# CURRICULUM - VITAE

**Dr. RM. KATHIRESAN,** M.Sc. (Ag.), Ph.D., D.Sc.
VICE CHANCELLOR
ANNAMALAI UNIVERSITY

# CURRICULUM VITAE

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| NAME | : | **Dr. RM. KATHIRESAN,** M.Sc.(Ag.), Ph.D., D.Sc., |
| DATE OF BIRTH | : | **02.07.1960** |
| CITIZENSHIP STATUS | : | Indian |
| OFFICIAL ADDRESS | : | Dr. RM. Kathiresan<br>VICE CHANCELLOR<br>Annamalai University<br>Annamalainagar<br>Tamilnadu-608 002, India.<br>Phone: ++91- 4144-237066<br>E-mail: rmkathiresan.agron@gmail.com & auvcrmk@gmail.com<br>Website: http://www.rmkathiresan.in/ |
| RESIDENTIAL ADDRESS | : | Dr. RM. Kathiresan<br>VICE CHANCELLOR BUNGALOW<br>Annamalai University<br>Annamalainagar<br>Tamilnadu-608 002, India.<br>Mobile: ++ 91- 9655188233 &<br>++91-7708218414 |

## EDUCATIONAL QUALIFICATIONS

| Degree | Discipline | University | Class / Division | Year of Passing / Awarded |
|---|---|---|---|---|
| **D.Sc. (Doctor of Science)** | Agronomy | Annamalai University, India. | **First Degree awarded by Research in Agronomy in the Whole of South India** *Title: "Contributions to Weed Management"* | 2009 |
| **Post Doctoral Research** | Agronomy | University of Bristol, U.K. | As **Commonwealth Senior Academic Staff Fellow** sponsored by ACU, **U.K.** | 1997-98 |
| **Ph.D.** | Agronomy | Annamalai University, India. | Weed management in rice based cropping System | 1992 |
| **M.Sc. (Ag.)** | Agronomy | Annamalai University, India. | First Class and First Rank with 90% marks (Distinction) | 1984 |
| **B.Sc. (Ag.)** | Agriculture | Annamalai University, India. | First Class | 1982 |

**Award of Doctor of Science (D.Sc.) Degree, 2009**

## PROFESSIONAL EXPERIENCE

| Organization | From | To | Designation | Cadre Service | Total Experience (Post-graduate Teaching & Research) |
|---|---|---|---|---|---|
| **Annamalai University** | 04.01.2016 | 27.03.2019 | Director, Centre for Research and Development | 3 Years & 3 Month | **36 Years, 2 month & 11 days** |
| | 14.11.2011 | 03.10.2013 | Dean, Faculty of Agriculture | 2 years | |
| | 01.07.09 | 07.11.13 | Head, Department of Agronomy | 4 Years & 4 Months | |
| **Faculty of Agriculture Annamalai University, India** | 11.02.03 | 30.06.2021 | Professor | 18 Years & 4 Months | |
| | 01.04.94 | 10.02.03 | Reader (Associate Professor) | 8 Years & 10 Months | |
| | 06.08.92 | 31.03.94 | Senior Lecturer | 1 Year & 8 Months | |
| | 20.04.85 | 05.08.92 | Lecturer (Assistant Professor) | 7 Years & 3 Months | |
| **IACR-Long Ashton & IACR – Rothamsted University of Bristol U.K.,** | 01.10.97 | 30.09.98 | **Common Wealth Senior Academic Staff Fellow** (on Deputation from Annamalai University) | 1 Year | |
| **Annamalai University** | 14.11.2011 | 03.10.2013 | **Member Syndicate** | 2 Years | |
| | 01.07.09 | 07.11.2013 | **Member Senate** | 4 Years & 4 Months | |
| | 01.04.94 | 25.9.2013 | **Member Academic Council** | 19 Years & 6 Months | |
| **Bharathidasan University** | 24.12.2019 | For Three year | **Governor Nominee - Selection Committee for recruitment of staff** | | |
| **Tamil Nadu Agricultural University** | 29.06.2021 | For Three year | **Governor Nominee – Member Board of Management** | | |
| **Indira Gandhi National Open University – School of Agriculture** | 22.10.2022 | For Two year | **Member- School board of School of Agriculture** | | |
| **National Biodiversity Authority, Ministry of Environment, Forest and Climate change, Govt. Of India, Chennai** | 2017-2019 | Two Years | **Member of Expert Committee on Invasive Alien Species** | | |
| **Associations of Indian Universities, New Delhi** | 2017 | | **National Coordinator Anveshan (All India Student Research Convention)** | | |

## AWARDS, FELLOWSHIPS & RECOGNITIONS

**International Awards**

1. Country Representative in **Food and Agriculture Organization** of United Nations (**Rome**) initiated Seminars, Projects and Publications in Weed Science, 2005-07.
2. **Bursary Award** of **British Crop Protection Council**, Brighton, **U.K.,** 2001.
3. Group Study Exchange Membership by the **Rotary International, USA,** 1997.
4. **Commonwealth Senior Academic Staff Fellowship** by the Association of Commonwealth Universities, **U.K,** 1997.

**National Awards**

5. **AIASA Life Time Achievement Award 2021** award winner from all India Agricultural Students Association **(AIASA) & ICAR**
6. **AIASA Harit Puraskar Award 2018** award winner from all India Agricultural Students Association **(AIASA) & ICAR**
7. **Heroes of Indian Agriculture 2017(MSIAA 2017)** Award Winner from Mahindra Samriddhi India Agri Award- 2017**, (Awarded by Honorable Union Minister of Agriculture Shri Radha Mohan Singh)**
8. **BIRAC - Grand Challenges India Award by DBT, Bill & Melinda Gates Foundation and USAID, Govt. of India, New Delhi** during March, 2014.
9. **Recognition Award of NIWS, Directorate of Weed Science Research (ICAR) Jabalpur (M.P)**, 2011.
10. ICAR - **Best NAIP Project Award**, New Delhi, 2010.
11. **Indian Society of Weed Science Gold Medal**, 2006.
12. **Indian Society of Weed Science Fellowship, 2003.**
13. **Ariviyal Kalanjiyam Award** by the **Mylai Thiruvalluvar Tamizh** Sangam, Tamilnadu during 17th May, 2016.
14. **Vocational Excellence Award** by the **Rotary Club of Karaikudi**, Tamilnadu during 3rd November, 2015.
15. **Dr. S.Kannaiyan Endowment** Best Researcher, 2009.
16. **Best Researcher Cash Prize**, Annamalai University, 2008.
17. **Srilochani Varadarajalu Endowment** Best Research Paper published award for 2007.
18. **Life time Achievement award as a Faculty** for the contribution and achievement in the field of Agronomy by the Venus International Foundation, Chennai, Tamilnadu, 2018.
19. **Best Researcher Cash Prize**, Annamalai University, 2019-2020

**Heroes of Indian Agriculture 2017(MSIAA 2017) Winner Award by Honorable Union Minister of Agriculture Shri Radha Mohan Singh**

Bursary Award by British Crop Protection Council, 2001

## INTERNATIONAL RESEARCH COLLABORATIONS

1. Collaborating with IACR-Rothamsted Experimental Station, **U.K** on commercial exploitation of herbicidal properties of *C. amboinicus.*
2. Collaborating with United States Department of Agriculture, Missisipi **USA** on Allelopathy of certain weed species.
3. Collaborated as National Expert in a proposed TCP Project with **FAO, Rome** on Management of Weedy Rice in South Asia.
4. Collaborating with National Institute of Agro-environmental Sciences, Tsukuba **Japan** in Monsoon Asia Agro-environmental Research Consortium.
5. Collaborating with International Rice Research Institute, **Philippines**, in evolving submergence tolerant rice.
6. Collaborating with **Bill & Melinda Gates Foundation – DBT- BIRAC, GCI-AGN** Project 2014-2016.
7. Collaborating with **USAID - IKP – AGN** Project 2017.
8. Collaborating with **Cornell University, USA, 2019**
9. Collaborating with Commercial Agriculture Alliance of Nepal and USAID, India for implementing cross border research on Rice + Fish + Poultry farming at Nepal.

## GLOBAL ACADEMIC LINKAGE

1. Hosted Dr.P.C. Bhowmik, Professor of Weed Science, **University of Massachusetts, U.S.A** for one month of his sabatic during 1999.
2. A team of Australian Scientists Comprising Dr. Deidre Lemerle and Dr. Rex Stanton of **Charles Sturt University** and Dr. Ann Cowling of **NSW University** visited to gain on hand experience in Integrated Rice Farming Systems during 2005.
3. Organised International Training for country representatives of Asia on Weed Risk Assessment jointly with **FAO, Rome** during September, 2007.
4. Imparted training on Water hyacinth bio-control for a team of six scientists from **Iraq** during 2008.
5. Collaborated with Dalhousie University, Canada for implementing a dual degree programme with Annamalai University, 2011-2013.
6. Organised International Training for Rice Technology Transfer Systems, Jointly with **IRRI, Philippines** during May, 2013.
7. Linkage with SAARC Agriculture Centre, Dhaka for Transfer of Technology on Rice + Fish + Poultry farming and flood tolerant rice in all SAARC member nations. Workshop at Annamalai University for SAARC Rice Focal Expert and site visits during 17$^{th}$ to 19$^{th}$ August, 2018.

## New Academic Programmes/ Innovative Courses Introduced

| S.No. | Nomenclature of Innovative Academic Programmes formulated | University/ Institute Implemented | Date of approval by Academic Council | Year of Introduction |
|---|---|---|---|---|
| **1.** | **Dual Degree of B.Sc. Ag (Annamalai University) and B. Tech. Environmental Landscape Horticulture (Dalhousie University, Canada)** (Dual Degree programme for B.Sc., Ag students of Annamalai University with Dalhousie University, Canada, enabling B.Sc. Ag. students to leave for Dalhousie University, Canada, after completing six semesters (out of total eight semesters) and to take up three more semesters in Nova Scotia Agriculture College of Dalhousie University, Canada. Finally, after 9 semesters (six in Annamalai University and three in Dalhousie) they would be entitled for two degrees, one from Annamalai University i.e. B.Sc., Agriculture and another from Dalhousie University, Canada, i.e. B. Tech., Environmental Landscape Horticulture. | Annamalai University | 18th , April, 2012 | 2012 |
| **2.** | **P.G. Diploma in Farming Systems** (Distance Education Mode) | Annamalai University | March,2010 | 2010-2011 |
| **3.** | **Diploma in Coastal Agriculture** (Distance Education Mode) | Annamalai University | March,2010 | 2010-2011 |
| **4.** | **M.Sc., Hort – Fruit Science** | Annamalai University | March,2012 | 2012 |
| **5.** | **M.Sc., Hort –Vegetable Science** | Annamalai University | March,2012 | 2012 |
| **6.** | **M.Sc., Hort –Floriculture and Landscape Gardening** | Annamalai University | March,2012 | 2012 |
| **7.** | **M.Sc., Hort – Spices, Plantation and Medicinal Plants** | Annamalai University | March,2012 | 2012 |
| **8.** | **Three Documentary Films (Two in English & One in Vernacular) on Research Output**<br>**Available in youtube link:**<br>https://youtu.be/Vh59cLQA4O4<br>**https://youtu.be/K2vqyXgjlLU**<br>https://www.youtube.com/watch?v=edadhIDLsXU | Annamalai University | 16th February, 2011 | 2011 |

# COMPLETED RESEARCH PROJECTS

## INTERNATIONAL

1. A short term project on "**Formulations of *Coleus amboinicus* natural product for bio-control of water hyacinth"** as a collaborating scientist with Dr. John Casely, IACR - Long Ashton, U.K, Funded by **Natural Resources International,** U.K., providing sponsorship for one Ph.D. student to go to U.K. and use the research facilities at IACR Long Ashton for a period of two months (Funds utilized **Rs.14 lakhs)**, 1999.

2. Research project on "**Improved rice crop management for rising productivity in the submergence prone and salt affected rainfed lowland in South Asia"** funded by Bill and Melinda Gates Foundation, **STRASA Phase III - IFAD** (Outlay of **Rs. 13.82 lakhs**), 2011-2019.

3. Research project on **"Annamalai Rice + Fish + Poultry Farming System for Improving Nutrition and Livelihoods of Small farmers in Nepal"** funded by United States Agency for International Development **(USAID)** and IKP knowledge park **(IKP)**. (Outlay of **Rs. 120.00 lakhs**), 2017- 2019.

## NATIONAL

1. Research project on **"Agronomic Integration of Technologies for Productivity Management and Optimal Water Use in Wetlands of Cauvery River Delta"** funded by Department of Science and Technology. (Outlay of **Rs. 209.87 lakhs**), 2018- 2021.

2. DBT-BIRAC - **Grand Challenges India** project on **"Designing on-farm participatory models of Integrated Farming Systems for enhancement of household diet diversity and livelihoods of women small holder farmers"** funded by Bill and Melinda Gates Foundation with an outlay of **Rs. 69.34 lakhs,** 2015-2016.
3. Research project on "**Climate Resilient Farming Systems for Sustainable Farming and Livelihood Enhancement of SC/ST Population in Disadvantaged Coastal Districts of Cuddalore and Nagapattinam in Tamilnadu**" funded by **Department of Science and Technology (DST)**, Government of India with an outlay of **Rs.35.56 lakhs,** 2014-2016.
4. **National Agricultural Innovation Project** on **"Farming systems for livelihood security of small and marginal farmers in disadvantaged districts of Tamil Nadu"** funded by **Indian Council of Agricultural Research (World Bank aided) with an outlay of Rs.9.64 crores,** 2008-2015.
5. Research project on "**From QTL to Variety:** Marker Assisted Breeding of Abiotic Stress Tolerant Rice Varieties with Major QTLs for Drought, Submergence and Salt Tolerance" funded by **Department of Biotechnology (DBT),** Ministry of Science and Technology with an outlay of **Rs.57.65 lakhs,** 2010-2015.

6. Research project on **"Control of water hyacinth through herbicides and its impact on aquatic environment"** funded by **Ministry of Water Resources** (Outlay of **Rs.29.96 lakhs),** 2009-2012.
7. Research project on **"National Invasive Weed Surveillance"** sponsored by **Department of Agriculture and Co-operation,** Government of India (Outlay of **Rs.21 lakhs),** 2008-2010.
8. Research project on **"Cellulose Nanofibers from Aquatic Weeds"** (Network mode) sponsored by **Department of Biotechnology (DBT), Ministry of Science and Technology,** Government of India (Outlay of **Rs. 30 lakhs**), 2007-2010.
9. Research project on **"Integrated Rice+Fish+Poultry farming for biological suppression of pests, sustainable food production and rural upliftment"** sponsored by **Department of Biotechnology** (**DBT**), **Ministry of Science and Technology,** Government of India (Total outlay of **Rs.21.28 lakhs**), 2004-2007.
10. Research project under Competitive Grant Programme of National Agricultural Technology Project sponsored by **Indian Council of Agricultural Research,** on **"Integration of Botanical Herbicide *Coleus amboinicus / aromaticus* with insect Biological control of water hyacinth"** (Total outlay of **Rs.14.33 lakhs**), 2001-2004.
11. Research project **on "Weed Management in Integrated Rice+Fish+Poultry farming system"** sponsored by **Indian Council of Agricultural Research (AP-Cess funds)** (Total outlay of **Rs.11.15 lakhs**), 2002-2005.

