



Self Study Report - 2012
(Submitted to the ICAR for Accreditation)



KERALA AGRICULTURAL UNIVERSITY
KAU PO
THRISSUR DISTRICT
KERALA-680656
www.kau.edu

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KERALA AGRICULTURAL UNIVERSITY

Main Campus, Kerala Agricultural University P.O., Thrissur-680 656, Kerala

Prof. (Dr.) P. RAJENDRAN
VICE - CHANCELLOR

FOREWORD

The Kerala Agricultural University (KAU), established as the 15th State Agricultural University in the country started functioning from 01.02.1972. At the time of inception of the University, there were only two colleges and 21 research stations, which grew to 10 colleges, 36 research stations, seven Krishi Vigyan Kendras (KVKs) and a few other institutions of specific objectives. With the division of the University to form two new universities viz., Kerala Veterinary and Animal Sciences University (KVASU) and Kerala University of Fisheries and Ocean Studies (KUFOS); during 2010-11, the number of institutions under Kerala Agricultural University was reduced to six Colleges, six Regional Agricultural Research Stations (RARS), 15 Research Stations, seven Krishi Vigyan Kendras (KVK) and 16 other units.

The University focuses its strategy on synergizing multi-disciplinary education and strengthening problem-specific research relevant to the state and help building innovative extension systems for sustainable agricultural production and overall improvement of rural livelihoods. Among the three faculties (Agriculture, Agricultural Engineering and Forestry), six constituent colleges (three for Agriculture, one each for Agricultural Engineering, Forestry, Cooperation Banking & Management) and 31 departments, the University offers graduate and post-graduate programmes at Masters as well as Doctoral levels in almost all the disciplines and specialties related to Agriculture, Horticulture, Forestry, Co-operation & banking, Agricultural engineering, Food engineering and allied sciences.

Right from its inception, the University is keeping its reputation as one of the best Agricultural Universities in the country. Quality assessment and assurance are essential requirements of any modern educational programme. I am glad that the Indian Council of Agricultural Research is having an effective and efficient system of quality assurance and accreditation process for the State Agricultural Universities (SAUs). The KAU is proud that it was accredited by the ICAR during the first phase itself when ICAR initiated the process of quality assurance and accreditation after 2000. The first Self Study Report of Kerala Agricultural University for accreditation was submitted to the ICAR during October 2001. The University was accredited by the Council up to July 2012. The current Self Study Report (2012) is a document to assist the ICAR in assessing the quality of education offered by KAU and to get continued accreditation. The materials presented in this document have been collated and processed meticulously by a team of dedicated professionals. It provides important information about the education, research and extension programmes of the University.

In addition, separate Self Study Reports have been prepared by the constituent colleges which may help the ICAR to assess the quality of education and institutional strength of each college under the University. Moreover, these reports may serve as a valuable document to our academia, planners and administrators to streamline the agricultural education programmes to meet the emerging challenges signified by globalisation, liberalization and climate change.

The Self Study Reports for quality assurance and accreditation were drafted, edited and documented by a team under the leadership of Dr. P.K. Ashokan, Director (Academic & Post Graduate Studies, Dr. (Mrs.) Lila Mathew, Professor (Academic, Kerala Agricultural University Head Quarters), and Mrs. Santhakumary V.R., Deputy Registrar (Academic). They were ably supported by Dr. Sverup John, Dean (Ag.), Dr. M. Sivaswamy, Dean (Ag. Engg.), Associate Deans Dr. C.T. Abraham, Dr. B. Mohankumar, Dr. M. Govindan, and Dr. A. Sukumaran, Dr. T.R. Gopalakrishnan, Director of Research, Dr. P.V. Balachandran, Director of Extension, Dr. P.K. Rajeevan, Registrar, Dr. Joy Mathew, Comptrollex, Mr. E.U. Rajan, Director of Students Welfare, Dr. V.R. Ramachandran, Director of Physical Plant, Mr. K.P. Sathyan, University Librarian, Prof. K. Madhavan Nair, Director (CITI), Dr. Sajjan Kurien, Director of Planning and Mr. B. Ajith Kumar Public Relations Officer. Secretarial services were provided by Ms. P.K. Babitha, PA to Director (Academic & Post Graduate Studies) and Mr. Noel R., former PA to the Vice Chancellor. The editorial support was also provided by Dr. P. Ahamed and his team at the Centre for e-learning, Vellanikkara.

The compilation of the comprehensive report was done under the supervision of the former Acting Vice-Chancellor Sri. Jyothilal, IAS.

I hope that the ICAR will find the report purposive and impressive and approve continued accreditation to the Kerala Agricultural University.

Vellanikkara
07th November 2012



Dr. P. Rajendran

Vice-Chancellor
Kerala Agricultural University

PREFACE

A system for quality assurance in agricultural education and accreditation of State Agricultural Universities (SAUs) was initiated by Indian Council of Agricultural Research (ICAR) during 2000. This provided the SAUs an opportunity for self-evaluation and peer review to sustain quality of education and to make it worthy of public confidence. The ICAR established an Accreditation Board and approved criteria and general institutional requirements to become eligible to be accredited. The University has submitted the first self study report during 2001 October and was granted provisional accreditation for 2007 - 2010 and it was extended up to July 2012, based on interim peer review by the Accreditation Board. At that time the University had 10 colleges, 36 research stations, seven Krishi Vignan Kendras (KVK) and a few other institutions of specific objectives. During 2010-11, the Kerala Agricultural University was divided to form two new universities viz., Kerala Veterinary and Animal Sciences University (KVASU) and Kerala University of Fisheries and Ocean Studies (KUFOS). As a result four colleges and some research stations were disaffiliated from KAU. At present Kerala Agricultural University have six constituent colleges, six Regional Agricultural Research Stations (RARS), 16 Research Stations, seven Krishi Vigyan Kendras (KVK), 16 other units.

The Academic Council of the Kerala Agricultural University appointed a steering committee during March 2012, with the Hon'ble Vice - Chancellor as Chairman, to prepare the new self study report for renewal of the accreditation by ICAR. The Steering Committee of the University gave necessary guidance and suggestions to the colleges to prepare the self study report of the concerned colleges. The steering Committee had a review meeting on 8-6-2012, to assess the progress of preparation of the self study report. The Deans / Associate Deans presented the draft self study report of the respective colleges and the Director (Academic and PG studies) presented the self study report of the University. It was decided to prepare the final self study report incorporating the suggestions made during the meeting.

As the Co-ordinator of the University level Steering Committee, I wish to place on record my gratitude to the Vice- Chancellor Sri. K.R. Jyothilal, IAS and former Vice-Chancellor, Dr. K.R. Viswambharan for their valuable advice and suggestions in preparing the report. The Deans, Associate Deans and the University officers like Director of Research, Director of Extension, Registrar, Comptroller, Director of Students Welfare, Director of Physical Plant, Librarian and Director (CITI) gave valuable inputs for the preparation of the report and I am thankful to all of them.

I wish to recall with gratitude the support received from Dr. Lila Mathew, Professor (Academic, Head Quarters) and Dr. Ahamed P., Professor & Director, Centre for e-learning. I am also thankful to Smt. V.R. Santhakumary, Deputy Registrar (Academic), Smt. E.K. Dalika, Section Officer, the staff of the Finance and Academic Wing of the University for helping me in the collection of relevant details. I wish to recall with gratitude the support received from Mr. B. Ajithkumar, Public Relations Officer in preparing the cover page of the report. The secretarial help rendered by Smt. P.K. Babitha is also acknowledged with gratitude. The report contains useful data/information about Kerala Agricultural University, required for renewal of accreditation by ICAR. The report will also serve as a document base for planning the future programmes of the University.



Dr. P.K. Ashokan,
Director (Academic & Post Graduate Studies) &
Co-ordinator, Institutional Accreditation,
Kerala Agricultural University,
Vellanikkara, Thrissur.



KERALA AGRICULTURAL UNIVERSITY

Main Campus, Kerala Agricultural University P.O., Thrissur-680 656, Kerala

Prof. (Dr.) P. RAJENDRAN
VICE - CHANCELLOR

Date: 07.11.2012

Certificate of the Self Study Report

This Self-Study Report is submitted for the purpose of assisting in the determination as to whether or not this institution should become accredited by the ICAR Accreditation Board.

It is certified that there was broad participation by various constituencies and the Self-Study accurately reflects the nature and substance of the Institution.



Prof.(Dr.) P. Rajendran

CONTENTS

Sl. No.	Items	Page
	Foreword	
	Preface	
	Certificate	
1	HISTORY AND DEVELOPMENT OF THE INSTITUTION	1-10
1.1	Historical background	1
1.2	Growth of institution	2
1.3	Academic institutions and programs at a glance	6
1.4	Students intake (yearly) and turnout	8
1.5	Present status of institution	10
2	MISSION AND GOALS	11-14
2.1	Mandate of the institution	11
2.2	Mission statement	11
2.3	Goals	11
2.4	Objectives	11
2.5	Current mission, goals and objectives	12
2.6	Future goals and objectives	12
2.7	Short and long term plans	13
3	ORGANIZATION AND GOVERNANCE	15-28
3.1	Authorization	15
3.2	Authorities, their composition, powers and responsibilities	15
3.3	Organizational structure	22
3.4	Flow chart showing the decision making process on various aspects of university functioning	23

3.5	Flow chart indicating channel of communication within the institution involving various authorities and different constituents of the university	25
3.6	Institutional Planning and Monitoring Process	25
3.7	Adoption of ICAR Model Act and guidelines	27
4	ACADEMIC PROGRAMS AND CURRICULA	29-101
4.1	UG and PG programmes	29
4.2	Eligibility for admission	30
4.3	Mode of admission	32
4.4	Academic regulations	32
4.5	Curricula development / revision process	95
4.6	Adoption of ICAR Model Curricula	95
4.7	Interdisciplinary approach in teaching	95
4.8	Evaluation and grading	96
4.9	Collaborative programs	97
4.10	Basis for starting and closing of educational institutions, programs, centers, and departments.	98
4.11	Non-degree granting programs, if any.	100
4.12	Accomplishments and challenges	101
5	FACULTY AND OTHER HUMAN RESOURCES	102-113
5.1	Employees classification	102
5.2	Personnel policy details including availability of manpower	102
5.3	Annually updated faculty profile reflecting their academic credentials.	103
5.4	Recruitment and promotion procedures.	106
5.5	Carrier development plan including competence improvement	107
5.6	Selection process for academic and other administrative officers	107

5.7	Pay structure.	108
5.8	Faculty research and scholarship policy.	109
5.9	Faculty contribution.	111
5.10	Faculty assessment.	112
5.11	Recognition and award system	112
5.12	Employees grievance redressal procedure and welfare schemes	113
5.13	Adoption of ICAR Norms	113
6	STUDENT DEVELOPMENT	114-129
6.1	Quality of student intake	114
6.2	Profile of students' body including their domicile status.	116
6.3	Program-wise and college-wise students intake, attrition and retention	119
6.4	Students' counselling and placement.	124
6.5	Co-curricular activities.	124
6.6	Follow - up services for alumni.	127
6.7	Students' achievements in academic, co-curricular and other fields.	127
7	LIBRARY AND OTHER LEARNING RESOURCES	130-140
7.1	Library space with list of holdings.	130
7.2	Photocopying facilities.	132
7.3	Availability of computers and access to internet.	132
7.4	Library borrowing including electronic borrowing arrangement with other institutions	134
7.5	Audio-visual and multi-media support.	134
7.6	Library timings and usages.	135
7.7	Other learning centers like classrooms, laboratories, instructional farms, etc.	135
7.8	Any other unique instructional material / technique adopted.	135

7.9	Adoption of ICAR Norms.	136
8	PHYSICAL FACILITIES	141-147
8.1	Institutional area and farm land.	141
8.2	Administrative building / block / space.	142
8.3	Classroom and laboratories.	142
8.4	Students' hostel for men and women	142
8.5	Instructional farm	142
8.6	Green house, glass house , polly house, etc.	142
8.7	Farm power, farm machines and equipment, and irrigation infrastructure	143
8.8	Facilities for sports, games, cultural and literary activities	143
8.9	Any other important facility.	143
9	FINANCIAL RESOURCES	148-153
9.1	Total budget (plan, non-plan) and source of funding including internal resources with their percentage contribution	148
9.2	Expenditure statement indicating percentage spent on teaching, research, extension education, administration, infrastructural development including creation of assets	149
9.3	Expenditure statement should also show percentage amount spent on salary, TA./DA, recurring and non-recurring contingencies (with their major heads)	151
9.4	Non-governmental endowment and large contributions including corpus fund	152
9.5	Fund raising campaign and targets for current and subsequent five year plans.	153
10	RESEARCH	154-199
10.1	Number, location and lead function of various research stations	154
10.2	Process of identifying research problem and their prioritization	161
10.3	Funding sources.	163
10.4	Faculty and students' involvement in research.	163

LIST OF TABLES

Sl. No.	Title	Page
1	HISTORY AND DEVELOPMENT OF THE INSTITUTION	
1.1	The Constituent Colleges with year of inception	4
1.2	Regional Agricultural Research Stations (RARS) and other Research Stations under the University	5
1.3	KrishiVigyanKendras with year of inception	6
1.4	Under graduate and Post graduate programmes offered by different faculties of the KAU	8
1.5	Intake capacities for the different degree programmes	9
1.6	Out-turn of students from 2002-2011	10
4	ACADEMIC PROGRAMS AND CURRICULA	
4.1	Credit load and weightage for practical for different programmes	33
4.2	Syllabi (UG, PG and Ph.D. Programmes)	33
5	FACULTY AND OTHER HUMAN RESOURCES	
5.1	Academic credentials of the teachers in the Faculty of Agriculture	103
5.2	Academic credentials of the teachers in the Faculty of Agricultural Engineering	105
5.3	Characteristics of teachers in different faculties	105
5.4	Faculty-wise details of externally aided Research Projects/ Schemes implemented during 2011-12	109
5.5	Trainings, summer institutes, seminars and symposia in India and abroad undergone by Scientists of different faculties	110
5.6	Trainings, summer institutes, seminars and symposia organized by the by Scientist of different faculties	111

5.7	Publication during the last five years	111
6	STUDENT DEVELOPMENT	
6.1	Composition of students in the Faculty of Agriculture (2011-2012)	116
6.2	Composition of students in the Faculty of Agrl. Engineering (2011- 12)	116
6.3	The number of students admitted for the different courses at the time of inception and during the current year.	117
6.4	Students graduated from KAU during the last 10 years	118
6.5	Attrition and retention data of the students registered during 2005, 2006 & 2007 in the Faculty of Agriculture, graduated during 2009-2010 and 2011 respectively	119
6.6	Attrition and retention data of students registered during 2005, 2006 and 2007 in the Faculty of Agricultural Engineering and graduated during 2009, 2010 and 2011 respectively	120
6.7	Attrition and retention of the M.Sc. students registered during 2005, 2006, 2007, 2008 and 2009 in the Faculty of Agriculture and graduated during 2007, 2008, 2009, 2010 and 2011 respectively	121
6.8	Attrition and retention data of the M.Sc. students registered during 2007, 2008 and 2009* in the faculty of Agrl. Engineering and graduated during 2009, 2010 and 2011 respectively	122
6.9	Attrition and retention data for Ph.D students registered during 2006, 2007 and 2008 in the Faculty of Agriculture and graduated during 2009, 2010 and 2011 respectively	123
6.10	Facilities provided for co-curricular activities	125
6.11	Alumni of the University entering Civil Services, Agricultural Research Service and qualifying in National Level Eligibility and fellowship Test	128
7	LIBRARY AND OTHER LEARNING RESOURCES	
7.1	Libraries attached to different Colleges and list of holdings	130
7.2	Particulars of books and journals in the Central Library	131

7.3	A.V. Support available in the Colleges	134
8	PHYSICAL FACILITIES	
8.1	Physical facilities available in the Faculty of Agriculture	141
8.2	Physical facilities available in the Faculty of Agricultural Engineering	145
8.3	Central facilities available in the University	146
8.4	Transport facilities available in different institutions	147
9	FINANCIAL RESOURCES	
9.1	Year-wise details of income and expenditure	148
9.2	Abstract of Budget for the last ten years	150
9.3	Percentage of expenditure on administration, education, research and extension for the last 5 years	150
9.4	Percentage of expenditure on salary, TA/DA, recurring, non-recurring and others for the last 5 years	151
9.5	Non-governmental endowment and Large Contributions including corpus fund	152
9.6	Budget proposal for 2012-13	153
10	RESEARCH	
10.1	Lead functions and important research findings of research stations	155
10.2	Ongoing Research Projects 2010-11	164
10.3	Improved varieties of crops	180
11	EXTENSION EDUCATION	
11.1	Extension Activities of the Directorate of Extension	201

LIST OF PLATES

Plate No.	Title	Between Pages
Plate 1	Location of KAU Campuses : a) Colleges b) Research Stations	10-11
Plate 2	KAU Institutional Networks and Educational Programmes	30-31
Plate 3	Awards received by the University (a)	112-113
	Awards received by the University (b)	128-129
Plate 4	Audio Visual Multimedia Support	134-135
Plate 5	Central Library and Auditorium	140-141
Plate 6	Students' hostels	142-143
Plate 7	Sports Facilities	146-147
Plate 8	Other Facilities	146-147
Plate 9	High yielding Varieties developed by KAU	188-189
Plate 10	IPR support to Farmers – Geographical Indicators (GI)	194-195
Plate 11	Varieties released	196-197
Plate 12	Protected Cultivation	196-197
Plate 13	Post Harvest Processing and Value Addition	196-197
Plate 14	Efforts to Maintain Biodiversity – College of Forestry	196-197
Plate 15	Support in Wildlife Crime investigations	196-197
Plate 16	Wood technology Lab and Facilities	196-197
Plate 17	Innovations and initiatives in Farm Mechanization	198-199
Plate 18	Extension Education activities/facilities	216-217

1. HISTORY AND DEVELOPMENT OF THE UNIVERSITY

1.1 HISTORICAL BACKGROUND

The history of agricultural education in Kerala can be traced back to the year 1896 when a scheme was evolved in the erstwhile Travancore State to train a few young men in scientific agriculture at the Demonstration Farm, Karamana, Thiruvananthapuram. This station is still a constituent unit of the Kerala Agricultural University and is known as Cropping Systems Research Centre, Karamana. Agriculture was introduced as an optional subject in the Middle School classes in the State in 1922, when an Agricultural Middle School was started at Aluva, Ernakulam District. The popularity and usefulness of this School led to the starting of similar institutions at Kottarakkara and Konni in 1928 and 1931 respectively. The need for agricultural education at higher levels was, however, keenly felt later. When the University of Travancore was formed, a scheme was proposed for organising a Diploma Course, which however did not materialise. Agriculture was later introduced as an optional subject for Intermediate Course in 1953.

In 1955, the erstwhile Government of Travancore-Cochin started an Agricultural College at Vellayani near Thiruvananthapuram and a Veterinary College at Mannuthy near Thrissur for imparting education in agricultural and veterinary sciences, respectively. These institutions were later directly brought under the administrative control of the Government and then brought under the Department of Agriculture and Animal Husbandry, respectively. The Post Graduate programmes leading to M.Sc.(Ag), M.V.Sc. and Ph.D. degrees were started in 1961, 1962 and 1965 respectively.

The Randhawa Commission constituted by the ICAR, recommended the establishment of Agricultural Universities in the country. The second National Education Commission (1964-66) headed by Dr. D.S. Kothari, the then Chairman of University Grants Commission, stressed the need for establishing at least one Agricultural University in each State. As a result, the Kerala Agricultural University (KAU) was established on 24th February 1971 by virtue of the Act 33 of 1971 and started functioning from 1-2-1972. The Kerala Agricultural University is the 15th in the series of the State Agricultural Universities of India. Sri. N. Chandrabhanu, I.A.S., was the first Vice-Chancellor of the University.

The Kerala Agricultural University was divided to form two new universities viz., Kerala Veterinary and Animal Sciences University (KVASU) and Kerala University of Fisheries and Ocean Studies (KUFOS), during 2010-11.

Mile stones :

- Cropping Systems Research Centre, Karamana in 1896
- Agricultural Middle School started at Aluva & Ernakulam Districts in 1922
- Agricultural Middle School Kottarakkara in 1928
- Agricultural Middle School Konni in 1931
- Agriculture introduced as an optional subject for Intermediate Course in 1953
- Agricultural College at Vellayani in 1955
- Veterinary College at Mannuthy in 1955
- M.Sc.(Ag) started in 1961
- M.V.Sc started in 1962
- Ph.D started in 1965
- Kerala Agricultural University Established in 1972
- Trifurcation of KAU to KVASU and KUFOS in 2011

1.2 GROWTH OF INSTITUTION

In accordance with the provisions of the KAU Act of 1971, the Agricultural College and Research Institute at Vellayani, which was affiliated to Kerala University and Veterinary College and Research Institute affiliated to Calicut University were brought under the KAU. In addition, twenty-one agricultural and animal husbandry research stations were also transferred to the University for taking up research and extension programmes on various crops, animals, birds etc. Thus at the time of inception of the University, there were two colleges and 21 research stations. Now the Veterinary College and the connected research stations are disaffiliated from KAU and is part of the newly formed Kerala Veterinary and Animal Sciences University.

The Main Campus of the University at Vellanikkara was inaugurated by the then Prime Minister of India Sri. Morarji Desai on 25-7-1977 and the headquarters of the University was shifted from Mannuthy to Vellanikkara during March 1978.

Realizing the importance of horticultural and plantation crops, the College of Horticulture was started on October 28, 1972 at the Mannuthy campus, with B.Sc (Horticulture) degree programme. Later on, during 1977, B.Sc. (Agriculture) programme was

also started in the College of Horticulture at Mannuthy. This college was shifted to Main campus, Vellanikkara during March 1978. However, after nine years, from 1981, the B.Sc (Horticulture) programme was discontinued as there were no enough opportunities for employment for the graduates, as Kerala state do not have a separate department of horticulture. To enable B Sc (Hort) graduates to get employment in the Department of Agriculture, the degree had to be equated with B Sc (Agri.). Hence it was decided to discontinue B.Sc. (Hort.) degree programme, but the name of the college was retained and the B. Sc. (Agri.) programme and post graduate programmes in agriculture and horticulture continued to be offered from this college.

A College of Fisheries was established from October 10, 1979 at the temporary premises at Mannuthy and in 1983 it was shifted to its own-building at Panangad, Kochi. Now this college is disaffiliated from KAU and is part of the newly formed Kerala University of Fisheries and Ocean Studies (KUFOS).

The Rural Institute, at Tavanur was taken over by the University in 1975 and was developed as an Institute for Agricultural Technology (IAT). The IAT continued to offer diploma programmes in two disciplines viz. Agricultural Sciences and Agriculture & Rural Engineering. This institute was upgraded to a full-fledged higher education centre in Agricultural Engineering, during 1985 and was re-named as Kelappaji College of Agricultural Engineering and Technology, to the memory of the Great Gandhian Freedom fighter Sri. Kelappaji.

The College of Co-operation and Banking started functioning from 1981 at Vellanikkara, in the College of Horticulture. In 1985 the programme was delinked from the College of Horticulture and an independent college named College of Co-operation and Banking was established in the temporary premises, at the Communication Centre, Mannuthy. During 1996 it was renamed as College of Co-operation, Banking and Management and the college was shifted to the new-own building at the Main Campus, Vellanikkara during August 1997.

Considering the need for more human resources in the field of forest management, the University started the College of Forestry in the year 1986 at the Main Campus. Over the years, the institution grew and the Univesity has established a faculty of Forestry (2012).

An increasing demand for scientific manpower in the dairying sector in Kerala was felt and hence the University started a College in Dairy Science and Technology in 1993 under the Faculty of Veterinary and Animal Sciences. The College, which is currently functioning in the premises of Directorate of Extension at Mannuthy, is now with the newly formed Kerala Veterinary and Animal Sciences University (KVASU).

In addition to the Research Stations that were transferred to it, the University has started a few Research Stations of its own, which are shown in Table 1.2.

At present, the Kerala Agricultural University is having six Colleges, six Regional Agricultural Research Stations (RARS), 16 Research Stations, seven Krishi Vigyan Kendra (KVK), 16 other units such as Central Library, Instructional Farms, Training Service Units, Information-cum-Sales Centres, Radio Tracer laboratory, High School, Press, etc., spread all over the State, catering to the needs of the farming community of the state. (Tables 1.1 to 1.3). The total land area with the University, including all its centers is 1985 hectares.

Table 1.1 The Constituent Colleges with year of inception

Sl.No	Name of Colleges	Year
1	College of Agriculture (COA), Vellayani, Thiruvananthapuram	1955
2	College of Veterinary and Animal Sciences (COVAS), Mannuthy, Thrissur	1955**
3	Kelappaji College of Agricultural Engineering and Technology (KCAET), Tavanur, Malappuram	1963*
4	College of Horticulture (COH), Vellanikkara, Thrissur	1972
5	College of Fisheries (COF), Panangad, Ernakulam	1979***
6	College of Cooperation, Banking and Management (CCBM), Vellanikkara, Thrissur	1981
7	College of Forestry (COF), Vellanikkara, Thrissur	1986
8	College of Dairy Science and Technology (DST), Mannuthy, Thrissur	1993**
9	College of Agriculture (COA), Padannakkad, Kasaragod	1994
10	College of Veterinary and Animal Sciences (COVAS), Pookode, Wayanad	1999**

*Formerly it was the Rural Institute started during 1963.

**Became a part of Kerala Veterinary and Animal Sciences University (KVASU)

***Became a part of Kerala University of Fisheries and Ocean Studies (KUFOS)

Table 1.2 Regional Agricultural Research Stations (RARS) and other Research Stations under the University

Sl.No	Name of Research Station	Year of inception
A	Regional Agricultural Research Stations	
1	(Northern Zone) Regional Research Station, Pilicode, Kasaragod	1916
2	(Central Zone) Regional Research Station, Pattambi, Palakkad	1927
3	(Special Problem Area Zone) Regional Research Station, Kumarakom, Kottayam	1937
4	(High Range Zone) Regional Research Station, Ambalavayal, Wayanad	1946
5	(Southern Zone) Regional Research Station, Vellayani, Thiruvananthapuram	1955
6	(Onattukara) Regional Research Station, Kayamkulam	2000
B	Research Stations	
1	Rice Research Station, Moncompu, Alappuzha	1940
2	University Livestock Farm, Mannuthy, Thrissur	1940*
3	Poultry and Duck Farm, Mannuthy, Thrissur	1943*
4	Coconut Research Station, Balaramapuram, Thiruvananthapuram	1948
5	Pepper Research Station, Panniyur, Kannur	1949
6	Aromatic and Medicinal Plants Research Station, Odakkali, Perumbavoor, Ernakulam	1954
7	Cropping Systems Research Centre, Karamana, Thiruvananthapuram	1955
8	Cardamom Research Station, Pampadumpara, Idukki	1956
9	Cattle Breeding Farm, Thumburmuzhi, Thrissur	1957*
10	Agricultural Research Station, Mannuthy, Thrissur	1957
11	Rice Research Station, Vyttila, Ernakulam	1958
12	Agronomic Research Station, Chalakudi, Thrissur	1962
13	Banana Research Station, Kannara, Thrissur	1963
14	Cashew Research Station, Anakkayam, Malappuram	1963
15	Centre for Pig Production and Research, Mannuthy, Thrissur	1965*
16	Livestock Research Station, Thiruvazhamkunnu, Palakkad	1972*
17	Goat and Sheep Farm, Mannuthy, Thrissur	1973*

18	Cashew Research Station, Madakkathara, Thrissur	1973
19	Sugarcane Research Station, Thiruvalla, Pathanamthitta	1979
20	Fisheries Station, Puthuvaipu, Ernakulam	1979**
21	Cattle Infertility Scheme, Vellimadukunnu, Kozhikode	1980*
22	Farming Systems Research Station, Sadanandapuram, Kollam	1986
23	Pineapple Research Station, Vazhakulam, Ernakulam	1995
24	Cocoa Research Centre, Vellanikkara, Thrissur.	1999

* Became a part of Kerala Veterinary and Animal Sciences University (KVASU) from 2010

** Became a part of Kerala University of Fisheries and Ocean Studies (KUFOS) from 2010

Table 1.3 Krishi Vigyan Kendras with year of inception

Sl. No.	Name	Year
1	Pattambi, Palakkad	1979/1982
2	Tavanur, Malappuram	2004
3	Ambalavayal, Wayanad	1982/1984
4	Sadanandapuram, Kollam	1994
5	Kumarakom, Kottayam	2000
6	Vellanikkara, Thrissur	2004
7	Panniyur, Kannur	2004

1.3 ACADEMIC INSTITUTIONS AND PROGRAMMES AT A GLANCE

1.3.1 Academic Programmes

Among the three faculties (Agriculture , Agricultural Engineering and Forestry), six constituent colleges (three for Agriculture, one each for Agricultural Engineering, Forestry, and Cooperation, Banking & Management), one Academy of Climate Change Education and Research and 31 departments, the University offers graduate and post-graduate programmes at Masters as well as Doctoral levels, in almost all the disciplines and specialties related to agriculture, horticulture, forestry, co-operation & banking, agricultural engineering and allied sciences. The new faculty of Forestry is established during 2012.

