

TAMIL NADU AGRICULTURAL UNIVERSITY

PROCEEDINGS

6th Scientist Meet on Community Science 2019

(May 16-17, 2019)

Lead Center

Community Science College and Research Institute,
Madurai-625 104.

Directorate of Research
Tamil Nadu Agricultural University
Coimbatore 641 003

2019

PROCEEDINGS

6th Scientist Meet on Community Science 2019

(May 16-17, 2019)

The Sixth Scientists Meet on Community Science-2019 was held at Tamil Nadu Agricultural University, Coimbatore on 17.05.2019. Dr.A.S.Krishnamoorthy, Registrar, TNAU, Coimbatore Dr.K.S. Subramanian, Director of Research TNAU, Coimbatore chaired the session and critically reviewed the progress of University Research Projects, Externally funded projects, AICRP projects and action plan for 2019-22. Dr.K.S. Subramanian, Director of Research TNAU, Coimbatore presented the research highlights of CSC&RI, Madurai.

The Technical Dean / Director had reviewed the on-going university research projects (14), action plan projects (9), core projects (2), AICRPs (1) besides externally funded projects (6). Professor and Head (HDFS), Professor and Head (FRMCS) and Professor and Head (FSN) presented the significant outcome of the review and proposed the action plan for the year 2019-2020. In the closing remarks, the Director of Research encouraged the scientists to bring lots of technologies to augment pulses productivity.

Action taken report on the recommendations made during previous crop scientist meet and progress report of various projects were presented by Dr. S.Amutha, Dean (Community Science). Dr.S.Kanchana, Professor and Head (HDFS) presented the progress of URP and action plan under the theme Food Processing and Value addition. Dr.P.Parimalam, Professor and Head (FRMCS) presented the progress of URP and action plan under the theme Nutrition and Health. Dr.G.Hemalatha, Professor and Head (FSN) presented the progress of externally funded projects and AICRP.

The proceedings of the meet is furnished as below

I .Food Processing and Value addition

- A. Decisions made on the Technology release /commercialization/ technology transfer
- B. Research projects on Food processing and value addition
- C. Remarks on the ongoing university research projects/AICRP/Externally funded projects
- D. Action Plan 2019-2022

II. Nutrition and Health

- A. Decisions made on the Technology release /commercialization/ technology transfer
- B. Research projects on Nutrition and Health
- C. Remarks on the ongoing university research projects/AICRP/Externally funded projects
- D. Action Plan 2019-2022

II. CLOSING REMARKS & WAY FORWARD

IV. PARTICIPANTS

I. Food Processing and Value addition

A. Research Projects on Food Processing and Value addition

Crops	Centres	URP	AICRP	EFP	CP	Total	No. of Scientists
Cereals /Millets	CSC &RI, Madurai	2	-	1	-	3	3
Pulses	CSC &RI, Madurai	2	-	1	-	3	3
Horticultural crops	CSC &RI, Madurai	4	-	-	1	5	5
	DARS, Chettinad	-	-	-	1	1	1
	AC &RI, Killikulam	1	-	-	-	1	1
Others	CSC &RI, Madurai	1	-	-	-	1	1
	Total	10	-	2	2	14	14

URP: University Research Project, AICRP: ICAR funded AICRP projects, EFP: Externally funded projects, CP-Core Research Projects

B. Ongoing URPs / AICRPs / Externally Funded Projects in Food Processing and Value addition

No.	Project No. and Title	Project leaders	Duration	Remarks
B1. University Research Projects (URPs)				
Cereals /Millets				
1.	HSCRI/MDU/FSN/2016/002 Assessing the suitability of TNAU released varieties of Sorghum and Bajra for product development	Dr.M.Ilamaran Assistant Professor (FSN)	Sep 2016- Aug 2018	Millet based breakfast cereal may be commercialized by contacting Director , Agri Business Development, TNAU, Coimbatore.
2.	HSCRI/MDU/FSN/2018/005 Functional beverage from quinoa	Dr.G.Sashidevi Assistant Professor (FSN)	Dec 2018- Nov 2020	The project may be closed and a new project may be proposed to EFA /URP.
Pulses				
3.	HSCRI/MDU/FSN/2017/001 Quality evaluation and value addition of Horse gram (<i>Dolichos biflorus</i> L.)	Dr.G.Hemalatha Professor and Head (FSN)	April 2017- March 2020	Suitable product from horse gram extract with therapeutic properties may be developed and commercialized.
4.	HSCRI/MDU/FSN/2018/003 Nutritional and sensory evaluation of tempeh prepared using <i>Dolichos lablab</i> .	Dr.S.Kamalasundari Assistant Professor FSN)	Dec 2018- Nov 2020	Use of <i>Rhizopus Oligoporus</i> to be restricted for product development. Other safe fungal cultures should be purchase only from authenticated culture