**TOTAL OUTLAY: Rs. 16.11 crores**

**Integrated Rice + Fish + Poultry farming system**

## CONSULTANCY SERVICES IN RESEARCH AND DEVELOPMENT

| Sl. No. | Agency served and Purpose | Year of service and Fees charged |
|---|---|---|
| 1 | **M/s. Barath Rasayan Limitd**<br>Evaluation of new herbicide | 2020-21<br>Rs. 3,00,000 |
| 2 | **M/s. Barath Rasayan Limitd**<br>Evaluation of new herbicide | 2017-2018<br>Rs. 1,50,000 |
| 3 | **M/s. Barath Rasayan Limitd**<br>Evaluation of new herbicide | 2017-2018<br>Rs. 2,00,000 |
| 4 | **M/s. Barath Rasayan Limitd**<br>Evaluation of new herbicide | 2017-2018<br>Rs. 1,50,000 |
| 5 | **M/s. Barath Rasayan Limitd**<br>Evaluation of new herbicide | 2017-2018<br>Rs. 1,50,000 |
| 6 | **M/s. Parijit Industries (India) Private Limited** Evaluation of new herbicide | 2015-2016<br>Rs. 4,00,000 |
| 7 | **M/s. Anu products Limited**<br>Evaluation of new herbicide | 2015-2017<br>Rs. 1,00,000 |
| 8 | **Dow Agro Sciences**<br>Evaluation of new herbicide | 2014-2016<br>Rs. 2,00,000 |
| 9 | **SDR Ramcides**<br>Evaluation of new herbicide | 2014-2016<br>Rs. 1,60,000 |
| 10 | **Dow Agro Sciences**<br>Evaluation of new herbicide | 2014-2016<br>Rs. 4,00,000 |
| 11 | **Dow Agro Sciences**<br>Evaluation of new herbicide | 2014-2016<br>Rs. 1,80,000 |
| 12 | **M/s. Anu products Limited**<br>Evaluation of new herbicide | 2014-2016<br>Rs. 4,00,000 |
| 13 | **Bayer Crop Science Limited**<br>Evaluation of new herbicide | 2013-2015<br>Rs. 2,40,000 |
| 14 | **Tropical Agro-system India Private Limited**<br>Evaluation of new herbicide | 2012-2013<br>Rs. 1,75,000 |
| 15 | **Dow Agro Sciences**<br>Evaluation of new herbicide | 2012-2013<br>Rs. 1,80,000 |
| 16 | **Food and Agricultural Organization of United Nations**<br>Impact of Climate Change on Invasive Traits of Weeds | 2011-2012<br>Rs. 1,00,000 |
| 17 | **Bayer Crop Science Limited**<br>Evaluation of new herbicides | 2011-2012<br>Rs. 2,80,000 |
| 18 | **Bayer Crop Science Limited**<br>Evaluation of new herbicides | 2010-2011<br>Rs. 75,000 |
| 19 | **Bayer Crop Science Limited**<br>Evaluation of new herbicides | 2009-2010<br>Rs. 1,95,000 |
| 20 | **Bayer Crop Science Limited**<br>Evaluation of new herbicides | 2007-2008<br>Rs. 1,30,000 |
| 21 | **Bayer Crop Science Limited**<br>Evaluation of new herbicides | 2006-2007<br>Rs. 2,60,000 |
| 22 | **Dow Agro Sciences**<br>Evaluation of new herbicide | 2006-2007<br>Rs. 1,00,000 |
| 23 | **Bayer Crop Science Limited**<br>Evaluation of new herbicides | 2006-2007<br>Rs. 1,30,000 |
| 24 | **Churches Auxiliary for Social Action**<br>Rehabilitation of Tsunami affected farmers | 2006<br>Rs. 60,000 |

| | | |
|---|---|---|
| 25 | **Bayer Crop Science Limited**<br>Evaluation of new herbicides | 2005 & 2006<br>Rs. 90,000 |
| 26 | **Government of Tamilnadu Public Works Department**<br>Management of invasive alien weed *Prosophis juliflora* | 2005<br>Rs. 45,000 |
| 27 | **Aventis Crop Science**<br>Evaluation of new Herbicides | 2002<br>Rs. 1,00,000 |
| 28 | **Aventis Crop Science**<br>Evaluation of new Herbicides | 2001<br>Rs. 60,000 |
| 29 | **Aventis Crop Science**<br>Evaluation of new Herbicides | 2000<br>Rs. 60,000 |
| **Total funds generated out of consultancy** | | **Rs. 50.70 lakhs** |

## INTELLECTUAL PROPERTY

### VARIETY INTRODUCED AND TECHNOLOGY DEVELOPED

| Title | Name | Variety/Type of invention/Type of document | Year of release/ year of award | Utility |
|---|---|---|---|---|
| Crop Varieties Introduced | **Submergence Tolerant Rice Variety SIGAPPI** | Submergence Tolerant Rice evolved by Marker Assisted Selection (Approved by IRRI). Accepted by Kerala State Department of Agriculture | 2012 | At present cultivated in 1000 acres of Kerala palakad region, proved tolerant over recurrent floods during 2018 |
| Technology Developed | **Integrated Aquatic Weed Control** | Integrated bio control of water hyacinth using insect agent and allelopathic plant material (Approved by ICAR-NATP). | 2004 | Implemented In 24 Watersheds In 4 Districts of Tamilnadu |
| | **Cellulose Nano-fibre** | TEMPO mediated Nano-fiber extraction from water hyacinth | 2010 | For use in manufacture of Acoustic boards, Paper making and Biodegradable polymer |
| | **Annamalai Rice+Fish+Poultry Farming System** | Designed the integrated farming system of Annamalai Rice + Fish + Poultry farmers in rice fields (Approved by ICAR – NAIP, BIRAC & IKP India Knowledge Park). | 2015 | Practiced by 1200 rice farmers in Tamilnadu and 100 farmers of Nepal. Accepted for upscaling by SAARC member states |

# ACADEMIC VISITS ABROAD

1. **Denmark**
2. **South Africa**
3. **U.K.**
4. **Australia**
5. **U.S.A.**
6. **Malaysia**
7. **Singapore**
8. **Vietnam**
9. **Zimbabwe**
10. **Japan**
11. **U.A.E.**
12. **China**
13. **Israel**
14. **Canada**
15. **Philippines**
16. **Thailand**
17. **Indonesia**
18. **Nepal**

**NIAES International Symposium, Japan, 2006.**

## SESSIONS CHAIRED IN GLOBAL MEETS

1. Chaired a session on "**Sustainable weed management in Cereals, pulses, oil seed crops, commercial crops, fibre and fodder crops under irrigated and rain-fed agriculture"**, in the **Indian Society of Weed Science Biennial Conference** at **ICAR- Central Coastal Agricultural Research Institute, Goa, India** during 5th -7th February, 2020.
2. Chaired a session on "**Weed biology and ecology including impact on climate change"**, in the **25th Asian Pacific Weed Science Conference** at Hyderabad, **India** during 13th -16th October, 2015.
3. Chaired a session on **Weed Invasive and Ecology** in the **24th Asian Pacific Weed Science Conference** at Bandung, **Indonesia** during 22nd – 25th **October**, 2013.
4. Chaired a plenary session on **Agriculture Diversification, Climate Change, Management and Livelihoods** in the **3rd International Agronomy Congress** at IARI, Pusa Campus, **New Delhi** during 26th– 30th November, 2012.
5. Organized and chaired a session on **Aquatic Weed control** in the **6th International Weed Science Conference** at Hangzhou, **China** during 17th – 23rd **June**, 2012.
6. Organized and chaired a session on **Spotlight on Global Weeds** at **5th International Weed Science Congress** at Vancouver, **Canada** during 23rd – 27th **June**, 2008.
7. Chaired a session on Rice Allelopathy – Bioassay methods in **FAO-Rice Allelopathy Seminar** at **China**, 2007.
8. Chaired a session on invasive alien plants in Asia at NIAES International Symposium on **"Evaluation and Effective Use of Environmental Resources for Sustainable Agriculture in Monsoon Asia"** at Tsukuba, **Japan** during 12th **–** 15th December, 2006.
9. Chaired a session on **"Herbicides"** at the 20th Asian Pacific Weed Science Society conference at Ho Chi Minh city, **Vietnam** during 7th – 11th November, 2005.
10. Chaired session on **"Ecology"** at the 4th World Congress on Allelopathy at Charles Sturt University, New South Wales, **Australia** during 21st - 26th August 2005.
11. Chaired session at the national work shop on **"Invasive alien species and biodiversity in India"** sponsored by Ministry of Environment and Forest at the Banaras Hindu University, **Varanasi** during 18th – 20th August 2004.

**Chairing Agriculture Session of Indian Science Congress with Dr. M.S. Swaminathan, 2007**

## INVITED LECTURES

**International**

1. Delivered a lecture on ***"Farming system design for diversification, Climate resilience, Sustainability, Livelihood and Nutritional Security In Rice farming"*** on International Rice Congress organized by **International Rice Research Institute** at Marina Bay Sands, Singapore during 14-17 October 2018.
2. Delivered a lecture on ***"Sustainable Management of Climate Change induced Invasive Alien Weeds in Rice"*** on International Rice Congress organized by **International Rice Research Institute** at Marina Bay Sands, Singapore during 14-17 October 2018.
3. Delivered an invited lecture on Integrated farming Systems in Grand Challenges India Meeting Organized by Biotechnology Industry Research Assistance Council and Bill and Melinda Gates Foundation, **New Delhi, India** during 21st to 23rd March 2017.
4. Delivered an invited lead lecture on "Climate smart agriculture and indigenous management of invasive alien weeds". In: Proceedings of the 25th Asian Pacific Weed Science Conference on *"Weed biology and ecology including impact of changing climate"* at **Hyderabad, India** during 13th -16th October, 2015.
5. Delivered an invited lecture on "Rice Farming System Designs for stress prone environments". In: Proceedings of International Training Workshop Organised by IRRI at **Pokhara, Nepal** during 20th to 22nd March, 2014.
6. Delivered an invited lecture on "Invasive Spread of Water Hyacinth in Veeranum Irrigation System and the Impact of Herbicidal Control on Aquatic Environment". In: Proceedings of the 24th Asian Pacific Weed Science Conference on *"Weed Invasives and Ecology"* at **Bandung, Indonesia** during 22nd – 25th October, 2013.
7. Delivered an invited lecture on "Sustainable options for the integrated management of invasive alien weed water hyacinth (*Eichhornia crassipes*) in aquatic systems" in the 6th International Weed Science Conference at **Hangzhou, China** during 17th to 23rd June 2012.
8. Delivered an invited lecture on "Utility tag, Farming elements and ITK for Sustainable Management of Weeds in Changing Climate" in 23rd Asian Pacific Weed Science Congress at **Cairns, Australia** during 25th to 30th September, 2011.
9. Delivered an invited lecture on "Sustainability through Integrated Farming Systems in small holder farms of Tamilnadu State of India" in Farming System

Design Symposium 2009 at **Monterey, California, USA** during 23rd to 26th August, 2009.

10. Delivered an invited lecture on "Status of Weedy Rice and its Management in India" at Regional Meeting on Weedy Rice in Asia organized by FAO at **Bangkok, Thailand** during 3rd to 7th November, 2008.

    Delivered an invited lecture on "Honey suckle mesquite, *Prosopis juliflora* (Sw.) DC, a major invasive plant in various regions of the world" in **5th International Weed Science Congress** at **Vancouver, Canada** during 23rd to 27th June, 2008

11. Delivered an invited lecture on 'Rice Allelopathy in Aquatic Systems' in the **FAO-Rice Allelopathy Workshop at Hainan, China** during 9th and 10th October, 2007.

12. Delivered **Key-note Address** in NIAES International Symposium, **Tsukuba, Japan**, during December, 2006.

13. Delivered a invited plenary lecture on "Effect of global warming on weed invasion world wide" at the 20th Asian – Pacific Weed science Society Conference, **Ho Chi Minh city, Vietnam** during 7th – 11th November, 2005.

14. Delivered a invited plenary lecture on "Allelopathy for bio-control of water hyacinth" at the Fourth World congress on Allelopathy" at **Charles Sturt University, New South Wales, Australia** during 21st to 26th August, 2005.

15. Delivered a lecture on "Integrating fish and poultry components for sustainable rice farming" at **World Fish Centre, Penang, Malaysia** during 1st September 2005.

16. Delivered an invited lecture on "Integration of elements of farming system for sustainable weed and pest's management in the tropics" at the 4th International Weed Science Conference at **Durban, South Africa** during 19th to 24th June, 2004.

17. Delivered an invited plenary lecture on "Invasive weeds in Tropics" at the 19th Asian Pacific Weed Science Society Conference, **Manila, Philippines** during March, 2003.

18. Delivered an invited lecture on 'Allelopathic Potential of Native Plants on Water hyacinth' at the 14th International Plant Protection Congress, **Jerusalem, Israel** during July, 1999.

19. Delivered an invited lecture at **University of California Davis, U.S.A**. on 'Biological Control of Water hyacinth' on 13th April, 1997.

In 5th International Weed Science Congress at Vancouver, Canada, 2008


## INVITED LECTURES

**National (In other Campuses)**

21. Participated in "Stakeholder Consultation on 'Impacts and Management of Invasive Alien Species in Agroecosystems of India", National Biodiversity Authority, Chennai during 27.04.2021.

**22.** Delivered an invited lecture on "Invasive alien weed and climate change" in virtual training innovations in weed management in context of changing Agrarian landscape, **SKUAST- KASHMIR during 6th August, 2020.**

**23.** Delivered an invited lecture on "Aquatic weed problems and their sustainable management" in the Indian Society of Weed Science Biennial conference at ICAR – Central Coastal Agricultural Research Institute, **Goa during 5th to 7th January, 2020.**

24. Delivered an invited lecture on "Circularity of Agricultural Systems in Rural Development" at the International conference on Rural Development, Social Dynamics and Welfare at **Hyderabad during 14th to 16th December, 2019**.

25. Delivered an invited lead lecture on "Sustainable Option for Managing Weeds under Changing Climate". In: Proceedings of the ISWS Golden Jubilee International Conference on *"Weeds and Society: Challenges and Opportunities"* at **Jabalpur, India** during 21st -24th November, 2018.

26. Delivered a lecture on "**BIRAC 7th Innovators Conclave, Vigyan se Vikas – Science Impacting Society: Innovators Conclave 2018**" organized by BIRAC on 19th to 20th September 2018 at Heritage Village Resort, Manesar, New Delhi.

27. Delivered a lecture on "*Innovative technology for establishing startups in Agriculture and Internet of things*" on Industry Interaction meet organized by **National Research Development Corporation (NRDC) in Association with Andhra Pradesh Chambers of Commerce and Industry federation** at Hotel Fortune Murali Park, Vijayawada on 5th October 2018.

28. Delivered a lecture on "*Designing Farming Systems for Climate Resilience, Livelihood Security and Sustainability*" on Scientific Challenges and Opportunities of the Current Generation organized at **Guru Nanak College, Chennai** on 28th Feb, 2018.

29. Delivered a lead lecture on "*Sustainable options for Managing Invasive Alien Weeds, Biodiversity conservation and Enhancement of Farming Livelihoods*" and ***Served the National Advisory Committee*** for International Conference on Bio – diversity strategies for Conservation and Sustainable Utilization organized at **Ethiraj College for Women (Autonomous)** on 1st and 2nd Feb, 2018.

26. Delivered a lecture on "Need for curriculum Reinforcement with Allied and Applied Sciences for Gender Parity in Agronomy Education and Technology Integration in Agronomic Research" Organized 41st Indian Social Science Congress Focal theme on *"Indian University Education System a Critical Appraisal"* at **Periyar University, Salem, India** during 18 – 22nd December, 2017. p.117-121.

27. Delivered a lecture on "Farming System option for Climate Resilience Livelihoods and Nutritional Security" on Training programme on Integrated Fish Farming Organized by M S Swaminathan Research Foundation, Poombuhar at 25.09.2017.

28. Delivered a lecture on "Advances in Weed Management Strategies under conservation Agriculture systems in India" Organised Weed Workshop at National Institute of Plant Health Management **(NIPHM), Hyderabad** during 29th to 30th November, 2016.

29. Delivered a lecture on "Scope, Relevance and Options for Diversification and Integration in Small Holder Farms for Sustainable Rural Livelihoods and Environmental Security, Under Changing Climate" at Indian Society of Agronomy Organised National Seminar at **PAU, Ludhiana** during 18th to 20th November, 2014.

30. Delivered a lecture on "Climate Resilient Farming Systems for Livelihood Enhancement and Sustainability" at refresher course held at CAFTA training on Farming System for the future - Approaches and Applications, **Coimbatore** during 18th February, 2013.

31. Expert participation in a Brain Storming meeting on "Making IPM Effective in India" organized by the National Academy of Agricultural Sciences Consultation in association with Indian Council of Agricultural Research at NAAS Complex, **New Delhi** on 29th – 30th September, 2010.

32. Delivered an invited lecture on "Integrated Weed Management in Era of Climate Change" with the national symposium organized by **Indian Society of Weed Science** at **NASC Complex, New Delhi** during 21st -22nd August, 2010.

33. Delivered a lead lecture on "Integrated Farm Management for Linking Environment and Sustainable Weed Control" at the National Symposium on New Paradigms in Agronomic Research at **Navsari Agricultural University, Navsari, Gujarat** during 19th - 21st November, 2008.

