-Bharati, Sriniketan, West Bengal on 17.12.2014 and delivered 6 theoretical and 1 practical class lectures
- Delivered an invited classroom and practical oriented lecture at UBKV on medicinal and aromatic plants to the students of Allahabad Agricultural Institute (Deemed University), Naini, Allahabad, UttarPradesh, on 23.06.2009.
- Class lecture in the Farmers' Field School at ATC, CoochBehar on Importance of medicinal and aromatic plants and Commercial cultivation of medicinal and aromatic plants like Aloe, Citronella, Mentha on 29.08.2005 and 31.08.2005 respectively.

Preparation of course module – for 5 times under different programmes

Organisation of Faculty upgradation lecture - for 5 times

Paper setter and External Examiner:

Act as External Paper setter and Evaluator (both theory and practical examinations) as well as expert in M. Sc. Thesis viva examination in different Universities of India the details of which is presented below -

UG – 36 times

PG – 16 times

Associated to examination procedure of other organizations

- **Board Observer** - For Joint Entrance Examination (WBJEEM-2014) for admission to Engineering/Technology and Medical/Dental and Pharmaceutical Degree Courses in Universities/Colleges in West Bengal held on 19-20 April, 2014 at COOCHBEHAR RAMBHALA SCHOOL; appointed by West Bengal Joint Entrance Examinations Board, Salt Lake City, Kolkata.
- Acted as an invigilator of JEXPO – 2011

POST GRADUATE THESIS SUPERVISION :

| Serial No. | Name of the Student / research scholar | Title of thesis | Doctorate or Master's level | Year of completion (or in progress) | Co-guide(s) (if any) |
|------------|----------------------------------------|-----------------|-----------------------------|-------------------------------------|----------------------|
| | | | | | |

| Serial No. | Name of the Student / research scholar | Title of thesis | Doctorate or Master's level | Year of completion (or in progress) | Co-guide(s) (if any) |
|------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------|----------------------|
| 1 | Khwairakpam Lily Devi Reg. No. - H-2010-1-D From – UBKV (Received <u>INSPIRE Fellowship</u>) | Studies on the quality planting material production <i>in-vitro</i> and the effect of bio-control agents and biofertilizers in the quality production of Gladiolus (<i>Gladiolus</i> sp.) through organic farming and the influence of plant growth regulators in the post harvest life of cut flowers in the Terai region of West Bengal | Doctoral | In progress (Ph. D. Thesis submitted on 19.08.2016) | Chairman |
| 2 | Abhinash Moirangthem Reg. No. - H-2012-7-D From - UBKV | Studies on growth, development, flowering and regeneration ability of tuberose (<i>Polianthes tuberosa</i> L.) cultivars in sub Himalayan Terai region of West Bengal | Doctoral | In progress | Chairman |
| 3 | Gayatri Khangjarkpam Reg. No. - H-2013-1-D From - UBKV | Studies on the effect of Gibberellic Acid (GA ₃) on growth, development, flowering, yield and quality of African Marigold (<i>Tagetes erecta</i> Linn.) cv. Pusa Narangi Gainda | Doctoral | Completed | Chairman |
| 4 | Rocky Thokchom Reg. No. - H-2013-3-D From - UBKV | Studies on the effect of plant bio-regulators on the regeneration abilities of Anthutium (<i>Anthurium andraeanum</i> Lind.) and Iris (<i>Iris ensata</i> Thunb.) <i>in-vitro</i> | Doctoral | In progress | Chairman |
| 5 | Ningma Sherpa Reg.No. - H-2011-2-M From - UBKV | Effect of plant growth regulators on growth, development and flowering of African Marigold (<i>Tagetes erecta</i> Linn.) cultivars | Master's | 2013 | Chairman |
| 6 | Pawan Gurung Reg. No.- H-2011-4-M From - UBKV | The effect of biological resources in the production of organic African Marigold (<i>Tagetes erecta</i> Linn.) | Master's | 2013 | Chairman |
| 7 | Bikash Bhattarai Reg. No. -H-2012-2-M From - UBKV | Comparative study of growth and flowering behavior of some winter season ornamental annuals under open field and polyhouse in the Terai Agro-ecological condition of West Bengal | Master's | 2014 | Chairman |