The five under graduate programmes offered are,

- B.Sc. (Honors) Agriculture
- B.Sc. (Honors) Forestry
- B.Sc. (Honors) Co-operation & Banking

- B.Tech. Agricultural Engineering and Technology
- B.Tech. Food Engineering

In 27 disciplines, the University offers seven post-graduate programmes leading to Masters' degree in,

- Agriculture
- Horticulture
- Forestry
- Agricultural Statistics
- Co-operation and Banking
- Home Science (Food and Nutrition)
- Agricultural Engineering and Technology

The University also offers M.Sc. Integrated programme of five year duration in,

- Biotechnology
- Climate Change Adaptations

And MBA programme is offered in,

- Agribusiness management

Doctoral programmes are offered in 25 disciplines leading to Ph. D degree in,

- Agriculture
- Horticulture
- Forestry
- Home Science (Food and Nutrition)
- Co-operation and Banking
- Agricultural Engineering and Technology

The University also supports NCC and NSS programmes as part of its obligation to instill discipline, sense of patriotism and social sensitivity and commitment among students. The NCC unit in the Forestry is unique, as it is part of the curriculum. In all colleges, the NSS units are functioning actively doing commendable social work.

The various degree programmes offered by the University are given in Table 1.4

Table 1.4 Under graduate and Post graduate programmes offered by different faculties of the KAU

Name of the College	Degree programmes offered	
	Under graduate	Post graduate
Faculty of Agriculture		
College of Agriculture (COA), Vellayani	B.Sc. (Hons.) Ag.	M.Sc.(Ag), M.Sc.(Hort), M.Sc. (FS & N) and Ph.D M.Sc. (Integrated) Biotechnology
College of Horticulture (COH), Vellanikkara	B.Sc. (Hons.) Ag.	M.Sc.(Ag), M.Sc.(Hort), M.Sc. (FS & N), M.Sc. (Ag.Stat) and Ph. D
College of Agriculture (COA), Padannakkad	B.Sc. (Hons.) Ag.	M.Sc.(Ag)
College of Forestry (COF)*, Vellanikkara	B.Sc. (Hons.) Forestry	M.Sc. (Forestry) and Ph. D
College of Cooperation, Banking and Management (CCBM), Vellanikkara	B.Sc. (Hons.) C&B	M.Sc. (C&B), Ph. D and MBA (Agri-business Management)
Academy of Climate Change Education and Research (ACCER), Main Campus, Vellanikkara	Nil	M.Sc. (Integrated) Climate Change Adaptations
Faculty of Agricultural Engineering		
Kelappaji College of Agricultural Engineering & Technology (KCAET), Tavanur	B.Tech. (Ag. Engg.) B.Tech. (Food Engg.)	M.Tech. (Ag. Engg.) and Ph.D.

*New Faculty from 2012

1.4 STUDENT INTAKE (YEARLY) AND TURNOUT

Every year the University admits, a maximum of 657 students: 355 under-graduates, 154 graduates (Masters) and 58 Doctorates (Ph D). On an average, the University has around 2000 students on its rolls, of which girl students constitute nearly 75 percent. The University has been providing professional education of best quality. During the year 2003, the Indian Council of Agricultural Research adjudged the KAU as the best State Agricultural University and awarded the Sardar Patel Award for the Outstanding ICAR Institution. The University won the Performance Award of ICAR continuously for the last six years, 2006, 2007, 2008, 2009, 2010 and 2011, of which last five were first places.

STUDENT ENROLMENT

The intake capacity of the students to the various degree programmes at the time of inception of the programme in the different faculties and the current year are given in Table 1.5.

Table 1.5 Intake capacities for the different degree programmes

Faculty	Degree programme	Annual intake capacity	
		At the time of inception	During 2011-2012
Agriculture	B.Sc. (Ag.) / B.Sc. (Hons) (Ag.)	50	209
	B.Sc. (Hort)*	20	Discontinued
	B.Sc. (Forestry) / B.Sc. (Hons) (Forestry)	15	30
	B.Sc. (C & B) / B. Sc. (Hons) (C&B)	40	46
	M.Sc. (Ag)	30	100
	M.Sc. (Hort)	16	20
	M.Sc. (Ag. Stat.)	8	4
	M.Sc. (F.S. & N)	4	8
	M.Sc. (Forestry)	5	13
	M.Sc. (C & B)	4	6
	M.Sc. (Integrated) Biotechnology	20	20
	M.Sc. (Integrated) Climate change adaptation	20	20
	Ph.D Ag	2	30
	Ph.D Hort	8	8
	Ph.D Forestry	5	5
	Ph.D Rural marketing	2	2
	Diploma in Agriculture	30	50
PG Diploma in solid waste management	10	10	
Agricultural Engineering	B.Tech. (Agrl.Engg.)	34	46
	B.Tech. (Food.Engg.)	30	30
	M.Tech. (Agrl.Engg.)	10	15
	Ph.D Agri. Engg.	3	3

* The course was discontinued from 1980-81

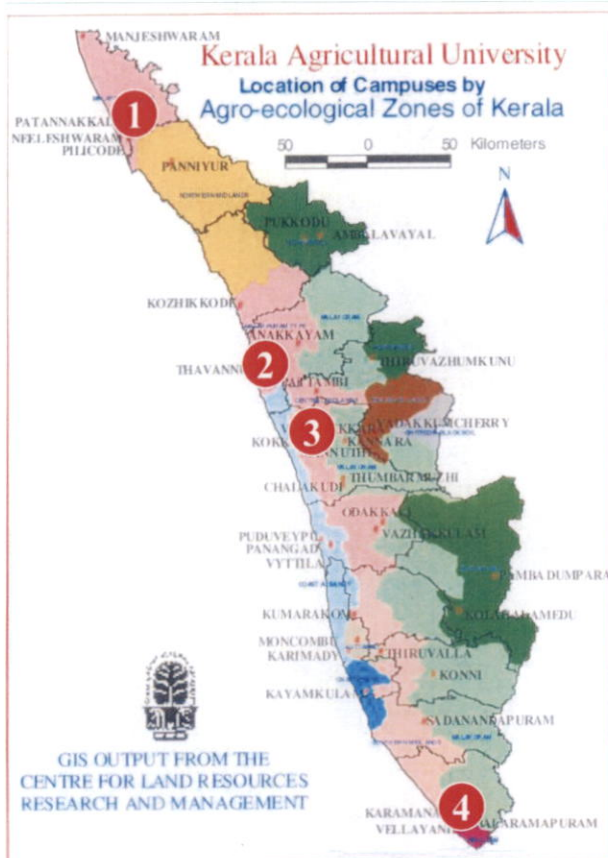
Table 1.6 Out-turn of students from 2002-2011

Degrees	2002	'03	'04	'05	'06	'07	'08	'09	'10	2011
Faculty of Agriculture										
B.Sc. (Ag)	163	171	173	127	67	129	219	185	113	126
B.Sc. (Forestry)	11	17	16	11	11	17	16	19	20	19
B.Sc. (C&B)	46	31	30	11	11	39	43	55	35	31
M.Sc. (Ag)	78	50	48	39	44	23	44	38	17	39
M.Sc. (Hort)	40	17	16	17	18	7	20	4	5	8
M.Sc. (FS&N)	19	11	5	7	7	4	11	4	4	10
M.Sc. (Forestry)	2	3	2	2	2	2	2	3	3	3
M.Sc. (C&B)	2	3	2	2	5	1	4	2	2	-
M.Sc. (Ag. Stat.)	3	1	-	-	1	1	-	2	-	-
MBA (ABM)	-	-	-	-	-	-	-	2	30	27
Ph.D. (Agriculture)	22	23	18	19	9	5	15	6	9	8
Ph. D. (Horticulture)	2	3	5	9	9	2	2	4	-	3
Ph. D. (FS & N)	-	1	-	1	3	-	1	1	1	-
Faculty of Agricultural Engineering										
B. Tech. (Ag. Engg.)	30	35	26	40	38	39	32	41	43	39
M.Tech.	-	-	-	-	2	-	-	2	11	-

1.5 PRESENT STATUS OF THE INSTITUTION

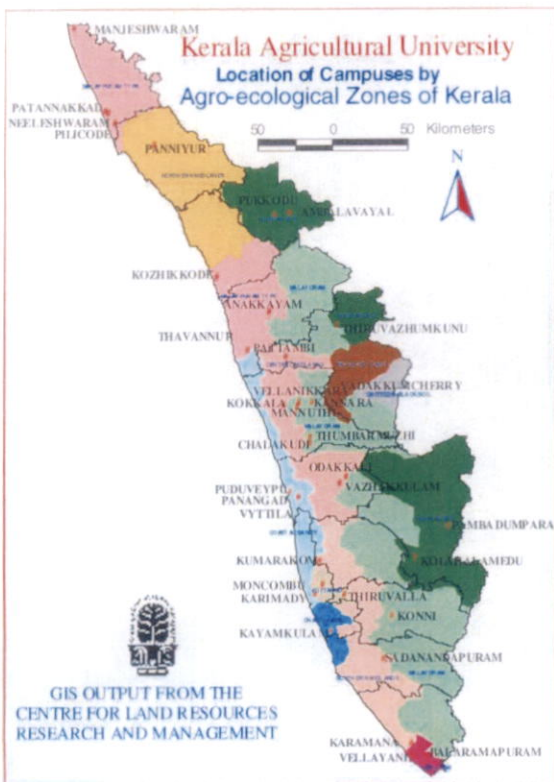
A State Agricultural University, recognized by UGC, accredited by ICAR since 2007. The accreditation expired on 12.07.2012.

Plate 1. Location of KAU Campuses : a) Colleges



- 1** COA, PADANAKKAD
- 2** KCAET, TAVANUR
- 3** MAIN CAMPUS
COH, VELLANIKKARA
COF, VELLANIKKARA
CCBM, VELLANIKKARA
- 4** COA, VELLAYANI

b) Research Stations



- 1. RARS, Pilicode
- 2. Pepper Research Station, Panniyur
- 3. RARS, Ambalavayal
- 4. Cashew Research Station, Anakayam
- 5. RARS, Pattambi
- 6. Banana Research Station, Kannara
- 7. Agricultural Research Station, Mannuthy
- 8. Agronomic Research Station, Chalakudy
- 9. Aromatic & Medicinal Plants Research Station, Odakkali
- 10. Rice Research Station, Vytilla, Kochi
- 11. Pine Apple Research Station, Vazhakulam
- 12. Pine Apple Research Station, Vellanikkara
- 13. Cardamom Research Station, Pampadumpara, Idduki
- 14. RARS, Kumarakom, Kottayam
- 15. Rice Research Station, Moncombu, Aalapuzha
- 16. Agricultural Research Station, Thiruvalla
- 17. RARS, Onattukara, Kayamkulam
- 18. Farming System Research Station, Sadanandapuram
- 19. Cropping System Research Station, Karamana
- 20. NARP Southern Zone (RARS), Vellayani
- 21. Coconut Research Station, Balaramapuram

2. MISSION AND GOALS

2.1 MANDATE OF THE INSTITUTION

The mandates of the University as defined in `The Agricultural University Act, 1971, are:

- Making provision for imparting education in different branches of study, particularly in agriculture, horticulture, animal husbandry including veterinary and dairy science, co-operation, fisheries, forestry, agricultural engineering, home science and other allied branches of learning and scholarship;
- Furthering the advancement of leadership and prosecution of research, particularly in agriculture and allied sciences;
- Undertaking an extension education programme; and
- Such other purposes as the University may from time to time to determine.

2.2 MISSION STATEMENT

Excellence in Agricultural Education, Research and Extension for Sustainable Agricultural Development and Livelihood security of farming community

2.3 GOALS

To provide human resources, skills and technology required for sustainable development of agriculture, including crop production, Animal Husbandry, Veterinary Sciences, Dairy Sciences & Technology, Co-operation, Fisheries, Forestry, Agricultural Engineering, Home Science and other allied disciplines by integrating education, research and extension.

2.4 OBJECTIVES:

The University focuses its strategy on synergizing multi-disciplinary education and strengthening problem-specific research relevant to the state and help building innovative extension systems for sustainable management of natural resources, sustainable agricultural production and overall improvement of rural livelihoods.

To achieve the Mission and Goal, the University propose to adopt the following programmes:

- Provide quality education in Agriculture, Horticulture, Co-operation, Banking and Management, Forestry, Agricultural Engineering, Home Science and other allied disciplines.
- Undertake basic, applied and adaptive research to address current and future challenges of farming community and to provide management options relevant to the prevailing agro-climatic and socioeconomic situations
- Generate appropriate technologies to support sustainable growth of agricultural entrepreneurship and agri-business.
- Develop innovative extension strategies and formulate effective mechanisms for Transfer of Technology to institutions and farmers for enhanced and sustainable agricultural production leading to improved rural livelihoods.
- Locate and protect biodiversity to preserve agro-ecosystem of the state and to document traditional knowledge and technologies.

2.5 CURRENT MISSION, GOALS AND OBJECTIVES (IF DIFFERENT FROM THE ORIGINAL AND REASON FOR CHANGE)

As above. Revised in 2009, considering the agricultural, socio-economic changes and emerging technological advancements.

2.6 FUTURE GOALS AND OBJECTIVES

The Kerala Agricultural University is well poised to meet the challenges ahead. It aims to transform the agriculture sector of the State into an engine of its economic growth, by providing the human resources, skills and technology for sustainable development. Realisation of this objective necessitates fostering the natural strengths and advantages that emanate from resource endowments such as abundant rainfall, sunshine and the tropical climate bestowing year round biomass production capability.

For ensuring livelihood security of the dependent population in the specific context of Kerala's highly heterogeneous resource base and societal values, a paradigm shift from maximisation of production of specific commodities to the maximisation of income and employment on a sustainable basis and optimisation of the biophysical resource base for agricultural development become critical. Similarly the public are well aware of the significance of environment friendly farming. So the University is also doing research and promoting eco-friendly farming like organic farming.

In education at the bachelor's level, professionalism would be fortified with entrepreneurship; and at the post graduate level, training would be imparted in emerging areas integrating relevant disciplines such as biotechnology, natural resource management, environment, intellectual property rights (IPR), biodiversity conservation, information technology, gender sensitisation etc.

Research will be reoriented towards a system approach for technology generation rather than following a commodity-centric policy. Integrated land use systems involving different life forms and product conversion and value addition will receive more emphasis in future.

Extension and technology transfer would focus on group approach and area approach, participatory technology assessment and refinement and technology for production systems rather than commodities; training for entrepreneurship rather than adding skills and support services to be rendered by a single window approach.

2.7 SHORT AND LONG TERM PLANS

SHORT TERM PLANS

Strengthening academic capabilities of Kerala Agricultural University by introduction of new academic programmes, upgradation of existing laboratories, faculties and infrastructure etc. and update curricula of the graduate and postgraduate courses.

- Start new degree/diploma/Masters/Doctorate in agriculture, horticulture, forestry, agribusiness management etc.
- Introduction of inter-disciplinary courses on Agriculture and related subjects.
- Initiate, equip and develop new higher education programmes in emerging areas like precision farming, organic farming, biotechnology, bioinformatics, climate change adaptations of crop plants, solid waste management, nanotechnology, etc.
- Optimise the productivity of mixed species systems especially those involving woody perennials
- Intensification of research on watershed development and protection
- A convergence of traditional knowledge with innovative science is needed to bring in the much needed breakthrough in agriculture of the State. Research in areas like biotechnology, molecular biology, nanotechnology, information technology, bioinformatics etc. will be strengthened.

LONG TERM PLANS

- Transform the University into a forward-looking international centre of eminence on tropical agriculture
- Add new faculties in subject areas like Home Science, Horticulture, Agri-business Management etc.
- Intensification of research on enhancing productivity of rice and vegetables by developing superior varieties and hybrids with targeted yield and quality, developing resource conservation technologies for improving soil and plant health management , developing eco-friendly crop protection technologies, addressing the mechanization needs and strengthening linkages between different stakeholders in agriculture. Develop sustainable land use practices for tropical agro ecosystems
- Participatory research involving State, Central Government and private organizations with similar mandates
- Genetic improvement of crop plants using modern tools of genetic engineering

3. ORGANISATION AND GOVERNANCE

3.1 Authorization

The Kerala Agricultural University was established under the KAU Act 33 of 1971.

3.2 Authorities, their composition, powers and responsibilities

The Authorities of the University are:

- General Council
- Executive Committee
- Academic Council
- Board of Studies of each faculty

3.2.1 The General Council

The supreme authority of the University is the General Council. The General Council is reconstituted every three years.

Members of the General Council

Ex-Officio Members [20]

- 1 The Chancellor (His Excellency the Governor of Kerala)
- 2 The Pro-Chancellor (The Hon'ble Minister of Agriculture)
- 3 The Vice Chancellor
- 4 The Agricultural Production Commissioner, Govt. of Kerala.
- 5 The Principal Secretary, Secretary or the Special Secretary to Government of Kerala, Department of Agriculture
- 6 The Principal Secretary, Secretary or the Special Secretary to Government of Kerala, Department of Finance
- 7 The Principal Secretary, Secretary or the Special Secretary to Government of Kerala , Department of Fisheries
- 8 The Principal Secretary, Secretary or the Special Secretary to Government of Kerala, Department of Animal Husbandry
- 9 The Director of Agriculture, Kerala State
- 10 The Director of Animal Husbandry, Kerala State
- 11 The Director of Dairy Development
- 12 The Director of Fisheries
- 13 The Principal Chief Conservator of Forests
- 14 The Chairman, Rubber Board

- 15 The Chairman, Spices Board
- 16 The Chairman, Marine Products Export Development Authority
- 17 The Director, CPCRI
- 18 The Director, KFRI
- 19 One representative of ICAR
- 20 The MLA representing the constituency in which the headquarters of the University is situated

Elected Members [15]

1. Four members elected according to the principles of proportional representation by means of single transferable vote by the members of the Legislative Assembly from among themselves, of whom one shall be a member belonging to SC/ST
2. One member elected by the Deans of Faculties of the University from among themselves
3. Four members elected by the teachers of the University from among themselves according to the principles of proportional representation by means of single transferable vote
4. Two members elected by the students of the University from among themselves according to the principles of proportional representation by means of single transferable vote
5. Two members elected by the non-teaching staff of the University from among themselves according to the principles of proportional representation by means of single transferable vote
6. Two members elected by the Permanent Labourers of the University from among themselves according to the principles of proportional representation by means of single transferable vote

Members Nominated By The Chancellor [11]

1. Four eminent Scientists in the field of Agriculture and allied subjects from the concerned University or from outside.
2. Four Farmers of whom one shall be a member belonging to SC/ST and one shall be a woman
3. One member from the Association of Planters, Kerala
4. Two Presidents of the Grama Panchayat

Other Members [3]

Three members to represent respectively the University of Calicut, Cochin and Kerala, elected by the Senates of the respective Universities.

3.2.1.1 Powers and functions of the General Council

The General Council is the supreme authority of the University with the following powers:

- To determine degrees, diplomas and other academic distinctions to be granted by the University
- To make, amend or repeal Statutes
- To cancel or amend any Ordinances passed by the Executive Committee or any Regulation passed by the Academic Council
- To institute fellowships, scholarships, studentships prizes
- To institute professorships, readership, lectureship and such other teaching or research posts
- To establish and maintain institutions deem to be necessary
- To prescribe the terms and conditions of service of the employees of the University
- To regulate emoluments and prescribe the duties and conditions of service of teachers
- To cancel any degree, diploma, title or any other distinction granted to any person in accordance with the provisions of the Statutes
- To make Statutes regulating the method of election to the Authorities of the University and
- To co-operate with other Universities and other authorities.

The General Council has three sub committees namely Statute committee, Assurance Committee and Accounts Committee.

3.2.2. The Executive Committee

The Executive Committee is the Chief Executive Authority of the University. The committee consists of three ex-officio members and 12 other members elected by the General Council, with Vice-Chancellor as the Chairman.

Composition of Executive Committee

Ex-Officio Members

- The Vice-Chancellor, (Chairman)

- The Agricultural Production Commissioner
- The Secretary to Government, Department of Finance (Expenditure)

Other Members

- The member representing the Indian Council of Agricultural Research in the General Council
- One Dean of the Faculty elected by the General Council
- One member elected from among the teachers in the General Council by the Council
- Five non-official members of the General Council elected by the Council of whom one shall be a member belonging to a scheduled caste or scheduled tribe and one shall be a woman
- The Member of Legislative Assembly representing the constituency in which the headquarters of the University is situated.

The Executive Committee has six sub-committees namely Finance Committee; Planning and Development Committee; Research Review Committee; Establishment Committee; Students' Welfare Committee and Works Committee.

3.2.2.1 Powers and functions of the Executive Committee

The executive powers of the University including the general superintendence and control over the institutions of the University are vested with the Executive Committee. It has also got the following powers:

- To make Ordinances and to amend or repeal the same
- To propose statutes for the consideration of the General Council
- To hold control of and administer the properties and funds of the University
- To arrange for and direct the inspection of colleges, hostels and other institutions
- To establish, maintain and manage colleges and institutes of research and other institutions of higher learning as it may, from time to time deem necessary
- To appoint teachers and other employees of the University and prescribe their duties
- To create administrative, ministerial and other necessary posts
- To suspend, discharge, dismiss or otherwise take any disciplinary action against the teachers and other employees
- To award fellowships, scholarships, studentships
- To exercise supervision and control over the residence and discipline of students
- To consider the financial estimates of the University
- To conduct University examinations and approve and publish the results
- To appoint members of the Board of studies

- To approve panel of examiners
- To withhold or cancel the results of any candidate at any University examination and
- To accept endowments, bequests, donations and transfers of any movable or immovable properties to the University.

3.2.3. Academic Council

The Academic council is responsible for the maintenance of standards of instruction, education and examinations in the University.

The Academic Council consists of the following members (34 members):

- The Vice-Chancellor
- Registrar
- The Deans of Faculties
- The Director of Research
- The Director of Extension
- The Director of Students Welfare
- The Librarian
- Director of Agriculture
- Director of Animal Husbandry
- Five members from ICAR / scientists from other institutions/ Universities
- Five members from Service Departments
- Six members from among the Heads of Departments of the Faculties, nominated by the Chancellor on rotation basis
- Three members from among the staff of the research stations of the University, nominated by the Chancellor
- Two members from among the Post-graduate students and one member from among the Research students of the University, elected in such manner as may be prescribed
- One member elected by the teachers (other than Deans) of each Faculty, from among themselves
- The Academic Council may co-opt as members, not more than ten persons for such periods and in such manner as may be prescribed, so as to secure adequate representation to different aspects of agriculture.

3.2.3.1 Powers and functions of Academic Council

- (1) The Academic Council shall, subject to the provisions of the Act and the Statutes, have the control and general regulation, and be responsible for the maintenance of standards of instruction, education and examinations within the University shall exercise such

other powers and perform such other functions as may be conferred or imposed upon it by the Statutes.

- (2) Subject to the provisions of the Act and the Statutes the Academic Council shall have the following powers, duties and functions, namely:-
- a) to advise the General Council and the Executive Committee on all academic matters;
 - b) to make regulations and to amend or repeal the same;
 - c) to prescribe the courses of the studies in the institutions maintained by the University;
 - d) to prescribe the qualifications of teachers: (i) in colleges; and (ii) in the institutions maintained by the University;
 - e) to prescribe the qualifications for admission of students to the various courses of studies and to the examinations and the conditions under which exemptions may be granted;
 - f) to make proposals for the instruction and training in such branches of learning as it may think fit;
 - g) to make proposals for research and advancement and dissemination of knowledge;
 - h) to make proposals for the institution of professorships, readerships, lectureships and other teaching and research posts required by the University;
 - i) to make proposals for the institution or fellowships, travelling fellowships, scholarships, studentships, medals and prizes;
 - j) to make proposals for determining what degrees, diplomas and other academic distinctions shall be granted by the University;
 - k) to decide what examinations of other Universities may be accepted as equivalent to those of the University and to negotiate with other universities for the recognition of the examinations of the University;
 - l) to formulate, modify or revise schemes for the constitution or re-constitution of departments of teaching, research and extension education;

- m) to make recommendations regarding post-graduate teaching, research and extension education;
- n) to exercise such other powers and perform such other functions as may be conferred or imposed on it by this act, Statutes, the Ordinances and the Regulations.
- o) to recommend the conferment of honorary degrees.
- p) to make regulations relating to the conduct of examinations and to maintain and promote standards of education.
- q) to make regulations regarding admission of students in the University and to determine the number of students to be admitted.
- r) to make proposals on the recommendations of the Board of Studies for the establishment, amalgamation, division or abolition of departments.
- s) to make proposals for establishment of research stations, libraries, laboratories, demonstration stations and such other Institutions necessary in the interest of agriculture.
- t) to make regulations regarding the holding of convocations.
- u) to approve or reject any subjects proposed for thesis by a candidate for a degree for Doctor of Philosophy.
- v) to make regulations for accepting endowments and for award of freeship, fellowship, scholarship, bursaries and prizes subject to the provisions in the Act and Statutes.

3.2.4. The Faculties

The University had four faculties, during 2010-11, the faculties of Veterinary & Animal Sciences and Fisheries were disaffiliated and attached to the new Universities, viz., Kerala Veterinary and Animal Sciences University and Kerala University of Fisheries and Ocean studies. Kerala Agricultural University was left with two faculties viz., Agriculture and Agricultural Engineering and Technology. A new faculty viz., Forestry was started during 2012.

The University has provisions for starting Faculties of:

- Basic Sciences and Humanities
- Co-operation

- Home Science
- Such other Faculties as may be prescribed

The Dean is the Chairman of the Faculty. The Head of a Department is responsible to the Dean, Director of Research and the Director of Extension respectively for the education, research and extension programmes the department.

3.2.5. Board of Studies

Each faculty has separate Board of Studies to formulate the academic programme and its course - curricula. The Board of Studies is reconstituted once in every three years. The members of the Board are the Dean of the faculty (who is the Chairman), Head of Departments under the faculty, two members who are specialists in the concerned subjects of the faculty and two members appointed by the Executive Committee from among the teachers of the Faculty. One student member from among the members of the Academic Council will be nominated to the Board of Studies by the Executive Committee.

3.2.6. The Vice-Chancellor

The Vice-Chancellor is the full time officer of the University. He is appointed by the Chancellor on the advice of the selection committee consists the nominee of the Chancellor, the Director General of ICAR and one nominee of the General Council (Chairman). The Vice-Chancellor is appointed for a period not exceeding five years or till completion of 65 years of age.