34. Expert participation in a Brain Storming workshop on Science & Technology for Rural India organized by the Scientific Advisory Committee to Prime Minister of India at Indian Institute of Technology, **Chennai** on 1st November, 2008.
35. Served as Expert for Govt. of India, **Ministry of Agriculture** for approval of Herbicide Tolerant GM Crops in India during December 10th - 11th, 2007 at **New Delhi**.
**36.** Delivered an invited lecture on weeds in changing climate at the biennial conference of the Indian society of weed science during 2nd and 3rd November 2007 at **CCSHAU, Hisar, Haryana.**
37. Delivered a lecture on "Ecology and Control of Parthenium Invasion in Veeranum Command area" at Second International Conference on Parthenium Management at University of Agricultural Sciences, **Bangalore**, India, during 5th-7th December, 2005.
38. Delivered an invited lecture on "Biotechnological approaches for aquatic weed control" at National Biennial Conference, Indian Society of Weed Science held at Department of Agronomy & Agro-meteorology, PAU, **Ludhiana** on 6th–9th April, 2005.
39. Delivered an invited lecture on "Biotechnological approaches for aquatic weed control" at satellite workshop Indian Society of Weed Science on use of biotechnology in weed science at **New Delhi** on 9th April 2005.
40. Delivered a key note address at the national work shop on "Invasive alien species and biodiversity in India" sponsored **Ministry of Environment and Forest at the Banaras Hindu University,** Varanasi during 18th-20th August 2004.
41. Delivered a lead paper on "Decision Support System in Weed Management" at XVI Biennial work shop of **All India Co-ordinated Research Programme on Weed Control** held at University of Agricultural Sciences, Bangalore during May 26th – 28th 2004.
42. Delivered a concept paper on "Integrated control of aquatic weeds (water hyacinth)" at eighth meeting of the subcommittee IV of **Indian National Committee on Irrigation and Drainage** held at Institute for Water Studies, Chennai on 25th March 2004.
43. Invited lecture on "Agrobiology and management of *Eichhornia crassipes*" sponsored by Assam Agricultural University, **Jorhat** and National Research Centre for Weed Science, **Jabalpur** during April 27th-29th, 2003.
44. Invited lecture in "Short Term Training Programme on Biotechnology – Emerging Trends and Challenges Ahead" sponsored by **All India Council for Technical Education** and **Indian Society for Technical Education** at Department of Technology (Chemical Engg.), Annamalai University during November, 2002.

45. Offered training on Role of "Allelopathy in Weed Management" sponsored by **ICAR at National Research Centre for Weed Science, Jabalpur, M.P**., as a **Resource Person** during 26th & 27th of April,2002.
46. Invited lecture on "Use of Bio agents in Weed Management" at the biennial conference of Indian Society of Weed Science 1998, **Banaras Hindu University** on 6th February, 1999.

**National (In Annamalai University)**

47. Delivered a lecture on "Allelopathic plant materials for Bio-control of weeds" at Faculty of Agriculture, **Annamalai University** during 4th January, 2019.
48. Delivered a lecture on "Sustainable management strategies for coastal environment and Agriculture" at Faculty of Agriculture, **Annamalai University** during 10th December, 2018.
49. Delivered a lecture on "Research Methodology" at refresher course held at Faculty of Science, **Annamalai University** during 10th December, 2018.
50. Delivered a lecture on "Two weeks short time course on sustainable development" at Faculty of Arts, **Annamalai University** during 10th December, 2018.
51. Delivered a lecture on "Bio fuels and fuel cell – Fundamental and Applications" at Department of Mechanical Engineering, **Annamalai University** during 3rd December, 2018.
52. Delivered a lecture in "National Children Science Congress" conducted by **Tamilnadu Science Forum** at **Annamalai University during** 26th October, 2018.
53. Delivered a lecture on "Training on clown Fish Aquaculture" at Faculty of Marine Science, **Annamalai University** during 29th August, 2018.
54. Delivered a lecture on "Anticipatory Research to Mitigate Climate Change Impact on Agriculture" Sponsored by AICTE**,** I National Seminar on **Climate Adaptation and Long – term Mitigation, Annamalai University** during 4th & 6th December, 2017.
55. Delivered a lecture on "Innovations in Farming Diversification and Integration for Small Holder Farms" at Faculty Development Programme on **ENTERPRENEURSHIP, Annamalai University** during 27th November, 2017.
56. Delivered a lecture on "Impact of climate change on Invasive Alien Plants" Sponsored by UGC – SAP – DRS III, National Seminar**, Annamalai University** during 21st and 22nd March, 2017.
57. Delivered a lecture on "Teaching through Value Education" at refresher course held at **Department of Philosophy, Annamalai University** during 7th June, 2012.
58. Delivered a lecture on "Natural Products in Weed Control" at refresher course held at **Annamalai University** during 2005.
59. Delivered a lecture on "Use of microorganisms in weed control programme" at refresher course held at **Annamalai University** during 2004.

## Parthenium Eradication and Awareness Campaign involving Honorable Ministers of Govt. of Tamilnadu, Members of Legislative Assembly and District Collector

**BOOK CHAPTERS PUBLISHED**

| Sl. No. | Chapter Title | Book Title | Publisher | Year |
|---|---|---|---|---|
| 1. | Farming System Approaches for Climate Resilience in Coastal Agriculture | Coastal Agriculture and Climate Change | New India Publishing Agency New Delhi-110034 | 2022 |
| 2. | Diversification of Rice-based Farming System to Improve farm Productivity and Livelihood: A Case of Tamilnadu in India, | Rice Technological Innovation and Value Chain Development in South Asia: Current Status and Future Directions | SAARC Agriculture Centre (SAC), South Asian Association for Regional Cooperation, BARC Complex, Farmgate, New Airport Road, Dhaka-1215, Bangladesh(www.sac.org.bd) | 2018 |
| 3. | Components integration in small holder farms for sustainability | Advances in Environmental Research (Vol-12) | Nova Science Publishers, Inc 400 Oser Avenue, Suite 1600 Hauppauge, NY 11788, USA | 2010 |
| 4. | Effect of global warming on invasion of alien plants in Asia | Climate change and Bio-diversity | Institute of Charted Financial Analysts of India. | 2008 |
| 5. | Utility of Weeds and their Wild Relatives as Resources in India | Utility of Weeds and their relatives as resources | Kyungpook National University, Korea. | 2007 |
| 6. | Sedge control in rice in India | Management of Sedge Weeds in Rice | Kyungpook National University, Korea. | 2007 |
| 7. | Invasion of Prosopis juliflora in India | Problems posed by the introduction of Prosopis spp in selected countries | FAO, Rome. | 2006 |
| 8. | Invasive Weeds in Agro-ecosystems of South India | Invasive Alien Species and Biodiversity in India | Ministry of Environment and Forest, Govt. of India and Department of Botany, Banaras Hindu University, Varanasi, India. | 2006 |
| 9. | Allelopathy for weed control in aquatic and wetland systems | Allelochemicals: Biological control of plant pathogens and diseases | Springer, The Netherlands. | 2006 |

**BOOK PUBLISHED**

| Sl. No. | Book Title | Publisher | Year | Pages |
|---|---|---|---|---|
| 1. | Components Integration in Small Holder Farms | LAMBERT Academic Publishing AG & Co. Koln, Germany | 2010 | 119 |
| 2. | Strategies for control and management of some selective invasive alien plant species endangering Indian biodiversity | National Biodiversity Authority, Chennai. | 2018 | 97 |

## RESEARCH PUBLICATIONS (Details in Annexure)

1. **11 International Journal Articles (With SCI Impact Factor)**
2. **23 Refereed National Journal articles**
3. **21 Research Papers** in **International Conferences**
4. **54 Research Papers** in **National Conferences**
5. **27 Popular Articles**
6. **58 News flashes on the Research Output**
7. **Three Documentary Films (Two in English & one in vernacular) on research output.**

## RESEARCH GUIDANCE

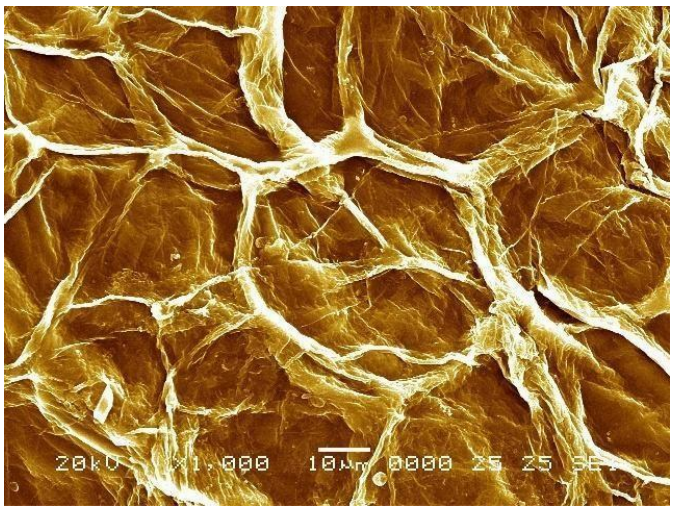
### Ph.D. Programmes

Completed : **Ten**

### M.Sc. (Ag.) Programmes (Research & Dissertation)

Completed : 31

**Cellulose Nano-fiber from aquatic weed water hyacinth**



## CONFERENCES / WORKSHOPS / SEMINARS / ORGANIZED

**International**

1. Organized **Regional Consultative Meeting for Exchange of Rice Based Production and Value Chain Development Technologies in SAARC Member States** at Annamalai University during 17th to 19th August, 2018, in collaboration with **International Rice Research Institute,** Manila, **SAARC Agriculture Centre, Dhaka.**

2. Organized **International Training** Workshop on "**Rice Technology Transfer Systems for Stress-Prone Environments in South Asia**" at Department of Agronomy, Annamalai University during 29th April to 3rd May, 2013, in collaboration with IRRI, Philippines.

3. Organized **FAO – Regional Training Workshop for Asia** on **Weed Risk Assessment**, in collaboration with **Food and Agriculture Organization of United Nations, Rome,** during 25th to 28th September, 2007**.**

4. Feed The Future – Workshop on Climate Resilient Farming Systems for Food & Nutritional Security of Nepal, organized jointly with **USAID – IKP** at Annamalai University, during 8th – 9th, September, 2017.

**National**

1. Organized "**National Seminar on Farming Systems (NSFS)**"at at Department of Agronomy, Annamalai University during 19th March, 2013.

2. Organized **National Seminar** on Sustaining Food Supply, Agro-biodiversity and Rural Livelihoods at Department of Agronomy, Annamalai University during 18th and 19th February, 2010.

3. Organized **International Biodiversity Day Workshop on Invasive Alien Species** at Department of Agronomy, Annamalai University during 22nd May, 2009.

4. Organized **National Seminar on Sustainability of Weed Control Options for the New Millennium**, at Department of Agronomy, Annamalai University during 21st and 22nd December, 2000.

5. Organized **VI Biennial Conference of Indian Society of Weed Science** at Annamalai University during 09th – 10th Feb, 1995.

## International Training Workshop jointly with IRRI, May, 2013


## Regional Consultative Meeting for Exchange of Rice Based Production and Value Chain Development Technologies in SAARC Member States jointly with IRRI & SAC, August, 2018

## MEMBERSHIP AND OFFICES HELD IN PROFESSIONAL BODIES

| | | |
|---|---|---|
| 1. | **Biotechnology Industry Research Assistance Council (BIRAC) – Department of Biotechnology(DBT)** | Expert reviewer |
| 2. | **Indian Society of Weed Science** | Panelists for ISWS and ICAR-DWR jointly organized a Brainstorming Webinar on "Weeds of National Importance" during 25th February 2021 |
| 3. | **Annamalai University 90th year celebration** | Souvenir Committee and Editorial Board Member |
| 4. | **Commonwealth Scholarship Commission in the UK** | CSC Alumni Advisory Panel Member |
| 5. | **National Biodiversity Authority, Govt. of India** | Member of Expert Committee on Invasive Alien Species |
| 6. | **Crop Protection** | Reviewer |
| 7. | **Amity Journal of Agribusiness** | Member of Editorial Advisory Board |
| 8. | **Indian Society of Weed Science Newsletter** | Editor (2000-2004) |
| 9. | **Indian Journal of Weed Science** | Chief Editor (2009-2011) |
| 10. | **World Journal of Agricultural Sciences** | Editorial Board Member |
| 11. | **International Weed Science Society** | Life member |
| 12. | **International Allelopathy Society** | Member |
| 13. | **Asian – Pacific Weed Science Society** | Member |
| 14. | **Indian Society of Weed Science** | Life member |
| 15. | **Indian Society of Weed Science** | Joint Secretary(Co-opted 2000 – 02) |
| 16. | **Indian Science Congress Association** | Life Member/Sectional Committee Member (Agri.)/Agri. Sectional Secretary-2007 |
| 17. | **Weed Biology and Management Editorial Board** | Member |

## REFEREE / REVIEWER FOR JOURNALS

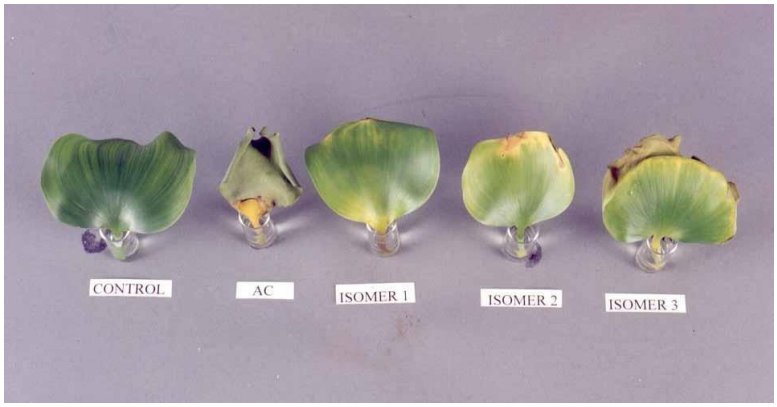
**International**

1. Allelopathy Journal
2. Weed Technology
3. Weed Research
4. Weed Biology and Management (Editorial Board Member)
5. Archives of Agronomy and Soil Science

**National**

1. Mysore Journal of Agricultural Sciences
2. Indian Journal of Agricultural Sciences
3. Indian Journal of Weed Science

**Allelopathic *Coleus amboinicus* active principle and synthetic isomers on water hyacinth**



## EXTENSION ACTIVITIES

1. **Transfer of Technology undertaken for 2400 farmers spread through 36 villages of four districts in livelihood security options**, that includes Integrated Farming Systems through NAIP Project, with an outlay of 9.65 crores, as Principal Investigator. Organized 36 Commodity Interest Groups with these 2400 farmers.
2. **Trained 100 farmers** in Integrated Rice + Fish + Poultry Farming with four on-farm demonstrations through DBT Project.
3. Established a net work of flood tolerant **"Sigappi"** rice growers, comprising 300 farmers spread through Cuddalore, Nagapattinam and Tiruvarur districts through STRASA – IFAD projects, in collaboration with IRRI, Manila. Sigappi is a rice variety evolved by the candidate for submergence tolerance, in collaboration with IRRI.
4. Organized State Level Mass Awareness Campaign on "**Parthenium Eradication"** involving **State Government Ministers, M.L.A, Collector,** and 200 stakeholders during 28.08.2011.
5. Participated in a **live phone in talk on the topic** "பருவத்திற்கேற்ற ஒருங்கிணைந்த பண்ணையம்" by **Vanavil Chat Show** in All India Radio(FM), Kodaikanal on 11-12-13.
6. Delivered **one T.V talk** on **Integrated rice + fish + poultry farming system foe biological suppression of pests, sustainable food production and rural upliftment** in pothigai channel of **Chennai Doordarshan** on **21.11.06**.
7. Delivered **five guest lecturers in the Agricultural officers training programme** organized by the **Pondicherry State Agricultural Department**.
8. Delivered **Three Radio Talks** in All India Radio, Pondicherry on Agricultural inputs and environment.
9. Delivered lectures on 'Weed Management in Wasteland' at the **training programme for Agricultural Officers of the Tamil Nadu State Agriculture Department**.
10. Delivered a special address in the seminar on **Rice Production Technology jointly organized by Southern Petro Chemical Industries Co-operation and State Agriculture Department** at Pinnathur on 21.10.2000.
11. Delivered a special lecture on Environment: Challenges at the **National Environmental Awareness Campaign** organized by the Department of Technology, Annamalai University on sponsored by **Sir. C.P. Ramaswamy Iyer Foundation**.
12. Delivered a special lecture on Organic Farming for Pollution Control organized **by the Department of Agriculture, Tamilnadu** at Cuddalore on 3.12.02.
13. Delivered a special lecture at 8th Regional Workshop on Science writing /Journalism entitled **Agro Bio-diversity** organized by **National Council for Science and Technology Communication,** Ministry of Science &Technology, Govt. of India, New Delhi **at J.J College of Arts & Science, Pudhukottai , Tamilnadu** on 30.8.08.
14. Published **58 news flashes** (in English and Vernacular Tamil), **27 popular articles** (in English and Tamil) and **two documentary films** (in English and Tamil)

## OTHER ACADEMIC CONTRIBUTIONS

1. Presented an exclusive presentation on Integrated Farming Systems entitled "Integrated Farming System – Resource Management Strategy for Enhancing Farm Income" on invitation from **State Planning Commission** at SPC Conference Hall, Chennai on 20th September, 2012, for replication and upscaling of IFS models evolved.
2. Served as a member of Expert panel for the Task force on Science & Technology for Rural India organized by **Scientific Advisory Committee to Prime Minister of India.**
3. Served as **Referee for United States Department of Agriculture** Research Programmes.
4. Serving as Examiner for Bachelor's degree and Masters Degree programmes of **Tamil Nadu Agricultural University, Coimbatore, India.**
5. Serving as Examiner for Master degree and Ph.D. programme of **University of Agricultural Sciences, Bangalore**.
6. Served as Member of Expert Panel, School **Teachers Recruitment Board, Government of Tamil Nadu.**
7. Served as Member of Expert Panel, **Tamil Nadu Public Service Commission.**
8. Served as Member of Expert Panel, **Karnataka Public Service Commission.**
9. Served as expert panel member in Brainstorming sessions on various topics like IPM, GM crops *etc*., organized jointly by National Academy of Agricultural Sciences and Indian Council of Agricultural Research.

