Curriculum Vitae

Name	-	**DR. RADHAKRISHNAN. S**
Father's Name	-	(Late) M. P. Sivaramapillai
Date of birth &Age	-	28.5.1965, 57 years
Present Address	-	Senior Scientific Officer, (Microbiology), Central Coir Research Institute (CCRI), Kalavoor, Alleppey Dt, Kerala-688522 Email- ccri.coirboard@gmail.com
Residential Address	-	KAUSTHUBHAM, T.P.Centre, Haripad P.O, Alleppey, Kerala – 690514, India Tel:0479 2411352, Mob: 9497442044 Email: rkharipad@gmail.com, rkhere65@gmail.com drrkhpd@gmail.com
Nationality		Indian
Religion & Caste		Hindu, Nair
QUALIFICATIONS		M.Sc (Zoology), Ph.D (Biotechnology) MBA (Marketing)
PROFESSIONAL EXPERIENCE		30 years (2years in CSIR (Regional Research Laboratory and 28 years in (CCRI) Central Coir Research Institute- A Research & development Centre of Coir Board.

EDUCATIONAL QUALIFICATIONS

Exam Passed	**University / Board**	**Year**	**Class / Division**
SSLC	Board of Public Examination, Kerala	1980	I Class
Pre-degree	University of Kerala	1983	II Class
B.Sc	University of Kerala	1986	I Class
M.Sc (Zoology)	University of Kerala	1988	I Class
Ph.D (Biotechnology)	University of Kerala	2009	* by thesis
MBA (Marketing),	IDE, University of Kerala	2019	1 Class

* The title of the thesis was "*Microbial Degradation of Coir Pith Using Natural Nitrogen Supplements*"

RESEARCH EXPERIENCE - Total 30 years

Regional Research Laboratory (CSIR) **- *2 years(1990-1992)***

Worked as Research Assistant in the Regional Research Laboratory (CSIR) on a sponsored project entitled "*Bioconversion of Agricultural biomass into value added products*". (Solid State Fermentation)

Coir Board ***- 28 years***

*(*Joined in the Microbiology Department at CCRI (Coir Board) in 12 th August, 1994

RESEARCH EXPERIENCE AS PART-TIME RRESEARCH SCHOLAR

M.G. University, Kottayam (1995-1998)

Worked as a part-time research scholar in the Microbiology laboratory of School of Bioscience, M.G. University, Kottayam on a project entitled "*Glucoamylase production by Aspergillus niger for industrial applications"*

University of Kerala, Thiruvananthapuram (2005-2009)

Worked in the as a part-time research scholar for Ph.D in the Department of Biotechnology, Kariavattom, Thiruvananthapuram

AWARDS AND RECOGNITION

- ✓ **Vocational Service Award** from Rotary Club, Alleppey from the development of ecofriendly technologies in agriculture using Coir Pith (23.01.2018).
- ✓ **Outstanding Performance Award** for the arrangement of R& D display/ dissemination of technologies in Coir Kerala-2016 held at Alleppey in Kerala.
- ✓ **First prize winner**- Winner in Hindi competition with first price in hindi music, writing held at CCRI in 2003,2006,2007,2012,2013,2014,2016)
- ✓ **Outstanding Performance Award** for the arrangement of R& D display/ dissemination of technologies in Dussahra Mela -2011 arranged at Kullu (Himachal Pradesh) by Ministry of MSME, New Delhi.
- ✓ **Outstanding Performance Award** for the arrangement of R& D display/ dissemination of technologies in Coir Kerala-2014 held at Alleppey in Kerala.
- ✓ **Award of Outstanding Performance** for the arrangement of R& D display/ dissemination of technologies in Coir Kerala-2013 held at Alleppey in Kerala
- ✓ **Award of Outstanding Exhibitor** for the arrangement of R& D display in the Coir Fest-2010 organized by the directorate of Coir development Board in association of Coir Fed and Coir Corporation at Alleppey.
- ✓ **Excellence merit honor** for the award of Ph.D in Biotechnology (by thesis from University of Kerala) from Haripad Block Panchayath by Shri.Banuprasad, Hon MLA, Haripad.
- ✓ **Excellence merit honor** for the award of Ph.D in Biotechnology (by thesis from University of Kerala) from Haripad Rotary Club by Shri.K.C.Venugopal, Hon. MP in 2010.
- ✓ **Award of Outstanding Exhibitor** for the arrangement of R& D display in the First National Expo of Small, Agro & Rural Industries organized by Ministry of Small Scale Industries & Ministry of Agro & Rural Industries, Government of India in 2006 at New Delhi

- ✓ **Award of Outstanding Exhibitor** for the arrangement of R& D display in the second National Expo of Small, Agro & Rural Industries organized by Ministry of Small Scale Industries & Ministry of Agro & Rural Industries, Government of India in 2005 at New Delhi.
- ✓ **Best performance award** from Chairman Coir Board for the development of a Treatment system for Coir retting effluent in 1995.
- ✓ **Merit award** from General Secretary, N.S.S for securing highest marks in M.Sc (Zoology) examination from N.S.S College, Pandalam in 1989.
- ✓ **Merit award** from Chairman, National Service Scheme for securing highest marks in M.Sc (Zoology) examination from N.S.S College, Pandalam in 1989.

ACHIEVEMENTS (Research, Development, Training & Extension services)

1. **Reference book** -Published a reference book **"Wealth from waste**", showcasing the value showcasing the value addition to coir pith for agri/horti applications released at the venue of IICF-2016 held at Coimbatore.
2. **Coir KrishiMithra** - A new innovative formulation intended especially for the cultivation of vegetables has been developed in the Microbiology department at CCRI using PITHPLUS (*Pleurotus sajor caju*), supplemented with Azolla, fish waste & neem cake powder substituting Urea, as nitrogen source.
3. **Cococore-** Coir wood made from coir fibre and resin has diversified new uses that will save the tropical forests, increases rural employment opportunities and also promotes agriculture leading to sustainable development. In order to showcase the technology an experience Centre for Coir Wood (Cococore) has been at CICT Campus for an area of 340 Sq.ft fully covered & paneled with coir composites could become the sunrise sector of the coir industry. In an effort to recycle coir waste, a model house made out of coir wood, ecofriendly technology developed by CICT, Bangalore has been displayed at Muncipal Town square, Alleppey in Kerala.
4. **Display hall at CICT**-A display hall showcasing the diversification of coir & coir products has been set up at CICT, Bangalore. This show cases the traditional processes and development of coir industry, including retting and fibre extraction, advent of mechanization in coir sector etc