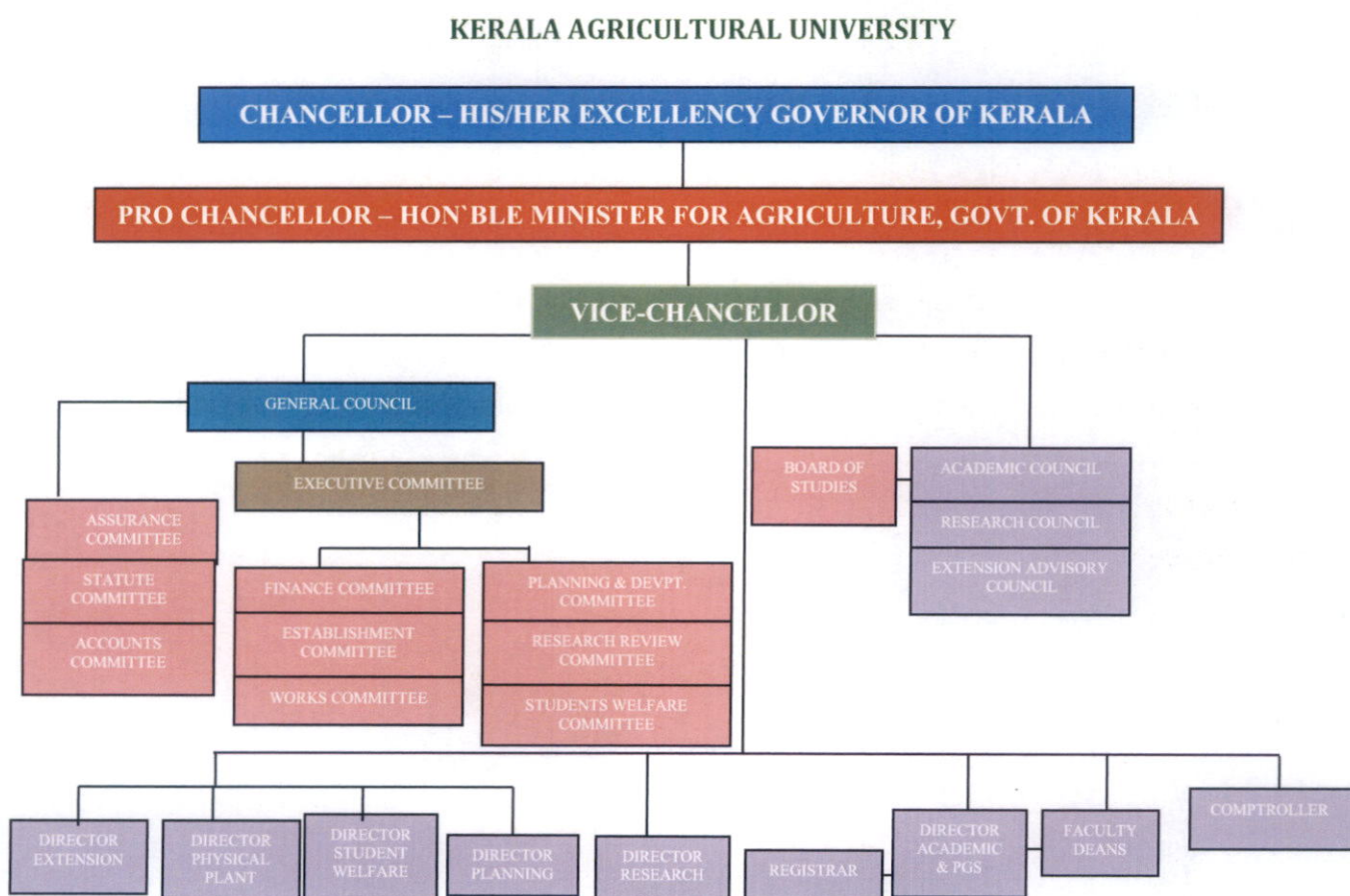
3.3. Organisational structure

The Vice-Chancellor is the Principal Executive and Academic Head exercising general control over all aspects of functioning of the University. He is the ex-officio chairman of the Executive Committee and Academic Council and presides over the General Council in the absence of the Chancellor and Pro-Chancellor. He is also the Chairman of Research Council and Extension Advisory Committee of the University. The General Council is the supreme authority of the University and Executive Committee is the chief executive body. The Director of Research on research administration, the Director of Extension on extension education and Deans of various faculties on academic matters assist the Vice-Chancellor. In addition, the Director of Academic and PG Studies assists the Vice-Chancellor in academic affairs. The Registrar and the Comptroller assist him in general administration and financial matters respectively. The Director of Physical Plant is the head of the engineering wing of the

University. The Director of Students' Welfare coordinates the student welfare programmes. Director Planning assists the Vice-Chancellor in planning.

The General Council, Executive Committee, Academic Council and Board of Studies of each Faculty are the statutory bodies of the University. Academic Council is responsible for maintaining the academic standards. The Board of Studies of each Faculty has an advisory role on various academic matters.

3.4. Flow chart showing the decision making process in University functioning



For effective formulation of research programmes a three stage screening system is being followed.

Stage I

During this stage, the scientists in the departments attached to the different colleges and research stations initiate research proposals on problems identified from the farmers' – field by the extension workers, by the scientists themselves, or by the agencies associated with various agricultural programmes. These proposals are then discussed among the

scientists available in the stations/departments. Based on the discussions, a detailed research programme is prepared.

Stage II

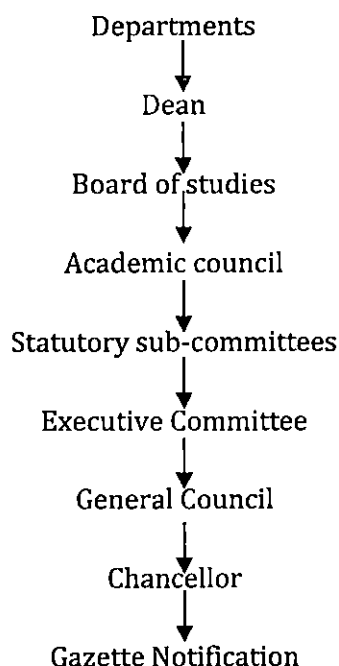
The research programme is then placed before the project co-ordination group, with experts in the topic and headed by the Project Co-ordinator. The revised programmes are then presented before the FRC.

Stage III

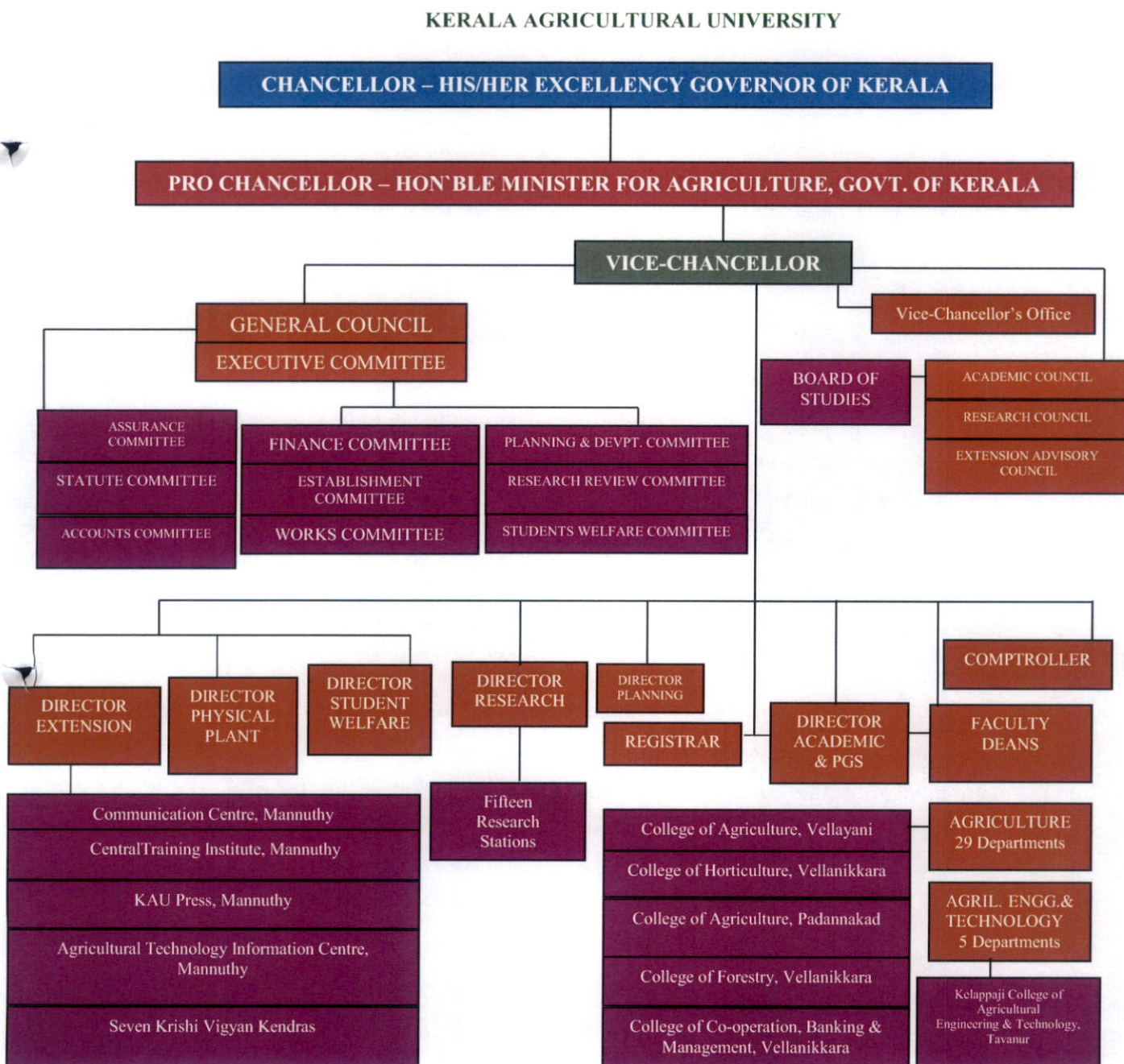
The programmes finalized by the Project Co-ordination group will then be placed before the Faculty Research Council. The scientist associated with the programme will conduct the programme once it is approved by FRC.

Creation of New Departments/Divisions

Creation of new departments is a new dimension for faculty development. This is systematically done by the University from time to time based on the felt needs. The steps involved in the creation of the department is given in flow charts given below:



3.5. Flow chart indicating Channel of communications within the institution involving various authorities and different constituents of the University.



3.6. Institutional Planning and Monitoring Process

The planning of curricula of various programmes is a multi-stage process. The planning relating to academic programmes is originated at college level. The syllabi of various courses and any modification for the existing courses are suggested by the concerned teachers, which are then discussed at the department meetings under the Heads of Departments. These proposals are compiled by the Dean of the faculty and placed in the

Board of Studies (BoS) of the concerned faculty. The Board approves or rejects or modifies the proposal. The proposals approved by the BoS are then placed before the Academic Council for discussion and approval. Once the Academic Council approves the academic programme, it becomes a part of the academic programme of the concerned faculty. The recommendations which require additional expenditure are further placed before the Executive Committee for approval. The new Academic programmes approved by BoS, Academic Council, Executive Committee are placed in the General council for approval. The General Council of the University is the supreme body to approve new academic institutions / programmes.

As a part of the post-graduate programme, students have to take course credits as well as research credits and submit a thesis for fulfillment of the requirement for the award of the degree. The research projects for the thesis are prepared by the students and approved by the Advisory Committee consisting of

- The Major Advisor,
- The Head of Department and
- Two additional members, of which one is from a minor subject.

In the case of Ph. D, there will be three additional members

All the post-graduate and Ph D research projects proposed are placed at the College level Research Committee (The Dean is the Chairperson and all the Head of the Departments and the major advisors of the students are members) for approval. After this, the projects are placed before the Faculty Research Committee (FRC) of the University. The members of FRC are:

- The Director of Research as Chairman
- The Director of Extension
- The Deans
- The Associate Deans
- The Associate Directors
- The Special Officers
- The Head of Departments of the Faculties and
- The Project Coordinators.

Thesis projects for the M. Sc. degree are to be finalized by the FRC. In the case of Ph.D. projects, after approval by the FRC, the research projects will be placed before the Academic Council for approval.

3.7. Adoption of ICAR Model Act and Guidelines

ICAR Model Act is not adopted so far and the old KAU Act prevails. In the KAU Act, there are provisions for General Council, Executive Council, Academic Council, the Faculties and Board of Studies for each faculty while in ICAR Model Act there are no provisions for a separate Executive Council. In the ICAR Act, there are provisions for Research Council and Extension Council, while in the KAU Act the Research Council and Extension Education Council are not statutory bodies. Both these councils act as Advisory bodies under the Vice – Chancellor.

In the KAU Act all the members suggested by the ICAR Act and also representatives from students, teachers, non-teaching staff, farm labourers, non-official representatives of plantation industry, cooperation, farmers, fishermen, animal husbandry, plantation labourers and agricultural labourers represent the General Council.

The Executive Committee meets as and when required for the conduct of the business of the University on dates fixed by the Vice-Chancellor. The KAU Act stipulates that the General Council should meet at least once in four months while in the Model Act it is once in three months. However, in the KAU Act, the day-to-day and immediate working of the University is being supervised by the Executive Committee, which meets at least once in a month.

Five members representing the Legislative Assembly are elected to the General Council of KAU while no such provisions are made in the Model Act. One member representing the Panchayats and Corporations are members of the General Council while no such provision has been made in the Model Act. In order to give proper representation to SC and ST, the KAU Act emphasizes that among the elected representative, at least one member be from SC/ST.

The term of office of the members as per the KAU Act is three years while in Model Act, it is only two years. In the KAU Act, the quorum for the meeting of the General Council is 1/5th of the total numbers, while in Model Act it is 1/3rd of the total numbers. There are no marked variations in the powers of General Council, Executive Committee envisaged in KAU Act and the Board of Management envisaged in the ICAR Act.

The Academic Council in KAU is a body, which is better represented than that suggested by the Model Act. In the KAU Academic Council, Vice-Chancellor nominates six members of the Heads of Departments of the faculties on rotational basis while in the Model Act only two Heads of Departments from each Faculty are nominated.

As per the Model Act, one Associate Director from Research and Extension and all Associate Deans are members of the Academic Council, while in the Academic Council of the KAU, this provision is not there. The KAU Act gives special emphasis to select three members of the staff of research stations, while such a provision is not in the Model Act. Similarly, there is no representation for Postgraduate and Research students in the Model Act whereas there are provisions for electing one Postgraduate and one Research student of the University, in KAU Act. The Academic Council meets once in four months/semester. The provisions of the Model Act in relation to faculties and Board of studies are similar with regard to composition and function. The duties and responsibilities of Vice-Chancellor in the KAU Act and the Model Act are almost similar.

4. ACADEMIC PROGRAMMES AND CURRICULA

4.1. UG and PG programmes

The Kerala Agricultural University offers various UG and PG degree programmes related to agriculture and allied sciences. Among the three faculties (Agriculture, Agricultural Engineering and Forestry), six constituent colleges (three for Agriculture, one each for Agricultural Engineering, Forestry, and Cooperation, Banking & Management) and 31 departments, the University offers graduate and post-graduate programmes at Masters as well as Doctoral levels, in almost all the disciplines and specialties related to agriculture, horticulture, forestry, co-operation & banking, agricultural engineering and allied sciences. The new faculty of Forestry is established during 2012.

The five under graduate programmes offered are,

- B.Sc. (Honors) Agriculture
- B.Sc. (Honors) Forestry
- B.Sc. (Honors) Co-operation & Banking
- B.Tech. Agricultural Engineering and Technology
- B.Tech. Food Engineering

In 27 disciplines, the University offers seven post-graduate programmes leading to Masters' degree in,

- Agriculture
- Horticulture
- Forestry
- Agricultural Statistics
- Co-operation and Banking
- Home Science (Food and Nutrition)
- Agricultural Engineering and Technology

The University also offers five year, M.Sc. Integrated programme in,

- Biotechnology
- Climate Change Adaptations

And MBA programme in,

- Agribusiness management

Doctoral programmes are offered in 25 disciplines leading to Ph. D degree in,

- Agriculture
- Horticulture
- Forestry
- Home Science (Food and Nutrition)
- Co-operation and Banking
- Agricultural Engineering and Technology

4.2 Eligibility for Admission

4.2.1 Bachelors Degree

The entrance examination for B.Sc. (Ag) and B.Sc. (Forestry) consists of two papers, one in Physics and Chemistry and the other in Biology. To appear for the examination, the candidates should have passed Pre-degree or Plus Two or recognized equivalent examination with minimum 50% marks in Biology separately and 50 % marks in Physics, Chemistry and Biology put together. The SC/ST candidates need only a pass in the qualifying examination. For candidates appearing for B.Sc. (Forestry), certain minimum physical standards are also prescribed.

The entrance examination for B. Tech. (Agrl. Engg.) and B. Tech. (Food Engineering) consists of two papers, one in Physics and Chemistry and the other in Mathematics. To appear for the examination, the candidates should have passed Pre-degree or Plus Two or recognized equivalent examination with minimum 50% marks in Mathematics separately and 50% marks in Physics, Chemistry and Mathematics put together. The SC/ST candidates need only a pass in the qualifying examination.

The admission to B.Sc. (C&B) course is based on merit/marks secured in Pre-degree or Plus Two or recognized equivalent examination. A minimum of 50% marks in optional subjects taken together is also prescribed. The SC/ST candidates need only a pass in the qualifying examination.

INSTITUTIONAL NETWORK

6 COLLEGES

6 REGIONAL (ZONAL) RESEARCH STATIONS

15 RESEARCH STATIONS

7 INSTRUCTIONAL FARMS

1 CENTRAL TRAINING INSTITUTE

1 CENTRE FOR CLIMATE CHANGE RESEARCH(CCCR)

EDUCATION PROGRAMS

UG program in 5 disciplines

M.Sc. in 26 disciplines

Integrated M.Sc in 2 disciplines

MBA in Agri-business management

Ph.D. Programme in 19 disciplines

***KAU admits 644 students annually, including
UG, M.Sc. , MBA, Integrated M.Sc & Ph.D***

***Around 1779 students are on its role
at a time of which 75 % are girls***

4.2.2 Masters Degree

Admission to M.Sc. courses is made through entrance examination conducted by the KAU. To appear for the entrance examination the candidate shall have a Bachelors Degree in the respective subject/ equivalent degree recognised by Kerala Agricultural University. OGPA of 7.0/10.00 or 2.25/4.0 or equivalent percentage of marks or an aggregate of 50 % in traditional system. For SC/ST 6.5/10 or 2.0/4.00 or a pass in qualifying examination is enough. For graduates of Kerala Agricultural University, under UG regulation 2007, the minimum OGPA is 6.0/10 for general category and 5.5/10 for SC/ST category.

Eligibility for M.Sc. (Forestry) is basic degree in Forestry/Agriculture/ Horticulture/ B.V.Sc. & A.H. (for Wildlife Science only) or equivalent with an OGPA of 7.0/10.00 or 2.25/4.0 or equivalent percentage of marks or an aggregate of 50 % in traditional system. For SC/ST candidates the minimum requirement is an OGPA of 6.5/10 or 2.0/4.00 or a pass in traditional system. For graduates of Kerala Agricultural University, under UG regulation 2007, the minimum OGPA required is 6.0/10 for general category and 5.5/10 for SC/ST category. Degree holders with higher grade certificate from Ranger's College or with Diploma in Forestry from State Forest College/ Indian Forest College, Dehra Dun are also eligible.

Eligibility for MBA in Agri-Business Management is all Professional graduates of SAUs / Deemed Universities under ICAR system with a minimum OGPA of 7.5/ 10.0 (7.0 for SC/ST candidates). All graduates, Professional graduates from Indian/ Foreign Universities recognized by AICTE/ UGC with a minimum 55% marks in traditional system (5% concession to SC/ST candidates). For SC / ST 6.5/10 or a pass in qualifying exam. For graduates of Kerala Agricultural University under UG Regulation 2007, the minimum OGPA is 6.0/10 for General Category and 5.5/10 for SC / ST category.

4.2.3 Ph.D. Programme

The selection of candidates for the Ph.D. programme is made based on overall assessment of merits of the candidates by the selection committee constituted for the purpose as detailed below:

- Academic merit based on the marks obtained in the Masters Degree programme: 40%
- Teaching/research/extension experience: 15%
- Published papers /meritorious teaching/research/extension work: 15%
- Project proposal: 10%

The remaining 20 per cent weightage is for the performance of the candidate in a personal interview conducted by a Committee formed by the Vice-Chancellor. The Dean of the concerned Faculty is the Chairman of the Committee.

4.3 Mode of Admission

The University admits the students to UG programmes through the Commissioner of Entrance Examinations, Government of Kerala, who admit the candidates based on the rank obtained in common entrance examination, their option and rules of communal and special reservations. The students are directly admitted to the respective colleges and after the admission process is over, the Head of institution sends the complete details of the students to the Registrar, KAU.

For post-graduate admissions a common entrance examination is conducted based on the syllabus of the relevant UG programme. The Faculty Deans conduct the entrance examination for the Postgraduate programmes, and the rank list is handed over to the University. The rank list is prepared based on the marks in the entrance examination, grade/marks obtained in the qualifying degree and sports activities. Admissions are conducted by a committee consisting of the Faculty Dean and other University officers. The successful candidates are directed to report to the Head of the Department concerned on the date of registration for the semester. The Head of Department concerned will assign each student to a Major Adviser depending on the major field of study and intimate the same to the Head of College for approval. The details about the admitted students are forwarded to the University by the Institution Head.

The Academic Council of the University fixes the intake capacity for the different courses every year. Apart from this, 15 per cent seats are also reserved for successful candidates from Entrance Examination conducted by ICAR/VCI. As per this quota stipulated, several students from other States are currently pursuing their studies for UG and PG programmes. Foreign nationals recommended by the Government of India, Department of Agricultural Research Education or Indian Council of Cultural Relations are also admitted to UG and PG programmes.

4.4 Academic Regulations

Semester system of teaching and with external and internal evaluation is followed.

Credit Requirements

Table 4.1 Credit load and weightage for practical for different programmes

Degree Programme	Credit load		
	Total	Practical	Percentage of credit for Practical
Faculty of Agriculture			
B.Sc. (Ag)	169+3 (Non credit)=172	52+20 RAWE+20 Experiential learning=92	54%
B.Sc.(C & B)	179	88	50%
B.Sc.(Forestry)	172	87	50%
Faculty of Agricultural Engineering			
B.Tech.(Agri. Engg.)	167	57	34%
B.Tech. (Food. Engg.)	159	64	40%

Practical component of the undergraduate programme varies from 34 to 54 percent.

The details of weightage of practical are given in Table 4.1

Table 4.2 Syllabi for (UG, PG and Ph.D. Programmes)

B.Sc. Hons (Ag.) Programme :

Department-wise courses

Sl. No.	Catalogue No.	Title course	Credit hrs
I.	Agronomy		
1.	Agro.1101	Introductory Agriculture (Ancient Heritage, Agriculture Scenario and Gender Equity in Agriculture)	1 (1+0)
2.	Agro.1102	Principles of Agronomy	2 (1+1)
3.	Agro.1203	Irrigation and Water Management	3 (2+1)
4.	Agro.1204	Weed management	2 (1+1)
5.	Agro.2105	Field crops-I	3 (2+1)
6.	Agro.2206	Practical crop production (Rice)	1 (0+1)
7.	Agro.2207	Field crops II	2 (1+1)

8.	Agro.3108	Cropping pattern and Farming systems	2 (1+1)
9.	Agro.3209	Sustainable agriculture and organic farming	2 (1+1)
Total			18 (10+8)
II	Plant breeding & Genetics		
1	Pbgn.1101	Morphology and Systematics of crop plants	1 (0+1)
2	Pbgn.1102	Principles of Genetics & Cytogenetics	3 (2+1)
3	Pbgn.2103	Principles of Plant Breeding	3 (2+1)
4	Pbgn.3104	Breeding of Crops	3 (2+1)
5	Pbgn.3205	Principles of seed Technology	2(1+1)
Total			12 (7+5)
III	Soil Science & Agricultural Chemistry		
1	Scac.1101	Introduction to Soil Science	3 (2+1)
2	Ssac.1202	Agricultural Biochemistry	3 (2+1)
3	Ssac.2103	Organic farming and Soil Health	2 (1+1)
4	Ssac.2204	Fertilizers and Agro-chemicals	2 (1+1)
5	Ssac.3105	Soil Chemistry, soil fertility and Nutrient Management	3 (2+1)
6	Ssac.3206	Environmental Science	2 (1+1)
Total			15(9+6)
IV	Agricultural Entomology		
1	Ento.1101	Insect Morphology, Physiology and Systematics	3 (2+1)
2	Ento.1202	Insect Ecology and Integrated Pest Management	3 (2+1)
3	Ento.2203	Pest of crops and stored Grains and their Management	3 (2+1)
4	Ento.3204	Plant Parasitic Nematodes, other non insect pests and their management	2 (1+1)
Total			11 (7+4)
V	Agricultural Economics		
1	Econ.1201	Principles of Agricultural Economics	2(2+0)
2	Econ.2102	Agricultural Finance and Co- operation	2 (1+1)
3	Econ.2203	Production Economics and Farm Management	2 (1+1)
4	Econ.3104	Agricultural Marketing , Trade and Prices	2 (1+1)
5	Econ.3205	Fundamentals of Agri-Business Management (including Product Development, Appraisal and Monitoring)	2 (1+1)
Total			10 (6+4)

VI	Agricultural Engineering		
1	Engg.1101	Fundamentals of Soil, Water and Conservation Engineering	2 (1+1)
2	Engg.1202	Farm Power and Machinery	2 (1+1)
3	Engg.3103	Protected Cultivation and Post –Harvest Technology	2 (1+1)
4	Engg.3204	Renewable Energy	1 (1+0)
Total			7 (4+3)
VII	Plant Pathology		
1	Path.1101	Introductory plant pathology	2 (1+1)
2	Path.2102	Principles of crop disease management	2 (1+1)
3	Path.3103	Disease of field crops and their management	3 (2+1)
4	Path.3204	Diseases of horticultural crops and their management	3 (2+1)
Total			10(6+4)
VIII	Horticulture		
1	Hort.1101	Fundamentals of Horticulture	1 (1+0)
2	Hort.1202	Plantation crops	2 (1+1)
3	Hort.2103	Landscaping and ornamental horticulture	2 (1+1)
4	Hort.2204	Vegetable Crops	3 (2+1)
5	Hort.3105	Fruit Crops	3 (2+1)
6	Hort.3206	Spices and Medicinal plants	2 (1+1)
7	Hort.3207	Post-Harvest Management and Processing of horticultural crops	3 (2+1)
Total			16(10+6)
IX	Agricultural Extension		
1	Extn.1201	Sociology and Psychology as applied to Agricultural Extension	2(2+0)
2	Extn.2102	Agricultural Extension and Rural Development	2(1+1)
3	Extn.3103	Communication and Extension Methodologies for Transfer of Agricultural Technology	2(1+1)
4	Extn.3204	Entrepreneurship Development and Extension Management	2(1+1)
5	Extn.4105	Rural Agricultural Work Experience Programme (RAWWE)	20(0+20)

Total			28(5+23)
X	Plant Physiology		
1	Crps.2201	Crop Physiology	3(2+1)
Total			3(2+1)
XI	Microbiology		
1	Micr.1101	Agricultural Microbiology	3 (2+1)
Total			3 (2+1)
XII	Statistics and Computer Application		
1	Stat.1201	Basic Statistics	2 (1+1)
2	Stat.2102	Introduction to Computer Applications	2 (1+1)
3	Stat.3203	Design and Analysis of Experiments	2 (1+1)
Total			6 (3+3)
XIII	Animal Husbandry		
1	Anhs.2101	Fundamentals of Livestock Poultry Production	3 (2+1)
Total			3 (2+1)
XIV	Agricultural Meteorology		
1	Agmt.1101	Agricultural Meteorology	2 (1+1)
Total			2 (1+1)
XV	Plant Biotechnology		
1	Biot.2201	Principles of Plant Biotechnology, Bio-safety Rules and Intellectual Property Rights	3 (2+1)
Total			3 (2+1)
XVI	Home Science		
1	Hmsc.2201	Food and Nutrition	2 (1+1)
Total			2 (1+1)
XVII	Non Credit Courses		
1	Phed.1101	Physical Education	1 (0+1)
2	Stur.2201	Study tour -I	1 (0+1)
3	Stur.3202	Study tour -II	1 (0+1)
Total			3(0+3)
XVIII	Experiential learning (any two from the list below)		20
I	CROP PRODUCTION		
1.	Elcp. 4201	Quality organic manure production	0+10
2.	Elcp. 4202	Rapid composting technologies for production of quality organic fertilizers	0+10

II	CROP PROTECTION		0+10
1	Elpt. 4201	Bio-pesticides	0+10
2	Elpt. 4202	Apiculture	0+10
3	Elpt. 4203	Mushroom Cultivation	0+10
4	Elpt 4204	Microbial Inoculants Production- Bio control and Bio fertilizer organism	0+10
III	HORTICULTURE		
1	Elht.4201	Commercial Horticulture Nursery	0+10
IV	POST HARVEST TECHNOLOGY AND VALUE ADDITION		
1	Elph 4201	Commercial Processing And Value Addition Of Horticultural Crops	0+10
V	AGRIBUSINESS MANAGEMENT		
1.	Elab 4201	Agribusiness Management	0+10
VI	SOCIAL SCIENCE		
1.	Elss 4201	Agricultural information Support Services	0+10
VII	BIOTECHNOLOGY		
1.	Elbt 4201	Production of tissue culture plants & virus indexing	0+10
2	Elbt 4202	Cultivation management and mass multiplication of Anthurium and Orchid hybrids through in-vitro propagation	(0+10)

Mode of evaluation of Experiential learning		
1	RPCW (Regular Practical Class Work)	20 marks
2	Maintenance of record and preparation of report	20 marks
3	Preparation of project proposal and work plan	20 marks
4	Acquire knowledge and expertise	15 marks
5	Demonstration and presentation	10 marks
6	Worth / Value of tangible outcome	5 marks
7	Viva-voce	10 marks
	Total	100 marks

Rural Agricultural Work Experience (RAWE): One semester practical training as listed below:

Programme	Duration (Weeks)
1. Orientation	1
2. Village attachment	6
3. Agri-clinics / Plant Health Clinics / Experiential leaning /Industrial Attachment	12
4 Project report preparation and examination	1
Total	20

RAWE Attachment with Agro-based Industries: During RAWE Programme the students will undergo internship in any one of the following industries / companies / institutes for a period of twelve weeks (the list is only suggestive and need based / location specific industries may be included).