				collection centers like from IMTEC. The coded culture must be used for research purpose.
Horticultural crops				
5.	HSCRI/MDU/FSN/2017/002 Exploitation of Tamarind varieties for product diversification.	Dr.R.Vijayalakshmi Associate Professor (FSN)	2017-2020	Commercializing tamarind candy by approaching Director, Agri Business Development, TNAU, Coimbatore.
6.	No. HSCRI/MDU/FSN/2017/004 Assessment of nutritional and bioactive compounds and value addition of <i>Muntingia calabura</i> (Singapore cherry) leaves and fruits	Dr.E.Tamilselvi Assistant Professor (FSN)	Sep 2017- Aug 2019	The project is recommended for closure immediately and a new project may be proposed in the field of Post harvest technology/ Nano technology.
7.	HSCRI/MDU/FSN/2018/004 Extraction of biocolours from Pasalikeerai fruits (<i>Basella alba</i>) and Sappathikalli fruits (<i>Opuntia ficus-indica</i>) and their utilization in the value added products	Dr.B.Nallakurumban Assistant Professor (FSN)	2018-2020	The process parameters, Specific characteristics of colour & bioactive compounds of Pasalikeerai fruits (<i>Basella alba</i>) has to be studied. Purification and stabilization of natural colours in food processing – Annatto (<i>Bixa orellana</i> L) may be taken up replacing Sappathikalli fruits (<i>Opuntia ficus-indica</i>).
8.	HSCRI /MDU /FSN 2018/001 Standardization of Texturized Vegetable Protein blending Mushroom and Underutilized Pulses	Dr.S.Kanchana Professor and Head(FSN)	July- 2018- Jun 2020	The amino acid profile of the developed products should be studied. Trials may be taken up for

				developing TVB from cereals and fungal sources (edible).
9.	HSCRI/KKM/FSN/2015/001 Development of banana flour based health mixes incorporated with millets, pulses and oilseeds	Dr.K.Shanthi Associate Professor(FSN)	Nov 2015- Dec 2017	The project is recommended for closure and the proposal has to be submitted before 15.06.2019.
Others				
No.	Project No. and Title	Project leaders	Duration	Remarks
10.	HSCRI/MDU/FSN/2018/002 Developing And Assessing The Efficacy of Antimicrobial Food Packaging Material: A Green Technology	Dr.T.Uma Maheswari Assistant Professor (Agrl.Micro)	Dec 2018- Nov 2020	The packaging materials properties has to be studied intensively. Feasibility of developing nano film in collaboration with Dept of Nanotechnology, TNAU, Coimbatore to be assessed.

B2. External Funded Schemes				
No.	Project No. and Title	Project leaders	Duration	Remarks
11.	DST/HSCRI/MDU/HSC/2015/R010 "Manufacture of simulated rice analogues from millets using extrusion technology	Dr.G.Hemalatha Professor and Head(FSN)	01.08.15 – 31.08.19	Simulated rice can be developed using broken/waste rice. It can also be fortified with moringa leaf and carrot powders

12.	SPDB/HSCRI/MDU/FSN/2015/R011 Development of Innovative High Value Pulse Based Food Products with Enhanced Functional and Nutraceutical Properties for Potential Utilization	Dr.G.Hemalatha Professor and Head(FSN)	December 2015 – December 2018	Best product to be commercialized. Innovative product may be patented. A proposal for technology commercialization on suitable product may be sent to Director ABD for commercialization.
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B3. University Core Project

No.	Project No. and Title	Project leaders	Duration	Remarks
13.	CSCRI/MDU/FSN/2018/CP092 Development and standardization of protein enriched fruit beverages	Dr.K.Jothilakshmi Assistant Professor (FSN)	Nov 2018- Nov 2020	Pectin/CMC/Xanthan gum can be added as stabilizer. Process parameters for the standardization of protein enriched fruit beverage has to be studied intensively. Green gram protein a better alternative instead of soyamilk isolate is recommended .
14.	CSCRI/CTN/FSN/2018/CP104 Optimization of Process Parameters Using Response Surface Methodology for Osmotic dehydration of cashew apple (<i>Anacardium occidentale</i> L.)	Dr.S.Jesupriya Poornakala Assistant Professor(FSN)	2018-2019	The method of reducing acidity, microbial quality and suitable packaging materials has to be studied.