| Serial No. | Name of the Student / research scholar | Title of thesis | Doctorate or Master's level | Year of completion (or in progress) | Co-guide(s) (if any) |
|------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------|----------------------|
| 8 | Priya Ranjan Koley Reg. No.- H-2013-6-M From - UBKV | Studies on effect of plant growth regulators on growth, development, flowering, corm and cormlet production of gladiolus (<i>Gladiolus grandiflorus</i> L.) | Master's | 2015 | Chairman |
| 9 | Manas Mandal Reg. No.-H-2015-08-M From - UBKV | Studies on the effect of cytokinin on growth and quality production of African marigold (<i>Tagetes erecta</i> Linn.) cv. Pusa Narangi Gainda | Master's | In progress | Chairman |
| 10 | Mingma Diki Sherpa | Effect of drying techniques on dehydration quality of African Marigold, Chrysanthemum and Gerbera | Master's | In progress | Chairman |

RESEARCH ACTIVITIES

Professional Training Received:

| Year | Nature of Training | Duration | Organization where training was provided |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2014 | 3rd International Course on GeneBank Management and Biodiversity Conservation Delivered a lecture on - Biodiversity Conservation of Medicinal Plants in India on 18.08.2014 | 5 days (18-22 August, 2014) | International Agricultural Research and Training Center (UTAEM) organized by UTAEM and AARI and sponsored by Ministry of Food, Agriculture and Livestock, Republic of Turkey at Izmir, Republic of Turkey |
| 2013 | International training programme on Genome Resource Conservation (Horticulture) | 93 days (9 th April – 10 th July, 2013) | Cornell University, Ithaca, New York, USA sponsored by National Agricultural Innovation Project (NAIP), Indian Council of Agricultural Research (ICAR), Government of India |
| 2012 | Winter School (CAFT Training) on Current biochemical and molecular techniques for nutritional enhancement and stress tolerance in crop plants | 21 days (01-21 November, 2012) | Division of Biochemistry, IARI, organized by Division of Biochemistry, IARI, New Delhi and sponsored by ICAR |

| Year | Nature of Training | Duration | Organization where training was provided |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2012 | International Training Workshop on Crop Seed Production Technology | 20 days (21 June - 10 July, 2012) | Huajhong Agriculture University, Wuhan, organized by Hubei Provincial Seed Group Company Ltd., Wuhan, Hubei and sponsored by Ministry of Science and Technology (MOST), P. R. of China |
| 2011 | Training programme on Data Analysis Using SAS | 6 days (19-24 September, 2011) | UBKV, Pundibari, CoochBehar, organized by DWM (ICAR), Bhubaneswar, Orissa and sponsored by NAIP, ICAR |
| 2011 | Short Course on Current Trends in Commercial Floriculture | 10 days (20-29 July, 2011) | National Research Centre for Orchids organized by NRC for Orchids, Pakyong, Sikkim and sponsored by ICAR |
| 2010 | International Training Workshop on Breeding Technology of Horticultural Crops Delivered a lecture on Present Scenario of Horticulture Industry in India | 14 days (13-26 September, 2010) | Institute of Vegetable and Flowers (IVF) organized by IVF, Chinese Academy of Agricultural Sciences, Beijing, China sponsored by MOST, P. R. of China |
| 2009 | Winter School on Protected Cultivation | 21 days (01-21 December, 2009) | University of Agricultural Sciences, Dharwad, organized by UAS, Dharwad, Karnataka and sponsored by ICAR |
| 2005 | Winter School on Advances in Medicinal, Aromatic and Under-Utilized Plants Research | 21 days (29 September - 19 October, 2005) | CCSHAU, Hisar, organized by CCSHAU, Hisar, Haryana and sponsored by ICAR |
| 2004 | Training Programme on Introduction to LAN/WAN Technology | 6 days (6-11 September, 2004) | Central Research Institute for Jute and Allied Fibre, organized by ERNET at CRIJAF, Barrackpore, West Bengal and sponsored by ICAR |