- Seed industries / companies
- Fertilizer industries
- Pesticides industries
- Biotechnological industries (Tissue Culture labs)
- Bio pesticides industries
- Commercial nurseries / landscaping units
- Sericulture units
- Food processing units
- Agricultural finance Institutions / Banks / Credit Societies etc.
- Non - Governmental organizations

Evaluation of RAWE Programme

Attendance: Minimum attendance for this programme - 85%.

Distribution of credits - Semester-wise

Year	Semester	Credits	Physical Education	Study Tour	Total
1	1	14+9 =23	0+1 (Non- credit)		23
	2	14+7 =21			21
2	3	12+9 =21			21
	4	12+9=21		0+1 (Non-credit)	21
	5	12+8=20			20

3	6	13+10=23		0+1 (Non-credit)	23
4	7	0+20			20
	8	0+20			20
Total		77+ 92 = 169	1	2	169+3=172

B.Sc. Hons. Forestry Programme:

Department-Wise Distribution of Courses

SILVICULTURE AND AGROFORESTRY			
1	Safo 1101	Principles of silviculture	2+0
2	Safo 1102	Fundamentals of geology and soil science	2+1
3	Safo 1203	Practice of silviculture	1+1
5	Safo 1204	Principles of hydrology, soil and water conservation	2+1
6	Safo 2105	Silvicultural systems	2+0
7	Safo 2106	Silviculture of Indian trees	1+1
8	Safo 2107	Forest ecology, biodiversity & conservation	1+1
9	Safo 2208	Agroforestry systems and management	2+1
10	Safo 2209	Chemistry and fertility of forest soils	2+1
11	Safo 2210	Tree seed technology	2+1
12	Safo 2211	Nursery management	1+1
12	Safo 3112	Soil survey and wasteland development	1+1
13	Safo 3213	Plantation forestry	1+1
Total			20+11=31
FOREST MANAGEMENT AND UTILIZATION			
1	Fmau 1101	Fundamentals of horticulture	2+1
2	Fmau 1202	Forest mensuration	2+1
3	Fmau 2103	Forest pathology	2+1
4	Fmau 2104	Forest recreation, landscape architecture and urban forestry	1+1
5	Fmau 2205	Forest management, policy and legislation	2+1
6	Fmau 3106	Tree propagation and nursery technology	1+1
7	Fmau 3107	Forest business management	1+0
8	Fmau 3108	Forest protection	1+1
9	Fmau 3109	Forest survey and engineering	1+1

10	Fmau 3210	Principles of forest economics, project planning and evaluation	1+1
11	Fmau 3211	Environmental management	2+0
12	Fmau 3212	Utilization of non-timber products	1+1
TOTAL			17+10=27
TREE PHYSIOLOGY AND BREEDING			
1	Tpbr 1101	Dendrology	2+1
2	Tpbr 1102	Elementary tree physiology	1+1
3	Tpbr 1103	Agro meteorology	1+1
4	Tpbr 1104	Plant biochemistry	1+1
5	Tpbr 1205	Principles of cytology and genetics	2+1
6	Tpbr 2106	Principles of tree improvement	2+1
7	Tpbr 2207	Medicinal and aromatic plants	1+1
8	Tpbr 3108	Ethnobotany	1+1
9	Tpbr 3209	Forest ecophysiology	2+1
10	Tpbr 3210	Plant biotechnology	2+1
TOTAL			15+10=25
WOOD SCIENCE			
1	Wosc 1101	Introduction to forestry	1+0
2	Wosc 1202	Wood anatomy	2+1
3	Wosc 2103	Wood science and technology	2+1
4	Wosc 2104	Wood products and utilization	1+1
5	Wosc 2205	Marketing and trade of forest produce	2+1
6	Wosc 3106	World forestry system	1+0
7	Wosc 3107	Logging and ergonomics	2+1
8	Wosc 3208	Entrepreneurship development and communication skills	2+1
9	Wosc 3209	Research methods and instrumentation techniques	1+1
TOTAL			14+7=21
WILDLIFE SCIENCE			
1	Wild 1201	Fundamentals of wild life	2+1
2	Wild 1202	Forest entomology and invertebrate biodiversity	2+1
3	Wild 2103	Remote sensing and GIS	1+1
4	Wild 2204	Ornithology	2+1
5	Wild 3105	Wildlife management	2+1

6	Wild 3106	Forestry extension education	1+1
7	Wild 3207	Forest tribology and anthropology	2+0
8	Wild 3208	Ecotourism	1+1
TOTAL			13+7=20
BASIC SCIENCE AND HUMANITIES			
1	Bsah 1101	Introductory economics	1+0
2	Bsah 1102	Basic mathematics	2+0
3	Bsah 1103	Computer application and information technology	1+1
4	Bsah 1104*	Structural and spoken English (Non credit course)	1+1*
5	Bsah 1105*	Physical education (Non credit course)	0+1*
6	Bsah 1206	Elementary statistics	2+1
7	Bsah 1207*	NCC (Non credit course)	0+1*
8	Bsah 2108*	NSS (Non credit course)	0+1*
9	Bsah 2209*	South India study tour	0+1*
10	Bsah 3210*	All India study tour	0+1*
TOTAL			6+2=8

Class room credits (up to 6 th semester)	=	132
Total non credit courses	=	7
Credits for forestry work experience	=	20
Credits for experiential learning	=	20
Grand total (excluding non-credit courses)	=	172

** Not included in the credit load.*

B.Sc. (Hon.) C&B Programme:

Department Wise Distribution of Courses

Co-operative Management			
1.	Cmgt 1101	Theory and principles of co-operation	2+0
2.	Cmgt 1102	Co-operative movement in India and abroad	3+0
3.	Cmgt 1203	Co-operative banking in India	2+1
4.	Cmgt 1204	Non-agricultural co-operatives	1+1
5.	Cmgt 2105	Co-operative legal environment in India	1+1
6.	Cmgt 2106	Agri-business co-operatives	2+1

7.	Cmgt 2207	Co-operative legal system in Kerala	2+1
8.	Cmgt 3108	Accounting & auditing of co-operatives	2+2
9.	Cmgt 3109	Behavioral sciences for co-operative extension	1+1
10.	Cmgt 3210	Human resource management in co-operatives	1+1
11.	Cmgt 3211	Management of co-operative enterprises	1+1
TOTAL			18+10 = 28
Development Economics			
1.	Econ 1101	Basic economics	2+0
2.	Econ 1202	Theory of markets	3+0
3.	Econ 2103	Macro economics	2+1
4.	Econ 2104	Managerial economics	1+1
5.	Econ 2205	Economics of development and planning	2+1
6.	Econ 3106	Fundamentals of econometrics	1+1
7.	Econ 3107	Indian economy	2+0
8.	Econ 3208	Agri-business project management	2+1
9.	Econ 3209	International trade	2+0
10.	Econ 3210	Rural development	2+0
TOTAL			19+5 = 24
Rural Banking and Finance Management			
1.	Bank 1101	Principles of banking	3+0
2.	Bank 1202	Indian banking	2+1
3.	Bank 2103	Banking law and practice	2+1
4.	Bank 2104	Micro finance	1+0
5.	Bank 2205	Financing of agriculture and agri-business	1+1
6.	Bank 2206	Financial services	3+0
7.	Bank 2207	Financial management	1+2
8.	Bank 3208	Investment analysis and portfolio management	2+1
9.	Bank 3209	International finance management	2+1
TOTAL			17+7 = 24
Rural Marketing Management			
1.	Mmgt.1101	Principles of organisation & management	2+0
2.	Mmgt 1202	Organisational communication	1+1
3.	Mmgt 1203	Financial accounting	1+2
4.	Mmgt 2104	Financial accounting	1+2

5.	Mmgt 2105	Agri-business entrepreneurship	1+1
6.	Mmgt 2206	Marketing management	1+1
7.	Mmgt 2207	Accounting for management	1+2
8.	Mmgt 3108	Agricultural marketing	1+1
9.	Mmgt 3209	Consumer behavior	1+1
10.	Mmgt 3210	Marketing communications	1+1
11.	Mmgt 3211	Rural marketing management	1+1
TOTAL			12+13 =25
Agricultural Sciences			
1.	Agro 1101	Agriculture	2+1
2.	Hort 1202	Horticulture	1+1
3.	Plpt 3103	Crop pests and diseases	2+1
4.	Extn 3101	Extension methods and techniques	1+1
5.	Anhs 1101	Livestock production	1+1
6.	Anhs 2102	Poultry production	1+1
7.	Engg 2201	Farm power and equipment	1+1
8.	Fish 2201	Aquaculture	1+1
9.	Fish 3102	Fish processing technology	1+1
Total			11+9 = 20
Quantitative Techniques			
1	Stat 1101	Business mathematics	2+1
2	Stat 1202	Statistical methods	2+1
3	Stat 2203	Quantitative techniques	2+1
Total			6+3 = 9
Computer Applications			
1.	Comp1101	Introduction to computer applications	1+1
2.	Comp2102	Computer applications for management	1+1
Total			2+2 = 4
Work Experience Programme in Co-Operation, Banking & Management			
1.	WEP 4101	Work experience programme	0+20
Total			0+20 = 20
Experiential Learning in Co-operation & Banking & Management			
1.		Experiential learning	5+15
Total			5+15=20

Communicative English (non-graded)			
1.	Ceng 1201	Communicative English	1+1
Total			1+1=2
Study Tour (non-graded)			
1	Stur 2101	study tour I	0+1
2	Stur 3202	study tour II	0+1
Total			0+2 = 2
Physical Education (non-graded)			
1	Phed 1201	Physical education II	0+1
Total			0+1 = 1

Distribution of Credits (subject-wise)		
1.	Co-operative management	18+10 = 28
2.	Development economics	19+ 5 = 24
3.	Rural banking & finance management	17+ 7 = 24
4.	Rural marketing management	12+13 = 25
5.	Agricultural sciences	11+ 9 = 20
6.	Quantitative techniques	6+ 3 = 9
7.	Computer applications	2+ 2 = 4
8.	Work experience programme in CB&M	0+ 20 = 20
9.	Experiential Learning	5+15 = 20
	Grand total	85+89 = 174
	Communicative English (non-graded)	1 + 1=2
	Study tour (non-graded)	0 + 2=2
	Physical education (non-graded)	0 + 1=1

Distribution of credit - Semester-wise

Semester	Years				Communicative English(NG)	Physical Edn.(NG)	Study tour (NG)	Total
	I	II	III	IV				
I	22	23	22	20			-	87
II	21	23	23	20	2	1	2	92
Total	43	46	45	34	2	1	2	179*

** including 1+4 non-graded courses*

B.Tech. (Agrl. Engg.) Degree programme:**Department Wise Distribution of Courses**

Subjects	Credit hours	No. of courses*	Total credit hrs.
Supportive and Allied Courses	36+11	18	47
Land and Water Resources	10+8	7	18
Electives	8+4	4	12
Irrigation & Drainage Engg.	11+5	5	16
Electives	8+4	4	12
Farm Machinery & Energy	31+17	16	48
Electives	12+6	6	18
Agricultural Processing Structure	16+7	7	23
Electives	20+10	10	30
Seminar	0+2	2	2
Projects	0+4	2	4
Total	152 + 78	83	230

* A student needs to take only 60 courses of 167 credits

Semester-wise courses:

<i>Semester 1</i>			
<i>Course Code</i>	<i>Course Title</i>	<i>Credits</i>	
		<i>Theory</i>	<i>Practical</i>
Fpme 1101	Electrical Circuits	2	1
Fpme 1102	Workshop Practice	0	1
Agri 1101	Agriculture for Engineers	2	1
Chem 1101	Engineering Chemistry	2	1
Math 1101	Engineering Mathematics-I	3	0
Phys 1101	Engineering Physics	2	1
Lwre 1101	Engineering Drawing	1	1
Iden 1101	Engineering Mechanics	2	1
Total Credits		14	7
<i>Semester 2</i>			
Fpme 1203	Machine Drawing	0	2
Fpme 1204	Workshop Technology	2	1
Phpt 1201	Heat and Mass Transfer	1	1

Comp 1201	Computer Programming and Data Structures	1	1
Elec 1201	Electronics and Instrumentation	2	0
Math 1202	Engineering Mathematics-II	3	0
Phed 1201	Physical Education	0	0
Iden 1202	Building Technology	1	1
Iden 1203	Strength of Materials	2	1
Lwre 1202	Surveying and Leveling	1	2
Total Credits		14	7
<i>Semester 3</i>			
Fpme 2105	Field Operation and Maintenance of Tractors and Farm Machinery-I	0	1
Fpme 2106	Theory of Machines	2	1
Fpme 2107	Thermodynamics and Heat Engines	2	1
Phpt 2102	Engineering Properties of Biological Materials and Food Quality	2	1
Math 2103	Engineering Mathematics-III	2	1
Iden 2104	Fluid Mechanics and Open Channel Hydraulics	2	1
Lwre 2103	Geotechnical Engineering	2	1
Lwre 2104	Watershed Hydrology	2	1
Total Credits		14	8
<i>Semester 4</i>			
Fpme 2208	Farm Machinery and Equipment-I	2	1
Fpme 2209	Farm Power	2	1
Fpme 2210	Machine Design	2	1
Phpt 2203	Crop Process Engineering	2	1
Math 2204	Engineering Mathematics-IV	2	1
Iden 2204	Design of Structures	2	1
Lwre 2205	Soil and Water Conservation Engineering	2	1
Total Credits		14	7
<i>Semester 5</i>			
Fpme 3111	Electrical M/C's and Power Utilization	2	1
Fpme 3112	Farm Machinery and Equipment-II	2	1
Fpme 3113	Field Operation and Maintenance of Tractors and Farm Machinery-II	0	1

Fpme 3114	Renewable Energy Sources	2	1
Iden 3106	Irrigation Engineering	2	1
Phpt 3104	Refrigeration and Air Conditioning	2	1
Comp 3102	Database Management and Internet Applications	0	2
	Elective-I	2	1
Total Credits		12	9
<i>Semester 6</i>			
Fpme 3215	Agribusiness Management and Entrepreneurship	3	0
Fpme 3216	Tractor Systems and Controls	2	1
Phpt 3205	Agricultural Structures and Environmental Control	2	0
Phpt 3206	Drying Technology	1	1
Iden 3207	Ground Water, Wells and Pumps	2	1
Lwre 3206	Soil and Water Conservation Structures	2	1
	Elective-II	2	1
	Elective-III	2	1
Total Credits		16	6
<i>Semester 7</i>			
Fpme 4117	CAD/CAM and Computer Graphics	0	1
Iden 4108	Drainage Engineering	2	1
Phpt 4107	Dairy and Food Engineering	2	1
Phpt 4108	Storage Engineering	2	0
	Elective-IV	2	1
	Elective-V	2	1
	Seminar	0	1
	Dissertation / Project	0	6
Total Credits		16	10
<i>Semester 8</i>			
Fpme 4117	In-Plant Training	0	22
Total Credits		0	22

Elective Courses:

Electives of Dept of FPME			
<i>Course Code</i>	<i>Course Title</i>	<i>Credits</i>	
		<i>Theory</i>	<i>Practical</i>
Elfm0001	Farm Power and Machinery Management	2	1
Elfm 0002	Fluid Power Controls	2	1
Elfm 0003	Human Engineering and Safety	2	1
Elfm 0004	Mechanics of Tillage and Traction	2	1
Elfm 0005	Production Technology of Agricultural Machinery	2	1
Elfm 0006	Quality Engineering and Management	2	1
Elfm 0007	Systems Engineering	3	0
Elfm 0008	Tractor Design and Testing	2	1
Electives of Dept of IDE			
Elid 0001	Design and Maintenance of Green House	2	1
Elid 0002	Environmental Engineering	2	1
Elid 0003	Landscape Design and Planning	3	0
Elid 0004	Micro Irrigation Systems Design	2	1
Elid 0005	Minor Irrigation & Command Area Development	2	1
Electives of Dept of LWRE			
Elid 0001	Flood Control Systems	2	1
Elid 0002	Geographical Information Systems and Applications	2	1
Elid 0003	Remote Sensing	2	1
Elid 0004	Reservoir and Farm Pond Design	2	1
Elid 0005	Soil-Plant-Water Relationship	2	1
Elid 0006	Surface Water Pollution and Control	2	1
Elid 0007	Water Resources Modeling	2	1
Elid 0008	Watershed Planning and Management	2	1
Electives of Dept of PHT&AP			
Elph 0001	Agricultural By-Product Utilization	2	1
Elph 0002	Development of Equipments and Processed Products	2	1
Elph 0003	Fish Processing Technology	3	0
Elph 0004	Food Industry Management	2	1
Elph 0005	Food Packaging Technology	2	1
Elph 0006	Food Processing Plant Design	2	1

Elph 0007	Food Safety and Quality Management	2	1
Elph 0008	Meat Processing Technology	3	0
Elph 0009	Post Harvest Engineering of Horticultural Crops	2	1
Elph 00010	Processing of Plantation Crops	2	1
Elph 00011	Seed Technology and Processing	2	1

B.Tech. - Food Engineering:

Department-wise Distribution of Courses

<i>Department of Food Engineering</i>		
Fden 1201	Engineering Properties of Biological Materials	2+1
Fden 1202	Heat and Mass Transfer	1+1
Fden 2103	Refrigeration and Cold Storage	1+1
Fden 2104	Crop Process Engineering	2+1
Fden 2205	Food Process Engineering	2+1
Fden 2206	Dairy Engineering and Technology	2+1
Fden 2207	Unit Operations in Food Engineering	2+1
Fden 3108	Energy for Food Industries	1+1
Fden 3209	Food Process Equipment Design and Layout	1+1
Fden 3210	Computer Aided Drafting of Food Processing Equipments	1+1
Total		15+10
<i>Department of Food Processing</i>		
Fdpr 2201	Post Harvest Engineering of Horticultural Crops	2+1
Fdpr 3102	Meat and Poultry Technology	2+0
Fdpr 3102	Oil Chemistry and Technology	2+1
Fdpr 3203	Post Harvest Engineering of Plantation Crops	2+1
Fdpr 4105	Food Packaging Technology	2+0
Fdpr 4106	Processing of Marine Products	2+1
Fdpr 4107	Storage and Preservation Technology	2+1
Total		14+5
<i>Department of Food Science</i>		
Fdsc 1101	Food Science and Nutrition	2+1
Fdsc 2202	Baking and Confectionery Technology	1+1

Fdsc 3103	Entrepreneurship and agribusiness management	2+0
Fdsc 3104	Food Safety and Quality Management	1+1
Fdsc 3205	Food Industry Waste Management	2+0
Fdsc 3206	Fermentation Technology	1+1
Fdsc 4107	Food Industry Management	2+1
Fdsc 4108	Sanitation and Hygiene in Food Industries	2+0
Total 13+5		
Department of Food Quality		
Fdqu 1201	Fundamentals of Biochemistry	2+1
Fdqu 1202	General Microbiology	1+1
Fdqu 2103	Bio Chemical Engineering	1+1
Fdqu 2104	Biochemistry of Processing and Preservation	1+1
Fdqu 2205	Food Microbiology	1+1
Total 6+5		
Department of Supportive Engineering		
Cien 1101	Basic Civil Engineering	2+1
Cien 1102	Engineering Drawing	0+2
Meen 1101	Production Technology	2+1
Elen 1201	Basic Electrical Engineering	2+1
Meen 1202	Machine Drawing	0+1
Meen 1202	Engineering Thermodynamics	2+1
Cien 2103	Fluid Mechanics	2+1
Meen 1203	Boiler and steam Engineering	1+1
Cien 2204	Mechanics and Strength of Materials	2+1
Meen 2104	Kinematics of Machinery	2+1
Cien 3105	Design of Structures	1+1
Meen 3106	System Engineering	2+0
Meen 3107	Machine Design	1+1
Elen 3202	Instrumentation and Process Control	2+1
Total		21+14
Department of Basic Science		
Basc 1101	Communicative English	2+0
Basc 1102	Engineering Mathematics - I	3+0
Basc 1103	Engineering Physics	2+1
Basc 1104	Engineering Chemistry	2+1

Basc 1205	Engineering Mathematics II	3+0
Basc 1206	Information Technology	1+1
Basc 2107	Computer Programming	1+1
Basc 2108	Engineering Mathematics III	2+1
Basc 2209	Numerical Methods for Engineering Applications	1+1
Basc 3110	Statistics	1+1
Basc 3111	Economics of Food Processing and Marketing	2+1
Basc 4112	Extension Methods and Transfer of Technology	1+1
Total		21+9
As per the offering Department		Elective I
		Elective II
Semr 3201	Seminar I	0+1
Proj 3201	Project Work	0+2
Semr 4102	Seminar II	0+1
Proj 4102	Project Work	0+2
Idtl 4201	Industrial Training	0+9
Sist 4201	South India Study Tour	0+1
Total		6+16

SEMESTERWISE DISTRIBUTION OF COURSES AND CREDITS

Sl. No.	Semester	No. of Courses	Credit Hours
1	I	8	15+7= 22
2	II	9	14+8= 22
3	III	9	13+9= 22
4	IV	8	13+8= 21
5	V	10	15+7= 22
6	VI	9	12+8= 20
7	VII	9	13+7= 20
8	VIII	2	0+10= 10
			95+ 64= 159

M.Sc. (Integrated) Programmes:

List of courses for M.Sc. (Integrated) Climate Change Adaptation Degree Programme

Course Code	Proposed courses	Credit hrs
Minor courses (Total 25 credits)		
Math 1101	Mathematics	2+1
Math 1202	Vector calculus	2+1
Stat 1101	Statistics	2+1
Comp 1201	Computer programming	2+1
Phys 1101	Thermo and fluid dynamics	3+1
Chem 1101	Physical chemistry	2+1
Major courses (Total 175 credits)		
Clim 1101	The Earth system: Atmosphere, climate and environment	2+0
Clim 1202	Physical meteorology	2+0
Clim 1203	Physical oceanography	2+1
Clim 1204	The climate system: Past, present and future	2+1
Clim 2105	Global physical climatology	2+1
Clim 2106	The Indian monsoons	2+1
Clim 2107	Fundamentals of agricultural meteorology	2+1
Clim 2108	Introduction to GIS	2+1
Clim 2209	Climatic dynamics: Functioning of the climate system	2+1
Clim 2210	Ocean and climate interactions	2+1
Clim 2211	Earth surface processes and soils in a changing global environment	2+1
Clim 3112	Principles of climate modeling	2+1
Clim 3113	The science of climate change and future climate change projections	2+1
Clim 3214	Principles of Remote Sensing and its applications in agriculture	2+1
Clim 3215	Natural resource management in light of future climate projections	2+1
Clim 3216	Applications of climate modeling to agriculture and related environmental issues	2+1
Clim 3217	Weather forecasting	2+1

Clim 3218	Instrumentation and measurements	1+2
Clim 4119	Weather modification and Risk Management Strategies	2+1
Clim 4120	Natural disaster management and mitigation under future climates	2+1
Clim 4121	Introduction to simulation models	1+1
Clim 4122	Agromet database management	1+1
Clim 4223	Research ethics and methodology	2+1
Clim 4224	Crop growth simulation models	2+1
Clim 4225	Advances in Agroclimatology	2+1
Clim 4226	Seminar	0+1
Clim 4227	RAWE	0+5
Clim 5128	Research work in 9 and 10 semesters	40
Agro 1101	Introductory Agriculture	1+1
Agro 2202	Irrigation and Water Management	2+1
Agro 3103	Conservation Agriculture	2+1
Agro 4201	Integrated Watershed Management	2+1
Scac 1201	Introduction to Soil Science	2+1
Scac 2102	Organic Farming and Soil Health	1+1
Pbgn 2202	Principles of Plant Breeding	2+1
Pbgn 2201	Biodiversity, Conservation and Global Climate Futures	2+1
Biot 3101	Principles of Biotechnology, Bio-safety Rules and Intellectual Property Rights	2+0
Biot 3202	Biotechnology Tools to Combat Climate Change	2+1
Phyl 2101	Concepts of Physiology	2+1
Phyl 4205	Crop Stress Physiology	2+0
Ento 3101	Insect Ecology and Integrated Pest Management	2+1
Path 3101	Diseases of Field Crops and their Management	2+1
Engg 2101	Fundamentals of Soil and Water Conservation Engineering	2+1
Engg 3202	Renewable Energy	1+1
Engg 4203	Protected Cultivation and Structures	2+1
Econ 3101	Climate Change: Economics and Society	2+1
Econ 4102	India in the context of Global Issues of Environmental Change	2+0
Econ 4103	Econometrics for Climate Science	2+1

Econ 4104	Climate policy and Planning	2+0
Extn 4101	Communication and Extension	1+1
		127 + 48
		175

Total Credits for Major Courses including RAWE and Research : 175

Total Credits for Minor Courses : 25

Total 200

Abstract of distribution of credits

Minor Courses	:	25
Major Courses	:	135
Research	:	40
Total Credits	:	200

Semesterwise distribution of credits

Semester	I	18
Semester	II	20
Semester	III	20
Semester	IV	20
Semester	V	20
Semester	VI	20
Semester	VII	19
Semester	VIII	23*
Semester	IX & X (Research)	20+20

Total Credits 200

** Meant for Elective Courses in various Faculties (Student's choice)*

M.Sc. (Integrated) Biotechnology

Credit requirements

The minimum credit requirement for the award of the degree shall be as follows:

Major courses:	52 credits
Minor Courses:	51 credits
Supporting Courses:	24 credits

Optional courses:	10 credits
Research:	30 credits
Seminars:	2 credits
Job training:	5 credits

Non credit course

1. Study tour	2 credits
2. Physical education	1 credits
3. English (2010 onwards)	2 credits

Total credits: course work + Research +Non credit = 144+30+5 = 179 credits.