**Integrated bio-control of water hyacinth**

*Coleus amboinicus*

*Neochetina eichhorniae / bruchii*


## CONTRIBUTIONS TO THE UNIVERSITY AS DIRECTOR, CENTRE FOR RESEARCH AND DEVELOPMENT

1. Organised All India Student Research Convention in Annamalai University (for the first time in the state) during 2017 sponsored by Association of Indian Universities, in the capacity as National Co- Ordinator.
2. Organized Anveshan-Student Research Convention 2016 (**for the first time in Annamalai University**), and took the students team in Agriculture to Zonal Anveshan 2016 at Kalady, Kerala, who won the South Zone Trophy, South zone Anveshan,2017 at Tumkur and Anveshan 2018 at Coimbatore.
3. Triggered research aptitude of teaching faculty through a competitive call for research proposals for sponsoring under UGC 12$^{th}$ Plan Grant, and awarded 45 Research Projects.
4. Invited nominations for awards as Best researcher (Grants), best Researcher (Publications, Young Researcher (grants) and Young Researcher (Publications), and awarded more than 20 faculty members in 2016, and 2017.
5. Contributed for getting PURSE (Pursuance of University Research in Science for Excellence) Phase II, with an outlay of Rs. 34 crores from DST, GOI, for the University.
6. Increased the number of major research projects by 86 per cent during the first year compared to the number of projects in the university before taking charge (2015-16) and by 45 per cent during the second year.

## CONTRIBUTIONS TO THE FACULTY OF AGRICULTURE AS DEAN (From 14.11.2011 to 03.10.2013)

1. Revised the curriculum for B.Sc. (Ag./Horti.) and M.Sc. (Ag.) programmes in line with the fourth Deans committee recommendations of ICAR.
2. Released a submergence tolerant rice variety 'Sigappi'.
3. Brought the collaborative agreement with Nova Scotia Agriculture College, Dalhousie University of Canada for implementation by sending four students for 3+1 B.Sc. Ag./Horti. and Bachelorette of Technology sandwich programme during 2011-12 and three students during 2012-13.
4. Commenced a wing of Women National Cadet Crops in 2012, for the first time in the 80 years history of the University.
5. Added five practical class rooms, two in orchards, two in the farm and one in dairy premises at a cost of Rs. 25 lakhs.
6. Added one building (class rooms and laboratory complex) with eight halls at a cost of Rs. 1.8 crores.
7. Added two water harvesting ponds at a cost of Rs 2 lakhs through personal projects.

8. Included 23 additional classrooms, in the Kumara Rajah Muthiah Building for conducting theory classes for the B.Sc. (Ag.) / Horti. Programmes.
9. Arranged for shifting Agricultural Economics Department from isolated old veterinary hospital complex to the new main block of the Faculty.
10. Brought in three more vehicles (Two Swaraj Mazda Mini Buses and one Bus) for student transport (In addition of the existing one bus and one van).
11. Installed four of 500 *lit/hr* mineral water plants for use by staff and students in the faculty premises.
12. Installed CCTV surveillance system in the Faculty main block and new block for monitoring students and staff, during 2012-13, even before the same was suggested as mandatory for common service providers, by the Government (at a cost of Rs. 2 lakhs).
13. Distributed agro inputs and infrastructural requirements for 3600 farming households in four disadvantaged districts of Tamilnadu, and trained them through a National Agricultural Innovation Project.
14. Brought out Annamalai University Agriculture Alumni News Letter, for the first time.
15. Commenced Regional Meeting of Annamalai University Agriculture Alumni Association (At Trichirapalli) for the first time.
16. Brought out agricultural students magazine entitled "Grains of Gold and Silver", after a gap of 20 years.

**CONTRIBUTIONS TO THE DEPARTMENT OF AGRONOMY AS HEAD (From 01.07.2009 to 07.11.2013)**

1. Brought Special Assistance Programme under Department of Research Support by UGC over an outlay of Rs. 43.50 Lakhs, with personal supervision as Principal Investigator.
2. Five of the department teachers were sent for IRRI training at Philippines, Nepal, Jabalpur, Varanasi and Lucknow sponsored through personal IRRI- IFAD, NIWS and NAIP collaborative projects.
3. Established an air conditioned Library with Internet facilities, Xerox Copier and Printing Machine and subscription for four International Journals.
4. Established an air-conditioned Hi-tech Lecture Hall with a 50 + capacity.
5. Installed RCC pavement in front of the Department over an outlay of Rs. 5 lakhs.
6. Installed an exclusive vehicle parking shed for staff and students from personal project funds.
7. Established two practical class rooms at a cost of Rs. 9 lakhs in the farm premises.

8. Added books to the Department Library over a cost of Rs. 3 lakhs.
9. Expanded the area under the Laboratory and added new Gents and Ladies toilets.
10. Organized fortnightly meetings of "Annamalai Agronomists Association" with external experts and Faculty members as speakers and organized annual social events for the families of teaching and non-teaching staff of the Department.
11. Added the Department to the National Network of Department of Biotechnology, Ministry of Science and Technology in QTL to Variety Project and installed a submergence pond at a cost of Rs. 9 Lakhs.
12. Organized International Training jointly with IRRI.

## ANNEXURES

## DETAILS OF RESEARCH PUBLICATIONS

**I. International Journal Articles (SCI Impact Factor)**

1. **Kathiresan Ramanathan** and Vishnudevi Sangeeviraman 2021. "Rice farming components for biological weed control in transplanted rice: perspective on weedy rice management", **Weed Sciencdoi:10.1017/wsc.2021.53. (SCI Impact Factor – 2.58)**
2. **Kathiresan Ramanathan**, Vishnudevi Sangeeviraman, Prabakar Chandrahasan, Badri Narayan Chaudhary , Srikrishna Sulgodu Ramachandra, 2020. "Integration of fish culture and poultry rearing in transplanted rice for nutritional security in smallholder farms", **Scientific Reports, 10:1038:**p.1-7. **(SCI Impact Factor – 4.25)**
3. **R.Kathiresan,** S.Vishnudevi andU.V.Jayakanth,2020."Impact of agro-input use in integrated rice (*Oryza sativa*) farming system", Indian Journal of Agronomy65(2): p.104-108. **(SCI Impact Factor – 0.08)**
4. Manzoor H. Dar, Najam W. Zaidi, Showkat A. Waza, Satish B. Verulkar, T. Ahmed,P. K. Singh, S. K. Bardhan Roy, Bedanand Chaudhary, Rambaran Yadav, Mirza Mofazzal Islam, Khandakar M. Iftekharuddaula, J. K. Roy, **R. M. Kathiresan**, B. N. Singh, Uma S. Singh & Abdelbagi M. Ismail. 2018. "No yield penalty under favorable conditions paving the way for successful adoption of food tolerant rice" **Scientific Reports**, 8:9245:p.1-7. **(SCI Impact Factor – 4.25)**
5. **Kathiresan, RM. and Gbehounou, G.** 2016. "Impact of climate change on invasive traits of weeds" **Weed Biology and Management,** 16: p.59-66.**(SCI Impact Factor – 0.68)**
6. Renu Singh, Yashi Singh, Neera Yadav, P.C. Sharma, S.L. Krishnamurthy, S.K. Sharma, J.L. Dwivedi, A.K. Singh, P.K. Singh, J. Singh, Rajesh Kumar, Nilanjay, N.K. Singh, T. Ahmad, S.K. Chetia, M. Rai, R. Perraju, D.N. Singh, Anita Pandey, T. Mohapatra, N.P. Mandal, J.N. Reddy,O.N. Singh, J.L. Katara, B. Marandi, P. Sawain, R.K. Sarkar, D.P. Singh, S. Verulkar, T. Ram, G. Padmawathi, Y. Suryanarayana, PV. Ramana Rao, M. Girija Rani, T. Anuradha, **R.M. Kathiresan,** S. Thirumeni, K. Paramsivam, S. Nadarajan, A.K. Singh, M. Nagarajan, Arvind Kumar, E. Septiningshih, U.S. Singh, A.M. Ismail, D. Mackill and Nagendra K. Singh. 2016. **"From QTL to variety – Harnessing the benefits of QTLs for drought, flood and salt tolerance in mega rice varieties of India through a multi – institutional network" Plant Science**. Special Issue. From Genomics to Breeding, **242.** p.278-287.**(SCI Impact Factor – 3.43)**
7. **Kathiresan, RM.** and S. Deivasigamani 2015. Herbicidal control of water hyacinth (*Eichhornia crassipes*) and its impact on aquatic environment. **Indian J. of Agronomy, 60**(4): 606-609. **(SCI Impact Factor – 0.28)**
8. **Kathiresan, RM**. 2009. Integrated farm management for linking environment. **Indian J. of Agronomy, 54**(1): 9-14. **(SCI Impact Factor – 0.28)**
9. **Kathiresan, RM** and J. Dhavabharathi. 2008. Rice allelopathy for weed management in aquatic ecosystems. **Allelopathy Journal**, 22(2). p.413-416. **(SCI Impact Factor – 1.05)**
10. **Kathiresan, RM**. 2007. Integration of elements of farming system for sustainable weed and pest management in the tropics. **Crop Protection**, **26.** 424-429. **(SCI Impact Factor – 1.83)**
11. **Kathiresan, RM**. 2000. Allelopathy Potential of Native plants against water hyacinth.**Crop Protection**. **19**(8-10): 705-708. **(SCI Impact Factor – 1.83)**

**OTHER REFEREED INTERNATIONAL RESEARCH PAPERS**

1. **Kathiresan, RM.** 2010. Spatial and Temporal Integration of Component- Enterprises in Small Holder Farms of India for Sustainability in Farming and Rural Livelihoods in 9th European IFSA Symposium at **Vienna, Austria**, p.2123-2128.
2. **Kathiresan, RM.** 2007. "Linking Environment and weed management through integrated farm management". In: Proceedings of the 21st Asian Pacific Weed Science Society Conference, **Colombo, Srilanka**, p. 21-26.
3. **Kathiresan, RM**. 2006. Effect of Global Warming on invasion of alien plants in Asia. In: Proceedings of NIAES International Symposium-National Institute of Agro-environmental Sciences, Tsukuba, Japan, 2006. p. 24-29.
4. **Kathiresan, RM.** 2005. Effect of global warming on weed invasion World Wide. In 20th Asian - Pacific Weed Science Society Conference, **Ho Chi Minh City, Vietnam**, p. 91- 98.
5. **Kathiresan, RM. 2005.** Allelopathy for bio-control of water hyacinth. (Eds J.D.I Harper, M. An, H.Wu and J.H.Kent). In: Proceedings of the Fourth World congress on Allelopathy, Charles Sturt University, **New South Wales, Australia**. p. 64 - 70.
6. **Kathiresan, RM. 2005**. Evaluation of allelopathic plant materials for aquatic weed control. In Proceedings of the Fourth World Congress on Allelopathy, Charles Sturt University, **New South Wales, Australia.** p. 266-269.
7. **Kathiresan**, **RM.** and Yaduraju. N.T. 2003. Invasive Weeds in the Tropics. In Proceedings: 19th Asian Pacific Weed Science Society Conference, **Manila, Philippines,** vol. I. p. 59-68.
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10. **Kathiresan, RM.** 2013. "Integrated rice + fish + poultry farming system in NAIP", ***Thamilaga Vivasayi Ulagam***, November 2013.
11. **Kathiresan, RM.** 2013. "Submergence Tolerant Rice". ***Pudhiya Thalaimurai*** 28.11.2013.
12. **Kathiresan, RM.** 2013. "Integrating poultry, fish and rice to triple income", ***The Hindu***, 24.10.13.
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14. **Kathiresan, RM.** 2011. "Eradication of Parthenium Weeds". ***Uzhavan Urimai***. October 2011.
15. **Kathiresan, RM.** 2011. "Three types of Income in Season crops", ***Valarum Vivasaya Thamizhagam***, 01.06.11.
16. **Kathiresan, RM.** 2011. "Waterhyacinth is a dangerous weed plant?", ***Valarum Vivasaya Thamizhagam***, June 2011.
17. **Kathiresan, RM.** 2011."Climate change and world food security", ***Theekkathir***, 22.02.11**.**
18. **Kathiresan, RM**.2011. "Three in one agriculture", ***Kalki***, 16.01.11.
19. **Kathiresan, RM**.2010. "Natural herbal solution for managing waterhyacinth", ***Kalki***, 26.12.10.
20. **Kathiresan, RM**.2010. **"**High profit from Seaweed culture", ***Thozhil Malar***, 09.09.10.

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## Sigappi Rice Variety

CHENNAI
THE HINDU • WEDNESDAY, MAY 1, 2013

# Annamalai university releases submergence-tolerant paddy variety

### 'Taking technology to farmers and seed multiplications crucial for success'

A.V. Ragunathan

**CUDDALORE:** The Faculty of Agriculture, Annamalai University, has introduced a new submergence-tolerant paddy variety "Sigapi," named after the wife of former Pro-Chancellor M.A.M. Ramasamy.

The new variety was released at the inauguration of the three-day international training workshop on "Rice technology transfer systems for stress-prone environments in South Asia" at Chidambaram on Monday.

Dean RM. Kathiresan said that the new variety was developed by incorporating the Sub-1 gene (submergence-tolerant gene) in the traditional CR 1009 paddy variety. While retaining the characteristics of the traditional variety, the new one could also withstand total submergence for 10 days and yet capable of giving 70 to 80 per cent of the normal yield in 145-150 days.

The traditional variety usually would wilt within four days of submergence. As the genetic potential of the traditional variety had declined radically, it had become necessary to develop the new variety, he said.


*Uma Shankar Singh, senior scientist, IRRI, releasing the new submergence-tolerant paddy variety at Annamalai University, Chidambaram on Monday.* – PHOTO: C. VENKATACHALAPATHY

Dissemination of the technology among farmers and seed multiplications were the other aspects that would determine the successful absorption of the variety on the fields, Mr. Kathiresan noted asking farmers to give their feedback for follow-up action. The faculty would continue to impart training for farm scientists and farmers.

Besides senior scientists from the International Rice Research Institute (IRRI), Philippines, delegates from India, Nepal, Bangladesh and farmers participated.

Senior Scientist of the IRRI Uma Shankar Singh said that 50 per cent of the area under paddy cultivation in South Asia was prone to stress conditions created by salinity, drought and floods. Therefore, to stabilise rice production, the IRRI had launched the stress tolerant rice for Africa and South Asia programme.

Of the new varieties, 'Swarna (MTU 7029)' was an overwhelming success. Later, Swarna-Sub 1 followed and soon Samba Muhsuri-Sub 1 variety would be introduced in Tamil Nadu.

Management practices were equally important as gene introduction for augmenting food grains production and productivity, he said.

IRRI Senior Manager Julian Latitan said that India had now emerged as the number one rice exporter in the world, relegating Thailand to the background. As India was releasing the stocks on time, the prices of the commodity had stabilised in the importing countries.

Mr. Latitan pointed out that 90 per cent of world rice production was in Asia and 90 per cent of the rice produced was being consumed in Asia. However, of late, Africans were now finding rice as a staple food and therefore there was an increasing demand for rice there.

In such circumstances, agriculture was facing many challenges such as dwindling land area, ageing farmer population, aversion of the youth to take to agriculture and declining registration in the agricultural universities. There was a need for transferring affordable and appropriate technology to the farmers to increase productivity and to improve their livelihood, he emphasised.

Rainfed Lowland Agronomist (IRRI) Sudhanshu Singh called for speedy dissemination of technology and adaptation of better management practices.