D. Action Plan (2019 – 2022)

The Action plan will be continued for the second year with identified scientists towards achieving the deliverables in Food Processing and value addition.

Theme No 1		Thermal and Non thermal preservation technique for tender palm fruit		
Theme Leader		Dr. S. Kanchana, Professor and Head (HDT&FS), CSC&RI, Madurai.		
Name of the scientists and centre	2019-20	2020-21	2021-22	Deliverables/expected outcome
Dr. P. Geetha, Assoc. Prof. (FSN), CPHT, AEC&RI, TNAU, Coimbatore. Dr. P. Rajkumar, Professor (FPE), AEC&RI, TNAU, Coimbatore.	Standardization of canning, retorting and cold plasma process parameters F_0 value, thermal inactivation time, effect of retorting, colour and other preservation medium factors	<ul style="list-style-type: none"> ➤ Studying the physico chemical, nutritional, organoleptic parameters and microbial load in the developed products. ➤ Packaging interaction studies 	Shelf life studies for commercialization (accelerated and real time studies)	<ul style="list-style-type: none"> ➤ Enhance the remunerative income per rupee of investment for farmers on the standardized products ➤ Developed products will meet out the high demand for hygienically processed conveniently packed tender palm fruit at domestic and international markets.

Theme No 2	Development of Minimally processed products, functional beverage and powder from banana pseudostem			
Theme Leader	Dr.G.Sashidevi Associate Professor,Dept of Human Development & Family Studies CSC &RI, TNAU, Madurai			
Name of the scientists and centre	2019-20	2020-21	2021-22	Deliverables/expected out come
Dr.G.Gurumeenakshi Associate Professor Centre for Post Harvest Technology, AEC &RI, TNAU, Coimbatore.	Standardization of Minimally processed foods (Fresh cut pseudostem – non thermal processing), beverages and dehydrated products from pseudostem.	Nutrient analysis and bioactive components of prepared products.	Shelf life study of prepared products	<ul style="list-style-type: none"> ➤ Human consumption of total pseudostem production is only 2% which could be processed as a healthy food . ➤ Pseudo stem and rhizome may be effectively utilized for improving the health status. ➤ Provide new vista for better utilization of banana plant bio-waste as a source of polyphenols rich beverage and dehydrated powder

Theme No 3	Optimize the Production process for development of grain based ice cream cones and cups by using mathematical models			
Theme Leader	Dr. M. Ilamaran, Asst.Prof ,Dept of EEC&CM, CSC&RI, Madurai.			
Name of the scientists and centre	2019-20	2020-21	2021-22	Deliverables/expected out come
Dr. B. Sivasankari, Ph.D., Assistant Professor (Maths),A.C&R.I, Madurai	Optimize the drying conditions and process for production of pumpkin flesh flour and kernel flour Manufacture of waffles (ice cream cone and cups) by prediction, process control, optimization and simulation	Measure the waffles batter quality, cone characteristics, moisture, weight, baking ability, textural profile and functionality (ice cream holding time)	Storage stability of the developed waffles (ice cream cone and cups) will be assessed.	<p>➤Process optimization for manufacture of waffles which could serve as a nutrient (protein and fat, fibre and micro nutrients) enriched novel snack food which could serve as a alternate for grain flour based cones and cups.</p> <p>➤Technology is practically viable as it will be readily acceptable by the ice cream consumers both within India and globally. The technology also hold promise for patenting as it will also have universal acceptance and serve as an ideal nutrient delivery</p>