5. **Coir based Vertical Garden-** With an aim to popularize the coir-based Vertical Garden and thereby to generate new market opportunities for coir pith, especially in the urban living areas a demonstration of vertical garden had been set up at CICT, Bangalore.
6. **Biochem Treatment-**An Ecofriendly formulation of **Biochem** with zero effluent has been developed to treat the coir fibres (green husk and dry husk fibres) and wrapping that for a period of 12 hours by which the fibres become softer and brighter and amenable to spinning. The new technology has been successfully demonstrated in the Coir industry.
7. **Janata mattress for Covid -19 affected patients**- A successful cleaner, faster and ecofriendly technology of bleaching and softening of coir using **"Biochem"** has been developed by Coir Board and is being popularized among coir entrepreneurs. A cost effective Janata mattress had been prepared using Biochem treated softened coir fibre for Covid-19 affected patients.
8. **COCOLAWN**- a lush green readymade lawn of grass encased in a composite comprising non woven coir fabric in coir netting with coir pith/ c-pom grass slips has been developed and the technology of COCOLAWN has been successfully demonstrated for an area of 25000 sq ft on the roof terrace of "Bodhigrah" at Indian Institute of Management (IIM), Lucknow & 1200 sq ft at Kerala University of Health Sciences, Thrissur.
9. **Incubation centre for value addition of Tender coconut husks at CICT, Bangalore**- An Incubation centre for Tender coconut husks through ecofriendly technology interventions for pollution abatement and sustainable development .The technology of composting of tender coconut husks using PITHPLUS and Urea has been successfully established under the project. Handmade papers using tender coconut husk fiber and paper wastes in varying proportions had made & samples of note pad, postal cover etc were developed. Preparation of Binder less board and garden article were also taken up under the project.

10. **Composting of coir pith** - The technology of coir pith composting using PITHPLUS / Urea (Conventional) have been developed by research and is being popularized through filed level demonstrations in all coconut growing states of India.
11. **Hillock composting of Coir pith** - Bulk composting of coir pith hillock (250 MT) as per conventional process and with the aid of a JCB has been conducted at Chilambu in

Chirayinkeezhu Taluk and the composted coir pith has been supplied to Kerala Agro Industries Corporation.

12. **Validation of Coir pith by ICAR**- In order to plan strategies for popularization of Coir pith to increase the export/ domestic market to achieve the target as approved by the Ministry an Action plan has been prepared and forwarded to Indian Council of Agricultural Research (ICAR), New Delhi for validation and certification endorsed with supporting documents
13. **Tender coconut composting**- The pollution problem created by the accumulated tender coconut husks at Sabarimala and Pampa has been alleviated by the implementation of the technology of composting with PITHPLUS and Urea in lieu of the direction from the Hon High Court of Kerala
14. **Effluent treatment system** – The technology of Effluent treatment system for coconut husk / Coir pith processing leachates has been implemented in the coir fibre/Coir Pith production units.
15. **Demonstration of COIRRET-**The technology on the application of COIRRET , a bacterial consortia for fast retting of coconut husks was successfully demonstrated in 3 coir fibre extraction units in Cherthala viz Poochakkal, Panavalli & Pallippuram. The demonstration was documented for a period of 18 months(1999-2001) and concluded with encouraging results.
16. **Preparation of Bio ethanol & Bio Oil from Coir waste**- The technologies of Bioethanol & Bio Oil from Coir waste have been successfully established using Fermentation / Fast pyrolysis process at CCRI.
17. **Nanocellulose Aerogel from Coir**- The technology for the synthesis of Nanocellulose Aerogel from Coir fibre/ pith had been developed & standardized and optimized the process parameters
18. **Biodegradability of Coir geotextiles, Coir log & Coir wood** - The process parameters have been studied and authentic data had been prepared and reported.
19. **Coir geotextiles Shade lamp, Fruit bowl, package container**- Worked as a team member for the development of Coir geotextiles Shade lamp, Fruit bowl, package container.

20. **Handmade paper using tender coconut husk fibres**- A study had been taken up and samples of handmade paper using Coir fibre and paper pulp in varying proportion have been prepared.
21. **Coir for packaging**- A study had been initiated and developed few products using Coir for its application in packaging of materials and samples.
22. **Krishidarshan programme in Doordarsan Kendra**- On behalf of Coir Board the innovative ecofriendly technologies on Coir developed by the Board has been disseminated in a live telecast Phone in programme " **Krishidarshan**" organized by Doordarsan Kendra, Thiruvananthapuram on 23.3.2017 as a part of popularization.
23. **ECOLAB-** The construction of Ecolab with advanced testing laboratories inclusive of facilities for testing of Coir products at CICT has been implemented through CPWD , Bangalore.
24. **Centre of Excellence- A Centre of Excellence (CoE) for** exploring the possibilities of using Coir Wood in the building construction and other various applications as a substitute for conventional timber wood and also extension of the results of the technology developed has been established through IPIRTI.
25. **Extension Service Centre for the production of PITHPLUS/ COIRRET/TESTING** – A PSL has been set up in CCRI in 1994 catering to the coir industry in Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, West Bengal and other coconut growing states for requirement of PITHPLUS, COIRRET and testing of coir pith. The PSL receives large number of enquiries for testing of samples of consignments of coir pith intended for export to more than 48 countries.
26. **Specification of Raw Coir Pith-** The Indian standard Raw Coir Pith specification has been prepared and published through BIS

PATENT FILED

1. Filed a Patent on the technology entitled *"Process of extraction of Sodium lignosulphonate from coir pith for industrial application* "has been filed. Das Anita Ravindranath,Sumisebastein, Geetamjali .**S.Radhakrishnan.** Indian Patent Application Indian Patent Application No.201841020488. Filing date 31.5.2018.

2. Filed a patent entitled *"An Ecofriendly Method for Production Of Urea Less Organic Biocomposted Coir Pith – Coir Krishimithra"*C.P.Radhakrishnan, Das Anita Ravindranath,.**S.Radhakrishnan.** Indian Patent Application No. 201741038680; Filing date 31/10/2017.

3. *A fully automatic Coir spinning machine to spin coir fibre into yarn*, Renjith kumar K.K;Sudheer N.S; Ajith Gopinathan pillai, Biju C.G; A.Radhakrishnan;C.R.Komalakumar; T.A.Rajendrababu; **S.Radhakrishnan**; Anita Das Ravindranath; P.K Ravi and U.S.Sarma (502/KOL/2012 dated 7th May,2012).

4. **PSN National Awards for excellence in Science and Technology 2011-** Application filed on the technology development of Bio-Chem Treatment for quality improvement in green husk fibre. U.S.Sarma, Anita Das Ravindranath**, S.Radhakrishnan** and P.KRavi

PAPERS PUBLISHED AND PRESENTED IN NATIONAL AND INTERNATIONAL JOURNALS

International

1. Jenifer Ganesan[a,b] Geetha Nandhabalan[c,d], Geetha Dhandabani[a,b], Radhakrishnan. Sivaramapillai[e,f] Malliga Perumal[a,b*],Isolation and molecular characterization of microorganisms from treated tannery sludge with Nava Rasa Karaisal (NRK) and coir pith.

2. C.T. Rejani, *Radhakrishnan. Study on the production of vanillin from lignocellulosic coir coir pith, International Journal of Research in BioSciences, Volume 9 Issue 4, pp. (1-8), July 2020.

3. Swarnalatha K, Lea Mathew, Anuranjana Jaya JG, Anita Das Ravindranath & S.Radhakrishnan (2018) Removal of dye from aqueous media using coir pith & modified coir pith. Book of Abstracts ICWR 2018. International Conference on Water Resource:

Innovation in Quality and Quantity , Sustainable Development Challenges and Management-pp 99.