## IV. NEWS FLASHES ON THE RESEARCH OUTPUT

1. "ICAR sanctions Rs. 7.32 crore project", ***The Hindu,*** 03.05.08.
2. "Farming Systems for livelihood security in disadvantaged districts of Tamil Nadu coming soon", ***Dhinathanthi,*** 20.05.08.
3. Consortium to implement 7.32 crore farm project, ***The Hindu***, 03.05.2008.
4. "Annamalai University to implement ICAR project", ***News Today,*** 21.05.08.
5. "NAIP farming system training in four districts", ***Dhinakaran,*** 13.12.08.
6. "Rice + Fish + Poultry farming system in Annamalai University", ***Dhinamalar,*** 17.12.08.
7. "Annamalai University initiate agricultural innovation project", ***Mirror,*** 02.02.09.
8. "Inauguration of integrated farming system", ***Dhinathanthi,*** 22.03.09.
9. "Free goats distribution to farmers", ***Dhinamani,*** 26.03.09.
10. "A research on biological good habits", ***Dhinathanthi,*** 26.05.09.
11. "International biodiversity day", ***Dhinakaran,*** 30.05.09.
12. "Inauguration of agronomy building in Annamalai University", ***Dhinamalar puduvai,*** 25.06.09.
13. "Rice cultivation training camp", ***Dhinathanthi,*** 14.08.09.
14. "Removal of water hyacinth by natural ayurvedic medicine", ***Dhinathanthi,*** 06.09.09.
15. "Poultry rearing in rice field" Cuddalore and Villupuram special, ***Dhinathanthi,*** 13.09.09.
16. "Annamalai University to screen submergence tolerant rice", ***New Indian Express,*** 01.10.09.
17. "International Rice research institute scientist visits the stress tolerant rice variety grown in fields nearby Chidambaram", ***Dhinathanthi,*** 03.10.09.
18. "International Rice research institute scientist visited the stress tolerant rice variety field nearby Chidambaram", ***Dhinakaran,*** 03.10.09.
19. "Annamalai Varsity's rice initiative", ***Deccan Chronicle Education,*** 12.10.09.
20. "Introducing the modern equipment in NAIP", ***Dhinathanthi,*** 14.10.09.
21. "Inauguration function of fish culture plan", ***Dhinakaran,*** 14.11.09.
22. "National innovation Project for livelihood enhancement in Tamil Nadu", ***Gnanasakthi,*** 16.03.10.
23. "Goat and millets farming system", ***Gnanasakthi,*** 17.03.10.
24. "Annamalai University undertaking National Agricultural innovation project", ***Dhinavanigam,*** 05.04.10.
25. "Integrated farming system", ***Tamil Osai,*** 30.05.10.

26. "Integrated Goat + Crop Farming in National Agricultural Innovation Project", ***Tamil Osai,*** 06.06.10.
27. "Seaweed culture for livelihood security", ***Karuthupettagam,*** 17.06.10.
28. "Seaweed culture for livelihood security", ***Dhinathandhi,*** 17.06.10.
29. ''Inauguration Rice +Fish + Poultry Farming System", ***Uzhavan Urimai,*** June 2010.
30. "Annamalai University to evaluate submergence tolerance of paddy", ***The Hindu,*** 27.12.10.
31. "Research institute plans 2012 release of flood tolerant rice", ***New Indian Express***, 17.02.11.
32. "India has vital role to play in global rice agenda: IRRI chief", ***The Hindu,*** 17.02.11.
33. "Changing climate reduces the rice production – IRRI director warned the farmers", ***Theekathir,*** 23.02.11.
34. "New challenges for rice production – Annamalai University Conference", ***Dhinavanigam,*** 30.02.11.
***35.*** "Eradication of Parthenium weeds through people movement", ***Dhinamani,*** 04.08.11.
36. "Conference on Parthenium eradication in Annamalai University", ***Makkal kural,*** 28.08.11.
37. "Stress on Controlling Parthenium", ***The Hindu***, 29.08.2011.
***38.*** "To eradicate a weed Parthenium by peoples movement", ***Dhinathanthi,*** 29.08.11.
39. "Inaugural function for Parthenium weed eradication", ***Dhinamalar,*** 29.08.11.
40. "The ministers Selvi Ramajayam, M.C. Sambath and Ramanathan, Vice Chancellor of Annamalai University are involved in Eradication of Parthenium weed in Mariyappa Nagar, Chidambaram", ***Kalaijothi,*** 02.09.11.
41. "Rice + Fish + Poultry farming", ***Dhinathanthi,*** 23.12.11.
42. "New Agricultural plan on second green revolution way", ***Theekkathir***, January 2012.
43. "How to control of water hyacinth?", ***Dhinamani,*** 05.04.12.

"New Agricultural plan", ***Uzhavan Urimai***, May 2012.

44. IRRI-EC-IFAD training workshop on "Rice Technology Transfer Systems for Stress Prone Environments in South Asia". ***Uzhavan Urimai,*** 29th April to 3rd May 2013.
45. "Annamalai University releases submergence-tolerant paddy variety", ***The Hindu,*** dated 1st May 2013.
46. "International Agricultural training Inauguration function in Annamalai University", ***Dhinamalar,*** 02.05.13.
47. "Introducing Sigappi rice variety on International training workshop organized by Annamalai University", ***Dhinamalar,*** 03.05.13.
48. "Submergence tolerant rice Variety 'Sigappi seed' distributed to farmers by Shiv Das Meena", ***Makkal kural,*** 04.08.13
49. "Submergence Tolerant Paddy Seeds given to 100 Farmers". ***The Hindu*** dated 04.08.2013.
50. "To learn from the farmers experience – Annamalai University Administrator advises the students", ***Theekathir,*** 05.08.13.
51. "Faculty of Agriculture – Sigappi paddy seed variety distribution function", ***Dhinamalar,*** 06.08.13.
52. "Inauguration of sigappi seed variety training function", ***Tamilaga Vivasayi Ulagam***, October 2013.
53. "In Agricultural Rice fields, fish and poultry can also be grown", ***Pudhiya Thalaimurai***, 3.10.13.
54. "New challenging Sigappi paddy variety to flood", ***Dhinathanthi,*** 31.07.14.
55. "TN Univ to help in Nepal in integrated rice farming Fish, Poultry to be reared on fields in project", ***The Tamil Hindu***, 10.09.2017
56. "Research on Integrated farming", ***The Hindu,*** 19.09.2017
57. "Inaugural Function for International Research Project at Annamalai University", ***The Tamil Hindu,*** 11.09.2017
58. "Integrated Farming to Boost Revenue", ***The New Indian Express***,14.05.2018

# TN univ to help Nepal in integrated rice farming

## Fish, Poultry To Be Reared On Fields In Project

**Bosco.Dominique**
@timesgroup.com

The method involves rearing fish in a 1m trench surrounding the farm measuring not more than an acre and 20 poultry cages — with 20 broiler hens in each cage — erected four feet above the paddy crops

**Cuddalore:** A project that integrates rice cultivation and rearing of fish and poultry, evolved by Annamalai University, Chidambaram, Cuddalore district, will be replicated in Nepal at a cost of ₹1.2 crore, thanks to the initiatives undertaken by USAID of the USA and Knowledge park of India (IKP). The project was successfully experimented in four districts between 2008 and 2015.

Annamalai University director (research and development) R M Kathiresan will supervise the implementation of the project in association with Commercial Agriculture A, a non-government organization in Nepal, from 2017 to 2019. Annamalai University registrar K Arumugam formally launched the project in a simple function on Friday.

Kathiresan said the project involves rearing fish (Katla, Common corp, Mrigal and Rahu) in a 1m trench surrounding the farm measuring not more than an acre and 20 poultry cages (with 20 broiler hens in each cage) erected four feet above the paddy crops.

"The fish feeds on the insects and worms in water that affect crops, while poultry droppings are rich manure for the crops. We have experimented the project involving more than 1,200 farmers in Cuddalore, Villupuram, Nagapattinam and Tiruvannamalai districts and found that the income of farmers went up three-fold by adopting integrated farming and rearing techniques," said Kathiresan.

He said farmers, who used to earn between ₹20,000 and ₹25,000 by cultivating paddy in one acre in a season have reaped a profit of more than ₹60,000 per acre by integrating cultivation of paddy with rearing fish and poultry.

Kathiresan said the university undertook the research with the help of assistance from World Bank (₹9 crore) and biotechnology research assistance council — Birac (₹70 lakh) and other funding agencies and partners including The Bill and Melinda Gates' Foundation, Dhan Foundations and Krishi Vigyan Kendras (KVKs).

"We worked on different and diversified farming and rearing techniques. We experimented integrating farming and rearing of fish, broiler chicken, Japanese quail, duck and rabbits and finally found that rice-fish-broiler chicken yielded the maximum profits," said Kathiresan. "Poultry droppings are rich in nitrogen content (1.25%) when compared to cattle droppings (0.5%). The manure is so rich in minerals that chemical fertilizers will not be required (barring initial stages of the project)," he said.

There are more than 100 countries in the world cultivating rice and more than 200 million families involved in cultivation of rice. "More than 70% of rice growing families own land less than one acre. Small land holders land are the predominant growers of rice. This integrated farming and rearing technique is most suited at farms less than an acre," said Kathiresan.

A delegation of scientists from the South Asian Association for Regional Cooperation (Saarc) nations will soon visit India to study the project implemented by the Annamalai University and replicate it in their respective nations.

THE NEW INDIAN EXPRESS | REGION

03 VILLUPURAM MONDAY 17.09.2018 newindianexpress.com

21.01 µg/m3 The PM 2.5 level recorded at IIT-Madras on Sunday. Nitrogen dioxide level was at 14.85 µg/m3 against the prescribed standard of 80.00 µg/m3

# Flood-tolerant paddy from Annamalai Univ helps Kerala farmers

Developed in 2013, submergence-tolerant 'Sigapi' is currently being sown in around 1,000 acres in Palakkad dist; it holds high potential for Tamil Nadu too

HARISH MURALI @ Cuddalore

A paddy variety developed at Annamalai University in 2013 has come handy for the farmers in Kerala who were recently hit by one of the worst floods in the history of the State.

Submergence-tolerant paddy 'Sigapi', named after the wife of former Pro-Chancellor M A M Ramasamy of the university, is currently being sown in around 1,000 acres of farmlands in Kerala's Palakkad district which is a major rice-producing region in the State.

R M Kathiresan, one of the key persons in developing Sigapi, has been busy ever since the deluge in neighbouring State. He said that Sigapi showed good resistance to flooding and stayed strong during the period. His counterpart in Kerala Agriculture University's Pattambi Research Station Dr Elangovan has been updating him with video clips from villages of Palakkad district where Sigapi is sown.

**Traditional varieties**

Traditional varieties that are sown extensively in Tamil Nadu do not have capacity to withstand submergence for over a week

According to officials of Annamalai University, Sigapi, developed in collaboration with the Indian Rice Research Institute, has a great potential.

Speaking to *Express*, Kathiresan said that traditional paddy varieties that are sown extensively by farmers in Tamil Nadu do not have the capacity to withstand submergence for over a week. Meanwhile, the new variety can survive at least 10 days of submergence at any stage of development.

Kathiresan, who has been involved in rice research for several decades, said that Sigapi was developed by incorporating Sub-1 gene (submergence-tolerant gene) in the traditional CR 1009 paddy variety.

He added that Sigapi retains the core characteristics of traditional varieties, yet it is capable of giving 70 to 80 per cent of the normal yield in 145-150 days, which is usual for a normal samba season.

University officials said that the unpredictable nature of northeast monsoon in the Tamil Nadu prompted them to carry out research on such a variety until they came up with Sigapi in 2013.

Experts inspecting a paddy field in Palakkad district of Kerala | EXPRESS

## V. THREE DOCUMENTARY FILMS (TWO IN ENGLISH & ONE IN VERNACULAR) ON RESEARCH OUTPUT

**(Available in youtube link:** https://youtu.be/Vh59cLQA4O4 **https://youtu.be/K2vqyXgjlLU** https://www.youtube.com/watch?v=edadhIDLsXU**).**

(i) Documentary film prepared for 22 minutes both in English and Vernacular, "Farming livelihoods" & "gz;ida tho;thjhuq;fs;".

(ii) Documentary film prepared for 12 minutes in English on "Farming livelihoods"

(iii) Documentary film prepared for 7 minutes in English on "Farming Systems and Nutrition"

(iv) Documentary film for 3.16 minutes - Special segment on outstanding BIRAC Innovations in Hunnarbaaz! In Hindi on BIRAC Farming System.

**Documentary Film Released by Dr. Robert S. Zeigler, Director General, IRRI, Philippines on 16th February, 2011**

## VI. RESEARCH FACILITIES AND EQUIPMENTS ADDED THROUGH RESEARCH PROJECTS

| Sl. No. | Items | No. of items | Amount (in Rs.) |
|---|---|---|---|
| | **BUILDINGS** | | |
| 1. | Village Knowledge Center and Laboratory Building (One Block with Five Halls) | - | 50,00,000.00 |
| 2. | Submergence pond | 1 | 8,80,000.00 |
| | **EQUIPMENTS** | | |
| 3. | Mobile Demonstration Vehicle (Innova) | 1 | 10,92,500.00 |
| 4. | Office and Laboratory furniture's & Accessories | - | 11,83,941.81 |
| 5. | FRB Motor boat | 1 | 5,50,000.00 |
| 6. | Generator | 1 | 4,01,874.00 |
| 7. | Laser guided land leveler | 1 | 3,85,000.00 |
| 8. | Printer - Konica Minolta Bizhub C253 | 1 | 3,64,000.00 |
| 9. | Air conditioner | 9 | 2,69,100.00 |
| 10. | Avian disease diagnostic equip.(digital binocular) | 1 | 2,22,300.00 |
| 11. | High tech nursery | - | 1,88,402.00 |
| 12. | Model feed plant 500 kg/hr capacity | 1 | 1,73,108.00 |
| 13. | PCR (thermocycler) | 1 | 1,45,600.00 |
| 14. | Sachet sealing machine | 1 | 1,42,320.00 |
| 15. | 40" LCD TV | 1 | 1,20,173.00 |
| 16. | DSC W300 (Sony digital camera) | 1 | |
| 17. | Ms-Mt cg / bl | 1 | |
| 18. | Autoclave & Drier | 1 | 96,043.00 |
| 19. | Model Hatchery | 1 | 81,000.00 |
| 20. | LCD projector | 1 | 86,000.00 |
| 21. | Audio gadgets – AHUJA SSA 100 A Amplifier & Accessories | 1 | 78,175.00 |
| 22. | Hp motor | 3 | 74,850.00 |
| 23. | Video camera | 1 | 72,910.00 |
| 24. | Dehydrator | 1 | 58,240.00 |
| 25. | Canon IR – 2318 L Printer with 2KVA stabilizer | 1 | 50,868.00 |
| 26. | Conference table | 1 | 44,500.00 |

| Sl. No. | Items | No. of items | Amount (in Rs.) |
|---|---|---|---|
| 27. | Conference table | 1 | 44,500.00 |
| 28. | Drinking water system | 1 | 36,337.00 |
| 29. | Bottling machine | 1 | 33,696.00 |
| 30. | Sony Digital Camera | 1 | 27,150.00 |
| 31. | AHUJA SSA 250 m Amplifier & Accessories | 1 | 25,420.00 |
| 32. | Konica Minolta Bizhub C253 image unit – black | 1 | 24,150.00 |
| 33. | Intercom | 1 | 18,720.00 |
| 34. | Refractometer | 3 | 16,538.00 |
| 35. | pH meter | 3 | |
| 36. | Display board | 1 | 15,919.00 |
| 37. | Inverter (UPS) | 1 | 15,080.00 |
| 38. | Double beam UV-Visible spectrophotometer | 1 | 9,000.00 |
| 39. | DVD Player | 1 | 5,325.00 |
| | **Total Amount** | | **1,19,88,239.81** |
| | | | **Rs. 1.198 Crores** |