OTHER TRAININGS RECEIVED:

- Block training – 15 days
- Farm training – 6 months
- Mushroom Cultivation Training – 1 month
- Training on flower arrangement – twice

SPONSORED PROJECTS UNDERTAKEN:

| Sponsoring Agency | Title of project | Amount of grant | Period | Co-investigators (if any) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| National Medicinal Plants Board, Department of Indian System of Medicine & Homoeopathy (Presently AYUSH), Ministry of Health and Family Welfare, Govt. of India | Central scheme for Development of Medicinal Plants | Rs. 11.00 Lacs | 31.03.2003 - 31.03.2007 | PI- Dr. S. Maitra Associated: Dr. S. Mukherjee Dr. S. Dutta Dr. A. N. Dey Dr. M. Ghosh |
| Indian Council of Agricultural Research, New Delhi | NATP Sub-project on Library Improvement and Networking | Only associated in execution part | 2002-2005 | Myself was one of the associated scientists |
| Department of Biotechnology, Ministry of Science and Technology, Government of India | Survey, identification and Micropropagation of elite clones of two high-valued endangered medicinal plants of Eastern Himalayas | Rs. 14.30 Lacs | 01.02.2005 - 31.03.2008 | PI: Dr. T. K. Mandal Co-PI : Dr. S. Maitra |
| Indian Council of Agricultural Research, New Delhi | Experiential Learning – Setting Up of Facilities for Hands On Training on Commercial Floriculture | Rs 84.00 Lacs | 5.12.2008 - 31.03.2010 | In-Charge of the Scheme: Dr. S. Maitra Associated Scientists : – Dr. S. S. Gantait, Dr. S. K. Ghosh, Dr. J. C. Jana |
| State Mission on Medicinal Plants, Dept. of FPI&H, Govt. of West Bengal, Under National Mission on Medicinal Plants, National Medicinal Plants Board | Establishment of model nursery (4 ha) in public sector at UBKV for medicinal plants | Rs. 20.00 Lacs | 16.04.2010 and continuing | PI- Dr. S. Maitra Co-PI: Dr. S. S. Gantait |
| Rashtriya Krishi Vikas Yoyona (RKVY) | Development of Bioresource Complex : A Single Window for Service and Training | Rs. 150.00 Lacs | 09.03.2010 and 31.03.2014 | One of the Co-Principal Investigators Many scientists are involved |
| Department of | <i>In-vitro</i> propagation and | Rs. 20.018 Lacs | 17.09.2012 | PI – Dr. S. Maitra |

| Sponsoring Agency | Title of project | Amount of grant | Period | Co-investigators (if any) |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------------|
| Biotechnology, Ministry of Science and Technology, Government of India | biofarming of Anthurium (<i>Anthurium andraeanum</i>) and Gerbera (<i>Gerbera jamesonii</i>) and transfer of technology in Terai-Dooars region of West Bengal | | and continuing | Co-PI: Dr. A. Sarkar |
| ACIAR, Australia | Improving water use for dry season agriculture by marginal and tenant farmers in the Eastern Gangetic Plains | Total amount is not yet finalized for this centre (Received about 5000 Australian Dollar initially) | 18.09.2014 (Launching workshop at Kathmandu) | One of the associated scientists Many scientists are involved |
| Department of Science and Technology, Govt. of W.B. | Technology standardization for lab to land of Asiatic Lily for development of tribal community in Terai-Dooars region of North Bengal under phase - I | Rs. 1421175/- | 04.04.2016 and continuing | P.I.- Dr. S Maitra |
| Directorate of Research, Uttar Banga Krishi Viswavidyalaya | Establishment of a plant tissue culture unit for research, training and commercial QPM production at UBKV | Rs. 2165000/- | 22.06.2016 and continuing | P.I.- Dr. S Maitra Co-PI: Dr. (Mrs.) M. Chakraborty Co-PI: Dr. (Mrs.) N. Sahana |