4. Radhakrishnan S , Anita Das Ravindranath , Abesh Reghuvaran , Geena MG. *Coir-Krishimithra: An Apposite Medium for Cultivation of Vegetable/ Medicinal/ Ornamental Plants.* Cord 2018, 34 (1)

5. Radhakrishnan S, Anita Das Ravindranath, Sarma U.S, Hanosh M S, and Jayakumaran Nair A. *Quantitative Evaluation of the Production of Ligninolytic Enzymes – Lignin Peroxidase and Manganese Peroxidase by Pleurotus Sajor Caju during Coir Pith Composting*. **Cord 2012**, 28 (1)

6. Radhakrishnan S, Anita Das Ravindranath, Sarma U.S and Jayakumaran Nair A. *Azolla & Soya hulls – Substitutes for Urea in Coir Pith Composting using Pleurotus Sajor Caju*. **Cord 2011**, 27 (2)

7. Radhakrishnan S. Biodegradation of coir pith with PITHPLUS using organic supplements substituting Urea for agri/horti end uses. **International Journal of Applied and Pure Science and Agriculture (IJAPSA),**2011.

8. Prasanta K.Ghosh, U.S.Sarma, Anita Das Ravindranath, Radhakrishnan S and Prasenjeet Ghosh, *A Novel Method for Accelerated Composting of Coir Pith*. **Energy Fuels.** 21 (2), 822-827, 2007.

9. Anita Das Ravindranath, Radhakrishnan S and U.S.Sarma. *A study on Biobleaching of Coir using bacterial cultures.* Paper presented in the International Seminar organized by **FAO** at Alappuzha on 8^{th} -9^{th} December 1997.

10. Ashok Pandey and Radhakrishnan S, (1993) *The Production of Glucoamylase by Aspergillus niger NCIM 1245.* **Process Biochemistry** 28,305-309.

11. Ashok Pandey and Radhakrishnan S, (1993) *Packed bed column for production of enzyme.* **Ezyme Microb.Technol,** 1992 vol 14, June.

National

1. Geena MG,Radhakrishnan S and Anita Das Ravindranath. Nanocellulose from Coir: A prospective candidates for Biomedical applications. Proceedings of BAT-2018, 7-9, January,2018.

2. Radhakrishnan S (2018).“*Status of Coir Industry with a value addition of Coir pith and Coir wood.* Proceedings of "CII Coconut Festival 2018” - a crop focused, exhibition cum conference on 27 - 28 January 2018 at CODISSIA Trade Fair Complex, Coimbatore.

3. Radhakrishnan S, Anita Das Ravindranath, Abesh Reghuvaran, and Geena MG (2017). Coir Krishimithra, An all purpose coir pith based Organic Manure. Proceedings-Preserving heritage & Assuring quality of Kerala Coir Industry

4. Annu Joshy, S. Radhakrishnan, R. Anita Das .An Innovative Method For The Extraction Of Sodium Lignosulphonate From Coir Pith. Proceedings of 27 th Swadeshi Science Congress – 2017.

5. Geena M. G., Radhakrishnan S. and Anita Das Ravindranath. Coir fibre Nanocelulose for making hygeine and absorbent products. Proceedings of 27th Swadeshi Science Congress-2017.

6. Chaithanya, S, Radhakrishnan S. and Anita Das Ravindranath Comparative Study Between Coir Krishimithra And C-Pom On The Growth Of Vegetable, Medicinal And Ornamental Plants. Proceedings of Coir Kerala 2017.

7. Radhakrishnan S, Abesh Reghuvaran, , Anita Das Ravindranath. An Innovative Biochem method for brightening / softening coir fibre for Manufacture of Janata Mattress. Proceedings of Coir Kerala 2017.

8. Geena M. G., Radhakrishnan S. and Anita Das Ravindranath. Coir Fibre Nanocelulose For Making Hygeine And Absorbent Products. Proceedings of Coir Kerala 2017.

9. Sinjula Cheeroth Sahajan, S.Radhakrishnan, Anita Das Ravindranath**.** Analysis On Nutrient Status Of Coir Krishimithra – A Comprehensive Biocomposted Coir Pith Organic Manure. Proceedings of Coir Kerala 2017.

10. Radhakrishnan. S and Anita Das Ravindranath. Biodegradation of coir pith with Pithplus using organic supplements substituting Urea for agri/horti end uses. Proceedings of IICF-2016.

11. Radhakrishnan S, Anita Das Ravindranath, Abesh Reghuvaran, and Geena MG (2017) Cultivation of Plants in Coir KrishiMithra – A coir pith based Organic Manure, Proceedings of Coir Kerala - 2016 held at Alappuzha.

12. Anita Das Ravindranath, U.S. Sarma and Radhakrishnan **S** (2012). *Utilization of Coir Pith for Value addition.* Paper presented in National Seminar organized by Coir Board at Thiruvananthapuram and Alleppey.

13. Nima K.V, Anita Das Ravindranath, U.S. Sarma and Radhakrishnan S, (2010) *Potential of Soft wood of the diseased Coconut palm for Diversified End Uses*. Proceeding of 1st Kerala Women's Science Congress held at Kochi.

14. Anita Das Ravindranath, Subha P.V, Hanosh M.S, Radhakrishnan S and U.S. Sarma (2010). *Coir pith as a Substrate for Biofuel production*. Proceeding of 1 st Kerala Women's Science Congress held at Kochi.

15. Chithralekha M, Anita Das Ravindranath, U.S. Sarma and Radhakrishnan S (2010). *Quality improvement of Coir fibre using Crude enzymes extracts from Pleurotus sajor caju* and *Coriolus versicolor*. Proceeding of 1 st Kerala Women's Science Congress held at Kochi.

16. Anita Das Ravindranath, U.S. Sarma and Radhakrishnan S (2009). *Application of Coir and Coir products in Agri/Horti/Floriculture field.* Paper presented in National Seminar organized by Coir Board in connection with the Kisan Mela at Palakkad.

17. Anita Das Ravindranath, U.S. Sarma and Radhakrishnan S (2007). *Biotechnology in Coir - past, present & future*. India International Coir Fair 2007 Souvenir (91).

18. Anita Das Ravindranath, U.S.Sarma and Radhakrishnan S (2006) "*Coir - A renewable agro-waste for horticulture"*. Coir News Vol. XXXV Bk. 12**.**

19. Anita Das Ravindranath, U.S.Sarma and Radhakrishnan.S, (2006) Coir-*A renewable Agro waste for horticulture*. Proceedings of National Seminar on Plant Physiology, organized by KAU, Thrissur.

20. Anita Das Ravindranath, U.S.Sarma and Radhakrishnan.S (2005) *Coir fibre extraction and coir pith composting using biotechnology*. Proceedings of National Workshop on Women Friendly Technologies Kochi, 20 - 22 January.

21. Ashok Pandey and Radhakrishnan.S (1993) *Bioconversion of Agricultural biomass into value added products.* Proceedings of Kerala academy of sciences, vol 1, 1990.