## VII. SCHOLARSHIPS GIVEN TO B.Sc. (Ag.), M.Sc. (Ag.) & Ph.D STUDENTS FROM THE RESEARCH PROJECT FUNDS

| S. No. | Name of Student | Project | Duration | Amount (in Rs.) (@ Rs.2000 per month) |
|---|---|---|---|---|
| | **B.Sc., (Ag.) Students** | | | |
| 1. | Sreelakshmi | Dow Agro Science | January 2014 – May 2014 | 15,000.00 |
| 2. | Aampur Dineshkumar Reddy | SDR Ramcide | January 2014 – May 2014 | 15,000.00 |
| | **M.Sc. (Ag) Students** | | | |
| 3. | Bandaru Pallavi | IFAD | August 2011- March 2012 | 16,000.00 |
| 4. | Veerakumar | IFAD | August 2011- March 2012 | 16,000.00 |
| 5. | Bandaru Pallavi | IFAD | April 2012 – March 2013 | 24,000.00 |
| 6. | Veerakumar | IFAD | April 2012 – March 2013 | 24,000.00 |
| 7. | Vishnudevi | IFAD | August 2012- March 2013 | 16,000.00 |
| 8. | Vamsi Krishna | IFAD | August 2012-March 2013 | 16,000.00 |
| 9. | Vallepu Harikumari | UGC-SAP | August 2012-March 2013 | 16,000.00 |
| 10. | Guvala Sumalatha | UGC-SAP | August 2012- March 2013 | 16,000.00 |
| 11. | Vishnudevi | IFAD | April 2013 – March 2014 | 24,000.00 |
| 12. | Sarath Kumar | IFAD | April 2013 – March 2014 | 24,000.00 |
| 13. | Vallepu Harikumari | UGC-SAP | April 2013 – March 2014 | 24,000.00 |
| 14. | Guvala Sumalatha | UGC-SAP | April 2013 – March 2014 | 24,000.00 |
| 15. | R.Karthikeyan | IRRI- STRASA | August 2017- December 2017 | 10,000.00 |
| 16. | S. Pallavamallan | IRRI- STRASA | August 2017- December 2017 | 10,000.00 |
| | **Ph.D Scholar** | | | |
| 17. | C. Kannan (All expenses for research in U.K. for two months) | Natural Resources International, **U.K.** | 1999 | 14,00,000.00 |
| | **TOTAL** | | | **16,90,000.00** |
| | | | | **Rs. 16.90 lakhs** |

## VIII. Fellowships given to Ph.D scholars from Research Project funds of RM. Kathiresan

| S. No. | Project Title | Funding Agency | Duration | Designation | Amount (in Rs.) |
|---|---|---|---|---|---|
| | **COMPLETED PROJECTS** | | | | |
| **1.** | Designing on-farm participatory models of Integrated Farming Systems for enhancement of household diet diversity and livelihoods of women small holder farmers | DBT- BIRAC, Bill and Melinda Gates Foundation | 2015-2016 | Senior Research Fellow – 3 Nos.<br>Junior Research Fellow – 2 Nos.<br>Technical Assistant - 4 Nos. | 3,18,526.00 |
| **2.** | Climate Resilient Farming Systems for Sustainable Farming and Livelihood Enhancement of SC/ST Population in Disadvantaged Coastal Districts of Cuddalore and Nagapattinam in Tamilnadu | Department of Science and Technology, Government of India | 2014-2016 | Senior Research Fellow – 2 Nos.<br>Field Assistant - 1 No. | 2,31,055.00 |
| **3.** | Control of water hyacinth through herbicides and its impact on aquatic environment | Ministry of Water Resources, GOI | 2009-2012 | Senior Research Fellows – 2 Nos. | 8,55,910.00 |
| **4.** | Cellulose Nanofibers from Aquatic Weeds | Department of Biotechnology, Ministry of Science and Technology, GOI | 2007-2010 | Senior Research Fellow – 1 No.<br>Field Assistant – 1 No. | 5,29,200.00<br>72,000.00 |
| **5.** | National Invasive Weed Surveillance | Department of Agriculture and Co-operation, GOI | 2008-2010 | Senior Surveillance Inspector – 1 No.<br>Surveillance Inspector – 3 Nos.<br>Skilled Person – 1 No. | 2,88,000.00<br>7,20,000.00<br>1,20,000.00 |
| **6.** | Integrated Rice+Fish+Poultry farming for biological suppression of pests, sustainable food production and rural upliftment | Department of Biotechnology, Ministry of Science and Technology, GOI | 2004-2007 | Senior Research Fellows – 2 Nos.<br>Field Assistant – 2 Nos. | 6,00,000.00<br>1,08,000.00 |
| **7.** | Weed Management in Integrated Rice+Fish+Poultry farming system | Indian Council of Agricultural Research (Adhoc) | 2002-2005 | Senior Research Fellows – 2 Nos. | 6,53,200.00 |
| **8.** | Integration of Botanical Herbicide *Coleus amboinicus/aromaticus* with insect Biological control of water hyacinth | Indian Council of Agricultural Research | 2001-2004 | Senior Research Fellow – 1 No. | 2,53,920.00 |

| S. No. | Project Title | Funding Agency | Duration | Designation | Amount (in Rs.) |
|---|---|---|---|---|---|
| **9.** | Integration of Botanical Herbicide *Coleus amboinicus/aromaticus* with insect Biological control of water hyacinth | Indian Council of Agricultural Research | 2001-2004 | Senior Research Fellow – 1 No. | 2,53,920.00 |
| **10.** | Farming systems for livelihood security of small and marginal farmers in disadvantaged districts of Tamil Nadu | Indian Council of Agricultural Research (World Bank aided) | 2008-2014 | Senior Research Fellows – 8 Nos.<br>Office Assistant – 1 No. | 87,06,708.00 |
| **11.** | From QTL to Variety: Marker Assisted Breeding of Abiotic Stress Tolerant Rice Varieties with Major QTLs for Drought, Submergence and Salt Tolerance | Department of Biotechnology, Ministry of Science and Technology, GOI | 2010-2015 | Senior Research Fellow – 1 No. | 6,53,660.00 |
| **12.** | Annamalai Rice + Fish + Poultry Farming System for Improving Nutrition and Livelihoods of Small farmers in Nepal | United States Agency for International Development (USAID) and IKP Indian Knowledge Park (IKP) | 2017 - 2019 | Senior Research Fellow -1No.<br>Technical Assistant – 4 Nos. | 26,00,000.00 |
| | **TOTAL (A)** | | | | **1,69,64,099.00** |
| | **ONGOING PROJECTS** | | | | |
| **13.** | Agronomic Integration of Technologies for Productivity Management and Optimal Water Use in Wetlands of Cauvery River Delta | Department of Science and Technology | 2018- 2021 | Senior Research Fellows – 2 Nos.<br>Technical Assistant - 2 Nos | 34,99,200.00 |
| | **TOTAL (B)** | | | | **34,99,200.00** |
| | **GRAND TOTAL (A+ B)** | | | | **2,04,63,299.00** |

## IX. Value of resources generated to the university through the research projects handled by Dr. RM. Kathiresan, Professor, Department of Agronomy, Faculty of Agriculture

**Research Projects**

| S. No. | Project title | Funding agency | Year | Total Budget (Rs. In Lakhs) | Over head Charges to the University (Rs. In Lakhs) | Value of Building / Equipment / Computers/ Infrastructure created from the project (Rs. In Lakhs) | Total value of resources generated to the university (Rs. In Lakhs) |
|---|---|---|---|---|---|---|---|
| **I. COMPLETED RESEARCH PROJECTS** | | | | | | | |
| **National** | | | | | | | |
| **1.** | Designing on-farm participatory models of Integrated Farming Systems for enhancement of household diet diversity and livelihoods of women small holder farmers | DBT - BIRAC- Grand Challenges India | 2015-2016 | 69.34 | 5.6 | - | 5.6 |
| **2.** | Climate Resilient Farming Systems for Sustainable Farming and Livelihood Enhancement of SC/ST Population in Disadvantaged Coastal Districts of Cuddalore and Nagapattinam in Tamilnadu | Department of Science & Technology, Government of India | 2014-2016 | 35.56 | 2.00 | - | 2.00 |
| **3.** | Farming systems for livelihood security of small and marginal farmers in disadvantaged districts of Tamil Nadu | Indian Council of Agricultural Research (World Bank aided) | 2008-2014 | 963.00 | 54.57 | Equipments: 54.96<br>Building: 47.00*<br>Furniture: 2.00<br>Books: 3.72<br>**Total : 107.68** | 162.25 |
| **4.** | Control of water hyacinth through herbicides and its impact on aquatic environment | Ministry of Water Resources, GOI | 2009-2012. | 29.96 | 5.09 | Equipments 4.00 | 9.09 |

| S. No. | Project title | Funding agency | Year | Total Budget (Rs. In Lakhs) | Over head Charges to the University (Rs. In Lakhs) | Value of Building / Equipment / Computers/ Infrastructure created from the project (Rs. In Lakhs) | Total value of resources generated to the university (Rs. In Lakhs) |
|---|---|---|---|---|---|---|---|
| 5. | National Invasive Weed Surveillance | Department of Agriculture and Co-operation, GOI | 2008-2010 | 21.00 | 1.96 | Equipments 1.00 | 2.96 |
| 6. | Cellulose Nanofibers from Aquatic Weeds" (Network mode) | Department of Biotechnology, Ministry of Science and Technology, GOI | 2007-2010 | 30.00 | 0.75 | Equipments 1.50 | 2.25 |
| 7. | Integrated Rice+Fish+Poultry farming for biological suppression of pests, sustainable food production and rural upliftment | Department of Biotechnology, Ministry of Science and Technology, GOI | 2004-2007 | 21.28 | 1.80 | -- | 1.80 |
| **8.** | Weed Management in Integrated Rice+Fish+Poultry farming system' | Indian Council of Agricultural Research (Adhoc) | 2002-2005 | 11.15 | 0.79 | Equipments 0.75 | 1.54 |
| **9.** | Integration of Botanical Herbicide *Coleus amboinicus/aromaticus* with insect Biological control of water hyacinth | National Agricultural Technology Project sponsored by Indian Council of Agricultural Research | 2001-2004 | 14.33 | 0.97 | Equipments 3.67 | 4.64 |
| **International** | | | | | | | |
| **10.** | A short term project on 'Formulations of *Coleus amboinicus* natural product for biocontrol of water hyacinth' as a collaborating scientist with Dr. John Casely, IACR - Long Ashton, U.K. | Funded by Natural Resources International, U.K | 1999 | 14.00 | Provided sponsorship for one Ph.D. student to go to U.K. and use the research facilities at IACR Long Ashton for a period of three months | | |

| S. No. | Project title | Funding agency | Year | Total Budget (Rs. In Lakhs) | Over head Charges to the University (Rs. In Lakhs) | Value of Building / Equipment / Computers/ Infrastructure created from the project (Rs. In Lakhs) | Total value of resources generated to the university (Rs. In Lakhs) |
|---|---|---|---|---|---|---|---|
| | **ONGOING RESEARCH PROJECTS** | | | | | | |
| **11.** | From QTL to Variety: Marker Assisted Breeding of Abiotic Stress Tolerant Rice Varieties with Major QTLs for Drought, Submergence and Salt Tolerance | Department of Biotechnology, Ministry of Science and Technology, GOI | 2010-2015 | 57.65 | 3.75 | Equipments: 2.50 Works(Submergence pond) : 8.80 **Total : 11.30** | 15.05 |
| **12.** | Improved rice crop management for rising productivity in the submergence prone and salt affected rainfed lowland in South Asia | Bill and Melinda Gates Foundation, STRASA Phase III-IFAD | 2011-2016 | 13.82 | 1.81 | -- | 1.81 |
| **13.** | Annamalai Rice + Fish + Poultry Farming System for Improving Nutrition and Livelihoods of Small farmers in Nepal | United States Agency for International Development (USAID) and IKP Indian Knowledge Park (IKP) | 2017 - 2019 | 120.00 | 5.90 | **-** | 5.90 |
| **14.** | Agronomic Integration of Technologies for Productivity Management and Optimal Water Use in Wetlands of Cauvery River Delta | Department of Science and Technology | 2018- 2021 | 209.87 | 14.86 | - | 14.86 |
| | **Sub Total** | | | **1610.96** | **100.39** | **129.90** | **230.29** |

| S.No. | Project title | Funding agency | Year | Total Budget (Rs. In Lakhs) | Over head Charges to the University (Rs. In Lakhs) | Value of Building / Equipment / Computers/ Infrastructure created from the project (Rs. In Lakhs) | Total value of resources generated to the university (Rs. In Lakhs) |
|---|---|---|---|---|---|---|---|
| | **II. CONSULTANCY SERVICES** | | | | | | |
| 1. | Evaluation of new herbicide | M/s. Parijit Industries (India) Private Limited | 2015-16 | 4.00 | 1.20 | --- | 1.20 |
| 2. | Evaluation of new herbicide | M/s. Anu products Limited | 2015-2017 | 1.00 | 0.30 | -- | 0.30 |
| 3. | Evaluation of new herbicide | Dow Agro Sciences | 2014-2016 | 2.00 | 0.60 | -- | 0.60 |
| 4. | Evaluation of new herbicide | SDR Ramcides | 2014-2016 | 1.60 | 0.48 | -- | 0.48 |
| 5. | Evaluation of new herbicide | Dow Agro Sciences | 2014-2016 | 4.00 | 1.20 | -- | 1.20 |
| 6. | Evaluation of new herbicide | Dow Agro Sciences | 2014-2016 | 1.80 | 0.54 | -- | 0.54 |
| 7. | Evaluation of new herbicide | M/s. Anu products Limited | 2014-2016 | 4.00 | 1.20 | -- | 1.20 |
| 8. | Evaluation of new herbicide | Bayer Crop Science Limited | 2013-2015 | 2.40 | 0.66 | -- | 0.66 |
| 9. | Bio-efficacy and residue trials | Tropical Agro-system India Private Limited | 2012-2013 | 1.75 | 0.26 | -- | 0.26 |
| 10. | Evaluation of new herbicide | Dow Agro Sciences | 2012-2013 | 1.80 | 0.27 | -- | 0.27 |
| 11. | Impact of Climate Change on Invasive Traits of Weeds | Food and Agricultural Organization of United Nations | 2011-2012 | 1.00 2000 US $ | 0.25 | -- | 0.25 |

| S. No. | Project title | Funding agency | Year | Total Budget (Rs. In Lakhs) | Over head Charges to the University (Rs. In Lakhs) | Value of Building / Equipment / Computers/ Infrastructure created from the project (Rs. In Lakhs) | Total value of resources generated to the university (Rs. In Lakhs) |
|---|---|---|---|---|---|---|---|
| 12. | Evaluation of new herbicides | Bayer Crop Science Limited | 2011-2012 | 2.80 | 0.42 | -- | 0.42 |
| 13. | Evaluation of new herbicides | Bayer Crop Science Limited | 2010-2011 | 0.75 | 0.11 | -- | 0.11 |
| 14. | Evaluation of new herbicides | Bayer Crop Science Limited | 2009-2010 | 1.95 | 0.30 | -- | 0.30 |
| 15. | Evaluation of new herbicides | Bayer Crop Science Limited | 2007-2008 | 1.30 | 0.19 | -- | 0.19 |
| 16. | Evaluation of new herbicides | Bayer Crop Science Limited | 2006 – 2007 | 2.60 | 0.39 | -- | 0.39 |
| 17. | Evaluation of new herbicides | Dow Agro Sciences Evaluation of new herbicide | 2006-2007 | 1.00 | 0.15 | -- | 0.15 |
| 18. | Evaluation of new herbicides | Bayer Crop Science Limited | 2006 – 2007 | 1.30 | 0.20 | -- | 0.20 |
| 19. | Rehabilitation of Tsunami affected farmers | Churches Auxiliary for Social Action | 2006 | 0.60 | 0.09 | -- | 0.09 |
| 20. | Evaluation of new herbicides | Bayer Crop Science Limited | 2005 and 2006 | 0.90 | 0.13 | -- | 0.13 |
| 21. | Management of invasive alien weed *Prosophis juliflora* | Government of Tamilnadu Public Works Department | 2005 | 0.45 | 0.06 | -- | 0.06 |
| 22. | Evaluation of new Herbicides | Aventis Crop Science | 2002 | 1.00 | 0.15 | -- | 0.15 |
| 23. | Evaluation of new Herbicides | Aventis Crop Science | 2001 | 0.60 | 0.09 | -- | 0.09 |
| 24. | Evaluation of new Herbicides | Aventis Crop Science | 2000 | 0.60 | 0.09 | -- | 0.09 |
| 25. | Evaluation of new herbicide | Bharat Rasayan Limited | 2017-2018 | 6.5 | 1.95 | - | 1.95 |
| | **Sub Total** | | | **47.70** | **11.28** | **--** | **11.28** |

| S. No. | Project title | Funding agency | Year | Total Budget Rs. (In Lakhs) | Over head Charges to the University | Value of Building/ Equipment/ Computers/ Infrastructure created from the project | Total value of resources generated to the university |
|---|---|---|---|---|---|---|---|
| | **III. DEPARTMENTAL PROJECTS** | | | | | | |
| 1. | SAP scheme | UGC | 2012-2017 | 43.50 | -- | Equipment: 8.00<br>Infrastructure : 10.00<br>Total : 18.00 | 18.00 |
| | **SUB TOTAL** | | | **43.50** | **--** | **18.00** | **18.00** |