				<p>vehicle for protein and essential micronutrients especially iron and carotenes.</p> <p>➤The pumpkin flesh and kernel can be used in product development to increase the consumption of pumpkin which have therapeutic properties. This would certainly serve as a boon to the Indian farming community.</p>
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Theme No 4	Purification and Stabilisation of natural colours in food processing - Annatto			
Theme Leader	Dr. B. Nallakurumban, Asst.Prof, Dept of FRM&CS ,CSC&RI, Madurai			
Name of the scientists and centre	2019-20	2020-21	2021-22	Deliverables/expected out come
Dr. B. Nallakurumban, Asst.Prof, Dept of FRM&CS ,CSC&RI, Madurai	Assessing the Process parameters for purification and the stability of the colour <ul style="list-style-type: none"> a) pH (acidic & alkaline) b) Temperature (100°C-150°C) c) Preservative (70ppm-700ppm) d)Light source 	<ul style="list-style-type: none"> ➤Application of annatto colour in food products <ul style="list-style-type: none"> a) Confectionery – Jujubes lolli pop b) Bakery – Icing c) Beverages – RTS jam and squash ➤ Assessing the colour value of the products 	Storage stability of the annatto colour in different packaging materials <ul style="list-style-type: none"> a) Brown bottle b) Aluminum foil Assessing the quality parameters in terms of <ul style="list-style-type: none"> a) Moisture b) Colour value c) Solubility 	<ul style="list-style-type: none"> ➤Natural food colour Safety to use in food product. ➤Biocolour with good antioxidant activity (Vitamin E)

Theme No 5	Empowerment of palmyrah growers of Tamil Nadu by value addition of tuber from Palmyrah			
Theme Leader	Dr.K.Shanthi, Assoc.Prof ,Dept of HDFS,CSC&RI			
Name of the scientists and centre	2019-20	2020-21	2021-22	Deliverables/expected out come
<p>Dr.K.Shanthi, Assoc.Prof, Dept of HDFS, CSC&RI</p> <p>Dr.C.Ravindran Asst.Prof(Hort) A.C.&R.I, Killikulam</p> <p>Dr.M.L.Mini,Asst.Prof(Bio Chemistry)</p>	<p>Studying the physical and chemical characteristic of palmyrah tuber.</p> <p>Development of palmyrah tuber base value added products such as pittu mix, kheer mix, kali mix etc.</p>	<p>Determination of chemical, nutritional, organoleptic parameters and microbial load in the developed palmyrah tuber based products</p> <p>Studying the storage behaviour with respect to chemical, sensory quality and microbial characteristic of the developed products</p>	<p>Cost analysis of the developed products</p> <p>Dissemination of new value addition technologies to the palmyrah growers in southern districts of Tamil Nadu.</p>	<p>➤ Palmyrah tubers are seasonal and highly perishable and its preservation is highly essential.</p> <p>➤ Value addition technique will create an additional income and employment generating opportunities for the palmyrah growers</p>

Theme No 6	Assessing the impact of Food processing technologies developed by CSC & RI , Madurai			
Theme Leader	Dr.R.Saravanakumar Assoc. Professor, Dept. of TSD			
Name of the scientists and centre	2019-20	2020-21	2021-22	Deliverables/expected out come
<p>Dr.R.Saravanakumar Assoc. Professor, Dept. of TSD, CSC&RI, MDU</p> <p>Dr.A.Janakirani, Assoc Prof (HDTFS)</p>	Collection of information on the Food processing technologies training programmes given by the CSC & RI, Madurai	Identification and selection of the respondents of the training programmes involved in entrepreneurial activities	Studying the impact of the training programmes through socio economic development	<ul style="list-style-type: none"> ➤ Impact of the food processing training programmes of the CSC & RI , will be assessed ➤ Scope of the training programs organized by the CSC & RI, Madurai will be known ➤ Socio – economic development of the stake holders will be assessed

Theme No 7	Edible coating on jackfruit (<i>Artocarpus heterophyllus</i> L.) by response surface methodology			
Theme Leader	Dr.S.Jesupriya Poornakala Assistant Professor (FSN)			
Name of the scientists and centre	2019-20	2020-21	2021-22	Deliverables/expected outcome
Dr.S.Jesupriya Poornakala Assistant Professor (FSN)	Determination of the total polyphenols, flavonoids, tannins, carotenoids, dietary fiber and nutrient composition of jackfruit fresh bulbs.	Optimization of process parameters for edible coating of jack fruit bulb using response surface methodology	Assessment of quality parameters such as Browning index, colour change, Firmness, total plate count and overall acceptability in jackfruit fresh bulbs	<ul style="list-style-type: none"> The application of edible coating can extend the shelf life of fresh cut jack fruit bulbs and better returns to the farmers. Development of quality and safety assured jack fruit bulbs for the consumers.