PAPER PRESENTATIONS IN NATIONAL SEMINARS/WORKSHOP/AWARENESS PROGRAMME

1. Scope of Diversification in Coir sector". Paper presented in the Residential training programme organized by the Director, National Coir Research and Management Institute (NCRMI), Trivandrum on 4.8.2022.

2. "Value addition of Coir pith in agri/horti sector". Presented a paper in the National seminar organized in connection with the Konkan Coir Mahotsav on 25.2.2022.
3. " Innovative Technologies on Coir " .Paper presented in the National Seminar organized in connection with North East Coir Expo-2021 16 th December,2021 at Guwahati.
4. " *Coir products for sustainable development* "Paper presented in the Orientation Training programme organized by CCRI on 8.3.2022.
5. "Ecofriendly technologies on Coir and its value addition for sustainable development". Paper presented in the Regional Seminar organized at Kuttiadi in Kozhikode on 23.3.2022.
6. Coir pith-a prospective candidate for agri/horti applications" Paper presented in a Webinar "A Wonder media for heights" held on 18th November, 2020.
7. "*Status Of Coir Industry In North-Eastern Region* Possibilities of COIR / coir products" . Paper presented a webinar **"***Opportunities in Natural Fibre Products & Medicinal Plants in Northeast***"** organized by the Federation of Indian Chambers of Commerce & Industry (**FICCI**) on 13th October 2020.
8. Export market on Coir . Presented in the Awareness programme & Interactive Meeting with the Coir exporters, Manufacturers & Associations in Karnataka on 10.7.2019.
9. "Maharashtra Coir Policy" . Presented a paper in a Workshop organized by the Maharashtra Small Scale Industries Development Corporation (MSSIDC) on 23.8.2019.
10. Technological interventions on Coir . Paper presented in a "Workshop on development of Coir Industries" organized by Regional Office on 28.8.2019 at Bhadravathi, Shimoga.
11. Potential use of Coir and Coir products for development. Paper presented in a Seminar ' Sustainability, Efficiency and Competitiveness' organized by Regional Office, Pollachi at Puducherry on 24 th May,2018.
12. "Ecofriendly technologies on Coir & Coir products for development". Paper presented in an Entrepreneurship Development programme organized jointly with Regional Office, and DIC, Bangalore on 15.11.2018 at Mangalore.

13. New innovative technological developments in the Coir sector" Paper presented in a meeting of representatives from different countries viz Mauritius, Sudan, Lebanon, South Sudan, South Africa, Sri Lanka , Jordan, Madagasskar, Kenya, Uganda, Nigeria, Zimbawe, Afganistan, Niger, Zambia, Mali, Cameroon, Russis and DR Congo in connection with an International programme under Promotion of Micro Enterprises (POME) on 12.12.2018 at CICT, Bangalore.
14. "Potential use of Coir pith and its value addition" Paper presented in the SPURTI meeting held on 22.11.2018 at CICT, Bangalore.
15. *"New innovations in Coir sector"*. Paper presented in an awareness programme organized by M/s.Arpana Impex at Chickballapur in Karnataka on 14.9.2019.
16. *"Maharashtra Coir Policy*". Presented a paper in a workshop organized by the Maharashtra Small Scale Industries Development Corporation (MSSIDC) Limited at Retnagiri on 23.8.2019.
17. "*Ecofriendly Technologies on Coir for sustainable development".* Paper presented in an Entrepreneurship Development programme focusing on the efforts taken by the Coir Board to explore the market for coir and its products in the region and to introduce high value coir products at District Small Industries Association Hall, Industrial Estate, Yeyyadi, Mangalore jointly with Regional Office, Bangalore and DIC, Bangalore on 15.11.2018.
18. *"Application of coir pith compost for vegetable cultivation".* Paper presented in an awareness programme organized by M/s.Pragathi Agrotech at Tumkur in Karnataka on 14.2.2019.
19. "*A comprehensive composting process for coir pith for the production of Coir Krishimithra using natural supplements*". Presented in the Regional Seminar on Coir at Farmers's Training hall, Thattanchavady, Puducherry on 24 th May,2018 organized by jointly by Regional Office, Pollachi and Agricultural department, Puducherry.
20. "*Coir Pith Organic Manure and its application in agriculture"*. Paper presented in the Seminar organized by Rotary club, Alleppey (2018).
21. "*Status Of Coir Industry In North-Eastern Region And Scope Of Geospatial Technology In Agriculture And Allied Sectors*". Paper presented in a workshop on Effective use of Geospatial technology in Agriculture and allied sectors in North

Eastern region organized by North Eastern Space Applications Centre, Govt. of India at Dept. of Space, Umiam, Meghalaya during 21-22 Nov 2017.

22. *"Coir –a green business for sustainable development".* Paper presented in a Workshop organized by Regional Office Kalavoor at North Paravoor, Ernakulam(2017).
23. *"Ecofriendly Interventions on Coir For Sustainable Development.* Paper presented in the National Seminar *organized by* Utkal University, on 27th , January, 2017,at Bhubaneswar.
24. *"Comprehensive Organic Biocomposted Coir Pith*: *A Prospective Candidate For Agri/Horti End Uses".* Paper presented in National Seminar organized by Coir Board at Kannur on 23.1.2017.
25. "*Coir Pith Composting using Pithplus- An Alternate Source Of Organic Manure for vegetable cultivation*". Paper presented in the National Seminar organized by Vegetable and Fruit promotion Council at Thiruvananthapuram. (2017).
26. *"Potential of biocomposting of coir pith using PITHPLUS substituting organic supplements alternate to Urea for Agri/Horti end uses".* Paper presented in India International Coir fare-IICF-2016, Coimbatore, Tamil Nadu.
27. "*New R& D Technologies on Coir*". Paper presented in a seminar organized by the Department of Biotechnology and Research of KVM College of Engineering & IT at Cherthala.
28. *"An ecofriendly Biochem Treatment method for quality improvement of coir fibre."* Paper presented in Coir Kerala -2016 in Alleppey.
29. "*Value addition of coir pith in horticulture*" .Paper presented in a workshop on "Development of Coir Industry "at Central Tobacco Research Institute, Rajahmundry, Andhra Pradesh organized by the State Horticulture Department in association with Coir Board on 28/09/2015.
30. *"Ecofriendly technologies for the production of Organic manure and Cocolawn from coir pith for sustainable development in agriculture/soil stabilization".* Paper presented in the International Conference on Renewable Energy and Sustainable Environment (RESE 2015) from 11-13, August, 2015 at Dr. Mahalingam College of Engineering and Technology, Pollachi, Tamil Nadu, India.