Resource scientist of the project

Identification, quantification and sustainable conservation of herbs and medicinal plants in six northern districts of West Bengal : their economic potentialities and market analysis sponsored by **DST, West Bengal** and conducted by **The Agri-Horticultural Society of India**

Coordinator

Chief Coordinator of the **Spoken Tutorial Project** of **IIT Bombay** at UBKV from 08.12.2016

RESEARCH ACHIEVEMENTS

Development of a herbal garden in the University

Germplasm registration to PGRC

Mandal, T.K., Ghosh, S. K., Maitra, S. and Bantawa, P.

- One germplasm of **Indian Wintergreen** Coll. No. SL. No. 005/FL No. 008 (INGR 10112) has been collected, conserved and registered by Plant Germplasm Registration Committee (PGRC) of ICAR, INDIA, on May 18, 2010.

Mandal, T.K., Bantawa, P., Ghosh, S. K. and Maitra, S.

- One germplasm of **Nepalese Kutki** Coll. No. 002/FI No. 002 (INGR 10111) has been collected, conserved and registered by Plant Germplasm Registration Committee (PGRC) of ICAR, INDIA, on May 18, 2010.

Important Conferences / Seminars attended

| Year | Conferences / Seminars attended | Title of paper read (if any) |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2000 | Attended the National Symposium on Commercial Floriculture in India, Kalyani, West Bengal, 22-24 January and presented a paper (oral) | Micropropagation of carnation (<i>Dianthus caryophyllus</i> L.) (oral) |
| 2000 | Attended the Seminar cum Exposition on Indigenous Drugs Their Resource Base Management, Utilisation & Conservation, The Agri-Horticultural Society of India | Took part in interaction |
| 2003 | Attended the National Symposium on Recent Advances in Indian Floriculture , 12-14 November, at Kerala Agriculture University, Trichur and presented papers | Rooting of carnation (<i>Dianthus caryophyllus</i> L.) cuttings by using different rooting media; Regeneration of carnation (<i>Dianthus caryophyllus</i> L.) from shoot-tip explants : Effect of NAA and Kinetin & Towards development of a suitable protocol for regeneration of carnation (<i>Dianthus caryophyllus</i> L.) through callus induction (posters) |
| 2005 | Attended and presented research paper in National Conference on Medicinal Plants : Resources, Application and Conservation in India, 11-12 Feb., Jadavpur University, Kolkata. | Importance of the genus <i>Piper</i> for rural health care (poster) |
| 2005 | Attended the All India Rose Convention and Rose Show , Indian Rose Federation & Agri-Horticultural Society of India, Kolkata, 14-16 January | |