Department - wise distribution of course-credits for M.Sc. (Integrated) Biotechnology

Sl. No.	Classification	Credits
1	Biotechnology	51
2	Environmental Science	6
3	Basic Science	11
4	Applied Science	51
5	Computer Science	7
6	Skill development	3
7	Job Training	5
8	Non-Credit	5
9	Optional courses	10
10	Research	30
	Total	179

Semester wise distribution of courses

Sl. No.	Catalogue No.	Title of the courses	Credit
I semester			
1	Biol 1101	Fundamentals of biology	2+1
2	Chem 1101	Fundamentals of chemistry	3+0
3	Phys 1101	Fundamentals of physics	2+0
4	Micr 1101	Fundamentals of microbiology	1+1
5	Biot 1101	Principles of molecular biology	2+0

6	Math 1101	Mathematics and statistics	2+1
7	Comp 1101	Introduction to computers	1+1
8	Engl 1101	English*	1+0
9	Phed 1101	Physical education*	0+1
Total			14+5=19
II semester			
1	Bich 1201	Biochemistry I	2+1
2	Biot 1202	Biophysics	3+0
3	Math 1202	Biomathematics and biostatistics	3+0
4	Biot 1203	Cellular and developmental biology	1+1
5	Biot 1204	Bioresources	1+1
6	Pbgn 1201	Fundamentals of genetics	1+1
7	Comp 1202	Computer applications	1+1
8	Engl 1202	English II*	1+0
Total			13+5=18
III semester			
1	Bich 2102	Biochemistry II	2+1
2	Biot 2105	Biodiversity I	2+1
3	Biot 2106	Introduction to genomics and proteomics	2+1
4	Anhs 2101	Animal physiology	2+1
5	Crps 2101	Plant physiology	2+1
6	Engg 2101	Fundamentals of Electronics and Instrumentation	2+1
Total			12+6=18
Semester IV			
1	Biot 2207	Enzymology and enzyme technology	2+1
2	Biot 2208	Biodiversity II	1+0
3	Pbgn 2202	Methods of plant breeding	1+1
4	Biot 2209	Analytical techniques in biotechnology	2+1
5	Biot 2210	Bioinformatics	1+2
6	Biot 2211	Plant biotechnology	2+1
4	Biot 2212	Structural and functional genomics	2+1
Total			11+7=18
Semester V			
1	Biot 3113	Animal biotechnology	2+1

2	Biot 3114	Environmental biotechnology	2+1
3	Biot 3115	Chemical engineering	2+1
4	Biot 3116	Basics of virology and oncology	2+1
5	Biot 3117	Industrial biotechnology	2+1
6	Biot 3118	Nanobiotechnology	2+0
Total			12+5=17
Semester VI			
1	Biot 3219	Food biotechnology	2+1
2	Biot 3220	Immunology	2+1
3	Biot 3221	Genetic engineering I	2+1
4	Resm 3201	Research methodology	2+1
5	Biot 3222	Molecular diagnostics	2+1
6	Biot 3223	Stem cell and tissue engineering	2+1
7	Stur 3201	Study Tour I (South India) *	0+1
Total			12+7=19
Semester VII			
1	Biot 4124	Genetic engineering II	2+1
2	Biot 4125	Bioprocess technology	2+0
3	Biot 4126	Ethics, economics and social implications of biotechnology	2+0
4	Biot 4127	Metabolomics	2+0
5	Biot 4128	Intellectual Property Rights and Laws	2+0
6	Biot 4129	Biosafety rules and regulations	1+0
7	Biot 4130	Gene therapy	2+0
8	Extn 4101	Professional and personal skill development	1+2
Total			14+3=17
Semester VIII			
1	Biot 4231	Management in biotechnology	2+0
2	Biot 4232	Biotechnology industry	2+1
3	Biot 4233	Seminar I	0+1
4	Biot 4234 to 4250	Optional courses	10 credits
5	Stur 4202	Study tour II (All India)*	0+1
Total			17
Semester IX			
1	Biot 5151	Job training (one month)	0+5

2	Biot 5152	Research	0+12
3	Biot 5153	Seminar II	0+1
Total			0+18=18
Semester X			
1	Biot 5254	Research	0+18
Total			0+18=18

* Non Credit Course

Optional courses

1	Biot 4234	Advanced agricultural biotechnology	2+1
2	Biot 4235	Advanced food biotechnology	1+1
3	Biot 4236	Agrobiotechnology, industry and infrastructure	2+1
4	Biot 4237	Soil biotechnology	2+1
5	Biot 4238	Transport properties of biological membrane	2+0
6	Biot 4239	Molecular drug designing and targeting	2+1
7	Biot 4240	Molecular medicine and diagnostics	2+1
8	Biot 4241	Advanced clinical biotechnology	1+1
9	Biot 4242	Drug metabolism	2+0
10	Biot 4243	Fermentation technology for animal and plant production	2+1
11	Bich 4244	Advanced carbohydrate and lipid technology	2+0
12	Biot 4245	Advanced modeling and simulation in bioprocess	2+1
13	Biot 4246	Advanced industrial biotechnology	1+1
14	Biot 4247	Downstream processing	2+1
15	Micr 4202	Microbial processing engineering	2+1
16	Biot 4248	Computational modeling in biology	2+1
17	Biot 4249	Vaccines	2+1
18	Biot 4250	Pharmacological screening and assays	2+1

Distribution of Credits -semester wise

Year	Semester	Credits	Physical education	English	Study tour	Total
I	I	13+4=17	0+1	1+0		19
	II	12+5=17		1+0		18
II	III	12+6=18				18
	IV	11+7=18				18
III	V	12+5=17				17

	VI	12+6=18			0+1	19
IV	VII	14+3=17				17
	VIII	0+16=16			0+1	17
V	IX	0+18=18				18
	X	0+18=18				18
Total		86+88=174	1	2	2	174+5=179

POST GRADUATE PROGRAMMES

The minimum credit requirements for the post-graduate programme is as follows:

a) Masters Programme {Except M.Sc. (Ag. Stat)}

I. Course work (minimum)

i)	Major subject	20 credits
ii)	Minor subject(s)	09 credits
iii)	Supporting subject(s)	05 credits
iv)	Non-credit Compulsory courses	06 credits
v)	Seminar	0+1 credit

Total for course work : 35 + 6

II. Research work 20 credits

Total (Course work +Research) -----
55+6 =61 credits

b) Doctorate Programme

I. Course work (minimum)

i)	Major subject	15 credits
ii)	Minor subject(s)	08 credits
iii)	Supporting subject(s)	05 credits
iv)	Non-credit Compulsory courses	06credits
	(Exempted if already studied at their Masters programme)	
v)	Seminar	0+2 credit

Total for course work : 30 +6

II. Research work 45 credits

Total (Course work +Research) -----
75 +6 credits

a) **M.Sc. (Ag.Stat) programme**

For M.Sc. (Ag. Stat.) the credit for remedial courses (32 credits) will be over and above the total credits mentioned above. The remedial courses are required for the students coming from maths-stream.

b) **M.Sc. (Ag) programme**

I **Agronomy**

Code Course	Course Title	Credits
Agron 501*	Modern concepts in crop production	3+0
Agron 502*	Principles and practices of soil fertility and nutrient management	2+1
Agron 503*	Principles and practices of weed management	2+1
Agron 504*	Principales and practices of water management	2+1
Agron 505	Agrometerology and crop weather forecasting	2+1
Agron 506	Agronomy of major cereals and pules	2+1
Agron 507	Agronomy of oilseed, fibre and sugar crops	2+1
Agron 508	Agronomy of medicinal ,aromatic and under utilized crops	2+1
Agron 509	Agronomy of fodder and forage crops	2+1
Agron 510	Agrostology and agroforestry	2+1
Agron 511	Cropping systems	2+0
Agron 512	Dryland farming	2+1
Agron 513	Principles and practices of organic farming	2+1
Agron 514	Agronomy of tubercrops	2+ 1
Agron 591	Masters seminar	0+1
Agron 599	Master's research	20
	Ph.D Courses	
Agron 601**	Current trends in agronomy	3+0
Agron 602	Crop ecology	2+0
Agron 603	Crop production and system modeling	2+1
Agron 604**	Advances in crop growth and productivity	2+1
Agron 605**	Irrigation management	2+1

Agron 606**	Advances in weed management	2+0
Agron 607	Integrated farming system	2+0
Agron 608	Soil conservation and watershed management	2+1
Agron 609	Stress crop production	2+1
Agron 610	Environmental protection and pollution control	2+1
Agron 691	Doctoral seminar 1	0+1
Agron 692	Doctoral seminar 11	0+1
Agron 699	Doctoral research	45
Remedial courses		
Agron 01***	Principles of agronomy	2+1
Agron 02***	Crop production	2+1

* Compulsory for Master's Programme

** Compulsory for Ph.D Programme

*** Remedial Courses for Non- Agricultural PG students

II Soil Science

Code Course	Title	Credits
Soils 501*	Soil physics	2+1
Soils 502*	Soil fertility and fertilizer use	3+1
Soils 503*	Soil chemistry	2+1
Soils 504*	Soil mineralogy, genesis, classification and survey	2+1
Soils 505	Soil erosion and conservation	2+1
Soils 506*	Soil biology and biochemistry	2+1
Soils 507	Geomorphology and geochemistry	2+0
Soils 508	Radioisotopes in soil and plant studies	1+1
Soils 509	Soil, water and air pollution	2+1
Soils 510	Remote sensing and gis techniques for soil and crop studies	2+1
Soils 511	Analytical techniques and instrumental methods in soil and plant analysis	1+2
Soils 512	System approaches in soil and crop studies	2+1
Soils 513	Management of problematic soils and waters	2+1
Soils 514	Fertilizer technology	1+0

Soils 515	Land degradation and restoration	1+0
Soils516	Plant biochemistry	2+1
Soils 517	Introduction to agrochemicals	2+0
Soils518	Soil health management	1+1
Soils 519	Basic biochemistry	2+1
Soils 520***	Introduction to soils	2+1
Soils 591	Master's seminar	0+1
Soils 599	Master's research	20
Ph. D programme		
Soils 601	Advances in soil physics	2+0
Soils 602**	Advances in soil fertility	2+0
Soils 603**	Physical chemistry of soils	2+0
Soils 604	Soil genesis and micropedology	2+0
Soils 605**	Biochemistry of soil organic matter	1+1
Soils 606	Land use planning and watershed management	2+0
Soils 691	Doctoral seminar i	0+1
Soils 692	Doctoral seminar ii	0+1
Soils 699	Doctoral research	40

* Compulsory for Master's programme

** Compulsory for PhD. programme

*** Remedial course for MSc (Agricultural Statistics)

III Agricultural Meteorology

Code	Course Title	Credits
Agm 501*	Fundamentals of meteorology and climatology	2+1
Agm 502*	Fundamentals of agricultural meteorology	2+1
Agm.503*	Micrometeorology	2+1
Agm 504*	Agro-meteorological measurements and instrumentation	1+2
Agm 505	Soil water balance climatology	2+1
Agm 506	Crop weather models	1+2

Agm 507	Weather modification and risk management strategies	2+0
Agm 508	Principles of remote sensing and its applications in agriculture	2+1
Agm 509	Applied agricultural climatology	1+2
Agm 591	Master's seminar	1+0
Agm 599	Master's research	20
Agm 510	Climate change and sustainable development	2+1
Agm 511	Advances in agroclimatology	2+1
Agm 512	Weather, climate and livestock	2+1

*Compulsory for Master's programme

IV Plant Breeding and Genetics

Code	Course Title	Credits
Gp501*	Principles of genetics	2+1
Gp502*	Cell biology and cytogenetics	2+1
Gp503*	Principles of plant breeding	2+1
Gp504*	Principles of quantitative genetics	2+1
Gp505	Mutagenesis and mutation breeding	2+1
Gp506	Population genetics	1+1
Gp507	Heterosis breeding	1+1
Gp508*	Molecular genetics	2+1
Gp509*	Biotechnology for crop improvement	2+1
Gp510	Breeding for biotic and abiotic stress resistance	2+1
Gp511	Breeding cereals, forages and sugarcane	2+1
Gp512	Breeding legumes, oilseeds and fibre crops	2+1
Gp513	Breeding for quality traits	1+1
Gp514	Gene regulation and expression	2+0
Gp515	Maintenance breeding, concepts of variety release and seed production	1+1
Gp 516	Germplasm collection, exchange and quarantine	2+1
Gp 517	Data base management, evaluation and utilization of pgr	2+1

Gp518	Breeding for tropical crops	1+1
Gp519	Intellectual property rights and plant breeding	2+0
Gp520***	Genetics	2+0
Gp591	Master's seminar	1+0
Gp599	Master's research	0+20
Ph D courses		
Gp601	Plant genetic resources and their utilization	2+0
Gp602	Advances in quantitative genetics	2+1
Gp603**	Genomics in crop improvement	2+1
Gp604**	Molecular and chromosomal manipulations in crop improvement	2+0
Gp605**	Advanced plant breeding systems	2+0
Gp606	Crop-evolution	2+0
Gp607	Breeding designer crops	2+1
Gp608	Advances in breeding of major crops	3+0
Gp609	Microbial genetics	2+1
Gp610	<i>In situ</i> and <i>ex situ</i> conservation of germplasm	2 + 1
Gp 691	Doctoral seminar i	1+0
Gp 692	Doctoral seminar ii	1+0
Gp 699	Doctoral research	45

*Compulsory for Master's programme

**Compulsory for Ph. D. programme

V. Agricultural Entomology

Code	Course Title	Credits
Ent 501*	Insect morphology	1+1
Ent 502*	Insect anatomy, physiology and nutrition	2+1
Ent 503*	Insects systematics	2+1
Ent 504	Insect ecology	1+1
Ent 505	Insect pathology	1+1
Ent 506	Biological control of crop pests and weeds	1+1

Ent 507	Toxicology of insecticides	2+1
Ent 508	Plant resistance to insects	1+1
Ent 509*	Principles of integrated pest management (ag. Stat. Also)	1+1
Ent 510	Pests of field crops	1+1
Ent 511*	Pests of horticultural and plantation crops	1+1
Ent 512	Storage entomology	1+1
Ent 513	Insect vectors of plant viruses and other pathogens	1+1
Ent 514	General acarology	1+1
Ent 515	Soil arthropods and their management	1+1
Ent 516	Vertebrate pest management	1+1
Ent 517	Techniques in plant protection	0+1
Ent 518	Commercial entomology i (productive insects)	1+1
Ent 519	Commercial entomology ii (urban entomology)	1+1
Ent 520	Plant nematology	2+1
Ent 521	Nematological techniques	1+1
Ent 522	Nematode pests of agricultural crops and their management	1+1
Ent 523	Biotechnology in nematode management	1+1
Ent 524	Introductory and economic entomology (ag. Stat. Only)	1+1
Ent 591	Master's seminar	0 + 1
Ent 599	Master's research	20
	Ph. D. Courses	
Ent 601	Advanced insect systematics	1+2
Ent 602	Immature stages of insects	1+1
Ent 603	Advanced insect physiology	2+0
Ent 604	Advanced insect ecology	1+1
Ent 605	Insect behaviour	1+1
Ent 606	Recent trends in biological control	1+1
Ent 607	Advanced insecticide toxicology	2+1
Ent 608	Advanced host plant resistance	1+1
Ent 609	Advanced acarology	1+1

Ent 610	Agricultural ornithology	1+1
Ent 611**	Molecular approaches in entomological research	1+1
Ent 612**	Advanced integrated pest management	2+0
Ent 613	Plant biosecurity and biosafety	2+0
Ent 614	Nematode morphology and taxonomy	2+1
Ent 615	Nematode ecology and control	2+1
Ent 691	Doctoral seminar i	1+0
Ent 692	Doctoral seminar ii	1+0
Ent 699	Doctoral research	45

**Compulsory for Master's programme;*

***Compulsory for Ph.D. programme*

VI Plant Pathology

Code	Course Title	Credits
Pl path 501*	Mycology	2+1
Pl path 502*	Plant virology	2+1
Pl path 503*	Plant bacteriology	2+1
Pl path 504*	Principles of plant pathology	3+0
Pl path 505*	Detection and diagnosis of plant diseases	0+2
Pl path 506	Principles of plant disease management	2+1
Pl path 507	Diseases of field crops and vegetables	2+1
Pl path 508	Diseases of fruits and ornamental crops	2+1
Pl path 509	Diseases of plantation crops, spices and medicinal plants	2+1
Pl path 510	Seed health technology	2+1
Pl path 511	Chemicals in plant disease management	2+1
Pl path 512	Ecology and management of soil-borne plant pathogens	2+1
Pl path 513	Disease resistance in plants	2+0
Pl path 514	Insect vectors of plant viruses and other pathogens	1+1
Pl path 515	Biological control of plant diseases	2+1
Pl path 516	Integrated disease management	2+1
Pl path 517	Mushroom production technology	2+1

Pl path 518	Epidemiology and forecasting of plant diseases	2+1
Pl path 519	Post harvest diseases	2+1
Pl path 520	Plant quarantine	2+0
Pl.path.521	Extensiopn plant pathology	1+1
Pl path 591	Master's seminar	0+1
Pl path 599	Master's research	20
Ph.D Courses		
Pl path 601	Advanced mycology	2+1
Pl path 602	Advanced virology	2+1
Pl path 603	Advanced bacteriology	2+1
Pl path 604**	Molecular basis of host-pathogen interaction	2+1
Pl path 605	Principles and procedures of certification	0+1
Pl path 691	Doctoral seminar i	0+10
Pl path 692	Doctoral seminar ii	0+1
Pl path 699	Doctoral research	45

*Compulsory for Master's programme;

** Compulsory for Ph. D. programme;

VII Microbiology

Code	Course Title	Credits
Micro 501*	Principles of microbiology	3+1
Micro 502*	Microbial physiology and metabolism	3+1
Micro 503*	Microbial genetics	2+1
Micro 504*	Soil microbiology	2+1
Micro 505*	Microbial biotechnology	2+1
Micro 506*	Food microbiology	2+1
Micro 507	Bacteriophages	1+1
Micro 508	Environmental microbiology	2+1
Micro 509**	Plant-microbe interactions	3+0
Micro 510	Industrial microbiology	2+1
Micro 511	Biofertilizer technology	1+1

Micro 512	Cyanobacterial and algal biotechnology	2+0
Micro 591	Master's seminar	1+0
Micro 599	Master's research	20

*Compulsory for Master's programme;

**Compulsory for Doctoral programme

VIII Agricultural Economics

Code	Course Title	Credits
Ag Econ 501*	Micro economic theory and applications	2+0
Ag Econ 502*	Macro economics and policy	2+0
Ag Econ 503	Evolution of economic thought	1+0
Ag Econ 504*	Agricultural production economics	1+1
Ag Econ 505	Agricultural marketing and price analysis	2+1
Ag Econ 506*	Research methodology for social sciences	1+1
Ag Econ 507*	Econometrics	2+1
Ag Econ 508	Linear programming	1+1
Ag Econ 509*	Agricultural finance and project management	2+1
Ag Econ 510	International economics	1+1
Ag Econ 511	Agricultural development policy analysis	2+0
Ag Econ 512	Institutional economics	1+0
Ag Econ 513	Natural resource and environmental economics	1+1
Ag Econ 514	Intellectual property management	1+0
Ag Econ 515	Rural marketing	2+0
Ag Econ 519***	General economics	2+0
Ag Econ 591	Master's seminar	0+1
Ag Econ 599	Master's research	20
Ph.D COURSES		
Ag Econ 601**	Advanced micro economic analysis	1+1
Ag Econ 602**	Advanced macro economic analysis	2+0
Ag Econ 603**	Advanced econometrics	2+1
Ag Econ 604	Advanced production economics	2+1

Ag Econ 605	Quantitative development policy analysis	1+1
Ag Econ 606**	Advanced agricultural marketing and price analysis	2+1
Ag Econ 607	Commodity futures trading	2+0
Ag Econ 608	Natural resource management	1+1
Ag Econ 609	Environmental economics	2+0
Ag Econ 691	Doctoral seminar i	0+1
Ag Econ 692	Doctoral seminar ii	0+1
Ag Econ 699	Doctoral research	45

*Compulsory for Master's Programme ** Compulsory for Doctoral Programme

*** Remedial course for Agrl Statistics

IX Agricultural Extension

Code	Course Title	Credits
Ext 501*	Development perspectives of extension education	1+1
Ext 502*	Development communication and information Management	2+1
Ext 503*	Diffusion and adoption of innovations	2+1
Ext 504*	Research methods in behavioral sciences	2+1
Ext 505*	E-extension	2+1
Ext 506*	Entrepreneurship development and management in Extension	2+1
Ext 507*	Human resource development	2+1
Ext 508	Visual communication	2+1
Ext 509	Participatory methods for technology development And transfer	1+1
Ext 510	Gender sensitization for development	2+1
Ext 511	Perspectives of distance education	2+0
Ext 512	Market-led extension	1+1
Ext 591	Master's seminar	0+1
Ext 599	Master's research	20
Ph. D. Courses		
Ext 601**	Advances in agricultural extension	2+1
Ext 602**	Advanced design and techniques in social science Research	2+1
Ext 603**	Advances in training technology	2+1

Ext 604**	Organizational development	2+1
Ext 605**	Advanced instructional technology	2+1
Ext 606	Theory construction in social sciences	2+0
Ext 607	Advanced management techniques	2+1
Ext 608	Media management	2+1
Ext 609	Transfer of technology in agriculture	2+1
Ext 691	Doctoral seminar i	0+1
Ext 692	Doctoral seminar ii	0+1
Ext 699	Doctoral research	45

X. Plant Physiology

Code	Course Title	Credits
Pp 501*	Principles of plant physiology- 1	2+1
Pp 502*	Plant developmental biology – physiological And molecular basis	2+0
Pp 503*	Physiological and molecular responses of plants to abiotic stresses	2+1
Pp 504*	Hormonal regulation of plant growth and development	2+1
Pp 506*	Physiology of growth , yield and modeling	1+1
Pp 507	Genome organization in higher plants	2+1
Pp 508*	Morphogenesis, tissue culture and transformation	2+1
Pp 509	Physiology of crop plants –specific case studies	2+0
Pp 510	Physiological and molecular aspects of photosynthesis- carbon and nitrogen assimilation	2+1
Pp 511	Mineral nutrition	2+1
Pp 512	Principles of plant physiology -ii	2+1
Pp 591	Master's seminar	1+0
Pp 591	Master's seminar	0+1
Pp 599	Master's research	20
Ph.D COURSES		
Pp 601**	Functional genomics and genes associated with a few physiological processes	2+0

Pp602**	Signal perceptions and transduction and regulation of physiological processes	2+0
Pp 603**	Molecular approaches for improving Physiological traits	2+1
Pp 604	Techniques in plant physiology	1+2
Pp 605	Climate change and crop growth	2+0
Pp 606	Post harvest physiology	2+0
Pp 607	Weed physiology and herbicide action	1+1
Pp 608	Seed physiology	2+1
Pp 691	Doctoral seminar i	0+1
Pp 692	Doctoral seminar ii	0+1
Pp 699	Doctoral research	45

*Compulsory for Master's programme;

** Compulsory for Ph. D. programme

XI.

Plant Biotechnology

Code	Course Title	Credits
Mbb 501**	Principles of biotechnology	2+1
Mbb 502**	Fundamentals of molecular biology	3+0
Mbb 503**	Molecular cell biology	2+0
Mbb 504	Plant tissue culture and its applications	1+1
Mbb 505**	Techniques in molecular biology i	0+3
Mbb 506	Microbial/ industrial biotechnology	2+1
Mbb 507	Molecular breeding	2+0
Mbb 508	Genomics & proteomics	2+0
Mbb 509	Techniques in molecular biology ii	0+3
Mbb 510*	Biosafety, ipr and bioethics	2+0
Mbb 511*	Animal biotechnology	3+0
Mbb 512*	Immunology and molecular diagnostics	2+1
Mbb 513*	Nano-biotechnology	3+0
Mbb 514*	Plant genetic engineering	1+1

Mbb 515	Introduction to bioinformatics	2+1
Mbb 516	Environmental biotechnology	3+0
Mbb 591	Master's seminar	0+1
Mbb 599	Master's research	20
Ph. D. Courses		
Mbb 601	Advances in plant molecular biology	3+0
Mbb 602	Advances in genetic engineering	3+0
Mbb 603	Advances in microbial biotechnology	3+0
Mbb 604	Advances in crop biotechnology	3+0
Mbb 605	Advances in functional genomics and proteomics	2+0
Mbb 606	Commercial plant tissue culture	2+0
Mbb 607	Advances in animal biotechnology	2+0
Mbb 608	Genomics and bioinformatics in horticulture	2+1
Mbb 609	Advances in biochemistry and biotechnology of flowers	2+1
Mbb 610	Application of biotechnology in foods and nutrition	1+1
Mbb 691	Doctoral seminar i	0+1
Mbb 692	Doctoral seminar ii	0+1
Mbb 699	Doctoral research	45

*Minor/supporting courses;

**Compulsory for M.Sc. Programme

XII Vegetable Science

Code	Course Title	Credits
Vsc 501*	Production technology of cool season Vegetable crops	2+1
Vsc 502*	Production technology of warm season vegetable crops	2+1
Vsc 503*	Breeding of vegetable crops	2+1
Vsc 504*	Growth and development of vegetable crops	2+1
Vsc 505	Seed production technology of vegetable Crops	2+1
Vsc 506	Systematics of vegetable crops	1+1
Vsc 507	Production technology of underexploited Vegetable crops	1+1
Vsc 508	Organic vegetable production technology	1+1

Vsc 591	Master's seminar	1+0
Vsc 599	Master's research	20
Ph. D. Courses		
Vsc 601**	Advances in vegetable production	2+1
Vsc 602**	Advances in breeding of vegetable crops	2+1
Vsc 603**	Protected cultivation of vegetable crops	1+1
Vsc 604**	Biotechnology of vegetable crops	2+1
Vsc 605	Seed certification, processing and storage of vegetable crops	1+1
Vsc 606	Abiotic stress management in vegetable crops	2+1
Vsc 691	Doctoral seminar i	1+0
Vsc 692	Doctoral seminar ii	1+0
Vsc 699	Doctoral research	45

* Compulsory for Master's programme;

**Compulsory for Doctoral programme

XIII Pomology and Floriculture

Code	Course Title	Credits
Fsc 501*	Tropical and dry land fruit production	2+1
Fsc 502*	Subtropical and temperate fruit production	2+1
Fsc 503	Biodiversity and conservation of fruit crops	2+1
Fsc 504	Canopy management in fruit crops	1+1
Fsc 505	Propagation and nursery management for fruit crops	2+1
Fsc 506	Breeding of fruit crops	2+1
Fsc 508	Growth and development of horticultural crops	2+1
Fsc 509	Biotechnology of horticultural crops	2+1
Fsc 510	Organic horticulture	1+1
Fsc 511	Protected fruit culture	2+1
Fsc 512	Gap for horticultural crops	1+0
Fsc 513	Climate management in horticultural production	1+0
Fla.501	Breeding of flower crops and ornamental plants	2+1
Fla.502*	Production technology of cut flowers	2+1

Fla.503	Production technology of loose flowers	2+1
Fla.504*	Landscaping and ornamental gardening	2+1
Fla.505	Protected floriculture	2+1
Fla.506	Value addition in flowers	2+1
Fla.507	Turfing and turf management	2+1
Fla.508	Cad for outdoor and indoor scaping	2+1
Fsc 591/ fla 591	Master's seminar	0+1
Fsc 599/ fla 599	Master's research	20
Ph. D. Courses		
Fsc 601	Advances in breeding of fruit crops	2+1
Fsc 602**	Advances in production of fruit crops	2+1
Fsc 603	Advances in growth regulation of fruit crops	2+1
Fsc 605	Biotic and abiotic stress management in horticultural crops	2+1
Fla 601	Advances in breeding of flower crops	2+1
Fla 602**	Advances in flower production technology	2+1
Fla 603	Advances in protected and precision floriculture	1+1
Fla 604**	Advances in landscape architecture	1+2
Fsc 691/ fla 691	Doctoral seminar i	0+1
Fsc 692/ fla 692	Doctoral seminar ii	0+1
Fsc 699/ fla 699	Doctoral research	45