31. *Coir - A natural resource".* Paper presented in "*Natural Fibre Conclave*" to present products, equipment, services and technology organized by Confederation of Indian Textile Industry (CITI) in Hotel Le Meridien, Coimbatore, Tamil Nadu on 22 nd July,2015.
32. "*Pollution abatement in Coir sector".* Paper presented in a Seminar "Environmental Management in Small and Medium Scale Industries" on 20 th June,2015 jointly organized by NIIST and by Indian Institute of Chemical Engineers (IIChE) Thiruvananthapuram Chapter.
33. *"Ecofriendly technologies of Coir.* Paper presented " in a Workshop on the post of initiatives of products of Kerala organized by Agriculture (WTO Cell), Govt of Kerala at Thiruvananthapuram on 26.5.2015.
34. "*Biotechnological intervention on coir for pollution abatement*". Paper presented in a national seminar on Biotechnology organized by the department of Biotechnology, Sree Sankara College Kalady (2015).
35. *"Utilization of Coir pith for the production of compost and Cocolawn*" *for agri / horti applications.* Paper presented in National Seminar organized by Codissia in connection with Agri Intex-2014 held during the period from 18-21 July,2014 at Coimbatore (2014).
36. "*New R&D Technologies inn Coir sector*" Paper presented in National Seminar on modern technologies on coir organized by Coir Board and Singai Clusters (p) Ltd at Sinagmpunari and Thiruppuvanam in Sivagangai District, Tamil Nadu on 26th & 28, February,2014.
37. *"Ecofriendly technologies on the application of Coir pith for the production of compost and Cocolawn*". Paper presented in National Seminar organized by Coir Board at Coimbatore on 8 th February,2014.
38. "*Modern technologies on coir for sustainable development*" Paper presented in an Awareness camp on Coconut technologies Workshop organized by CPCRI & Project Associates from Business Planning and Development unit, National Agricultural Innovation Project (NAIP) and Indian Council of Agricultural Research (ICAR) at Fourth Estate Hall, Thiruvananthapuram on 7 th, February,2014.

39. "*Quality improvement of coir fibre using Biochem treatment*". Paper presented in a workshop organized the Regional Office at Chirayinkeezhu in connection with the launching of the technology of due retting at Chirayinkeezhu CVCS (2013).
40. *"Manure and Cocolawn from coir pith for agri/horti endues".* Paper presented in the seminar organized by the Board at Chethanalaya, New Delhi on 27 th November,2013.
41. "*New R &D innovations in Coir sector for sustainable development*". Paper presented in a Seminar organized by the Regional Office , Attingal at Thiruvananthapuram in connection the launching of new machineries by Hon Union Minister (2013).
42. "*New R& D Technologies in Coir Sector for self employment"*. Paper presented in National Seminar on Popularization of Coir Technologies in North East States organized jointly by CSIR- North East Institute of Science & Technology and CCRI at Tripura during the period from 5-6 th , May,2013.
43. "*Utilization of Coir Pith for Value addition".* Paper presented in National Seminar organized by Coir Board at Thiruvananthapuram (2013).
44. "*Coir pith and its application as Agri/ Horticulture media*"**.** Paper presented in "*International Fair for Horticulture"* at Novi Sad, Belgrade from 25th to 30th September 2012.
45. *"Composting of coir pith using Pithplus and Urea".* Paper presented in National seminars organized by the Regional office in Vadnappally, Thrissur (2012).
46. "*Utilization of Coir Pith for Value addition".* Paper presented in National Seminar organized by Coir Board at Alleppey (2012).
47. **"***Potential applications of Coir Pith Organic Manure"*. Paper presented at the Seminar on Development of Coir Industry in Thanjavur in Tamil Nadu in 2012.
48. **"***Biodegradation of coir pith substituting Urea"*. Paper presented in a National Seminar organized by Central Plantation Crops Research Institute (CPCRI), Kaseragod (2012).
49. *"Comprehensive Organic Biocomposted Coir Pith*: *An enriched nutrient supplement for horticulture"*. Paper presented in a National seminar organized by the Kerala State Horticultural Board at Sreekaryam, Thiruvananthapuram (2012).
50. *"Ecofriendly technologies on the application of Coir pith for the production of Organic manure*". Paper presented in National Seminar organized by Stae Horticultural department, Mysore in Karnataka (2012).

51. "*New R& D Technologies in Coir Sector. Business planning and Development"*. Paper presented in National Seminar on Popularization of Coir Technologies in North East States organized jointly by CSIR- North East Institute of Science & Technology and CCRI at Jorhat, Assam during the period from 6-7 th , November,2012
52. "*Value addition in coir pith for horti/agri applications".* Paper presented in a Model Training Course (MTC) to NGO's organized by CPCRI at Kasaragod on 21.11.2012.
53. *Composting of coir pith using Pithplus and Urea.* Paper presented in National seminars organized by the Regional office in Kodungallur (2012).
54. "*A Biotechnological approach in Coir industry for pollution abatement"*. Paper presented in a seminar organized by Kerala State Pollution Control Board at Alleppey on 16.11.2012.
55. *"Composting of coir pith using Pithplus and Urea".* Paper presented in National seminars organized by the Regional office in Alappuzha (2011).
56. "*Composted coir pith – an ideal fertilizer for orchids, anthurium plants".* Paper presented in a workshop organized at Panikkers nursery at Kottarakkara (2011).
57. *"Composting of coir pith using natural supplements substituting Urea"***.** Paper presented in a National seminar on Organic farming organized by Krishivinjan Kendra at Thiruvananthapuram (2011).
58. ***"****New R& D Developments in Coir Sector*". Paper presented at the Seminar on Development of Coir Industry in Bhubaneswar in Orissa (2011).
59. "*Potential use of Coir Pith Organic Manure (CPOM) in agri / horticulture"*. Paper presented in Agricultural seminars organized by M/s.SICAF India Ltd at Kottayam (2011).
60. "*New R& D Innovations in Coir Sector for sustainable development"*. Paper presented in National Seminar on Popularization of Coir Technologies in North East States organized jointly by CSIR- North East Institute of Science & Technology and CCRI at Assam (2010).
61. *"Composting of coir pith using Pithplus and Urea".* Paper presented in National seminars organized by the Regional office at Cherthala (2010).
62. ***"****New R& D Developments in Coir Sector*". Paper presented at the Seminar on Development of Coir Industry in Durgapur in West Bengal (2011).

63. **"***Technological interventions in Coir Industry"***.** Paper presented in the national seminar arranged in connection with Dussehra mela organized by Ministry of MSME, New Delhi at Kullu (Himachal Pradesh).
64. **"***Potential applications of Coir Pith Organic Manure for agri/ floriculture".* Paper presented in the International Seminar organized by Coconut Development Board at Hotel Grand days, Chennai (2009).
65. **"***Utilization of Coir Pith Organic Manure (CPOM) in agri / horticulture"*. Paper presented in Agricultural seminars organized by Malayala Manorama Karshakasree at Kannur (2008).
66. **"***Potential applications of Coir Pith Organic Manure & COCOLAWN"*. Paper presented at the Seminar on Development of Coir Industry in Singampunari in Tamil Nadu in 2008.
67. **"***Utilization of Coir Pith Organic Manure (CPOM) in agri / horticulture"*. Paper presented in Agricultural seminars organized by Malayala Manorama Karshakasree at Wayanad(2008).
68. "*Coir pith and its application as agri/ horticulture media*". Paper Presented at the workshop on "Utilization of coir pith for horticultural applications" organized at Bangalore on 3.11.2007.
69. **"***Coir Pith Organic Manure (C-POM) – an organic fertilizer for improvement of productivity in Agriculture"*. Paper presented at the seminar organized by Indian Institute of Co-operative Management in Thiruvanathapuram (2007).
70. **"***Coir Pith Organic Manure (C-POM)- a biocomposted fertilizer for organic farming"*. Paper presented at the seminar organized by the Kerala State Coir Marketing Federation Ltd (COIRFED) at Thiruvananthapuram (2007).
71. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by the Krishibhavan at Chettikulangara (2007).
72. "*Coir Pith Composting using Pithplus- An Alternate Source Of Organic Manure For vegetable cultivation*". Paper presented in the National Seminar at Botanical Research Station, Palode, Thiruvananthapuram (2007).
73. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Rice Research Station, Kayamkulam (2007).