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|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2007 | Attended the First Symposium on Conservation of Biodiversity on 18 March organized by Departments of Botany and Zoology, A.B.N.Seal College, CoochBehar sponsored by West Bengal Biodiversity Board and presented an invited lecture | Conservation of biodiversity of medicinal plants in India (oral) |
| 2007 | Attended the National Symposium on Medicinal and Aromatic Plants for Economic Benefit of Rural People organized by RKVM – IAS and Visva – Bharati at Kolkata, 16-18 February and presented a paper on | Role of herbal gardens in the conservation of biodiversity of medicinal plants (oral) |
| 2008 | Attended the National Workshop on “ Production, processing and marketing of spices and aromatic plants ” on 16-17 January at UBKV, Pundibari, Cooch Behar and presented a paper and acted as a Rapporteur | Studies on the effect of FYM and GA ₃ on growth and yield of Sweet Flag (<i>Acorus calamus</i> L.) under Terai Zone of West Bengal (oral) |
| 2009 | Attended the National Conference on Floriculture for Livelihood and Profitability organized by ISOH and Division of Floriculture and Landscaping, IARI at IARI, New Delhi on 16-19 March, and presented a paper (poster) | Effect of plant growth regulators on sucker production and flowering of Anthurium (<i>Anthurium andraeanum</i> Lind.) cv. Nitta in the plains of West Bengal (poster) |
| 2009 | Participated in the seminar on Medicinal Plants and Drug Industries – Prospects in West Bengal on 01 September at Rabindra-Okakura Bhavan, Salt Lake, Kolkata organized by West Bengal State Medicinal Plants Board | |
| 2010 | Attended the UGC sponsored seminar on trends in biodiversity and bioresource management organized by A.B.N.Seal College, CoochBehar, West Bengal, India, 15-16 November and delivered a lecture | Herbal Garden : an efficient tool for conservation of biodiversity of medicinal plants (oral) |
| 2010 | Attended the Botanicals in Integrated Health Care Convention 2010 (international) organized by the Agri-Horticultural Society of India, Kolkata on 26-28 December, and delivered a lecture (oral) | Herbal garden: an effective <i>ex-situ</i> conservation approach of biodiversity of medicinal plants (oral) |
| 2012 | Attended the National Level Conference on Biodiversity: Threats and Conservation through Traditional and Biotechnological Approaches organized by Dumdum Motijheel College and sponsored by UGC, CSIR and DST, Govt. of West Bengal on 4-6 February and delivered an invited talk and also act as a chairman of a session. | Conservation of biodiversity of medicinal plants in northern part of West Bengal: instant potential approaches (oral) |

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|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2012 | Attended the National Seminar on Anthropogenic Toxicants, Green Chemistry, Biodiversity and Sustainable Development: An Interdisciplinary Approach organized by Department of Zoology, P. D. Women's College, Jalpaiguri, West Bengal, India and sponsored by UGC on 13-14 March, and delivered a lecture (oral) | Multiplication techniques of herbal bioheritage of Northern part of West Bengal (oral) |
| 2012 | Act as a resource person and delivered a lecture in the State Level Seminar on Grow Spices For High Return under NHM, sponsored by DASD, Ministry of Agriculture, Govt. of India at UBKV on 28-29 March | <i>Sugandhi udvider chara tairir padhati</i> (propagation techniques of aromatic plants) (oral) |
| 2012 | Attended the National Seminar on Biotechnology for People : Applications and Awareness at P. D. Women's College, Jalpaiguri, West Bengal on 4-5 December, and presented (oral) a paper | Effect of plant bioregulators on seed germination of Ashwagandha [<i>Withania somnifera</i> (L.) Dunal] <i>in-vitro</i> (oral) |
| 2013 | Attended The First International Conference on bio-resource and stress management at Science City, Kolkata, India on 6-9 February, and presented (oral) a paper | Effect of pinching and spacing on branching and flowering of carnation (<i>Dianthus caryophyllus</i> L.) in the plains of West Bengal (oral) |
| 2013 | Attended the 4 th International Conference on Landscape and Urban Horticulture : Impact of Landscape Horticulture on Development of Urban Economy with Green Environment organized by International Society for Horticultural Science at Science City, Kolkata on 12-14 th September, , as Organizer and presented (poster) a paper | Diversity in potting media for organic vegetables and flowers among urban household – a case study in CoochBehar city of West Bengal (poster) |
| 2014 | Attended the National Symposium on Himalayan Biodiversity: Prospects and Challenges organized by North Eastern Hill University, Shillong, Meghalaya, India on 20-21 March, and presented (Oral) a paper | Chemotaxonomic diversity of herbal leafy vegetables in the Teari region of West Bengal (oral) |
| 2014 | Attended the National seminar on adaptation and mitigation strategies of climate change for sustainable livelihood on 5-7 March, at Uttar Banga Krishi Viswavidyalaya, Pundibari, Coochbehar, West Bengal, India and presented a paper (poster) | Effect of Boron application to mitigate the calyx splitting of Carnation (<i>Dianthus caryophyllus</i> L.) (poster) |