**Total fund generated out of Research Projects : Rs. 16.11 crores**
**Overhead charges paid to University : Rs. 111.67 lakhs**
**Value of Equipments and Buildings added : Rs. 1.48 crore**
**Scholarship amount given to B.Sc. (Ag.), M.Sc. (Ag.) & Ph.D students : Rs. 16.90 lakhs**
**Fellowship amount given to research scholars : Rs. 2.04 crores**

## X. Dignitaries Visited (International)

| Sl. No. | Name | Designation | Year Visited |
|---|---|---|---|
| 1. | **Dr. Robert S. Zeigler** | **Director General**<br>**International Rice Research Institute**<br>Manila, **Philippines** | 2011 |
| 2. | **Dr. Prasanta Bhowmik** | **Professor,** Weed Science<br>**University of Massachusetts, U.S.A** | 1999 |
| 3. | **Dr. Deidre Lemerle** | **Director,** E. H. Graham Centre<br>**Charles Sturt University**<br>Wagawaga, **Australia** | 2005 |
| 4. | **Dr. Ricardo Labrada Romero** | **Weed Officer**<br>**Food and Agricultural Organization**<br>**Rome** | 2007 |
| 5. | **Dr. Yoshiaru Fujii** | **Professor & Head,**<br>Division of International Environmental Agriculture<br>National University Corporation<br>**Tokyo University of Agriculture & Technology**<br>Tokyo, **Japan** | 2007 |
| 6. | **Dr. Chaoxian Zhang** | **President,** Weed Science Society of China<br>Institute of Plant Protection (IPP)<br>**Chinese Academy of Agricultural Sciences**<br>Beijing, **China** | 2007 |
| 7. | **Dr. Krishna N. Reddy** | **Research Leader**<br>Crop Production Systems Research Unit<br>**United States Department of Agriculture (USDA)**-ARS, **USA** | 2008 |
| 8. | **Dr. Hussain F. Alrubeai** | **Deputy Director**<br>Agricultural Research, **Ministry of Science and Technology**<br>Baghdad, **Iraq** | 2008 |
| 9. | **Dr. Bokhtiar** | **Director,**<br>SAARC Agriculture Centre, Dhaka, Bangladesh | 2018 |
| 10. | **Dr. Matthew Morell** | **Director General, International Rice Research Institute, Philippines** | 2018 |
| 11. | **Dr. U.S. Singh** | **South Asia Regional Coordinator & India Country Manager at International Potato Centre (CIP),New Delhi, India** | 2010-2020 |

## Dignitaries Visited (National)

| Sl. No. | Name | Designation | Year Visited |
|---|---|---|---|
| 12. | **Dr. Mangala Rai** | **Director General,**<br>**Indian Council of Agricultural Research** &<br>Secretary, Department of Agricultural Research and. Education (DARE)<br>New Delhi, India | 2007 |
| 13. | **Dr. A.R. Sharma** | **Director**<br>Directorate of Weed Science Research<br>**Indian Council of Agricultural Research**<br>Jabalpur, India | 2014 |
| 14. | **Dr. S.L. Mehta** | **Chairman**<br>Research Programme Committee<br>NAIP, **Indian Council of Agricultural Research**<br>New Delhi, India | 2013 |
| 15. | **Dr. Arvind Kumar** | **Deputy Director General**<br>**Indian Council of Agricultural Research**<br>New Delhi, India | 2011 |
| 16. | **Dr. Kokatae** | **Deputy Director General**<br>**Indian Council of Agricultural Research**<br>New Delhi, India | 2012 |
| 17. | **Dr. R.R. Sinha** | **Adviser**<br>**Department of Biotechnology**<br>New Delhi, India | 2009 |
| 18. | **Dr. Sathish** | **Senior Social Development Expert**<br>**World Bank**<br>New Delhi, India | 2009 |

2 TIMES REGION SUNDAY TIMES OF INDIA, CHENNAI SEPTEMBER 10, 2017

# TN univ to help Nepal in integrated rice farming

## Fish, Poultry To Be Reared On Fields In Project

Bosco.Dominique
@timesgroup.com

The method involves rearing fish in a 1m trench surrounding the farm measuring not more than an acre and 20 poultry cages — with 20 broiler hens in each cage — erected four feet above the paddy crops

**Cuddalore:** A project that integrates rice cultivation and rearing of fish and poultry, evolved by Annamalai University, Chidambaram, Cuddalore district, will be replicated in Nepal at a cost of ₹1.2 crore, thanks to the initiatives undertaken by USAID of the USA and Knowledge park of India (IKP). The project was successfully experimented in four districts between 2008 and 2015.

Annamalai University director (research and development) R M Kathiresan will supervise the implementation of the project in association with Commercial Agriculture A, a non-government organization in Nepal, from 2017 to 2019. Annamalai University registrar K Arumugam formally launched the project in a simple function on Friday.

Kathiresan said the project involves rearing fish (Katla, Common corp, Mrigal and Rahu) in a 1m trench surrounding the farm measuring not more than an acre and 20 poultry cages (with 20 broiler hens in each cage) erected four feet above the paddy crops.

"The fish feeds on the insects and worms in water that affect crops, while poultry droppings are rich manure for the crops. We have experimented the project involving more than 1,200 farmers in Cuddalore, Villupuram, Nagapattinam and Tiruvannamalai districts and found that the income of farmers went up three-fold by adopting integrated farming and rearing techniques," said Kathiresan.

He said farmers, who used to earn between ₹20,000 and ₹25,000 by cultivating paddy in one acre in a season have reaped a profit of more than ₹60,000 per acre by integrating cultivation of paddy with rearing fish and poultry.

Kathiresan said the university undertook the research with the help of assistance from World Bank (₹9 crore) and biotechnology research assistance council — Birac (₹70 lakh) and other funding agencies and partners including The Bill and Melinda Gates' Foundation, Dhan Foundations and Krishi Vigyan Kendras (KVKs).

"We worked on different and diversified farming and rearing techniques. We experimented integrating farming and rearing of fish, broiler chicken, Japanese quail, duck and rabbits and finally found that rice-fish-broiler chicken yielded the maximum profits," said Kathiresan. "Poultry droppings are rich in nitrogen content (1.25%) when compared to cattle droppings (0.5%). The manure is so rich in minerals that chemical fertilizers will not be required (barring initial stages of the project)," he said.

There are more than 100 countries in the world cultivating rice and more than 200 million families involved in cultivation of rice. "More than 70% of rice growing families own land less than one acre. Small land holders land are the predominant growers of rice. This integrated farming and rearing technique is most suited at farms less than an acre," said Kathiresan.

A delegation of scientists from the South Asian Association for Regional Cooperation (Saarc) nations will soon visit India to study the project implemented by the Annamalai University and replicate it in their respective nations.

THE NEW INDIAN EXPRESS | REGION
03 VILLUPURAM MONDAY 14.05.2018

# INTEGRATED FARMING TO BOOST REVENUE

Delta farmers to try their hands at the Central govt funded project; lands of 100 farmers included in initial stage

**Rice, poultry and fish to grow at one place**

The project involves on-farm participatory experiments in about 100 farmers' holdings in the district. Major technological intervention would be with regard to Annamalai rice variety, fish and poultry. A one-metre deep trench is dug up across the farmland and coops are built on the four corners of the land. As water is required on a constant basis for the rice varieties to grow, the fish farm on the side will aid them. Additionally, the chicken droppings from the coops will boost organic farming. Annamalai University will be the lead partner of the consortium and the International Institute of Biotechnology and Ethiraj College for Women in Chennai would be consortia partners

*The project was executed on a trial basis in several farmlands across the region in the last few years. The process would ensure additional revenue for farmers, optimal use of water and organic farming*

Dr R M Kathiresan, Project in-charge

HARISH MURALI @ Cuddalore

AN integrated farming process that has tasted success in various localities will now be implemented exclusively for farmers in the Cauvery Delta region. The project will primarily focus on optimisation of water use and will be implemented by the Annamalai University along with a few other colleges. The funding for the project was approved by the Department of Science and Technology (DST) recently.

The project has been named "Agronomic Integration of Technologies for Productivity Management and Optimal Water Use in Wetlands of Cauvery River Delta", and would be carried out at a cost of ₹2.09 crore.

The Technology Mission Division of DST, New Delhi, sanctioned this project and Dr R M Kathiresan, director, Research and Development, is the project in-charge. Annamalai University will be the lead partner of the consortium and the International Institute of Biotechnology and Ethiraj College for Women in Chennai would be consortia partners.

The project involves on-farm participatory experiments in about 100 farmers' holdings in the district. Major technological intervention would be with regard to Annamalai rice variety, fish and poultry.

Speaking to *Express*, Kathiresan said that the project was executed on a trial basis in several farmlands across the region in the last few years. "The process would ensure additional revenue for farmers, optimal use of water and organic farming," he added.

Though several integrated farming methods have been tried in the region over the years, Kathiresan's idea stands out from the rest. According to the professor, a one-metre deep trench is dug up across the farmland and coops are built on the four corners of the land. As water is required on a constant basis for the rice varieties to grow, the fish farm on the side will aid them. Additionally, the chicken droppings from the coops will boost organic farming, added Kathiresan.

Growing poultry and fish in paddy fields is an essential part of the integrated farming project | EXPRESS

The professor has been researching in this field with the help of a few establishments and he also trains farmers in Nepal on integrated farming methods.

THE HINDU | CHENNAI, THURSDAY, OCTOBER 24, 2013

# Integrating poultry, fish and rice to triple income

## Annamalai University supplied the first batch of chicken and fishes

M.J. PRABU

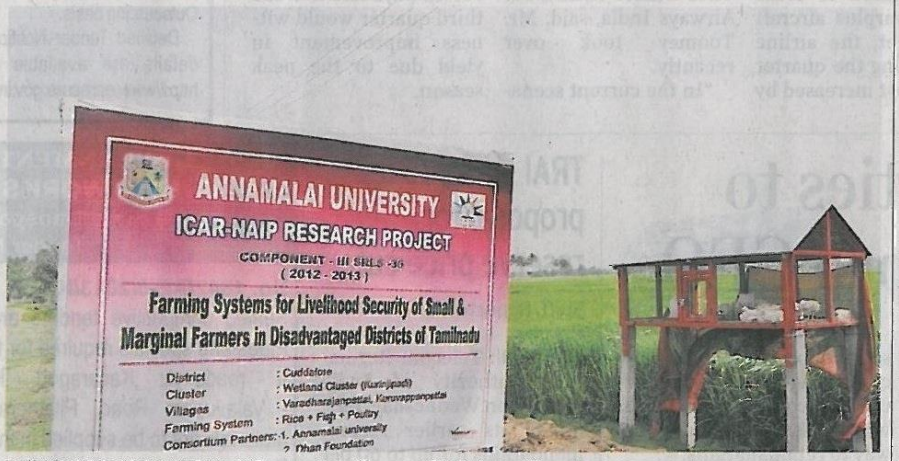
Instead of growing only a single crop, farmers can try and diversify agricultural activities like dairy, bio-gas, mushroom, fish, poultry, silkworm rearing, or apiary along with crops to get a higher income. This also helps in effective recycling of waste products from the animals and birds as manure for crops and cuts down input cost to a major extent.

### Feasibility

The feasibility of such a model integrating rice/fish and poultry was taken up by Annamalai University, Tamil Nadu, and its impact on the farmers' lifestyle is being studied for the last 15 years. It was found that the model, apart from being helpful in generating some revenue, also helps in weed control by 40 per cent, and pest incidence by 30 per cent in paddy crops.

"The model was field tested in different villages during 2004-07. At present it is being implemented in Cuddalore, Villupuram and Nagapattinam districts. Nearly 600 farmers have adopted this model in the last five years, and the annual income of these small cultivators has gone up from Rs. 30,000 (only crop cultivation in 1-2 acres) to Rs. 60,000," says Dr. R.M. Kathiresan, Professor and Head, Dept of Agronomy, Faculty of Agriculture, Annamalai University.

Resource-poor farmers adopting low input agriculture are the main beneficiaries of this system. The simple reason is that it offers multiple benefits like bio-control of pests, infestations, weeds, and better crop growth because the fish feed on the pests and insects attacking the rice plant and poultry droppings are constantly washed into the field making it more fertile and conducive for healthy crop growth.




**DEMONSTRATION PLOT:** The model offers multiple benefits. – PHOTO: SPECIAL ARRANGEMENT

**FARMER'S NOTEBOOK**

### Why this study?

But why did the University take up fish and poultry with paddy cultivation?

"There is plenty of data available on rice/fish/poultry integrated model in several Universities across the country. But if you study closely, you will find that in an acre, a pond would have been dug and a poultry cage erected over it. The paddy crop will be grown in a plot adjacent to this.

"There will be no connection to all the three activities. But in our model we have carefully planned to avoid such a gap and implemented it in such a way that all three are connected to each other," says Dr. Kathiresan. He went on to explain how it is different from other models.

### Easy replication

Replicating this model is quite easy, according to him. For example in an acre (100 cents) beneficiary farmers are growing paddy in 90 cents. In five cents they grow fishes like grass carp, common carp, roghu, cutla in a trench (one feet depth and width) on one side of the field.

In the remaining five cents poultry cages propped up on concrete poles are erected fitted with wire meshes. The cage is erected in such a way that a part of the cage is above the water-filled trench and the remaining part over the paddy crop.

A part of the bird droppings falls directly into the water as feed for fishes and the remaining on the fields as manure for the crop.

During single rice cropping season (about 5-6 months) poultry can be reared three times. Common NPK fertilizer schedule for rice is being followed as basal input, but farmers are cautioned not to practice split application of the chemical fertilizers as it may affect good fish growth. Also as plant protection measures, neem kernel extract is used instead of spraying chemical insecticides.

### Marketing

Regarding the marketing of fish and birds Dr. Kathiresan says, "We encouraged the farmers to form groups and open a marketing outlet and bank account. The income from the sale of fish and poultry is deposited in the account and later shared.

"The University supplied the first batch of chicken and fishes to the farmers and after the first harvest farmers themselves started purchasing them. We have received sanctions to start more such models in the region after receiving a good response from both the farmers and the Government."

For more information farmers can contact Dr. R.M.. Kathiresan, Professor and Head, Dept of Agronomy, Faculty of Agriculture, Annamalai University: 608002, email rm.kathiresan@sify.com, mobile:9655188233.

FARMER'S NOTEBOOK

CHENNAI
THE HINDU • THURSDAY, SEPTEMBER 11, 2014

# New Sigappi paddy variety creating interest among growers

## It is much sought after by Cauvery delta farmers in Tamil Nadu

M.J. PRABU

**NEW RELEASE**: *The International Rice Research Institute recorded its appreciation for the release of this new variety.* – PHOTO: SPECIAL ARRANGEMENT

Cauvery delta region, considered to be the granary of Tamil Nadu, is prone to many natural calamities like uncertain monsoon rains, periodical floods etc.

Under these circumstances, a new rice variety named "Sigappi" has been developed by researchers at Annamalai University to get better yields under submerged conditions. It is 150-154 days under irrigated condition and is ideally suited for samba (khariff) season in Tamil Nadu.

### Better yield

"With the North East Monsoon affecting the livelihoods of small and medium farmers of Cuddalore, Nagapattinam, Tiruvarur and Thanjavur districts, this semi dwarf, erect, and non-lodging variety gives higher productivity of 3.4 tonnes per hectare even if fields get submerged in water during monsoon for 10-12 days continuously," says Dr.RM. Kathiresan, Professor, Department of Agronomy, Faculty of Agriculture, Annamalai University.

Being similar to the traditional popular variety called Ponmani, released nearly a decade back, the Sigappi variety has white coloured short and bold grains, is best suited for making idli and dosa and fetches a good price.

It is also found to be resistant to leaf folder, stem borer and moderately susceptible to green leaf hopper, brown spot, rice Tungro disease and rice blast, according to him.

"The main reason for developing an alternative variety to Ponmani for Samba season was a long felt need among delta farmers.

In these regions the choice among rice varieties with fine grains that suit the requirement for lunch purposes are comparatively more than the options for rice varieties that suit tiffin purposes (idly and dosa making) with bold grains and better dough making quality, and Sigappi variety suited well," explains Dr. Kathiresan.

### Market

A kg of this paddy is priced at Rs.20 to 23 and Rs.30 to 32 as rice today in local market. When sold for seed purpose, it fetches a price of Rs.35 to 40 per kg.

Though most of the rice varieties generally withstand partial submergence for prolonged duration, complete submergence is intolerable for more than a day or two.

It also gives a straw yield of six tonnes per hectare, on an average, and the straw remains unaffected even after ten days of complete submergence under water.