74. "*Value addition in coir pith for horti/agri applications".* Paper presented in an awareness programme organized by the Regional Office, Kannur at Kozhikode (2007).
75. *"Coir pith – a prospective candidate for agriculture".* Paper presented in a national seminar organized by Kerala Agricultural University at Palakkad (2006).
76. **"***Coir Pith Organic Manure (C-POM) – an organic fertilizer for improvement of productivity in Agriculture"*. Paper presented at the seminar organized by Indian Institute of Co-operative Management in Thrissur (2006).
77. **"***New R& D Developments in Coir Industry*". Paper presented at the Seminar on Development of Coir Industry in Amalapuram in Andhra Pradesh in 2006.
78. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Krishi Bhavan in Thrikkunnapuzha in Alappuzha (2005).
79. **"***Coir Pith Organic Manure (C-POM) – an organic fertilizer for improvement of productivity in Agriculture"*. Paper presented at the seminar organized by Indian Institute of Co-operative Management in Vadakkancherry (2005).
80. **"***Coir Pith Organic Manure (C-POM) – an organic fertilizer for improvement of productivity in Agriculture"*. Paper presented at the seminar organized by Indian Institute of Co-operative Management in Thalasserry (2005)
81. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Krishi Bhavan in Kottarakkara (2004).
82. **"***Applications of COIRRET & PITHPLUS in Coir industry"*. Paper presented at the National Seminar on Development of Coir Industry in Bhubaneswar in Orissa in 2004. **"***Coir Pith Organic Manure (C-POM) – an organic fertilizer for improvement of productivity in Agriculture"*. Paper presented at the seminar organized by Indian Institute of Co-operative Management in Chathannoor, Kollam (2004).
83. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Krishi Bhavan in Mynagappally (2003).
84. **"***Coir Pith Organic Manure (C-POM) – an organic fertilizer for improvement of productivity in Agriculture"*. Paper presented at the seminar organized by Indian Institute of Co-operative Management at Maradu, Cochin (2003).
85. **"**Coir pith and its value addition". Paper presented in a Seminar organized by Kerala State Coir Corporation at Alleppey (2003).

86. "*Coir pith compost-A plant nutrient in organic farming"*. Paper presented in the one day Seminar on organic cultivation and vegetative propagation with special attention to coir pith organized by the Horticultural Board at Thiruvanathapuram (2002).
87. **"***Coir Pith– an organic media/soil conditioner for enhancement of productivity in Agriculture"*. Paper presented in a national seminar organized by the State Agricultural department at Manipur(2002)
88. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Krishi Bhavan in Karunagappally (2002).
89. *Coir pith compost- an apt* organic fertilizer for agriculture. Paper presented in a National seminar on Organic farming at Bathalagundu, Tamil Nadu (2002).
90. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Krishi Vinjyan Kendra at Chengannur, Alleppey (2001).
91. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Krishibhavan at Sashtamkotta, Kollam (2001).
92. "*Coir and its diversified applications*". Paper presented in a interactive session on the development of the coir industry in Kerala organized at Mar Ivanios College Rd, Bethany Hills, Thiruvananthapuram, Kerala (2001).
93. *"Hygienic process of composting for pollution abatement*". Paper presented in an awareness programme organized by the district panchayat at Kaniyapuram, Thiruvananthapuram (2001).
94. "*Technological development in husk retting (reducing the retting period and improving quality) and utilization / conversion of coir pith into organic manure"*. . Paper presented in agricultural seminars organized by Institute of Co-operative Management (2001).
95. "*Coir pith compost- a nutrient rich organic manure for agriculture for sustainable development".* Paper presented in a seminar organized by M/s.Karshakamithram organic fertilizers at Kaniyapuram in connection with the inauguration of the composting unit by Chairman, Coir Board (2000).
96. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Krishi Vinjyan Kendra at Ochira (2000).
97. "Application of *COIRRET for coconut husk retting/ fibre bleaching"*.Ppaer presented in a seminar organized at Thiruvallam CVCS at Thiruvananthapuram (2000).

98. "*Innovative technology of composting of coir pith using* PITHPLUS". Paper presented in technology transfer seminar organized by Kerala Agricultural University, Vellayani (2000).
99. *"COCOLAWN- an instant lawn made our of coir for landscaping applications"*. Paper presented in a workshop organized by Kripasanam at Cherthala (2000).
100. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Krishi Bhavan in North Paravoor (1999).
101. "*Retting of coconut husk by COIRRET*". Paper presented in an awareness programme organized by the Regional Office at Panavally, Cherthala (2000).
102. "*Utilization of C-POM for agriculture purpose"*. Paper presented in a National Seminar on Organic manure organized by Kerala Agricultural University, Mannuthy,Thrissur (1999).
103. **"***Coir Pith Organic Manure (C-POM)* an apt media for rubber plantation. Paper presented in a Seminar organized by the Rubber plantation association at Idukki (1999).
104. Coir pith a growing media for rubber seedlings. Paper presented in a National Seminar on Organic manure organized by Rubber Board (1999).
105. "*Application of COIRRET in husk retting*. Paper presented in a one day seminar organized in connection with the launching of due retting at Kuripuzha in Kollam (1999).
106. "Application of *COIRRET for coconut husk retting/ fibre bleaching"*. Paper presented in a workshop organized by Chavakkad CVCS at Chavakkad (1998).
107. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Krishi Bhavan in Thiruvalla (1998).
108. "*Technological development in husk retting*. Paper presented in a workshop organized by Vavakkad Coir Co-operative Society, Cherthala(1998),
109. Coconut husk retting using COIRRET. Paper presented in a meeting held by the district Panchayath at the Community hall, Vycome (1998).
110. **"***Coir Pith Organic Manure (C-POM)* an apt media for plant cultivation. Paper presented in a Seminar organized by Central Plantation Crops Research Institute at Kayamkulam (1998).

111. *"Retting of coconut using COIRRET for fast extraction of white fibres".* Paper presented in the awareness programme organized at Kottuvally CVCS, North Paravoor (1997).

112. "*Applications of Composted coir pith in Agriculture*. Paper presented in an agricultural seminar organized by Krishi Vinjyan Kendra / Krishi Bhavan all over Kerala (1997).

113. *"PITHPLUS- an affective fungal strain for composting of coir pith"*. Paper presented in an awareness programme organized by the Kuttanadu vikasana samithi at Edathua in Alleppey (1997).