*Compulsory for Master's programme

** Compulsory for Doctoral programme

XIV Plantation Crops and Spices

Code	Course Title	Credits
Psma 501*	Production technology of plantation crops	2+1
Psma 502*	Production technology of spice crops	2+1
Psma 503*	Production technology of medicinal and aromatic crops	2+1
Psma 504*	Breeding of plantation crops and spices	2+1
Psma 505*	Breeding of medicinal and aromatic crops	2+1
Psma 506	Organic spice and plantation crop production technology	2+1

Psma 507	Underexploited medicinal and aromatic crops	1+1
Psma 591	Master's seminar	0+1
Psma 599	Master's research	20
Ph. D. Courses		
Psma 601**	Advances in production technology of plantation crops	2+1
Psma 602**	Advances in production technology of spices	2+1
Psma 603**	Advances in production technology of medicinal and aromatic crops	2+1
Psma 604**	Advances in breeding of plantation crops and spices	2+1
Psma 605	Advances in breeding of medicinal and aromatic crops	2+1
Psma 606	Biotechnology in plantation crops and spices	1+1
Psma 607	Environmental horticulture	2+1
Psma 691	Doctoral seminar i	0+1
Psma 692	Doctoral seminar ii	0+1
Psma 699	Doctoral research	45

*Compulsory for Master's programme;

** Compulsory for Doctoral programme

XV Processing Technology

Code	Course Title	Credits
Prt 501*	Processing and product diversification of fruits	2+1
Prt 502*	Processing and product diversification of vegetables	2+1
Prt 503*	Processing and value addition of plantation crops & spices	2+1
Prt 504*	Processing and value addition of medicinal and aromatic plants	2+1
Prt 505*	Sensory evaluation and quality control in processing of horticultural produce	2+1
Prt 506	Entrepreneurship development for horticulture based processing industries	2+1
Prt 507	Packaging of fresh and processed horticultural produce	1+1
Prt 591	Seminar	0+1
Prt 599	Research	20
Prt 601**	Advances in value addition of fruits and vegetables	2+1

Prt 602**	Advances in value addition of plantation crops	2+1
Prt 603**	Advances in value addition of spices	2+1
Prt 604**	Advances in value addition of medicinal and aromatic plants	2+1
Prt 605	Hi-tech methods in storage, transportation and packaging of horticultural produce	2+1
Prt 606	Microbial spoilage, pesticide residues and post- harvest diseases / disorders of horticultural produce	2+1
Prt 607	Advances in fermentation technology with reference to fruit and vegetable preservation	2+1
Prt 608	Technology of food flavours	1+1
Prt 691	Doctoral seminar i	1+0
Prt 692	Doctoral seminar ii	1+0
Prt 699	Research (thesis)	45

*Compulsory Courses for Master's programme;

** Compulsory Courses for Doctoral Programme

XVI Agricultural Statistics

Sl.No	Code	Course Title	Credit
1. Major courses For M.Sc.			
1	Stat 551	Mathematical methods-1	3+0
2	Stat 552	Mathematical methods-2	2+0
3	Stat 560	Probability theory	2+0
4	Stat 561	Statistical methods	2+1
5	Stat 562	Statistical inference	2+1
6	Stat 563	Multivariate analysis	2+1
7	Stat 564	Design of experiments	2+1
8	Stat 565	Sampling techniques	2+1
9	Stat 566	Statistical genetics	2+1
10	Stat 567	Regression analysis	1+1
11	Stat 568	Statistical computing	1+1
12	Stat 569	Time series analysis	1+1

13	Stat 570	Acturial statistics	2+0
14	Stat 571	Bioinformatics	2+0
15	Stat 572	Econometrics	2+0
16	Stat 573	Statistical quality control	2+0
17	Stat 574	Optimaisation techniques	1+1
18	Stat 575	Demography	2+0
19	Stat 576	Statistical methods for life sciences	2+0
20	Stat 577	Statistical ecology	2+0
21	Stat591	Master's seminar	0+1
22	Stat 599	Master's research	20
2. Service / Minor/ Supporting Courses for Agricultural Statistics			
23	Stat 500	Applied multivariate analysis	1+1
24	Stat 501	Mathematical methods for applied sciences	3+0
25	Stat 502	Numerical analysis	2+0
26	Stat 503	Mathematical foundations in computer science	3+0
27	Stat 504	Data processing	1+1
28	Stat 505	Operation researh	2+1
29	Stat 506	Biostatistics and computer applications	2+1
30	Stat 507	Computer application for managemnt	2+1
31	Stat 508	Computers-fundmentals and programming	2+1
32	Stat 509	Introduction to networking and internet applications	1+1
33	Stat 510	Database management systems	1+1
34	Stat 511	Statisticalmethods for applied sciences	2+1
35	Stat 512	Experimental designs	2+1
36	Stat 513	Sampling techniques	2+1
37	Stat 521	Applied regression analysis	2+1
38	Stat 531	Data analysis using statistical packages	2+1
39	Stat 532	Applied statistical genetics	2+1
40	Stat 533	Applied linear programming	1+1
41	Stat 534	Time sries and quality control	2+1

42	Stat 536	Non parametric methods	2+0
3. Remedial/ supporting courses in Mathematics and Statistics for Agriculture Graduates			
1.	Stat 537	Calculus	2+0
2.	Stat 538	Analytical geometry	2+0
3.	Stat 539	Modern algebra	1+0
4.	Stat 540	Matrix algebra	2+0
5.	Stat 541	Trigonometry	1+0
6.	Stat 542	Probability theory	2+0
7.	Stat 543	Mathematics	2+0
8.	Stat 544	Basic statistics	2+0
4. Supporting /Remedial courses for Non Agricultural graduates			
1.	Soils 519	intoduction to soil science	2+1
2.	Agron 501	Modern concepts in crop production	3+0
3.	Agecon 519	General economics	2+0
4.	Ext 501	Development perspective of extension education	1+1
5.	Pfma 501	Production of plantation crops	1+1
6.	Vsc 502	Production technology of warm season vegetable crops	2+1
7.	Fsc 505	Propagation and nursery management for fruit crops	2+1
8.	Ent 525	Introductory and economic entomology	1+1
9.	Agm 506	Crop weather models	1+2
10.	Fn 515	Food and nutrition	2+0
11.	Gp 520	Genetics	2+0
12.	Vs 501	Fundamentals of livestock and poultry production	2+1
13.	Vs 502	Dairy cattle production	2+0
14.	Vs503	Animal breeding	2+0
5. Non -Credit compulsory for Non -Agricultural Graduates in addition to the above.			
1.	Pgs 507	Crop production: concepts and practices	2+1

XVI Food Science and Nutrition

Sl.No.	Code	Course Title	Credits
1.	Fn 501*	Advanced food science	2+1
2.	Fn 502 *	Advanced nutrition	2+1
3.	Fn 503 ¹	Food analysis	1+2
4.	Fn 504*	Advances in community nutrition	2+1
5.	Fn 505	Food preservation and processing technology	2+1
6.	Fn 506	Clinical nutrition	2+1
7.	Fn 507	Nutrition during life cycle	3+0
8.	Fn 508	Nutrition and physical fitness	2+1
9.	Fn 509*	Advanced diet therapy	2+1
10.	Fn 510	Food toxicology	2+0
11.	Fn 511	Advanced human physiology	2+1
12.	Fn 512	Food service management	1+2
13.	Fn 513	Food product development	1+1
14.	Fn 514	Nutrition and immunity	2+0
15.	Fn 591	Master's seminar	0+1
16.	Fn 599	Master's research	20
17.	Fn 515***	Food and nutrition	2+0
18.	Fn 601**	Advances in carbohydrates, proteins and lipids	3+1
19.	Fn 602**	Advances in vitamins and hormones	2+0
20.	Fn 603**	Minerals in human nutrition	2+1
21.	Fn 604	Advances in food science and technology	2+1
22.	Fn 605	Advances in energy metabolism	2+0
23.	Fn 606 ¹	Nutrition and agricultural interface	3+0
24.	Fn 607	Nutrition in emergencies	2+0
25.	Fn 608 ¹	Application of biotechnology in food science and nutrition	1+1
26.	Fn 609	Global nutritional problems	2+0
27.	Fn 610	Maternal and child nutrition	2+1
28.	Fn 691	Doctoral seminar i	0+1

29.	Fn 692	Doctoral seminar ii	0+1
30.	Fn 699	Doctoral research	45

* Compulsory for Master's Programme

** Compulsory for Ph.D Programme

*** Remedial Courses for Agricultural Statistics

† Interdisciplinary course

XVIII Compulsory Non-Credit Courses

Sl. No.	Code	Course Title	Credits
1.	Pgs 501	Research Methodology	1+1
2.	Pgs 502 (e-course)	Intellectual property and its management in Agriculture	1+0
3.	Pgs 504	Basic Concepts in Laboratory techniques	0+1
4.	Pgs 505 (e-course)	Agricultural research, research ethics and rural development programmes	1+0
5.	Pgs 506 (e-course)	Disaster management	1+0

M.Sc. (Forestry) Courses

1. Department of Wood Science

Sl. No.	Code	Course Title	Credits
1.	WST 501*	Forest Products – Chemistry and Industries	1+1
2.	WST 502*	Wood Variation	2+1
3.	WST 503*	Identification of Wood	0+2
4.	WST 504	Chemistry of Wood	1+1
5.	WST 505*	Developmental Anatomy of Woody Plants	1+1
6.	WST 506*	General Properties of Wood	2+1
7.	WST 507	Seasoning and Preservation of Wood	2+1
8.	WST 508	Paper and Pulp Technology	2+1
9.	WST 591	Master's Seminar	0+1
10.	WST 599	Master's Research	0+20

* Compulsory for Masters programme

The advisory committee at its discretion may decide on additional courses from other departments of the college as "major courses" depending on the research needs of the student concerned and the availability of such courses.

2. Department of Silviculture and Agroforestry

Sl. No.	Code	Course Title	Credits
1.	SAF 501*	Silviculture	2+1
2.	SAF 502*	Forest Seed Technology	2+1
3.	SAF 503	Plantation Forestry	2+1
4.	SAF 504*	Agroforestry Systems	2+1
5.	SAF 505	Modern Nursery Technology	1+1
6.	SAF 506	Ecology and Management of Wildland Soils	2+1
7.	SAF 507	Energy Plantations and Biofuels	1+1
8.	SAF 508	Climate Change Mitigation Through Land Use Management	2+0
9.	SAF 509	Forest Hydrology	1+1
10.	SAF 510	Watershed Management	2+1
11.	SAF 511	Socioeconomics of Agroforestry System Management	1+1
12.	SAF 591	Agroforestry and Reclamation of Degraded and Problem Areas	2+0
13.	SAF 512	Master's Seminar	0+1
14.	SAF 599	Master's Research	0+20

* Compulsory for Master's programme

The advisory committee at its discretion may decide on additional courses from other departments of the college as "major courses" depending on the research needs of the student concerned and the availability of such courses.

3. Department Of Forest Management And Utilization

Sl. No.	Code	Course Title	Credits
1.	FEM 501*	Forest Management	2+1
2.	FEM 502*	Forests and People	2+0
3.	FEM 503	Forest Resource Management and Economics	1+1
4.	FEM 504	Forest Protection	1+1
5.	FEM 505	Environmental Impact Assessment	2+0
6.	FEM 506	Forests and Environmental Policies, Laws and International Conventions	2+0
7.	FEM 507	Advances in Nursery Management	2+1
8.	FEM 508	Non Timber Forest Produce	1+1

9.	FEM 509	Measurement and Assessment of Vegetation	1+1
10.	FEM 510	Principles and Practices of Arboriculture	1+1
11.	FEM 591	Master's Seminar	0+1
12.	FEM 599	Master's Research	0+20

*Compulsory courses

The advisory committee at its discretion may decide on additional courses from other departments of the college as "major courses" depending on the research needs of the student concerned and the availability of such courses.

4. Department Of Tree Physiology And Breeding

Sl. No.	Code	Course Title	Credits
1.	TPB 501*	Tree Breeding	2+1
2.	TPB 502*	Forest Ecophysiology	1+1
3.	TPB 503	Tissue Culture in Forest Trees	1+2
4.	TPB 504	Quantitative Genetics in Forest Tree Breeding	1+1
5.	TPB 505	Forest Genetic Diversity and Conservation	2+0
6.	TPB 506*	Biotechnology Approaches in Forestry	1+1
7.	TPB 507	Molecular Biology	2+1
8.	TPB 508	Principles and Techniques of Genetic Engineering	2+1
9.	TPB 509*	Tree Physiology	2+1
10.	TPB 591	Master's Seminar	0+1
11.	TPB 599	Master's Research	0+20

*Compulsory courses for Master's programme

The advisory committee at its discretion may decide on additional courses from other departments of the college as "major courses" depending on the research needs of the student concerned and the availability of such courses.

5. Department Of Wildlife Sciences

Sl. No.	Code	Course Title	Credits
1.	WLS 501*	Fundamentals of Conservation Biology	2+1
2.	WLS 502*	Advanced Wildlife Management	2+1
3.	WLS 503*	Ecotourism - Concepts and Modern Approaches	2+1
4.	WLS 504*	Economics of Ecotourism	2+1
5.	WLS 505	Mammalogy and Indian Mammals	2+1
6.	WLS 506	Ornithology and Indian Birds	2+1

7.	WLS 507	Herpetology and Ichthyology	1+1
8.	WLS 508	Wildlife Ecology	1+1
9.	WLS 509	Quantitative Methods in Wildlife Management	2+1
10.	WLS 510	Invertebrate Biodiversity	2+1
11.	WLS 511	Wetland Ecology and Management	1+1
12.	WLS 512	Principles and Practice of <i>Ex Situ</i> Conservation	1+1
13.	WLS 513	Ethno Biology and Tribal Welfare	1+1
14.	WLS 514	Ecosystems of the World	2+0
15.	WLS 515	Ecotourism in Protected Areas	2+0
16.	WLS 516	Ecotourism and Landscaping	2+1
17.	WLS 517	Design and Management of Ecotourism	2+1
18.	WLS 518	Environmental Impact Assessment of Protected Areas	2+1
19.	WLS 519**	Remote Sensing and Geographic Information System	1+1
20.	WLS 591	Master's Seminar	0+1
21.	WLS 599	Master's Research	0+20

*Compulsory courses;

** Supporting course for MSc (Forestry) programmes in all disciplines.

The advisory committee at its discretion may decide on additional courses from other departments of the college as "major courses" depending on the research needs of the student concerned and the availability of such courses.

6. Supporting Courses For Msc (Forestry) Programme

Sl. No.	Code	Course Title	Credits
1.	STAT 512*	Experimental Designs	2+1
2.	WLS 519	Remote Sensing and Geographic Information Systems	1+1

*Offered by Department of Agricultural Statistics

7. Non-Credit Compulsory Courses

Five courses (PGS 501-PGS 505) are of general nature and are compulsory for Master's programme. PhD students may be exempted from these courses if already studied during Master's degree. For course catalogue please refer the course curricula and syllabi for postgraduate programmes in agricultural sciences.

Sl. No.	Code	Course Title	Credits
1.	PGS 501	Research Methodology	1+1

2.	PGS 502 (e-Course)	Intellectual Property Rights and its Management in Agriculture	1+0
3.	PGS 503	Basic Concepts in Laboratory Techniques	0+1
4.	PGS 504 (e-Course)	Agricultural Research, Ethics and Rural Development Programmes	1+0
5.	PGS 505 (e-Course)	Disaster Management	1+0

Ph. D in Forestry

I. Department Of Silviculture And Agroforestry

Sl. No.	Code	Course Title	Credits
1.	SAF 601*	Quantitative Silviculture 1+1	1+1
2.	SAF 602*	Agroforestry for Ecosystem Services and Environmental Benefits	2+0
3.	SAF 603	Intermediate and Recalcitrant Seeds	1+1
4.	SAF 604	Plantation Forest Productivity	1+1
5.	SAF 605	Productivity of Agroforestry Systems	2+1
6.	SAF 606	Advanced Silviculture	1+1
7.	SAF 607	Changing Concepts in Agroforestry Research and Management	2+0
8.	SAF 608	Climate Change Mitigation Through Agroforestry	2+0
9.	SAF 609	Advances in Forest Soil Management	1+1
10.	SAF 610	Dynamic Modeling of Environmental Systems: Principles and Applications	1+1
11.	SAF 611	Forest Stand Dynamics	2+0
12.	SAF 612	Land Use Planning and Watershed Management	2+0
13.	SAF 691	Doctoral Seminar I	0+1
14.	SAF 692	Doctoral Seminar II	0+1
15.	SAF 699	Doctoral Research	0+45

*Compulsory courses

The advisory committee at its discretion may decide on additional courses from other departments of the college as "major courses" depending on the research needs of the student concerned and the availability of such courses.

II. Department Of Forest Management And Utilisation

Sl. No.	Code	Course Title	Credits
1.	FEM 601*	Advances in Forest and Ecosystem Management	2+1
2.	FEM 602*	Forestry Interventions for Environment Amelioration	2+0
3.	FEM 603	Advances in Natural Resources and Environment Economics	2+1
4.	FEM 604	Forest Certification	2+0
5.	FEM 605	Project Planning and Evaluation	1+1
6.	FEM 606	Applied Tropical Forest Biology and Management	2+1
7.	FEM 607	Advances in Biodiversity Conservation and Management	2 +1
8.	FEM 608	Modern Greenhouse Technology	1+1
9.	FEM 609**	Climate Change and Forestry	2+0
10.	FEM 691	Doctoral Seminar I	0+1
11.	FEM 692	Doctoral Seminar II	0+1
12.	FEM 699	Doctoral Research	0+45

*Compulsory courses

**Supporting course for PhD (Forestry) programme in all disciplines.

The advisory committee at its discretion may decide on additional courses from other departments of the college as "major courses" depending on the research needs of the student concerned and the availability of such courses.

III. Department Of Tree Physiology And Breeding

Sl. No.	Code	Course Title	Credits
1.	TPB 601*	Advances in Tree Improvement	2+1
2.	TPB 602	Advances in Quantitative Forest Genetics	2+1
3.	TPB 603	Molecular Genetics of Forest Trees	2+1
4.	TPB 604*	Advances in Forest Ecophysiology	2+1
5.	TPB 605	Advances in Forest Biotechnology	2+1
6.	TPB 606*	Advances in Molecular Biology of Forest Trees	2+1
7.	TPB 607	Tree Physiology and Forest Productivity	2+1
8.	TPB 608	Genetic Engineering and Bioinformatics	2+1
9.	TPB 691	Doctoral Seminar I	0+1
10.	TPB 692	Doctoral Seminar II	0+1
11.	TPB 699	Doctoral Research	0+45

*Compulsory courses

The advisory committee at its discretion may decide on additional courses from other departments of the college as "major courses" depending on the research needs of the student concerned and the availability of such courses.

IV. Department Of Wood Science

Sl. No.	Code	Course Title	Credits
1.	WST 601*	Advances in Wood Products	2+1
2.	WST 602*	Energy and Chemicals from Wood	2+1
3.	WST 603	Modern Trends in Wood Preservation	2+1
4.	WST 604	Wood Processing and Timber Engineering	2+1
5.	WST 605*	Dendrochronology	2+1
6.	WST 691	Doctoral Seminar I	0+1
7.	WST 692	Doctoral Seminar II	0+1
8.	WST 699	Doctoral Research	0+45

* Compulsory courses

The advisory committee at its discretion may decide on additional courses from other departments of the college as "major courses" depending on the research needs of the student concerned and the availability of such courses.

V. Department of Wildlife Sciences

Sl. No.	Code	Course Title	Credits
1.	WLS 601*	Advances in Conservation Biology	2+1
2.	WLS 602*	Advanced Techniques in Wildlife Management	2+1
3.	WLS 603*	Behavioural Ecology	2+1
4.	WLS 604	Ecotourism - Business And Conservation	2+1
5.	WLS 605	Ecological Economics	2+1
6.	WLS 691	Doctoral Seminar I	0+1
7.	WLS 692	Doctoral Seminar II	0+1
8.	WLS 699	Doctoral Research	0+45

* Compulsory courses

The advisory committee at its discretion may decide on additional courses from other departments of the college as "major courses" depending on the research needs of the student concerned and the availability of such courses.

VI. Supporting Courses For Ph.d (Forestry) Programme

Sl. No.	Code	Course Title	Credits
1.	MCA 501*	Computers-Fundamentals and Programming	2+1
2.	MCA 566*	Database Management Systems	1+1
3.	MCA 574*	Multimedia Applications	1+1
4.	MCA 576*	Bioinformatics Computing	2+1
5.	FEM 509	Climate Change and Forestry	2+0

M.Sc. and Ph. D in C& B

1. Msc (C&B) Rural Marketing Management

Sl. No.	Course particulars	Minimum credit requirement
1	Major Courses - Core Courses	12
2	Major Courses - Optional Courses	12
3	Major Courses - Seminar	01
4	Supporting Courses	15
Total course work		40
5	Research	20
Total		60

A.1. Core courses

12 credits

Sl. No.	Catalogue No.	Course	Credit
1	Mmgt 601	Strategic Marketing Management	2+1
2	Mmgt 602	Advances In Rural Marketing Management	2+1
3	Mmgt 603	Strategic Marketing Communications	2+1
4	Mmgt 604	Marketing Research and Information System	2+1

A.2. Optional courses minimum 12 credits

Sl. No.	Catalogue No.	Course	Credit
5	Mmgt 605	Services Marketing	2+1
6	Mmgt 606	Brand Equity Management	1+1
7	Mmgt 607	New Products Management	2+1
8	Mmgt 608	Supply Chain Management	2+1

9	Mmgt 609	Relationship Marketing	2+1
10	Mmgt 610	International Marketing Management	2+1
11	Mmgt 611	Agricultural Commodity Markets	3+1
12	Mmgt 612	Sales Management	3+0
13	Mmgt 613	Consumer Behaviour	2+1

A.3. Seminar 1 credit

Sl. No.	Catalogue No.	Course	Credit
14	Mmgt 614	Seminar	0+1

B. Supporting courses

15 credits

B.1. Compulsory supporting courses

9 credits

Sl. No.	Catalogue No.	Course	Credit
1	Comp.601	Computer Application for Management	2+1
2	Stat 632	Statistics in Social Sciences	2+1
3	Resm 601**	Research Methodology	2+1

B. 2 Other supporting courses

6 credits

Total course work

40 credits

C. Research

20 credits

Sl. No.	Catalogue No.	Course	Credit
1	Mmgt 661	Research	20

2. M.Sc (C&B) Co-Operative Management

A. Major

25 credits

A.1. Core courses

12 credits

Sl. No.	Catalogue No.	Course	Credit
1	Cmgt 601	Advanced Co-operative Theory	3+0
2	Cmgt 602	Legal Environment of Co-operatives	2+1
3	Cmgt 603	Financial Management in Co-operatives	2+1
4	Cmgt 604	Management of Dairy Co-operatives	2+1

A.2. Optional courses**minimum 12 credits**

Sl. No.	Catalogue No.	Course	Credit
5	Cmgt 605	Organizational Behaviour of Co-operatives	2+1
6	Cmgt 606	Co-operative Business Policy	2+0
7	Cmgt 607	Management of Co-operative Banks	2+1
8	Cmgt 608	Management of Micro Finance and Micro Enterprises	1+1
9	Cmgt 609	Human Resource Development in Co-operatives	2+0
10	Cmgt 610	Management of Marketing Co-operatives	2+1
11	Cmgt 611	Production and Operations Management in Co-operatives	2+1
12	Cmgt 612	Materials and Logistics Management	2+0

A.3. Seminar**1 credit**

Sl. No.	Catalogue No.	Course	Credit
13	Cmgt 613	Seminar	0+1

B. Supporting courses**15 credits****B.1. compulsory supporting courses****9 credits**

Sl. No.	Catalogue No.	Course	Credit
1	Comp.601	Computer Application for Management	2+1
2	Stat 632	Statistics in Social Sciences	2+1
3	Resm 601	Research methodology	2+1

B.2. Other supporting courses**6 credits****C. Research****20 credits**

Sl. No.	Catalogue No.	Course	Credit
1	Cmgt 661	Research	20

3. M.Sc.(C&B) Rural Banking And Finance Management

A. Major courses **25 credits**

A.1. Core courses **12 credits**

Sl. No.	Title of the Courses	Credit
1.	Bank 601 Marketing of Financial Services	2+1
2.	Bank 602 Agricultural Insurance	2+1
3.	Bank 603 Working Capital Management	2+1
4.	Bank 604 Risk Management in Banks	2+1

A.2. Optional courses **12 credits**

Sl. No.	Title of the Courses	Credit
5.	Bank 605 Electronic Banking	2+1
6.	Bank 606 Securities Market	2+1
7.	Bank 607 Depository Services	2+1
8.	Bank 608 Commodities Market	2+1
9.	Bank 609 Financial Derivatives	2+1
10.	Bank 610 Funds Management in Banking Companies	2+1

A.3. Seminar **1 credit**

11.	Bank 651 Seminar	0+1
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Sporting Courses **15 credits**

Sl. No.	Title of the Courses	Credit
12.	Resm 601 Research Methodology *	2+1
13.	Stat 632 Statistics in Social Sciences*	2+1
14.	Comp. 601 Computer Application for Management*	2+1

*Compulsory

Total course work **40 credits**

C. Rbfm 661 Research **20 credits**

Total **60 credits**

Ph. D. in C&B

1. Rural Marketing Management

Total Credit Requirement

Sl. No.	Course particulars	Minimum credit requirement
1	Major - Core courses	06
2	Major - Optional courses	06
3	Seminar	02
4	Supporting courses	12
5	Total course work	26
6	Research	44
7	Total credit	70

Major courses

14 credits

A.1. Core courses

6 credits

Sl. No.	Catalogue No.	Course	Credit
1	Mmgt 701	Marketing research and information system	2+1
2	Mmgt 702	Advances in consumer behaviour	2+1
3	Mmgt 703	Agri-business marketing strategies and techniques	2+1

A.2. Optional courses

6 credits

Sl. No.	Catalogue No.	Course	Credit
4	Mmgt 704	Strategic marketing management	2+1
5	Mmgt 705	Supply chain management in agri-business	2+1
6	Mmgt 706	Marketing communication	2+1
7	Mmgt 707	Relationship marketing	2+1
8	Mmgt 708	Retail management	2+0
9	Mmgt 709	Operations research in marketing	2+1
10	Mmgt 710	Brand management	1+1

A.3. Seminar

2credits

Sl. No.	Catalogue No.	Course	Credit
11	Mmgt 751	Seminar	0+1

12	Mmgt 752	Seminar	0+1
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B. Supporting Courses

12credits

Total course work

26 credits

C. Research

Sl. No.	Catalogue No.	Course	Credit
1	Mmgt761	Research	44

MBA Agribusiness Management

Semester I -Foundation Courses (FC) – Compulsory

Sl. No.	Code No.	Title	Credit
1.	FC 1	Principles of Agri-business Management	2+0
2.	FC 2	Accounting for Management	2+1
3.	FC 3	Macro-economics of Agri-business Management	3+0
4.	FC 4	Agri-business Marketing Strategies and Techniques	1+1
5.	FC 5	Organizational Communication	2+1
6.	FC 6	Quantitative Methods for Management	2+1
7.	FC 7	Laboratory for Personal Growth and Development	0+1
Total			12+5 = 17

Semester II - Courses in General Management area (GM) – Compulsory

Sl.No.	Code No.	Title	Credit
1.	GM 1	Research Methodology	2+1
2.	GM 2	Financial Management for Agri-business	2+1
3.	GM 3	Managerial Economics	1+1
4.	GM 4	Legal Framework of Agri-business	2+0
5.	GM 5	Agribusiness Entrepreneurship	1+1
6.	GM 6	Management Information System	1+1
7.	GM 7	Agri-business Production and Operations Management	2+1
8.	GM 8	Human Resources Management in Agri-business	1+1
Total			12+7=19