The package of practices for cultivation is again similar to any long duration samba variety, with a seed rate of 30 kg / hectare, spacing. The rice was distributed free of cost to farmers in delta regions under different schemes implemented by the University. This has resulted in farmers exchanging the seeds among themselves thereby increasing the area under its cultivation.

### Appreciation

The International Rice Research Institute recorded its appreciation to the University for the release of this new variety.

It could also be a suitable variety for consideration under new seed subsidy scheme, if released by State Variety Release Committee. "Sigappi would certainly serve the best interest of Cauvery delta farmers as it protects their livelihood and economic interests at times of natural calamities," says Dr. Kathiresan.

Especially, in villages like Keelathirukallipalai of tsunami affected parangipettai block this variety has made a significant farm impact.

Previously, local varieties grown there it did not produce better yield, after the tsunami so many switched over to this variety and they observed this variety to be better. From an acre the farmers have been able to harvest 2 tonnes under normal conditions. In case of flash floods they can get 1.2 to 1.5 tonnes of grain from an acre, whereas from other varieties, less than one tonne alone could be expected.

In Thalaignayiru and Vattakudi villages of Vedaranyam in Nagapattinam district, the Sigappi variety is being tried under direct sowing conditions. It is also a perfect choice for integrated rice farming designs such as paddy, fish and poultry integration.

### Seed distribution

For the ensuing season free seeds have been distributed to more than 100 farmers and nearly 150 farmers are cultivating it.

It is also suitable for growing in other parts of the country which are prone to flooding during monsoon, according to Dr. Kathiresan.

For more details contact Dr. RM. Kathiresan, Professor,Department of Agronomy, Faculty of Agriculture, Annamalai University, Annamalai Nagar – 608 002, email: rmkathiresan.agron@gmail.com, phone:04144 –239816, mobile:9655188233.

THE NEW INDIAN EXPRESS | REGION

03 VILLUPURAM MONDAY 17.09.2018 newindianexpress.com

21.01 µg/m3

The PM 2.5 level recorded at IIT-Madras on Sunday. Nitrogen dioxide level was at 14.85 µg/m3 against the prescribed standard of 80.00 µg/m3

# Flood-tolerant paddy from Annamalai Univ helps Kerala farmers

Developed in 2013, submergence-tolerant 'Sigapi' is currently being sown in around 1,000 acres in Palakkad dist; it holds high potential for Tamil Nadu too

HARISH MURALI @ Cuddalore

A paddy variety developed at Annamalai University in 2013 has come handy for the farmers in Kerala who were recently hit by one of the worst floods in the history of the State.

Submergence-tolerant paddy 'Sigapi', named after the wife of former Pro-Chancellor M A M Ramasamy of the university, is currently being sown in around 1,000 acres of farmlands in Kerala's Palakkad district which is a major rice-producing region in the State.

R M Kathiresan, one of the key persons in developing Sigapi, has been busy ever since the deluge in neighbouring State. He said that Sigapi showed good resistance to flooding and stayed strong during the period. His counterpart in Kerala Agriculture University's Pattambi Research Station Dr Elangovan has been updating him with video clips from villages of Palakkad district where Sigapi is sown.

**Traditional varieties**

Traditional varieties that are sown extensively in Tamil Nadu do not have capacity to withstand submergence for over a week

According to officials of Annamalai University, Sigapi, developed in collaboration with the Indian Rice Research Institute, has a great potential.

Speaking to *Express*, Kathiresan said that traditional paddy varieties that are sown extensively by farmers in Tamil Nadu do not have the capacity to withstand submergence for over a week. Meanwhile, the new variety can survive at least 10 days of submergence at any stage of development.

Kathiresan, who has been involved in rice research for several decades, said that Sigapi was developed by incorporating Sub-1 gene (submergence-tolerant gene) in the traditional CR 1009 paddy variety.

He added that Sigapi retains the core characteristics of traditional varieties, yet it is capable of giving 70 to 80 per cent of the normal yield in 145-150 days, which is usual for a normal samba season.

University officials said that the unpredictable nature of northeast monsoon in the Tamil Nadu prompted them to carry out research on such a variety until they came up with Sigapi in 2013.

Experts inspecting a paddy field in Palakkad district of Kerala | EXPRESS

தி இந்து
நிலமும் வளமும்
உழவே தலை
சனி, செப்டம்பர் 23, 2017

# ஒருங்கிணைந்த விவசாயம்... இரட்டிப்பு லாபம்!

■ ந. வினோத் குமார் ■

'உழவர்களின் லாபத்தை இரட்டிப்பாக்குவதுதான் இப்போதைய தேவை' என்று பலரும் சொல்லி வருகிறார்கள். அதற்கு இயற்கை விவசாயம் முதற்கொண்டு பல வகை விவசாய முறைகளைப் பின்பற்றி வருகிறார்கள்.

அந்த வகையில், இப்போது பல இடங்களிலும் பரவலாகப் பின்பற்றப்பட்டுவருவது... ஒருங்கிணைந்த விவசாயம்!

**சீருக்கெல்லாம் முதலாகும் 'சிதம்பரம்'**

உலகம் முழுக்க உள்ள பெரும்பாலான மக்களின் முக்கிய உணவு, அரிசி. ஆனால் ஆசியா, ஆப்பிரிக்கா, லத்தின் அமெரிக்கா போன்ற சில பகுதிகளில் மட்டுமே அரிசி விளைவிக்கப்படுகிறது. அதிலும், ஆசியாவில் மட்டும் சுமார் 90 சதவீத அரிசி பயிரிடப்படுகிறது. எனினும், பல கோடிக்கணக்கான மக்கள் ஒவ்வொரு நாள் இரவும் பட்டினியுடன் படுக்கச் செல்கிறார்கள். அவர்களில் பலர் குழந்தைகள்.

இதற்கிடையில், ஐக்கிய நாடுகளின் உணவு மற்றும் வேளாண் அமைப்பும் உலக சுகாதார நிறுவனமும் தரும் தகவல்கள் மேலும் அதிர்ச்சியை அளிக்கின்றன. அதாவது, நமது மக்களுக்குத் தாவரங்களின் மூலம் கிடைக்க வேண்டிய புரதம் கிடைத்தாலும், அவர்களுக்குக் கிடைக்க வேண்டிய விலங்குப் புரதம் கிடைக்க வில்லை. அதனால், பலர் ஊட்டச்சத்துக் குறைபாட்டால் அவதிப்படுகின்றனர் என்கின்றன அந்த அமைப்புகள்!

இந்நிலையில் உழவர்களும், அவர்கள் மூலமாக இதர மக்களும் பயன்படும் வகையில், 'நெல் – மீன் – கோழி' எனும் ஒருங்கிணைந்த வேளாண் முறையை சிதம்பரத்தில் உள்ள அண்ணாமலைப் பல்கலைக் கழகத்தின் உழவியல் துறை, முதன்முறையாக அறிமுகப்படுத்தி இருக்கிறது. இந்த விவசாய முறையின் மூலம், இயற்கை முறையில் நெற் பயிர் விளைவிக்கப்படுவதுடன், பற்றாக்குறையாக உள்ள விலங்குப் புரதத்தை ஈடுசெய்ய மீன், கோழி வளர்ப்பும் கைகொடுக்கின்றன.

## செலவும்... லாபமும்... (5 சென்ட் ஏரியாவுக்கு)

**செலவு**

நெல் விவசாயம் : ரூ. 500
கோழிக் கூண்டு : ரூ. 2000
மீன் பள்ளம்: ரூ. 250
மீன் குஞ்சுகள்: ரூ. 200
கோழிக் குஞ்சுகள்: ரூ. 1, 500
கோழித் தீவனம்: ரூ. 3,600
மொத்தம்: ரூ. 8,050

**லாபம்**

நெல் விவசாயம்: ரூ. 1000
கோழி வளர்ப்பு: ரூ. 12,000
மீன் வளர்ப்பு: ரூ. 1,080
மொத்தம்: ரூ. 14, 080
நிகர லாபம் (5 சென்ட்டுக்கு): ரூ. 6, 030
நிகர லாபம் (1 ஏக்கருக்கு): ரூ. 1,20,600

மேலும், பொருளாதார ரீதியாகவும் இந்த ஒருங்கிணைந்த விவசாய முறை மிகவும் லாபகரமானது.

கதிரேசன்

**5 சென்ட் போதும்**

இந்த விவசாய முறை குறித்து அண்ணாமலைப் பல்கலைக்கழகத்தின் ஆராய்ச்சி, மேம்பாட்டுத் துறையின் இயக்குநர், ஆர்.எம். கதிரேசன் பகிர்ந்துகொண்டார்:

"1994-95-ம் ஆண்டு காலகட்டத்தில், நான் உழவியல் துறையில் பேராசிரியராகப் பணியாற்றிக் கொண்டிருந்தேன். அப்போது முதுநிலை மாணவர்களுடன் இணைந்து நெல் வயல்களில் மீன்களைப் பயன்படுத்தி களைகளைக் கட்டுப்படுத்துவது தொடர்பாக ஓர் ஆய்வை மேற்கொண்டோம். அது வெற்றிகரமாக அமைந்தது.

பிறகு, 96-ம் ஆண்டிலிருந்து பல்கலைக்கழக நிலத்திலேயே 'நெல் – மீன் – முயல்', 'நெல் – மீன் – அசோலா', 'நெல் – மீன் – கோழி' எனப் பல வகை ஒருங்கிணைப்புகளின் மூலம் நெற் பயிரை விளைவிக்கும் ஆய்வுகளை மேற்கொண்டோம். அதில், 'நெல் – மீன் – கோழி ஒருங்கிணைப்பு, நல்ல லாபத்தைத் தந்தது. இதர ஒருங்கிணைப்புகளில் சிற்சில குறைகள் இருந்தன.

இந்த ஒருங்கிணைந்த வேளாண்மையை மேற்கொள்ள, ஒரு ஏக்கர் நிலத்தில் 5 சென்ட் மட்டும் போதும்.

நிலத்தின் மொத்தப் பரப்பளவில் 10 சதவீதத்துக்கு மேல் போகாதபடி, வயல் ஓரத்தில் ஒரு மீட்டர் ஆழம், ஒரு மீட்டர் அகலத்தில் சிறிய பள்ளம் ஒன்றை ஏற்படுத்த வேண்டும்.

வயல் முழுக்கத் தேங்கியிருக்கும் நீரின் வெப்பநிலையில் மாற்றம் இருந்துகொண்டே இருக்கும். ஆனால், வயலின் ஓரத்தில் உள்ள இந்தப் பள்ளத்தில் இருக்கும் நீரின் வெப்பநிலையில் எந்த மாற்றமும் இருக்காது. இந்தப் பள்ளத்தில் ரோகு, மிர்கால், கட்லா, கெண்டை, புல் கெண்டை ஆகிய மீன் இனங்களை விடவேண்டும். சுமார் 8 முதல் 10 செ.மீ. நீளமுள்ள மீன் குஞ்சுகளை விட வேண்டும். ஒவ்வொரு இனத்திலும் 20 குஞ்சுகள் வீதமாக 100 குஞ்சுகளை விடவேண்டும். இந்த மீன்கள் காலையும் மாலையும் வயலில் நீந்திக்கொண்டு, களைகளை உணவாக உட்கொள்ளும். மதிய நேரத்தில் வயலில் உள்ள நீரின் வெப்பம் அதிகரிக்கும். எனவே, அப்போது அவை வயலின் ஓரத்தில் உள்ள பள்ளத்துக்கு வந்து விடும்.

**மதிப்புக்கேற்ற விலை**

கோழிகளுக்கு 20 முதல் 24 சதுர அடிக்கு ஒரு கூண்டு அமைக்க வேண்டும். 6x4 என்ற அளவில், அந்தக் கூண்டு இருக்க வேண்டும். நிலத்தில் 4 அடி ஆழத்துக்கு கான்கிரீட் தூண்களைப் புதைத்து, நிலத்திலிருந்து 4 அடி உயரத்துக்கு அந்தத் தூணை நட வேண்டும். இந்தக் கூண்டின் அடிப்பகுதி, கம்பி வலையால் செய்யப்பட்டிருக்க வேண்டும். பிறந்து ஒரு நாளேயான கோழிக் குஞ்சுகளை வாங்கி, அவற்றை ஒரு அறையில் வைத்து 12 நாட்களுக்கு வளர்க்க வேண்டும். பின்பு ஒரு கூண்டுக்கு 20 கோழிகள் வீதம் வளர்க்க வேண்டும். இந்தக் கோழிகளின் கழிவு, மீனுக்கு உணவாவதுடன் வயலுக்கும் நல்ல உரமாக அமைகிறது. பொதுவாக, கோழிகளின் கழிவில் அமிலத்தன்மை அதிகமாக இருப்பதால், ஒரு கூண்டுக்கு 20 கோழிகளுக்கு மேல் வளர்க்கக் கூடாது. ஒரு ஏக்கருக்கு 20 கூண்டுகள் வரை வைக்கலாம்.

குறுவை சாகுபடியின்போது இரண்டு முறையும், சம்பா சாகுபடியின்போது மூன்று முறையும் என இந்த மீன்களையும் கோழிகளையும் வளர்க்க முடியும். மீன்கள் 15 முதல் 20 கிலோ வரையும், 45 நாட்களில் வளர்ந்துவிடும் கோழிகள் சுமார் 2 கிலோவரை இருக்கும். இவற்றைச் சந்தை மதிப்புக்கேற்ற விலையிலேயே விற்கலாம்" என்கிறார் கதிரேசன்.

**சார்க் நாடுகளுக்கு வழிகாட்டி**

அனைத்து வகையான நெல் ரகங்களுக்கும் இந்த வேளாண் முறை பொருந்தும். ஊட்டச்சத்து, பொருளாதார லாபம், வேலைவாய்ப்பின் மையைப் போக்கும் இந்த வேளாண் முறைக்கு தேசிய, சர்வதேச அளவில் விருதுகளும் அங்கீகாரங்களும் கிடைத்துள்ளன. இந்த விவசாய முறையை நேபாளம் உள்ளிட்ட சார்க் நாடுகள் பின்பற்றப்படவுள்ளன. அதன் தொடக்க விழா கடந்த 8-ம் தேதி அண்ணாமலைப் பல்கலைக்கழகத்தில் நடைபெற்றது. தற்போது, கடலூர் மாவட்டத்தின் ஐந்து கிராமங்களில் இந்த விவசாய முறை நடைமுறையில் உள்ளது.

பலன் தரும் புதிய முறைகளை வரவேற்று வாழ்த்துவதுதானே முறை!

வளர்ந்த மீனும்...

அறுவடைக்குக் காத்திருக்கும் நெற்கதிரும்...

படங்கள்: ந. வினோத்குமார்

SCIENCE & TECHNOLOGY / AGRICULTURE

# Innovative approach to manage water hyacinth

R.M. KATHIRESAN

The aquatic weed, water hyacinth, is ranked among the top ten weeds worldwide and is one of the most successful colonisers in the plant kingdom.

A native of Brazil, the weed has spread to other parts of the world, through initial intentional introductions for its aesthetic values in Africa, Southern Asia and the U.S.

Manual removal is laborious and expensive. Though herbicides are effective, none of them has been registered in India for use on water bodies restricting their application for the management of this weed.

## Sponsored research

Research sponsored by Ministry of Water Resources, Government of India, at Annamalai University has shown that herbicides like 2, 4-D, glyphosate and paraquat are effective in controlling the weed.

However, herbicide use in water system impairs the water quality in terms of dissolved oxygen, electrical conductivity etc. Among the herbicides tried, glyphosate was observed to be safer comparatively.

Besides causing mortality of fishes, the water treated with all these herbicides caused histological damages in fish organs like gills, liver, kidney and brain.

However, water treated with these herbicides proved safe for irrigation to crops like rice and cotton. The Department of Agronomy, Annamalai University through a National Agricultural Technology project sponsored by Indian Council of Agricultural Research, brought out an innovative approach of managing the weed with the application of dried leaf powder of a medicinal plant called Coleus amboinius/aromaticus (Karpooravalli or Omavalli in Tamil).

Dried leaf powder of karpooravalli at rate of 20g/l of water makes water hyacinth dead within 5h of treatment and through electrolyte leakage, water hyacinth biomass gets reduced drastically in 3 days.

## Large scale cultivation

However, this karpooravalli needs to be cultivated on a large scale to make available the required quantity of leaf powder. Utilising this weed , through composting and incorporation at 6.25 t/ha favoured rice yields.

(Dr. R.M. Kathiresan, Prof and Head, Department of Agronomy, , Annamalai University, Annamalai Nagar, Tamil Nadu, India – 608 002, email: rm.kathiresan@sify.com, mobile: 9655188233.)