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|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2014 | Attended the International Conference on Horticulture for nutritional, livelihood and environmental security in hills: opportunity and challenges at UBKV RRS Kalimpong, Darjeeling, India on 22-24 May, and presented two papers - | Effect of plant growth regulators on growth, development and flowering of carnation (<i>Dianthus caryophyllus</i> L.) cv. Chabaub Super Mix (poster) and Effect of different potting media on growth, development and flowering of anthurium (<i>Anthurium andraeanum</i> Lind.) cv. Nitta (oral). |
| 2014 | Attended the International seminar on Integrating agriculture and allied research : prioritizing future potentials for secure livelihoods at BCKV, Kalyani, Nadia West Bengal, India on 6-9 November, and presented one paper (poster) | Studies on the comparative performance of Anthurium (<i>Anthurium andraeanum</i> Lind.) cv. Nitta under different bedding media in the plains of West Bengal (poster) |
| 2015 | Attended the National Conference on Bioresources Management for Sustenance of Ecosystem and Livelihood organized by COBACAS and Uttar Banga Krishi Viswavidyalaya on 26-29 November, 2015 at Pundibari, Coochbehar, West Bengal, India and acted as a rapporteur of a technical session | Essential oils: a value-addition for improvisation of commercial floriculture in India (Lead Lecture) |

CHAIRMAN/ RAPPORTEUR OF SEMINAR / SYMPOSIUM

Chairman / Co-Chairman of a session – 3 times

Rapporteur – 2 times

SHORT TERM COURSES/WORKSHOPS/SEMINARS ETC. ORGANIZED

Seminar and workshops

State Level – 2 times

National Level - 7 times

International Level - 1 time

Other programmes organized by the University – 12 times

RESOURCE PERSON IN DIFFERENT DISTRICT, STATE AND NATIONAL LEVEL WORKSHOPS AND SEMINARS

State Level – 10 times

Regional level – 3 times

National level - 5 times

International organized in India – 1 time

INVITED LECTURE

National Level – 3 times

LEAD LECTURE

National Level - 1 time

PUBLICATIONS

Research Paper in Journals:

Medicinal and aromatic plants

- Maitra, S.** and Chatterjee, R. (2014). Chemotaxonomic Diversity of Herbal Leafy Vegetables in the Foot Hills of Eastern Himalayan Region, India. *American Journal of Ethnomedicine*. ISSN: 2348-9502. **1**(5): 334-345.
- Chatterjee, R. and **Maitra, S.** (2014). An Inventory of the Diversity and Ethnomedicinal Properties of Cucurbitaceous Vegetables in the Homestead Gardens of Sub Himalayan Districts of West Bengal, India. *Research and Reviews: Journal of Botanical Sciences*. e-ISSN: 2320-0189 / p-ISSN: 2347-2308. **3** (4): 40-45.
- Maitra, S.** (2013). Multiplication techniques of herbal bioheritage of northern part of West Bengal : an overview. *Indian Journal of Social and Natural Sciences*. **2** (1): 122-129.
- Datta, S., Dey, A. N. and **Maitra, S.** (2009). Effect of FYM and GA₃ on growth and yield of sweet flag (*Acorus calamus* L.) under Terai Zone of West Bengal. *Journal of Horticultural Sciences*. **4**(1): 59-62.
- Bantawa, P., Ghosh, S. K., **Maitra, S.**, Ghosh, P. D. and Mondal, T. K. (2009). Status and conservation threats of *Picrorhiza scrophulariiflora* Pennell. (Scrophulariaceae): an endangered high valued medicinal plant of the Indo-China Himalayan region. *Bioremediation, Biodiversity and Bioavailability*. **3**(1&2): 15-22.
- Pal, S., **Maitra, S.** and Sarkar, I. (2009). Record of Common Rose Butterfly, *Pachliopta aristolochiae* (Fab.) on medicinal plant, *Aristolochia indica* L. in Terai region of West Bengal. *Insect environment*. **15**(1): 17-18.
- Datta, S., Dey, A. N. and Maitra, S. (2008). Effect of sowing time on growth and yield of black cumin (*Nigella sativa* L.) under Terai zone of West Bengal. *Journal of medicinal and aromatic plant sciences*. **30**: 31-33.
- Laskar, N., Datta, S., Dey, A. N. and **Maitra, S.** (2007). Alfalfa caterpillar *Colias eurytheme* Boisduval infestation in *Cassia alata* Linn. and *Cassia occidentalis* Linn. In Sub-Himalayan tract of West Bengal. *Journal of applied Zoological researches*. **18**(1): 21-23.
- Dey, A. N., Datta, S. and **Maitra, S.** (2007). Traditional knowledge on medicinal plants for remedy of common ailments in Northern part of West Bengal. *The Indian Forester*. **133**(11): 1535-1544.
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Bengali Leaflets on:

- Some common medicinal plants
- Commercial cultivation techniques of Sweet Flag
- Commercial cultivation techniques of Long Pepper
- Commercial cultivation techniques of Japanese Mint
- Gladiolus Phuler Chas (Commercial cultivation techniques of Gladiolus)

- Gainda Phuler Chas (Commercial cultivation techniques of Marigold)
- Samatal Uttarbange Sitkalin Gainda Ful Chaser Paddhati (Cultivation technique of winter marigold in North Bengal Plains)
- Gladiolus Chaser Khuntinati (Techniques of Gladiolus cultivation)

Review/ research/design/feasibility report:

- Annual report of the Central Scheme for Development of Medicinal Plants – 2003-04
- Annual report of the Central Scheme for Development of Medicinal Plants – 2004-05
- Annual report of the Central Scheme for Development of Medicinal Plants – 2005-06
- Annual report of the Central Scheme for Development of Medicinal Plants – 2006-07
- Preparation of project evaluation report on behalf of West Bengal State Medicinal Plants Board sponsored by NMPB for WB as a member of monitoring team of WBSMPB for six times after evaluation of project sites.
- Act as an evaluator of project proposal for the Department of Science and Technology, Ministry of Science and Technology, Govt. of India
- Act as an International peer reviewer of the submitted projects of GEORGIA NATIONAL SCIENCE FOUNDATION, STATE SCIENCE GRANTS COMPETITION 2009, Tbilisi 2009 invited by GEORGIA NATIONAL SCIENCE FOUNDATION, and evaluated two project proposals.

EXTENSION ACTIVITIES

CONTINUING EDUCATION PROGRAMMES CONDUCTED:

Myself is constantly engaged in technology transfer among the peasantry of North Bengal for human resource development through organizing Farmers' training programmes and delivering both theory and practical oriented lectures in the training programmes organized by different establishments of the University or other organizations or Institutions. Besides, regular advisory service related to Floriculture, Medicinal and Aromatic plants is also provided to the farmers by me **free of cost**.

I have been selected as a Member of task force for women empowerment, nutritional security and homestead intervention for reconstruction of agricultural scenario and upliftment of standard of living taking agriculture as a means of the adopted village (Uttar Chaokoakheti) of the University from 16.02.2015.