Semester III - Functional Management Courses - Compulsory (CFM)

Sl. No.	Code No.	Title	Credit
1.	CFM 1	Organizational Behaviour	2+1
2.	CFM 2	Tax Planning for Agri-business	1+1
3.	CFM 3	Strategic Management	1+1
4.	CFM 4	Agri-business Project Management	1+1
Sub Total			5+4 = 9
Functional Management Electives*			12
Total			21

*Elective Segment - Functional Management Electives

(Maximum 12 credits spread over two groups subject to a minimum of three courses from one group)

Elective Papers:

Group I - Marketing Management (MM)

Sl. No.	Code No.	Title	Credit
1.	MM 1	Strategic Marketing Management for Agri-business	1+1
2.	MM 2	Supply Chain Management in Agri-business	1+1
3.	MM 3	International Agri-business Marketing	2+0
4.	MM 4	Marketing Legislations	2+0
5.	MM 5	Marketing Communication for Agri-business	2+1
6.	MM 6	Operations Research in Marketing	2+1
7.	MM 7	Marketing Research and Information System	2+1
8.	MM 8	E-marketing for Agri-business	1+1
9.	MM 9	Brand Management	1+1
10.	MM 10	New Products / Services Management	1+1
11.	MM 11	Agricultural Pricing policy and Price Behaviour	1+1
12.	MM 12	Relationship Marketing	1+1
13.	MM 13	Services Marketing	1+1
14.	MM 14	Advances in Rural Marketing Management	1+1
15.	MM 15	Consumer Behaviour	2+1

Group II - Financial Management (FM)

Sl. No.	Code No.	Title	Credit
1.	FM 1	Strategic Financial Management for Agri-business	1+1

2.	FM 2	Cost Planning and Control for Agri-business	1+1
3.	FM 3	Materials Management for Agri-business	1+1
4.	FM 4	International Finance Management for Agri-business	2+1
5.	FM 5	Agricultural Commodity Derivatives	2+1
6.	FM 6	Security Analysis and Portfolio Management	2+1
7.	FM 7	Marketing Finance	1+1
8.	FM 8	Investment Banking and Financial Services	2+1
9.	FM 9	Management Control Systems for Agri-business	2+1
10.	FM10	Financing of Agriculture and Agri-business	1+1

Group III – Behavioural Sciences (BS)

Sl. No.	Code No.	Title	Credit
1.	BS 1	Organizational Culture	2+0
2.	BS 2	Human Resource Planning in Agri-business	1+1
3.	BS 3	Designing Organizational Structures for Agri-business	1+1
4.	BS 4	Human Resource Development	2+0
5.	BS 5	Workshop on Achievement Motivation	0+2
6.	BS 6	Managing Conflict and Negotiation	1+1
7.	BS 7	Soft Skills for Agri-business Management	1+1
8.	BS 8	Environment and Agri-business	2+0
9.	BS 9	Managing Organizational Change	1+1
10.	BS 10	Total Quality Management in Agri-business	1+1
11.	BS 11	New Venture Management	1+1
12.	BS 12	Management of Farmer Centered Organizations	2+0
13.	BS 13	Media and Communication Management for Agri-business	1+1

Semester IV - Advanced Management Courses (AM)

Class Room Segment - Advanced Management Courses (AM) – Compulsory

Sl. No.	Code No.	Title	Credit
1.	AM 1	Strategic Quality Management Systems for Agri-business	2+0
2.	AM 2	International Trade	3+0
3.	AM 3	Information Technology in Agri-business	1+1
4.	AM 4	Leadership Skills	1+1

Sub Total	7 + 2 = 9
Management Experience Programme – Project Work	0+9
Total	18

4.5 Curricula Development / Revision Process

The curricula followed for UG and PG programmes cover the fundamentals as well as the recent technological advancements in the various fields concerned. The curriculum followed in different colleges for a degree programme under a faculty is uniform. The revision of syllabi for the graduate and postgraduate levels is done periodically to update the standards, to be in line with national and international levels. This is done by the Academic Council, with the recommendation of the Board of Studies. Traditional system of education was followed before the inception of the University. The syllabi for the various courses under different faculties were revised during 1971-72 from the Traditional to Trimester system when the University was formed. These syllabi were then revised during 1986 and changed over to Semester system. It was then revised in parts from time to time to include new topics/subjects and delete others. A major revision of the syllabi of the different Faculties was done in 1995. The external evaluation component was introduced under this revision.

The curricula and syllabi of these programmes are designed and revised at regular intervals based on the recommendations of the Vice Chancellor's conference of SAUs organized by ICAR and also considering regional requirements and emerging trends in science and society.

4.6 Adoption of ICAR Model Curricula

Adopted with minor modifications. The UG curricula was revised in 2003 and 2007 based on the model curricula proposed by the Deans Committee appointed by the ICAR. The PG regulations were revised during 2007 and 2009.

4.7 Interdisciplinary approach in teaching

Many courses, especially RAWE and Experiential learning courses are offered by interdisciplinary approach.

4.8 Evaluation and Grading

4.8.1 Undergraduate Programme

At the time of the formation of the University, the Trimester pattern was followed. This was changed to Semester pattern during 1986. Earlier, the examinations and valuation of the answer papers of the UG courses were carried out internally by the course teachers. However, in 1995 an internal - external evaluation system was introduced. Earlier 4 point grading system with grade A, B, C, D, F etc. Now 10 percent system and the marks scored are converted to graded by formula $\frac{(ax-by)}{(a+b)}$, where a= credit for theory, b= credit for practical, x=marks for theory and y= marks for practical.

Internal valuation:

Theory:- The internal examinations component has a mid-term examination conducted around 70 days after the commencement of the semester with a weightage of 20 per cent marks. The mid-term examinations are conducted by the respective course teachers while the University conducts semester final examination of the UG courses.

Answer scripts of internal examinations are evaluated by the teacher and shown to the students within 10 days of the conduct of the examination. The students have the option to request the teacher for clarification of any doubts in scoring. Unless a student appears for mid term examination, he/she will not be permitted to appear for the semester final examination in the concerned course.

Practical:- Practical examinations are conducted by a Board constituted by the Head of the Institution, which includes the Head of the Department, a teacher nominated by the Head of the Institution and the course teacher. Marks for the practical examination are awarded based on regularity in practical class work (20%), Viva Voce (10%), Practical Records (20%) and Final Practical Examination (50%).]

External valuation:

The semester final theory examination is held at the end of each semester in each course for a total of 80 per cent marks. Answer papers of final examinations are valued by external examiners appointed by the Director (Acad. & PG Studies) from a panel of examiners forwarded by the Dean/Associate Dean.

Even though the minimum grade point required for passing a course is 5.0, to complete the degree requirement, the student has to get a minimum OGPA of 5.5 out of 10.0.

4.8.2 Postgraduate Programme

Unlike the under-graduate programme, the evaluations of course credits in postgraduate programme are done by the course teachers. Periodical monthly tests/quizzes /mid-semester/ final examinations including practical and viva-voce and library/laboratory assignments etc., are employed for evaluating the progress of the students. The grading allocated for the courses is the same as that followed in the UG programme. However, the minimum grade point required for passing a course is 6.0, to complete the master's degree requirement, the student has to get a minimum OGPA of 6.5 out of 10.0 in the case of Masters Degree and Doctorate programme.

Qualifying examination/Comprehensive examination:

The Masters and Doctorate degree students have to appear for a qualifying examination after completion of 75 % of their course work. There will be theory papers and a viva-voce examination. The valuation is a combination of external and internal process.

Thesis evaluation and Final Viva-voce examination:

The thesis shall be referred for adjudication to one External Examiner in the case of Masters programme and to two External Examiners in the case of Doctorate programme. The external examiners are appointed by the Dean/Associate Dean/ Head of the Institution.

The final viva-voce examination is conducted by the Advisory committee and one External Examiner.

4.9 Colloborative Programmes

The research support for the sustainable development of the agriculture sector of the State is rendered in the partnership mode in close association with the research institutions managed by the Indian Council of Agricultural Research, Development and Commodity Boards, Departments of the State and Central Governments. Over 700 research projects are currently in operation including 34 All India Coordinated Research projects/Network projects in various fields of agriculture, horticulture, forestry and other allied fields. The externally aided projects are funded by ICAR, ICFR, DST, DBT, NWDPR, DOE & F, STEC, PPIC, BARC etc.

The PG diploma in Solid waste management is conducted in collaboration with Suchithwa Mission, State Pollution Control Board, Medical College, Regional Cancer Centre and several governmental and non- governmental organizations.

The M. Sc. (Integrated) Biotechnology course is being conducted in a multi-institutional collaboration mode. Five leading biotechnology institutes in Kerala are participating in the course. The faculty and facilities of these institutes are being utilized for the smooth conduct of the course.

The M.Sc. (Integrated) Climate Change Adaptation is also being conducted on a multi-institutional collaboration mode. MoU is signed with UWA, ICRISAT, CUSAT, etc.

The Department of Home Science is recognized as the Programme Study Centre for IGNOU since 2005 and offers the course on M.Sc. (Dietics and Food Service Management).

4.10 Basis for Starting and Closing of Educational Institutions, Programmes, Centres and Departments

When the University was formed, there were only two Colleges under its control. Considering the need for technically trained human resources in different fields of Agriculture, Veterinary, Engineering, Fisheries, Co-operative Management, Forestry and Dairying, eight new colleges were started in different parts of the State (Veterinary College and College of Fisheries are now transferred to the new Universities viz., KVASU and KUFOS). These colleges were primarily located in rural areas enabling the students from rural areas to study and earn a degree. The starting of new courses or closing of existing programmes are based on the needs of the State and the user agencies.

Kerala was dependent on other states and institutions for training personnel to look after forest management. To overcome this, the University started a College of Forestry to train professionals in forestry.

The weakest link in the development of agriculture in the State is marketing. Nevertheless, marketing assumes great significance as 75% of the farmers have tiny holdings of below half a hectare. For such farmers, remunerative price for their produce can be realized only if the marketing societies of the State are strong. In Kerala, there is shortage of

trained personnel for management of departments, institutions and organisation providing support-services to agriculture such as cooperative department and cooperative organisations and to undertake research in functional, managerial and organisational issues relating to support services. With these intensions, a College of Co-operation, Banking & Management was started.

The State has a very long coastline and tremendous potential for coastal and inland fisheries and aquaculture activities. The State ranks first in fish production and in the export of fish in India. To train professionally and technically qualified manpower in fisheries to cater to the needs of fast developing fishery section of the State and other parts of the country, the University established a separate College of Fisheries near Kochi, the centre of marine business and the queen of the Arabian Sea (This College is now transferred to KUFOS).

Agricultural engineering is a field, which has not received adequate attention. Most of the agricultural engineering posts were filled with civil/mechanical engineers or even with agricultural graduates. It was projected in a study by the ICAR that thousands of Agricultural Engineers would be needed on an all India basis for implementing projects in the field of farm mechanization and water/watershed management in Agriculture. Realising the importance of this, the Faculty of Agricultural Engineering was established in 1985, by upgrading the existing Institute of Agricultural Technology into a College.

The upsurge in milk production in the State was achieved through intensive efforts made by the various departments under the Government of Kerala. It has been estimated that nearly 60 % of cattle population in Kerala are crossbreds. This conversion of non-descript animals to high yielding crossbred cows also resulted in problems for the farmers and dairy entrepreneurs. One of the major problems is the increased cost of production of milk due to high feed and labour costs. This necessitates producing value added dairy products to economise the entire industry. For the production of value added products, it is very essential to have a set of trained and qualified hands in this field. With this idea, a College of Dairy Science and Technology was started (This College is now transferred to KVASU).

There is an acute shortage of veterinary surgeons in Kerala. The State had only one Veterinary College producing veterinary graduates. In order to provide more qualified veterinary personnel a new College of Veterinary and Animal Sciences was started in 1999 at

Mannuthy, which was shifted to Pookode in Wayanad district later on (This College is now transferred to KVASU).

4.11 Non-degree granting programmes, if any

4.11.1 Diploma in Agricultural Sciences (DASc.) is offered at the Institute of Agricultural Technology & Regional Agricultural Research Station, Pattambi, Mele Pattambi P.O., Palakkad district. Started during 2011.

- Number of seats : 50
- Duration of the course : Four semesters (approx. 2 yrs.), each semester with a minimum of 105 working days
- Eligibility : Pass in + 2 with Biology, Physics, Chemistry or equivalent examination or Pass in VHSE (Agriculture)
- Age : Minimum 16 years. No upper age limit
- Reservation : 20% seats are reserved for VHSE (Agri) holders. In the absence of VHSE(Agri) candidates, the seats will be treated as open quota
- Mode of selection : Based on total marks in +2 or VHSE (Agri) or equivalent examination
- Medium of Instruction : English
- System of teaching and evaluation : Semester system of teaching and internal evaluation

4.11.2 PG Diploma in Solid Waste Management :

Started at College of Agriculture, Vellayani, Trivandrum from 2011.

Eligibility for admission : B.Tech. or Masters degree in science

Duration : Two semesters (one year)

4.12 Accomplishments and Challenges

- Performance Award of ICAR: For six years (2006, 2007, 2008, 2009, 2010 and 2011), with continues four five prizes JRF, IAS, IFS etc. (confusion)
- "Sardar Patel Outstanding Institution Award of the ICAR" during 2004
- Best teacher award of ICAR
- More than 25 achievement awards
- Many Jawaharlal Nehru Awards of ICAR for best Ph. D theses.
- Over the last five years , KAU scientists won more than 20 best paper awards
- Many Young Scientist Awards: More details are given in the reports of Colleges.

5. FACULTY AND OTHER HUMAN RESOURCES

5.1. Employees Classification

The employees working in the different categories, i.e., teaching, research, extension, administration, finance and physical plant, have been classified into different cadres: Supporting /administrative staff, farm staff, Directorate of Physical Plant including – Assistant Engineer, Assistant Executive Engineer (civil) and Electrical Engineer, etc.

The different categories of academic staff before the inception of the University were Professor, Jr. Professor and Lecturers. The research staffs were designated as Research Officers and Research Assistants. The transfer of the colleges to Kerala Agricultural University and with the integration of teaching, research and extension services, the different categories of posts in these wings were amalgamated and re-designated as Professors, Associate Professors, Assistant Professors and Junior Assistant Professors. With the introduction of UGC/ICAR package in 1986, the post of Jr. Asst. Professor was merged with Asst. Professor.

5.1.1 Faculty profile

The Faculty of Agriculture is the largest among the two faculties of the University. Under the control of this faculty there are three Agricultural Colleges, one College of Forestry and one College of Cooperation, Banking & Management. The College of Agriculture, Vellayani established in 1955 is the oldest among the various colleges under this faculty. The College of Horticulture (1972), College of Agriculture, Padannakkad (1994), and College of Forestry (1986) and College of Co-operation and Banking (1981) were started after the inception of the University. The Faculty offers under graduate, masters and doctorate courses.

The faculty of Agricultural Engineering and Technology has only one college viz. Kelappaji College of Agricultural Engineering and Technology (KCAET) which started in 1963.

At the time of the inception of the University, in the Agricultural faculty, there were 9 Professors, 21 Jr. Professors and 32 Lecturers. There was substantial growth in the faculty strength during the last 40 years. Thus, by year 2000, there were 52 professors 236 associate professors and 212 assistant professors. By 2011-12 the strength of scientists in the

university increased to Professors 350 Associate Professors 150, Assistant Professors 200. The strength of scientific staff in the university is given in Table 5.1.

5.2. Personal Policy details including availability of manpower

The human resources in the University form its social capital comprising the faculty, administrative staff and other supporting staff, students and labourers.

The University Act and the Statutes clearly define the duties of the personnel working in the different cadres of the University. The information pertaining to the human resources available in the University for implementing teaching, research and extension have been properly documented.

The name of teachers, designation, qualifications, field of specialisation, details of employment etc. of each faculty are available in an easy to access format in computerized form.

5.3. Annually updated faculty profile reflecting their academic credentials

The academic credentials of the staff members of the Faculty of Agriculture have improved considerably after the inception of the University. Most of the faculty have high qualifications like Ph.D. and Post Doctorate. Selected faculty members without Ph. D are deputed to different institutions for undergoing doctorate programmes. Now more than 90 per cent of the Faculty members have Doctoral/Post-doctoral qualifications. (Table 5.1)

Table 5.1 Academic credentials of the teachers in the Faculty of Agriculture

Departments	COA Vellayani		COH Vellanikkara		COA Padannakkad	
	M.Sc.	Ph.D.	M.Sc.	Ph.D.	M.Sc.	Ph.D
1. Agronomy	1	13	0	8	0	1
2. Pl. Physiology	0	3	0	1	0	1
3. Pl. Breeding & Genetics	1	9	0	5	0	3
4. Plantation Crops and Spices	0	3	0	8	0	1
5. Pomology & Floriculture	0	3	0	7	0	1
6. Olericulture	0	3	0	7	0	1
7. Processing Technology	0	2	1	3	0	1
8. Soil Science & Agrl. Chemistry	0	12	0	5	0	3

9. Ag. Entomology	0	16	0	5	0	3
10. Ag. Economics	2	1	0	4	0	2
11. Ag. Extension	0	9	0	4	0	2
12. Food Science and Nutrition	0	6	0	2	0	1
13. Ag. Statistics	0	2	3	0	1	0
14. Microbiology	0	4	0	3	0	0
15. Plant Pathology	0	9	0	5	0	1
16. Agricultural Meteorology	1	0	0	2	0	1
17. Agricultural Engineering	0	2	1	2	1	0
18. Biotechnology	0	4	0	5	1	0
19. Physical Education	0	1	1	0	0	1
20. Animal Husbandry	0	1	0	0	0	0
21. Instructional Farm	0	7	0	2	0	0
22. Total	5	110	6	78	3	23
23. Percentage of total	4%	96%	7%	93%	11%	89%

* excluded Faculties working in EAPs, AICRPs and other supporting centres.

Table 5.1 (contd.)

College of Forestry

Departments	M.Sc	Ph.D
1. Silviculture and Agroforestry	1	3
2. Tree physiology and breeding	1	2
3. Forest management & utilization	1	1
4. Wood science	0	1
5. Wild life science	1	1
Total	4	8
Percentage of total	33%	66%

* excluded Faculties working in EAPs, AICRPs and other supporting centres

Table 5.1 (contd.)**College of Co operation, Banking & Management**

Departments	M.Sc	Ph.D
1. Co-operative Management	1	5
2. Rural marketing management	2	2
3. Rural Banking & Finance Management	0	3
4. Development Economics	3	1
Total	6	11
Percentage of total	39%	61%

**Table 5.2 Academic credentials of the teachers in the Faculty of
Agricultural Engineering**

Kelappaji College of Agricultural Engineering and Technology

Departments	M. Tech.	Ph.D
1. Supportive and Allied courses	3	2
2. Land and Water Resources	2	3
3. Irrigation and Drainage Engineering	3	3
4. Farm power machinery and Engineering	2	4
5. Post harvest technology and Agricultural processing	2	3
Total	12	15
Percentage of total	44%	56%

Table 5.3 Characteristics of training of teachers in different faculties

Highest degree	Agriculture in %	Agricultural Engineering in %
Professors		
Same University	64	0
Other University within State	2	0
Out of State	32	100
Foreign Country	2	0
Associate Professors		
Same University	50	7
Other University within State	17	0

Out of State	33	75
Foreign Country	-	18
Assistant Professors		
Same University	82	0
Other University within state	12	33
Out of State	6	67
Foreign Country	0	0

5.4. Recruitment and Promotion procedures

The recruitment of scientist/teachers are taken care of by the KAU Act, statutes and ordinances framed and amended from time to time. Selection Committees are constituted for the specific purpose. The administrative, technical and political leadership are involved in the selection processes to ensure a transparent and fair recruitment system. Since the implementation of the UGC/ICAR pay package, the guidelines issued by the UGC/ICAR are followed in the recruitment of teaching staff including the Deans and Directors.

Recruitment of teachers/scientists are done after nation-wide advertisement. All qualified Indian nationals are considered on par for the purpose of recruitment of faculty members.

The supporting staff are recruited by state wide advertisement and their promotions by considering seniority.

5.4.1 Selection procedure for the post of Deans and Directors

The Deans of Faculties, Director of Research and Director of Extension are selected by a panel consisting of the Vice Chancellor, one non official member of the Executive Committee and one external expert nominated by the Chancellor (Governor of Kerala) and two experts from outside the University. The recommendations of the Selection Committee were placed before the Executive Committee for approval. The guidelines issued under UGC scheme are followed in recruitment.

5.4.2 Selection procedure for the posts of teachers

The following procedures are adopted for appointment of Professors, Associate Professors and Assistant Professors. NET is made compulsory for recruitment of teachers.

The Selection Committee for the recruitment of the Professors, Associate Professors and Assistant Professors consists of the Vice Chancellor as Chairman, one non official member of the Executive Committee, Dean of the concerned Faculty, Director of Research or Director of Extension nominated by the Vice Chancellor, two experts from outside the University from the panel of experts prepared by the Executive Committee and one external expert nominated by the Chancellor (Governor of Kerala). The recommendations of the Selection Committee were placed before the Executive Committee for approval. The guidelines issued under UGC scheme are followed in the recruitments/ promotions.

5.5. Career Development Plan including Competence Improvement

Career Advancement as per the UGC package is being implemented in the University. Any teacher of the University may request in writing to the Registrar with his/her bio-data for up-gradation of his/her post according to the principles listed in the statutes. On receipt of the request, the Vice-chancellor conducts the screening of applications and if found eligible, constitute a selection committee to select the candidate based on the biodata and / or interview. The composition of the committee is same as the one constituted for selection of Professors. The recommendations of the Screening Committee are placed before the Executive Committee for approval. Since the implementation of the UGC/ICAR pay package, the regulations/guidelines issued by UGC/ICAR are followed in the career advancement of teachers.

5.6 Selection Process for Academic and Other Administrative officers

The University has a distinct and clear-cut personnel policy. Recruitment of scientists, teachers, administrative staff, supporting staff and farm staff, labourers, their service conditions including pay revision, promotion, career advancement, disciplinary procedures, superannuation, attendant benefits, etc. are guided by the KAU Act 33 of 1971 and Statutes as amended from time to time. The service rules stipulated in KSR and KS&SSR, *mutatis-mutandis* are applicable to the employees of KAU. The MOP, KFC and PWD Manual are applied in office procedures, financial transactions and civil works respectively. The pension rules are that of the Government of Kerala employees.

Employees' recruitment is guided by statutory provisions and Selection Committee is constituted for this specific purpose. Administrative, technical and political leadership is involved in the selection process to ensure transparent and fair recruitment system. The

provisions of KS & SSR are applied to take care of the disciplinary procedure in respect of employees.

Supporting staff:

Assistant Grade I : Method of appointment is direct appointment.

Qualification : 1. Any degree from a recognised University.

2. Knowledge in computer application.

Promotion avenues and mode:

- (i) Common ratio 1:1:1 among Gr.I, Senior Grade Assistant and Selection Grade Assistant
- (ii) Section Officer : 1:3 ratio among Assistants and Section Officer
- (iii) Section Officer (Hr. Gr.): 1:1 ratio among Section Officer and Section Officer (Hr. Gr.)
- (iv) Assistant Registrar/ Assistant Comptroller/ Administrative Officer Gr.II/ Recruitment Officer/ Financial Assistant: Promotion to the above posts is strictly on the basis of seniority.
- (v) Assistant Registrar/ Assistant Comptroller/ Administrative Officer Gr.II / Recruitment Officer / Financial Assistant and Assistant Registrar/ Assistant Comptroller/ Administrative Officer Gr.II / Recruitment Officer / Financial Assistant (Hr. Gr.): 1:2 among the two categories.
All the cadre strength will be fixed twice in a year i.e. 1st of January and 1st of July.
- (vi) Deputy Registrar/ Deputy Comptroller/ Administrative Officer Gr. I: Promotion from senior most Assistant Registrar/ Assistant Comptroller/ Administrative Officer Gr.II / Recruitment Officer / Financial Assistant
- (vii) Joint Registrar/ Senior Deputy Comptroller/ Senior Administrative Officer: 1/3 post of Deputy Registrar/ Deputy Comptroller/ Administrative Officer Gr. I will be upgraded to the above cadre and promoted on the basis of seniority.

5.7. Pay Structure

The UGC/ICAR pay package was introduced in the University in 1986 and it was revised during 1996 and 2006. The teachers are eligible for DA and other allowances as per the State Govt. rules, issued from time to time. The HRA, leave, retirement age (Now 60 years), retirement – gratuity and pension are as per the State Government rules.

For supporting staff the State Government pay package is applicable. The retirement age is 56 years

5.8. Faculty Research and Scholarship Policy

The faculty members who undertake teaching also allocate part of the time for conducting independent research programmes funded by various agencies. The research programmes are funded by a) University, b) State Govt., c) ICAR, d) Govt. of India, e) other Govt. agencies and f) private agencies. The number of such externally funded projects headed by the teachers is presented in Table 5.4

Table 5.4 Faculty-wise details of externally aided Research Projects/ Schemes implemented during 2011-12

Description	Agriculture	Engineering
ICAR Co-ordinated Project (75%-25%)	24	4
ICAR Co-ordinated Project (100%)	7	1
Other Externally Aided Projects (DST, DBST, Boards etc.)	58	1
Revolving Fund Scheme (ICAR 100%)	2	1

In-service Schemes

As a part of the faculty improvement programme, faculty members are deputed to undergo several types of in-service programmes for various subjects. Teachers who possess only Masters degree at the time of appointment of the University are encouraged to go for higher studies. They are granted different types of privileges.

Rules for deputing for higher studies

The University allows deputation to teachers/ scientists for higher studies/ training. It is an important pre-requisite for a University to have well qualified teachers if it aims at upgrading the quality of teaching, research and extension. It was only in realization of the benefits derived by India in general and the Universities/ Institutes in particular that programmes like 'Faculty Improvement Programme (FIP)', 'Quality Improvement Programme (QIP)', etc., were implemented by the University Grants Commission (UGC), All India Council of Technical Education (AICTE) and the likes. In line with this and as a University aspiring to remain among the top-rated Agricultural Universities in India, the

Kerala Agricultural University (KAU) intends to depute its members of faculty for higher studies /trainings. The following are the Rules in this regard.

Deputation shall be ordinarily for undergoing any of the programme for trainings listed below in an institution attached to the KAU or in any other institution in India or abroad.

- a) Doctorate Programme
- b) Post Doctorate Programme
- c) Training

Eligibility for deputation:

- (i) A teacher of the KAU who has put in a minimum of 5 years of service in the KAU shall alone be eligible for deputation under these rules.
- (ii) A teacher shall be eligible for deputation for a Doctorate Programme or a Post Doctorate programme or training, if only the said teacher has not successfully undergone the said programme or training earlier in his / her Post-Doctoral Programme or a Training

The Executive Committee may, at its discretion and at any time, grant deputation to a teacher for undergoing a Post-Doctoral programme or Training, subject to Rule (ii) and others above, if it is of the opinion that the said programme / training is useful to the KAU. This is valid even in a case where the teacher has already secured admission / entry / selection/ nomination at his own initiative.

The number of teachers deputed to undergo training, summer institutes, seminars and symposia in India and abroad (Table 5.5.1)

Table 5.5 Trainings, summer institutes, seminars and symposia in India and abroad undergone by Scientists of different faculties

Faculty	2007-08	2008-09	2009-10	2010-11	2011-12
Agriculture	160	216	191	178	203
Agricultural Engineering	8	9	11	15	17
Forestry	12	8	10	12	13

**Table 5.6 Trainings, summer institutes, seminars and symposia organized by the
by Scientist of different faculties**

Faculty	2007-08	2008-09	2009-10	2010-11	2011-12
Agriculture	29	29	32	30	30
Agricultural Engineering	20	18	21	15	19
Forestry	2	2	1	1	1

5.9. Faculty Contribution

The members of the different faculties are constantly in touch with the farming community to solve the problems associated with agriculture and allied fields. The services of the various faculty members are regularly made available to Govt., Cooperative, Public and private sector undertakings for solving their problems related to agriculture.