II. Nutrition and Health

A. Research Projects on Nutrition and Health

Crops	Centres	URP	AICRP	EFP	CP	Total	No. of Scientists
Therapeutic food formulation	AC &RI, Trichy	1	-	1	-	2	2
Intervention studies	AC &RI, Eachankottai	1	-	2	-	3	3
Profiling of Nutraceutical foods	CSC &RI, Madurai	2	-	1	-	3	3
	Total	4	-	4	-	8	8

URP: University Research Project, AICRP: ICAR funded AICRP projects, EFP: Externally funded projects, CP-Core Research Projects

B. Ongoing URPs / AICRPs / Externally Funded Projects in Food Processing and Value addition

No.	Project No. and Title	Project leaders	Duration	Remarks
B1. University Research Projects (URPs)				
Therapeutic food formulation				
1.	HSCRI/TRY/FSN/2018/001 Formulation of millet based therapeutic breakfast foods	Dr.K.Geetha Assistant Professor(FSN)	Jan 2019- June 2021	Millet based therapeutic breakfast foods has to be developed using suitable probiotic culture and physio chemical characteristics of the product should be analysed.
No.	Project No. and Title	Project leaders	Duration	Remarks
Intervention studies				
2.	CSCRI/MDU/FSN/2018/001 "Efficacy of equitable interventions in combating health and nutritional disorders among AC&RI, ECK college students and staff	Dr.G.G.Kavithashree Assistant Professor(FSN)	Jan 2018- Dec 2019	Ways and means to improve the Haemoglobin level of students may be worked out. Apart from parupupodi acceptable iron rich product may be standardized.
Profiling of Nutraceutical foods				
3.	HSCRI/MDU/FSN/2018/001 Assessing the hypoglycemic effect of selected medicinal plants for Type II Diabetics	Dr.L.Karpagapandi Assistant Professor(FSN)	Jan 2018- dec 2020	The antiviral property of Nilavembu has to be studied. The chromatogram of Andrographis paniculata has to be rechecked.

4.	HSCRI/MDU/FSN/2017/003 Phytochemical and Therapeutical profile of conventional foods (<i>Solanum torvum</i> , <i>Hibiscus sabdariffa</i> , <i>Coccinia indica</i>)	Dr.V.Meenakshi Assistant Professor (FSN)	Nov 2017-Sep 2019	Popularization of the products highlighting the therapeutic properties may be carried out.
B2. External Funded Schemes				
No.	Project No. and Title	Project leaders	Duration	Remarks
5.	E28 (ABC) &Enhancing nutritional security of pregnant women, infants and young children in rural households at Tamil Nadu, India through agricultural intervention	Dr.S.Amutha Dean, CSC &RI, Madurai	01.04.17 – 30.09.19	Promising rice and kavuni cultures may be utilized for developing diversified food products such as expanded rice, flakes and analogues using identified rice variety with better therapeutic properties to be developed.
6.	No.DST/HSCRI/MDU/FSN/2016/R013 Development of functional fermented millet based drink for combating vitamin B12 deficiency	Dr.T.Uma Maheswari Assistant Professor (Agrl. Micro)	01.08.15 – 31.08.19	The technology is recommended for Commercialization Through Agri Business Development , TNAU, Coimbatore.
7.	TANII/HSC&RI/MDU/FRM/2016/D001, Mitigating occupational drudgery of farm women through ergonomic interventions	Dr.P.Parimalam Professor and Head(FRM &CS)	December 2015 – December 2019	Tools developed to be submitted for Technology release.
8.	Skill development of Persons with Disabilities under the Schemes for Implementation of Persons with Disabilities Act (SIPDA)	Dr. M. Murugan, Prof. (Ag. Ento.),TNAU, Coimbatore. Dr. P.S. Geetha, Assoc. Prof. (FSN), Dept. of Diff. Abled Studies, CSC&RI, MDU	01.04.18 – 31.03.21	Project may be continued as per the objective.

B3. Post Doctoral Fellow			
Project No. and Title	Project leaders	Duration	Remarks
Impact of evidence based ayurvedic food for revitalization of mental health among 3-10 years ADHD affected children	Project Director(i/c) Dr.A.Subramanian, Associate Professor Mentors Dr.M.Murugan, Professor Dr.P.S.Geetha, Associate Professor		The work may be carried out as per the objective. Efficacy trails to be conducted by coordinating with Scientist from Centre for Nanobio Translational Research(CENTRE) Bharathidasan Institute of Technology Anna University, Tiruchirappalli

Action plan for 2019-2020 on the Identified themes

The Action plan will be continued for the second year with identified scientists towards achieving the deliverables in Nutrition and Health.