114. "*Coir Pith Organic Manure (C-POM)-an ideal growing medium for seed germination"*. Paper presented in the national seminar organized by the department of Microbiology, CPCRI, Kayamkulam (1997).

115. **"***Utilization of Coir pith in agriculture"* Paper presented in a Seminar organized by Rice Research Institute, at Mankompu (1997).

116. "*Applications of Composted coir pith in Agriculture*. Paper presented in agricultural seminar organized by Krishi Vinjyan Kendra in Mavelikkara (1996)

117. Composted coir for Agriculture. Paper presented in a Seminar on organic farming organized by Krishibhavan at Prayar, Ochira (1996).

118. "*Organic farming using biodegraded coir pith*" Paper presented in an awareness programme on organic farming organized by the Krishivinjan Kendra at Manarkad in Kottayam (1996).

119. "*Composting of coir pith using PITHPLUS- an effective way of elimination of pollution by the coir pith hillock*". Paper presented in an awareness programme organized at Devikulangara Panchayath office, Kayamkulam (1996).

NODAL OFFICER FOR COLLABORATIVE PROJECTS

COLLABORATIVE PROJECTS UNDERTAKEN AT CCRI, KALAVOOR

1. Development of coir pith based formulation of agri/horti end uses with FACT, Kochi.

2. Development of Commercial bioformulation of plant growth promoting Rhyzobacteria (PGPR) using coir pith as carrier with CSIR, NIEST, Jorhat.

3. "Development and demonstration of coir fibre & coir pith products for rubber root trainer Nurseries in the North east region".

4. Development for appropriate product by studying the possible use of coir dust in oil industry with reference to North-East India for absorption of oil spill (NEIST, Jorhat.

5. Studies on Coir pith as an adsorbent in pollutant removal from waste water**".** College of Engineering **(**CET), Trivandrum.

6. Establishment of an aquaponics system in the CCRI campus and conduction of experimental analysis on the same using composted coir pith as a growth medium. M/s.Solvable Reliable Valuable, Navi Mumbai.

7. Development of research and training centre for tannery waste treatment using coir pith and effective microorganisms to convert organic manure. Dept. of Marine Biotechnology, Bharathidasan University, Tiruchirappalli.
8. "*Genetic manipulation of Coirret for application on coir for quality improvement*" .RGCB,Thiruvananthapuram.

INHOUSE PROJECTS

9. Pilot Scale Laboratory (PSL) for the production of Pithplus Biochem in CCRI/CICT/RO (Pollachi/ Rajahmundry & Bhubaneswar.

10. Potential application of Biodegraded coir pith (C-POM) for setting up of Roof /Home/Vertical garden.

11. Study of the potential of Nanocellulose extracted from coir and its application in biomedical industry

12. Extraction of Bio-oils From Coir Pith

13. Standardization and Improvisation of the technology of Fibre magic treatment of machine extracted green husk and dry husk fibre.

14. Standardization of Sodium Lignosulphonate from Coir Pith

15. Composting of coir pith at Chirayinkeezhu, Thiruvananthapuram.
16. Standardization and Bulk production of Krishimithra for agri/horti end uses & popularization in Coconut growing states.

17. Setting up of Demonstration plot for showcasing the major R& D Technologies on coir viz MFEM, Coir pith composting (Conventional & Krishimithra), Cocolawn, Vertical garden, Coir geotextiles application, Coir net house etc at CCRI campus.

18. Pilot scale laboratory for the production of sodium lignosulphonate from coir pith and technology transfer to entrepreneurs .

19. Standardization, Improvisation and Popularization of Biochem treatment on Machine extracted green husk and dry husk fibres".

20. "Standardization, Improvisation and Popularization of Biochem treatment on Machine extracted green husk and dry husk fibres".

21. Study on coir pith/ coir fibre Nanocellulose for Hygiene and Absorbent Products.

22. Comprehensive study on the biodegradability of coir fibre based products viz. coir geotextiles, coir wood, coir mattress and matting's etc.

23. Extension of the Pilot Scale laboratory for continuing the production of PITHPLUS/Biochem/testing at CCRI/CICT / RO's.

COLLABORATIVE PROJECTS UNDERTAKEN AT CICT, BANGALORE (2020-2022)

1. Establishment of Centre of Excellence for Coir Composites (Cecc) For Utilization of Coir Fibers for transforming into High Value Added Coir Composites for various end use applications with IPIRTI, Bangalore

2. Evaluation of coir composites as an alternative to existing panel products for its various end use applications with IPIRTI, Bangalore.

3. Setting up of an Experience centre for Coir Wood for focusing to educate the furniture & panel industry as a graduation project in collaboration with National Institute of Design (NID), Bangalore.

4. Standardization of media , Evaluation of plant species and nutrient module of vertical land scape using coir based products" with IIHR, Bangalore.

5. Prototyping of different types of knockdown furniture using coir wood panel for demonstration purpose**.**

IN-HOUSE PROJECTS

6. Incubation centre at CICT, Bangalore for Value Addition of Tender coconut husks through ecofriendly technology interventions for pollution abatement and sustainable development

7. Strengthening of Physical Testing Laboratory & Coir wood Testing laboratory at Central Institute of Coir Technology (CICT,) Bangalore for the application of coir skin /coir wood in photo framing, handicraft items and other gift articles to meet the requirement of industry.

8. General Research on coir composite and technical assistance/extension service to the coir composite units at CICT, Bengaluru**.**

9. Service Extension Centre (PSL) for the production of PITH PLUS/BIOCHEM/C-POM & Testing at CICT, Bangalore.

M.Sc PROJECTS SUPERVISED (HRD)

1. "*Study on the production of Vanillin by biodegradation of coir pith using microorganisms*" submitted to the Cochin University of Science and Technologies, Cochin, Kerala for MSc. Biotechnology (2011).

2. "*A Study on the physical properties of biosftened coir fibre using spray formulation of COIRRET* "submitted to Mahatma Gandhi University, Kottayam M.Sc. Biotechnology (2012).

3. "*A Study on the effect of different growth parameters on endoglucanase enzyme activity of bacteria in COIRRET consortium"* submitted to Mahatma Gandhi University, Kottayam M.Sc. Microbiology. (2012).

4. "*Biodegradation of cellulose extracted from coir fibre using cellulolytic fungi'* submitted to Mahatma Gandhi University, Kottayam M.Sc. Microbiology. (2012).

5. "*Biosoftening of mechanically extracted coir fibre using Biochem treatment method"* submitted to Mahatma Gandhi University, Kottayam M.Sc. Microbiology. (2012)

6. "*Biosoftening of coir fibre using White rot fungi"* submitted to Mahatma Gandhi University, Kottayam M.Sc. Microbiology. (2017)

7. "*Effect of cellulolytic fungi in composting delignified coir pith obtained after the extraction of Sodium Lignosulphonate*" submitted to Mahatma Gandhi University, Kottayam M.Sc. Microbiology. (2017).

8. "*Decolorization of dye compounds by selected bacterial strains isolated from dyestuff industrial area*" submitted to Mahatma Gandhi University, Kottayam M.Sc. Microbiology. (2017)

9. "*Decolorization of dye compounds by selected bacterial strains isolated from dyestuff industrial area"* submitted to Mahatma Gandhi University, Kottayam M.Sc. Microbiology. (2017).