I am also associated to the agromet advisory service and Kissan Call Centre from which my suggestions on regular weather-based agro-techniques related to the crops are published several times in bulletins (weekly). I have also delivered lectures on the need for conservation of biodiversity of medicinal plants among the school-goers. The details of the activities are presented below –

Organized Farmers' Training Programme

Organized and delivered lectures in the Farmers' Awareness programme on some common medicinal plants and improved cultivation techniques of Sweet flag, long Pepper and Japanese Mint have been organized in three areas

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Bararangras on 25.03.2004

Madhupur on 26.03.2004

Patlakhawa on 28.03.2004 of CoochBehar District

Under the Central Scheme for Development of Medicinal Plants

Organized and delivered lecture in the Farmers' Awareness programme on some common medicinal plants and improved cultivation techniques of Sweet flag, long Pepper and Japanese Mint in three different beats of Chilapata Forest Range-

Chilapata Beat on 21.03.2005

Bania Beat on 22.03.2005

Mendabari Beat on 23.03.2005

Under the Central Scheme for Development of Medicinal Plants

Organised and delivered lecture in the Farmers' Awareness programme on some common medicinal plants and improved cultivation techniques of Sweet Flag, Long Pepper and Japanese Mint in two different areas –

Seminar Hall, Lalturam High School, Salkumar – 1 Gram Panchayat on 07.02.2007

Eco-Tourism Complex at Kunjanagar Forest, Jalpaiguri on 07.03.2007

Under the Central Scheme for Development of Medicinal Plants

Act as a coordinator and Delivered lecture in the farmers' training programme on **Medicinal Plants: Their Cultivation Practices in Terai Zone** organized by KVK CoochBehar at Pundibari on 24.02.2010 – 26.02.2010

Organized and delivered lecture in the farmers' training programme on Biofarming of Anthurium and Gerbera under a DBT sponsored project entitled - *In-vitro* propagation and biofarming of Anthurium (*Anthurium andraeanum*) and Gerbera (*Gerbera jamesonii*) and transfer of technology in Terai-Dooars region of West Bengal on **05.08.2013 - 07.08.2013 and 19.08.2013 – 21.08.2013.**

Organized and delivered lecture in the farmers' training programme on Organic Farming Technique of Anthurium and Gerbera under a DBT sponsored project entitled - *In-vitro* propagation and biofarming of Anthurium (*Anthurium andraeanum*) and Gerbera (*Gerbera jamesonii*) and transfer of technology in Terai-Dooars region of West Bengal on **16.03.2015 – 18.03.2015, 19.03.2015 – 21.03.2015 and 26.03.2015 – 28.03.2015.**

Delivered lecture (both theoretical and practical oriented) in farmers' training programmes for transfer of agro-technology of ornamental, medicinal and aromatic plants –

More than 140 times

Regular advisory services from the department on commercial cultivation of Flowers and Medicinal & Aromatic Plants

Invited lectures for technology transfer in programmes organized by different institutions

More than 20times

PROGRAMMES IN MASS MEDIA

Radio (Prasar Bharati) Recorded : 4

Television (Prasar Bharati) recorded : 1

Television (ETV) recorded : 8

Live Phone-in Programme (Radio) : 4

Live Phone-in Programme (TV) : 1

JUDGE IN FRUIT, FLOWER AND VEGETABLE SHOW : 20 times

MEMBER EDITORIAL BOARD

Member of Editorial board cum Publication committee of UTTARER KRISHIKATHA - the seasonwise agriculture based bulletin of Uttar Banga Krishi Viswavidyalaya in Bengali from its inception – October, 2013

Member of Editorial Board of Glacier Journal of Scientific Research from September, 2016

Editorial Board Member of the Bilingual Magazine 'Prajukti' published from BCKV from 24.08.2016

REVIEWER

National

Act as a reviewer of Journal of Medicinal and Aromatic Plants Sciences (JMAPS), CIMAP, CSIR, Lucknow, for two times and reviewed two research papers

Act as a reviewer of *Journal of Agriculture and Technology* and reviewed one research paper

International

Act as a reviewer of **Acta Physiologia Plantarum** for three times and reviewed three research papers

Act as a reviewer of **African Journal of Agricultural Research**, and reviewed a research paper

Act as a reviewer of **African Journal of Pharmacy and Pharmacology** and reviewed one research paper

Act as a reviewer of **International Journal of Agriculture Sciences** and reviewed one research paper

Dated: Pundibari, the 31st March, 2017


(SOUMEN MAITRA)