Theme No 1	Sensitizing farm women on drudgery reducing technologies used in horticultural crops		
Theme Leader	Dr. P. Parimalam, Prof & Head (FRM&CS)		
Name of the scientists and centre	2019-20	2020-21	Deliverables/expected out come

Dr. P. Parimalam, Prof & Head (FRM&CS) Dr. B. Nallakurumban, Asst. Prof	Data collection on drudgery prone agricultural activities	<ul style="list-style-type: none"> • Refine / develop one prototype of farm tool. • Sensitize farm women on the developed farm tools through training programmes. 	Reduce the drudgery of farm women - development of women friendly farm tools
Theme No 2	Fortification of iron in idly batter		
Theme Leader	Dr. V. Veeranan Arun Giridhari, Asst. Prof (FSN)		
Name of the scientists and centre	2019-20	2020-21	Deliverables/expected out come
Dr. V. Veeranan Arun Giridhari, Asst. Prof (FSN) Dr. M. L. Mini, Asst. Prof (Biochemistry) Dr. T. Uma maheshwari, Asst. Prof. (Agri. Microbiology)	<ul style="list-style-type: none"> ✓ Standardizing - soaking time and temperature, grinding time, fermentation time and temperature. ✓ Fortifying the iron in different forms. 	<ul style="list-style-type: none"> ✓ Analysing the retention of iron after fermentation in the idli batter. ✓ Assessing the total bacteria, fungi, yeast and LAB of the idli batter. ✓ Assess the bio-availability of iron in the fortified idly batter. 	Optimizing the method and suitable form of iron for fortification will be standardized.

IV Closing Remarks & Way Forward

Registrar

- New products which compete with commercial products may be developed
- Nutritious products for replacement of unhealthy snacks in the market to be developed
- Viable products out of student and staff research to be commercialized
- All the Food Scientists in the University should coordinate and formulate viable projects in future
- The Principal Investigator of TANII project on moringa leaf at HC&RI, Periyakulam may be contacted for further study on product development in moringa
- Dean, CSC&RI, can conduct brainstorming session at Madurai with the Scientists of Community Science across TNAU for merging/expelling few departments, for eg. Dept. of Apparel Design which are not related to Farm Science and report to be submitted to the Vice Chancellor

Director of Research

- The scientist working in "Antimicrobial packaging material" should consult the Department of Nano Science & Technology, TNAU, Coimbatore for further study
- Research work on "Quinoa" shall be continued after getting external funding. The scientist should work on crops grown in Tamil Nadu
- The scientists need not study on the pathogen material obtained from Private firms and the study should be discontinued. The materials can be obtained only from the Government approved Institutions. Common circular may be communicated by the Director, CPPS, regarding this aspect.
- The FSN scientists working across TNAU including AEC&RI, CPHT have to be reviewed by the Dean, CSC&RI, Madurai. The reports should be submitted to the Dean, CSC&RI for compilation and presentation in Community Scientists Meet from the year 2020 onwards
- Externally funded projects on product development from "Kavuni rice" need to be proposed

- Research work should be proposed on multidisciplinary mode having linkage the Departments across TNAU.
- The technologies available in CSC &RI, Madurai need to be showcased in ABD Centre, TNAU, Coimbatore and ABD, Madurai
- Brain storming should be conducted for proposing viable projects with quantifiable targets.
- A scientist may be identified from CSC &RI, Madurai for having liaison with Ethical Committee in TNAU, Coimbatore
- Nutritional status of college students of TNAU should be improved by introducing 'fruit night' and establishing and maintenance of nutrition garden in the campus premises.

Director of Research

Way forward

- Each Department in the Community College & Research Institute, Madurai, should have core research activities
- Establish research collaborations with CFTRI, IIFPT, NIFTEM and other well recognized national institutes
- Linkage with eminent scientist of relevant field should be encouraged.
- Strengthen VCS in various campuses and research stations
- All the scientists have to propose Externally Funded Projects to National and International funding sources and expected to handle minimum one Externally funded project /scientist.

IV) PARTICIPANTS

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