EXPERIENCE IN HANDLING EQUIPMENTS

Inductive Coupled Plasma (ICP), UV.VIS-Spectrophotometer, Atomic absorption spectroscopy (AAS), Gas Chromatography (GC),Gas Chromatography-Mass Spectrometry (GC-MS),High Performance Liquid Chromatography(HPLC), CHNSO Analyzer, Polymerase Chain Reaction equipment (PCR),Flame Photometer, P article size Analyzer etc

TRAINING IMPARTED

Training on the technologies developed by the Board viz, Pithplus production and composting of Coir pith, COIRRET / Biochem treatment for quality improvement in coir fibre, production of a urea less coir pith compost-Coir Krishimithra, Cocolawn for landscaping, Coir geotextiles for soil stabilization, coir pith grow bag cultivation, coir net house for vegetable cultivation, Coir wood /coir composite for wood substitute have been imparted to entrepreneurs, workers, students, scientists, exporters and visitors under SFURTI, Coir Udyami Yojana (CUY) , Coir Vikas yojana, etc with an aim to promote coir products to reduce global warming impact. In addition, the information on the R&D techniques were imparted to visitors including students, small scale farmers from various districts of Kerala and entrepreneurs from Tamil Nadu, Karnataka, Andhra Pradesh and other coconut growing states. Training also imparted to entrepreneurs, project staff, students on testing of samples of coir pith/coir fibre/cocolog/coir geotextiles for its physical and chemical properties and phytosanitary certification as per Australian Quarantine Inspection Service (AQIS)/Association of Agricultural Chemists(AOAC)/BIS standard intended for export.

TRAINING UNDERTAKEN

Institute	**Area**	**Period**
Entrepreneurship Development Institute of India (EDP) & Productivity Council	Business management programme and Personality development	19.9.1999-20.9.1999; 7.8.2000-9.8.2000 16.5.2003-19.5.2003 21.6.2009-22.6.2009 13.8.211-15.8.2011
Entrepreneurship Development Institute of India(EDP)	Revitalization and cost management programme for coir clusters in Kerala under UNDP PROJECT	23.8.2001 – 4.9.2001 14.6.2006-16.6.2006

Small Industries Service Institute, Ministry of SSI & ARI, Govt. of India Chennai	Training for Internal Auditor Training course based on ISO 9001-2000	18.3.2002 – 19.3.2002 3.9.2002- 10.9.2002
Coir Board Govt. of India	Intensive training on application of Coir Geotextiles	18.2.2002 – 1.3.2002 10.12.2001 – 22.12.01
M/s.Lab India Instrument, Thiruvanathapuram	Training on the application of Chromatography**.**	13.3.2000 & 14.3.2000
M/s. Asian and Mideast Institute of Chemists(AMIC) in collaboration with AIMS, Kochi	Training on Trends in the versatile techniques of HPLC	4.11.2005-5.11.2005
M/s. Amrita Institute of Medical Sciences, Kochi	Training on the Basic fundamentals in Gas Chromatography	11.6.2006-13.6.2006
M/s.Wipro Biomed India Limited, Mumbai	Training on Thin layer Chromatography	21.7.2009-22.7.2009
Dept of Biotechnology, University of Kerala	Training on Biotechnological approach for value addition of Agricultural waste.	6.12.2010
Kerala Agricultural University, Mannuthy, Thrissur	Training session on package of practices. Utilization of organic manures	16.2.2011
College of Engineering , Thiruvananthapuram	Modeling Optimization and Computing	21.4.2012

College of Engineering , Thiruvananthapuram	Cost management programme for coir clusters in Kerala	13.2.2013
Dept of Microbiology, Kerala Agricultural University, Vellayani, Thiruvananthapuram	Training session on Mushroom cultivation	23.5 2014
CCRI	Attended the Training on the accreditation of National Accreditation Board for Testing and Calibration Laboratories (**NABL**) for CCRI & CICT laboratories	2015,2016,2017
CCRI	Attended the training programme on the implementation of **ISO 9000-verson2001** (International Organization for Standardization), to establish, and maintain an effective quality assurance system for manufacturing and service industries in coir sector.	2007,2008, 2019,2011, 2012, 2013,2014,2015,2016
National Institute for Interdisciplinary Science and Technology (CSIR-NIIST) at Thiruvananthapuram	Attended the National Seminar/ Training in connection with the commencement of IPR and Patents course.	22.08.2022

Ministry of Environment , Forests and Climate change (MoEFCC), Govt of India and CentrL Pollution Control Board (CPCB) along with AFICCI, GIZ & UNEP	Attended the Training Workshop for Registration on Centralized Extended producers Responsibility (EPR) portal for plastic packaging.	13.09.2022

EXTENSION ACTIVITIES

The technology for composting of coir pith using Pithplus and improving the quality of coir fibre using spray formulation of Biochem, COCOLAWN for landscaping and restoring vegetation in denuded areas, the Effluent Treatment System for abatement of pollution in coir fibre extraction units and application of Coir geotextiles for soil stabilization etc have been developed through research and is being disseminated / demonstrated through field level demonstrations all over India. Apart from the normal routine research work, being actively involved in the extension activities related to research for popularization of the R & D technologies developed at CCRI/CICT among the coir/agri/horticulture industry.

SCHEME OF FUND FOR REGENERATION OF TRADITIONAL INDUSTRIES (SFURTI)

1. Participated in the "Workshop on development of Coir Industries" organized by Regional Office on 28.8.2019 at Bhadravathi, Shimoga. The new innovative R& D Technologies developed by the Board have been disseminated to the public by a presentation made on that occasion.

2. Attended the Awareness programme & Interactive Meeting with the Coir exporters, Manufacturers & Associations in Karnataka on 10.7.2019. A presentation on export market for coir for the past has been taken on that occasion.

3. A detailed lecture on the potential use of Coir pith and its value addition was made in the SPURTI meeting held on 22.11.2018 at CICT, Bangalore.

TECHNOLOGY DISSEMINATION THROUGH INTERACTIONS

1. The R&D activities of CCRI were disseminated through the SSO (Microbiology) in an interactive session with Master Trainers of elementary school education at socio-economic foundation, Sarvodayapuram, Alleppey on 15 October,2016

2. Technologies dissemination of R& D on coir was made to representatives from different countries viz Mauritius, Sudan, Lebanon, South Sudan, South Africa, Sri Lanka , Jordan, Madagasskar, Kenya, Uganda, Nigeria, Zimbawe, Afganistan, Niger, Zambia, Mali, Cameroon, Russia and DR Congo in connection with an International programme under Promotion of Micro Enterprises (POME) on 12.12.2018 at CICT, Bangalore.

3. Technological interventions on the bioformulation, enrichment and standardization of coir pith compost was made at the unit of M/s.Sree Kumaran Coir Products, Pollachi (2019).

COUNTRY VISITED

Visited Serbia for the participation in **International Fair for Horticulture** held in Novi Sad, Hajduk Veljkova 11 at Belgrade from September 25-30th, 2012