Publications

The teachers and research workers of the University are regularly publishing their research findings in National and International journals. Faculty members are also participating in various national, international symposia/seminars to present their findings. Several books and publications are also brought out by the teachers and scientists of the University. The number of research articles and books published by the faculty members are given in the Table 5.7

Table 5.7 Publication during the last five years

Faculty/ College	Research Papers	Popular Articles	Bulletins	Radio/ Doordharsan
COA, Vellayani	129	251	42	119
COH,Vellanikkara	348	416	61	160
COA, Padanakkad	30	16	2	16
COF,Vellanikkara	223	64	56	10
CCB&M,Vellanikkara	34	440	26	12
KCAET, Tavanur	25	12	18	8

Awards/ Recognitions : College of forestry

College Level	University Level	National Level	International Level
13	7	5	1

The staff of COA, Vellayani, COH, Vellanikkara and COA, Padannakkad conduct regular plant disease diagnosis clinics comprising of the members of the different disciplines to identify and chalk out remedial measures for problems related to pests, diseases, deficiencies of soil and atmospheric pollution. There is a call centre at the College of Agriculture working for 24 x 7 x 365 hours, for the service of the farmers. The University plans to expand such activities.

The Head of Department of Plant Pathology is the designated officer to inspect the imported plants kept under quarantine establishment so as to restrict the introduction of new pests and microbes into India from abroad.

The Agro meteorological advisory service is operating in COA, Vellayani and COH, Vellanikkara. The Centre on a weekly basis gives regular forecasting of weather and its influence on yield, pests and diseases status of crops. The Agrl. Economics department of the COH has developed a computer model for forecasting the prices of important crops of Kerala. This forecast helps the farmers in selection of crops to be grown and scheduling their management.

5.10 Faculty Assessment

A system of evaluation of teachers by the students were introduced, for assessing the teaching performance of faculty members in the courses offered by them. For the purpose of promotions, assessment of teachers are done based on the guidelines issued under UGC package.

5.11 Recognition and Award System

The University has provided for granting advance increment, grade promotions, good service entry awards, certificate of merit, citations at General Council meeting/ EC/ AC meetings and best teacher / scientist/ extension worker award, for motivating the employees.

Award of Doctor of Science (*Honoris causa*)

The University has awarded the degree of Doctor of Science (*Honoris causa*) on the following eminent persons for their outstanding contribution to the field of agriculture.

Plate 3. Awards received by the University (a)

Performance Award of ICAR:

- For six years (2006, 2007 , 2008, 2009, 2010, 2011), with continues five first Prizes



"Sardar Patel Outstanding Institution Award of the ICAR" during 2004



- Sri. N. Kaleeswaran, I.A.S., Vice-Chancellor, K.A.U.
- Prof. M.S. Swaminathan, Director General of ICAR & Secretary, DARE
- Dr. Salim Ali, Ornithologist
- Dr. V. Kurien, Chairman, Institute of Rural Management, Anand.
- Dr. K.N. Raj, Economist

5.12 Employee grievance redressal procedure and Welfare Schemes

Employees' grievances and redressal through the normal administrative hierarchy with the Vice-Chancellor acting as an appellate authority is functioning in the University. Grievance cells have also been instituted for this purpose. Besides, the Establishment Committee and the Executive Committee are also empowered to rectify the employees' grievances. Periodic meetings involving officers of the University, members of the Executive Committee and representatives of service/labourers/students' organisations are held to facilitate timely redressal of grievances.

The University has got a permanent Women's Complaint Committee. The Committee attends to all the complaints of the women employees and girl students, pertaining to harassment and necessary action is promptly taken.

Numerous Welfare Schemes are in operation in the KAU for the benefit of employees and their dependants. Housing loans, vehicle loan, festival advance, family benefit scheme, family welfare scheme, group insurance scheme, reimbursement of medical expenses, GPF, outstation allowance, hill tract allowance, dying in harness scheme, soft loans for purchase of computers, interest free medical advance, loans for marriage of the daughters of Class IV employees and permanent labourers, University school, University hospital, staff clubs, canteen service, Co-operative Societies, residential quarters, sports facilities, photocopy centres, computer center, and sales counter are but a few among these. The comprehensive health insurance scheme proposed to be implemented in KAU shortly will be yet another measure aimed at employees' welfare.

5.13. Adoption of ICAR Norms

Partially adopted

6. STUDENT DEVELOPMENT

6.1 Quality of Student intake

6.1.1 Under graduate courses

At the time of formation of the University, students were admitted to the under graduate and post graduate programmes based on the marks in their qualifying examinations. In 1981 Kerala Government rationalized the process of admission to the various under graduate professional degree programmes. Since then, admission to the under graduate courses of the KAU is based on the Common Entrance Test conducted by the Commissioner of Entrance Examinations (CEE), Government of Kerala. The entrance examination for B.Sc. (Ag) and B.Sc. (Forestry) consists of two papers, one in Physics and Chemistry and the other in Biology. To appear for the examination, the candidates should have passed Plus Two or recognized equivalent examination with minimum 50% marks in Biology separately and 50 % marks in Physics, Chemistry and Biology put together. The SC/ST candidates need only a pass in the qualifying examination. For candidates appearing for B.Sc. (Forestry), certain minimum physical standards are also prescribed.

The entrance examination for B.Tech. (Agrl. Engg.) and B. Tech. (Food Engineering) consists of two papers, one in Physics and Chemistry and the other in Mathematics. To appear for the examination, the candidates should have passed Plus Two or recognized equivalent examination with minimum 50% marks in Mathematics separately and 50% marks in Physics, Chemistry and Mathematics put together. The SC/ST candidates need only a pass in the qualifying examination.

The admission to B.Sc. (C&B) course is based on merit/marks in qualifying examination. The qualification is that candidates should have passed Plus Two or recognized equivalent examination with minimum 50% marks in optional subjects taken together. The SC/ST candidates need only a pass in the qualifying examination.

6.1.2 Masters Degree

Minimum eligibility for admission is Bachelors Degree in the respective subject/ equivalent degree recognised by Kerala Agricultural University with an OGPA of 7.0/10.00 or 2.25/4.0 or equivalent percentage of marks or an aggregate of 50 % in traditional system. For SC/ST candidates, a pass in qualifying examination is enough. For graduates of Kerala

Agricultural University, under UG regulation 2007, the minimum OGPA required is 6.0/10 for general category and 5.5/10 for SC/ST category.

Eligibility for M.Sc. (Forestry) is basic degree in Forestry/Agriculture/ Horticulture/ B.V.Sc. & A.H. (for Wildlife Science only) or equivalent with an OGPA of 7.0/10.00 or 2.25/4.0 or equivalent percentage of marks or an aggregate of 50 % in traditional system. For SC/ST candidates the minimum requirement is a pass in the qualifying exam. For graduates of Kerala Agricultural University, under UG regulation 2007, the minimum OGPA required is 6.0/10 for general category and 5.5/10 for SC/ST category. Degree holders with higher grade certificate from Ranger's College or with Diploma in Forestry from State Forest College/ Indian Forest College, Dehra Dun are also eligible.

Eligibility for MBA in Agri-Business Management is all Professional graduates of SAUs / Deemed Universities under ICAR system with a minimum OGPA of 7.5/ 10.0 (7.0 for SC/ST candidates). All graduates, Professional graduates from Indian/ Foreign Universities recognized by AICTE/ UGC with a minimum 55% marks in traditional system (5% concession to SC/ST candidates). For SC / ST 6.5/10 or a pass in qualifying exam. For graduates of Kerala Agricultural University under UG Regulation 2007, the minimum OGPA is 6.0/10 for General Category and 5.5/10 for SC / ST category.

Admission to M.Sc. courses is made based on mark/ OGPA at degree level, marks of entrance examination conducted by the KAU

6.1.3 Ph.D. Programme

The selection of candidates for the Ph.D. programme is made based on overall assessment of merits of the candidates by the selection committee constituted for the purpose as detailed below:

- Academic merit based on the marks obtained for the masters degree programme: 40%
- Teaching / research / extension-experience : 15%
- Published papers / meritorious teaching/research/extension work: 15%
- Project proposal : 10%

The remaining 20 percent weightage is ofr the performance of the candidate in a personal interview conducted by a Committee of Hed of Departments and the Dean of the concerned Faculty who is the Chairman of the Committee.

6.1.4 Intake capacity

The Academic Council of the University fixes the intake capacity for the different courses every year. For UG programmes, 15 per cent seats are also reserved for successful candidates from Entrance Examination conducted by ICAR. For PG programmes 25% seats are reserved for ICAR candidates. As per this quota stipulated, several students from other States are currently pursuing their studies for UG and PG programmes. Foreign nationals recommended by the Government of India, Department of Agricultural Research Education or Indian Council of Cultural Relations are also admitted to UG and PG programmes.

6.2 Profile of Students' body including their domicile status

Domicile status of the students admitted to the faculties of Agriculture and Agricultural Engineering are furnished in tables 6.1 and 6.2.

Table 6.1 Composition of students in the Faculty of Agriculture (2011-2012)

Students from	COA Vellayani	COH Vellanikkara	COA Padannakkad	COF Vellanikkara	CCBM Vellanikkara
Within the State	90	59	42	30	40
UG	41	39	1	18	32
PG					
Other State					
UG	10	-	8	-	0
PG	15	17	-	-	2
Foreign					
UG	-	1	-	-	0
PG	-	4	-	-	2

Table 6.2 Composition of students in the Faculty of Agrl. Engineering (2011- 12)

Students from	KCAET, Tavanur
Within the State	
UG	55
PG	0
Outside States	
UG	1
PG	0

Foreign	
UG	-
PG	-
Total	
UG	55
PG	1

Annual intake of students in the different faculties has increased over the period of time. This is largely because of the popularity of the different courses in agriculture and due to the consequent increase in the number of colleges under the University. In 1972, there were only three degree/diploma programmes in Agriculture / Veterinary which increased to 23 during 2011.

The number of students admitted for the different graduate programmes when the colleges was formed and during the current year are given in the Table 6.3

Table 6.3 The number of students admitted for the different courses at the time of inception and during the current year.

Degree	Number of students admitted during			
	1955	1972	2000	2011
B.Sc. (Ag.)	40	50	125	211
B.Sc. (Hort.)	-	20	-	-
B.Sc. (C&B)	-	-	18	40
B.Tech. (Ag. Engg.)	-	-	43	39
B.Tech. (Food Engg.)			-	17
B.Sc. (Forestry)	-	-	14	30
M.Sc. (Ag.)	-	-	36	56
M.Sc. (Hort.)	-	-	27	28
M.Sc. (Ag.Stat.)	-	-	1	-
M.Sc. (FS & N)	-	-	3	7
M.Sc. (Forestry)	-	-	7	13
M.Sc. (C&B)	-	-	3	-
MBA (Agribusiness Management)	-	-	-	40
M.Tech. (Ag. Engg.)	-	-	1	-
M.Sc (Integrated) Biotechnology	-	-	-	20

M.Sc (Integrated) Climate Change Adaptation	-	-	-	20
Ph.D. – Agriculture	-	-	24	16
Ph. D. – Horticulture	-	-	-	0
Ph.D. – Home Science	-	-	4	2
Ph.D. – Forestry	-	-	-	5
Ph.D. – C & B	-	-	1	-
Diploma Programme			0	-
Diploma in Agriculture	-	-	-	50
PG Diploma in Solid Waste Management			-	4
Total	40	70	307	598

Table 6.4 Students graduated from KAU during the last 10 years

Degrees	'02	'03	'04	'05	'06	'07	'08	'09	'10	2011
Faculty of Agriculture:										
UG Programme										
B.Sc. (Ag)	163	178	173	127	67	129	106	135	113	125
B.Sc. (Forestry)	11	17	16	11	11	17	16	11	11	17
B.Sc. (C&B)	26	31	30	14	25	32	34	34	29	28
Total										
PG Programme										
M.Sc. (Ag)	58	57	48	39	44	49	30	21	18	49
M.Sc. (Hort)	20	17	16	17	18	7	9	4	5	18
M.Sc. (FS&N)	15	11	5	7	7	4	11	4	4	10
M.Sc. (Forestry)	2	3	2	2	2	2	2	3	3	3
M.Sc. (C&B)	2	3	2	2	5	1	4	2	2	-
M.Sc. (Ag. Stat.)	3	1	-	-	1	1	-	2	-	-
Total										
Ph. D. Programme										
Ph.D. (Agriculture)	22	23	18	19	9	15	5	6	9	8
Ph.D.(Horticulture)	2	6	7	9	9	2	2	4	-	3
Ph. D. (FS & N)	-	1	-	3	1	-	1	1	1	-
Total										

Faculty of Agricultural Engineering:										
B. Tech. (Ag. Engg.)	3	23	26	40	38	39	32	41	43	39
B.Tech (Food Engg.)										
M.Tech.	-	1	2	-	2	-	-	2	1	-
MBA (ABM)	-	-	-	-	-	-	-	2	30	27

6.3. Programme-wise and College-wise students intake, attrition and retention

The problem of students dropping out of courses is not a serious one in the KAU. However, the students admitted to a course continue to try for admission to other preferred courses. Those who get admission for the preferred course during subsequent years may shift from one course to the other. For postgraduate courses, the problem of students dropping out is very rare. The attrition and retention data of the students are given in Tables 6.5 to 6.9.

Table 6.5 Attrition and retention data of the students registered during 2005, 2006 & 2007 in the Faculty of Agriculture, graduated during 2009-2010 and 2011 respectively

Details of Bachelor Programme*	COA		COH		COA		COF		CCBM	
	Vellayani		Vellanikkara		Padannakkad		Vellanikkara		Vellanikkara	
	M	F	M	F	M	F	M	F	M	F
2005-2009										
Students admitted	15	44	12	40	3	21	9	3	5	36
Dropped out								1	5	7
Appeared for final exam during 2009	15	44	12	40	3	21	9	2	5	33
Failed to appear for examination				1	-	2	-	-	-	-
Passed	15	44	12	39	3	19	9	2	5	29
2006-2010										
Students admitted	12	25	10	33	5	15	10	2	6	39
Dropped out				1	-	1	0	1	0	6
Appeared for final exam during 2010	12	25	10	32	5	14	10	1	3	26

Failed to appear for examination							0	0	3	7
Passed	12	25	10	32	5	14	10	1	3	26
2007-2011										
Students admitted	11	43	9	44	4	16	9	8	1	42
Dropped out									1	2
Appeared for final exam during 2011	11	43	8	43	4	16	9	8		
Failed to appear for examination			1	1	-	-	0	0		
Passed	11	43	8	43	4	16	9	8	4	24

* Students admitted during 2005, 2006 and 2007 appeared for the final examination during 2009, 2010 and 2011 respectively.

Table 6.6 Attrition and retention data of students registered during 2005, 2006 and 2007 in the Faculty of Agricultural Engineering and graduated during 2009, 2010 and 2011 respectively

Details of Bachelors programmes*	Agrl. Engg.	
	KCAET Tavanur	
	M	F
2005-2009		
Students admitted	12	28
Dropped out	0	0
Appeared for final exam during 2009	12	28
Failed to appear for examination	0	0
Passed	12	28
2006-2010		
Students admitted	16	22
Dropped out	0	0
Appeared for final exam during 2010	16	22
Failed to appear for examination	0	0
Passed	15	22
2007-2011		
Students admitted	10	29
Dropped out	0	0

Appeared for final exam during 2011	10	29
Failed to appear for examination	0	0
Passed	8	25

* Students admitted during 2005, 2006, and 2007 appeared for the final examination during 2009, 2010 and 2011 respectively.

Table 6.7 Attrition and retention of the M.Sc. students registered during 2005, 2006, 2007, 2008 and 2009 in the Faculty of Agriculture and graduated during 2007, 2008, 2009, 2010 and 2011 respectively

M.Sc.	Faculty of Agriculture							
	COA Vellayani		COH Vellanikkara		COF Vellanikkara		CCBM Vellanikkara	
	M	F	M	F	M	F	M	F
2005-2007								
Students admitted	5	15	9	32	2	1	1	1
Dropped out		2	2	6	0	0		
Appeared for final exam (2005 Admn.)	5	13	7	26	2	0	1	1
Failed to appear for examination	0	0	0	0	0	0	0	0
Passed	5	13	7	26	2	1	1	1
2006-2008								
Students admitted	4	12	9	20	2	0	2	2
Dropped out		4	0	2			1	1
Appeared for final exam (2006 Admn.)	4	8	9	18	2	0	1	1
Failed to appear for examination	0	0	0	0	0	0	0	0
Passed	4	8	9	18	2	0	1	1
2007-2009								
Students admitted	3	6	5	13	2	2	2	3
Dropped out	1		1	0	0	1	1	2
Appeared for final exam (2007 Admn.)	2	6	4	13	2	1	1	1

Failed to appear for examination	0	0	0	0	0	0	0	0
Passed	2	6	4	13	2	1	1	1
2008-2010								
Students admitted	5	11	9	10	3	0	0	0
Dropped out	4		1	1				
Appeared for final exam	1	11	7	8	3	0	1	1
Failed to appear for examination			1	1				
Passed	1	11	7	8	3	0	1	1
2009-2011								
Students admitted	5	31	13	36	2	1	0	0
Dropped out		3		2	0	0		
Appeared for final exam	5	28	12	32	2	1		
Failed to appear for examination			1	2			0	0
Passed	5	28	12	32	2	1	0	0

*Students admitted during 2005, 2006, 2007, 2008 and 2009 appeared for the final examination during 2007,2008,2009, 2010 and 2011 respectively.

Table 6.8 Attrition and retention data of the M.Sc. students registered during 2007, 2008 and 2009* in the faculty of Agrl. Engineering and graduated during 2009, 2010 and 2011 respectively

M.Tech.	Faculty of Engineering	
	KCAET, Tavanur	
	M	F
2007-2009		
Students admitted	0	0
Dropped out	0	0
Appeared for final exam (2007 Admn.)	0	0
Failed to appear for examination	0	0
Passed	0	0
2008-2010		
Students admitted	0	0
Dropped out	0	0

Appeared for final exam (2008 Admn.)	0	0
Failed to appear for examination	0	0
Passed	0	0
2009-2011		
Students admitted	2	0
Dropped out	1	0
Appeared for final exam (2009 Admn.)	1	0
Failed to appear for examination	0	0
Passed	1	0

* Students admitted during 2007, 2008 and 2009 for Masters' Degree programme appeared for final examination during 2009, 2010 and 2011 respectively

Table 6.9 Attrition and retention data for Ph.D students registered during 2006, 2007 and 2008 ** in the Faculty of Agriculture and graduated during 2009, 2010 and 2011 respectively

Ph.D.	Faculty of Agriculture					
	COA Vellayani		COH Vellanikkara		CCBM * Vellanikkara	
	M	F	M	F	M	M
2006-2009						
Students admitted	1	8	4	6	-	-
Dropped out		1	0	1	-	-
Appeared for final exam	1	7	4	5	-	-
Failed to appear for examination					-	-
Passed	1	7	4	5	-	-
2007-2010						
Students admitted	0	7	1	0	-	-
Dropped out	0	1	1	0	-	-
Appeared for final exam	0	3	0	0	-	-
Failed to appear for examination		3			-	-
Passed	0	3	0	0	-	-
2008-2011						
Students admitted	0	2	1	2	-	-
Dropped out	0	1	0	1	-	-
Appeared for final exam	0	1	1	0	-	-
Failed to appear				1	-	-

Passed	0	1	1	0	-	-
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* In other colleges, there was no Ph. D programme during the period.

** Ph.D students admitted during 2006, 2007 and 2008 appeared for final examination during 2009, 2010 and 2011.

6.4. Students Counselling and Placement

Student counselling units exist in all the colleges. One faculty member is nominated as Officer i/c of the College Counselling Unit.

Whenever an agency contacts the University, the Deans/ Associate Deans of the colleges makes arrangements for campus selection. Recently, placements to various banks were arranged at the College level. The placement details are included in the self study report of the colleges. Several private organizations and industries are approaching the University for conducting campus recruitment. However, unofficially, many of them prefer boys, 75% students being girls we are not in a position to meet their demand.

At the University level a placement cell is functioning with the Registrar as Chairman.

An Employment, Information and Guidance Bureau of Government of Kerala is functioning in KAU Campus. The Bureau regularly publishes employment bulletins giving details about job opportunities in India and abroad.

6.5. Co-Curricular Activities

Ample opportunities are being provided to the students for co-curricular programmes such as NSS and NCC. To promote the participation of the students in extra and co-curricular activities, a Directorate of Students Welfare (DSW) has been functioning with the Director Students Welfare as its head, with the following functions and responsibilities:

- Promoting sports and games among students
- Promoting the extra-curricular activities such as arts, literary etc. connected with youth affairs
- University Youth Festival and inter-collegiate sports and games
- Preparation and presentation of students in the Inter University Youth Festival and sports and games

- Presentation of students in various State as well as National essay, elocution and other competitions
- Guidance for the various Students' Union activities
- Guidance in employment and career development
- Guidance in competitive examinations

Director of Students Welfare and a student representative act as members in the State Sports Council.

To encourage students to participate in extracurricular activities, the University has taken the following measures:

- Inclusion of Physical Education in the curriculum
- Students' Insurance: University has implemented Students Insurance Scheme such as personal accident and Jan Arogya (Hospitalization) insurance scheme from 1999 onwards and many students are enjoying the benefits.

Induction and orientation programme for the new admission: Every year orientation programmes are arranged for freshers.

Table 6.10 Facilities provided for co-curricular activities

College	Sports & Games	Facilities	Floor space	Playground	Equipment
COA Vellayani	Athletics, Football, Hockey, Basketball, Volleyball, Badminton and Gymnasium	200x150 Open stadium with a 400 track. Well built Indoor Stadium with flood light 80x50M with 5 tier Gallery	200x150M 80x50M	Track, Football field and turf Cricket Basketball 2; Volleyball 2; Badminton 2 with all equipments	Well equipped
Main Campus facilities are shared by COH, COF and CCBM	Athletics, Football and Cricket Basketball, Volleyball and Ball Badminton	Open ground Open ground	200x100M 50x50M	200M track and Football ground Basketball 2; Volleyball 2; Ball Badminton 2 Nos.	With necessary attachments 12 station multigym

COA Padannakkad	Athletics, Football, Basketball; Volleyball; Badminton and Gymnasium	Outdoor	200M Track	Track – Football field Basketball 1; Concrete	With necessary equipments
		Outdoor	100x50M	Volleyball 2; Badminton 2	
		Indoor	30x30M	Gymnasium with multigym10 stations	
KCAET, Tavanur	Athletics, Football, and Cricket Basketball; Volleyball; and Badminton	Open Space	200x 150M	200 M Athletic track 1 No. Cricket pitch 1	With all necessary facilities
		Open court	80x 50M	Football Ground 1 No. Basketball 1; Volleyball 2	
		Indoor	40x 30M	Indoor court 1	

6.5.1 NCC

Kerala R&V Sqn. NCC is functioning in the College of Veterinary and Animal Sciences. The students from the Colleges of Co-operation & Banking and Forestry are enrolled in NCC.

6.5.2 N.S.S.

The overall aim of NSS is to give an extension dimension to the higher education system and orient the student youth to community service while they are studying in educational institution. It is necessary to arouse the social conscience of the students and to provide them opportunity to work with the people in the villages and to expose them to realities of life and bring about a change in their social perception. With these objectives, NSS programme is organised in all the College of the University.

Every College of the University has a NSS Unit. Majority of the students of the constituent colleges are members of NSS. Director of Extension is the Chief Co-ordinator of this programme. Every College has one or more programme officers to supervise the NSS activities. Several social service activities such as medical camp, eye care camp, blood donation campaign, laying out of kitchen gardens and roads in socially backward areas, cleaning of hospital premises etc. are organised by NSS Units. The other activities of the Unit

include organizing workshops on subjects of topical interest, vaccination camps, charitable relief work, anti-rabbis camp, pulse polio immunization programmes, exhibition, etc.

A ten-day field camp is organised every year for the members of NSS. During this period, they live in villages and work for the development of the village, on a specific theme.

6.6. Follow-up Services for Alumni

Alumni Associations are functioning in the individual colleges and at the University level. This provides an effective forum for getting information of the alumni after graduation. Majority of the alumni are employed in the State Departments of Agriculture, Veterinary, Co-operation, Forestry, Fisheries, Soil Survey Departments and the KAU. Now most of the top positions in these departments are occupied by Alumni of the University. Alumni of the University are also occupying prestigious positions in various SAUs, ICAR, IVRI, National Institutes, Land Boards, Banks, plantation sectors, agribusiness houses and industries. Recently many of the graduates and postgraduates have started to branch off to non-agricultural fields like IT, film production, advertising and management. Some of the students are entering the All India Civil Services like IAS; IPS, IFS, IRS etc. Many of the students of the University have migrated to USA, UK, Canada, Brazil, and Australia and are occupying important positions. A website is being maintained by the Alumni of the colleges.

6.7. Students' Achievements in Academic, Co-Curricular and other fields

Performance of the students of the University in the JRF/SRF examinations is commendable. A large number of our students get admission in IARI/IVRI/ IIM and other prestigious institutions in India and abroad. Trainings by the faculty to orient the students for the competitive examinations help the students very much in this achievement. Twenty eight students of COF have joined Civil services. This includes an all India third rank in Civil service examination and First rank in IFS examination.

The performance award of ICAR for achieving the highest number of JRF is won by KAU during 2006, 2007, 2008, 2009, 2010 and 2011.

Table 6.11 Alumni of the University entering Civil Services, Agricultural Research Service and qualifying in National Level Eligibility and fellowship Test

Particulars	Agriculture					Ag. Engg.
	COA Vellayani	COH Vellanikara	COA Padanakkad	COF, Vellanikkara	CCB & M, Vellanikkara	KCAET Tavanur
2007						
Civil service	0	0	0	2	0	0
ARS/Net	0	0	0	0	0	0
SRF	0	0	0	1	0	0
JRF	0	8	4	2	0	1
GATE	0	0	0	0	0	6
2008						
Civil ser.	0	0	0	4	0	0
ARS/Net	16	0	0	0	0	0
SRF	0	0	0	0	0	1
JRF	7	20	9	1	0	0
GATE	0	0	0	0	0	5
2009						
Civil ser.	1	0	0	6	0	0
ARS/Net	14	0	0	0	0	0
SRF	0	0	0	0	0	0
JRF	4	17	7	2	0	1
GATE	0	0	0	0	0	3
2010						
Civil ser	1	0	0	3	0	0
ARS/Net	6	0	0	0	0	0
SRF	0	0	0	0	0	0
JRF	1	16	4	2	0	2
GATE	0	0	0	0	0	9
2011						
Civil ser.	2	0	0	4	0	0
ARS/Net	3	0	0	0	0	0
SRF	1	0	0	2	0	0
JRF	2	7	6	2	0	2
GATE	0	0	0	0	0	5

Awards received by the University (b)

National Award for Biotech

Research: Biotech Product & Process
Development and Commercialization Award for the
year 2003



BEST KVK AWARD OF ICAR (2010)



2012						
Civil ser	1	0	0	0	0	0
ARS/Net	4	0	0	0	2	0
SRF	2	0	0	2	0	0
JRF	1	7	4	0	13	4
GATE	0	0	0	0	0	4

- The students are actively involved in the following Co-curricular activities at College level and University level arts and sports festivals
- Activities of different clubs for the students – Arts Club, Planning Forum, Sports Club, Photography Club, Nature Club, Film Club, Computer Club and Quiz Club
- State and National Level sports and cultural events
- Publication of College Magazines

7. LIBRARY AND OTHER LEARNING RESOURCES

7.1. Library Space with list of Holdings

As a consequence of the rapid development taking place in science and technology there is a virtual information explosion the world over. For achieving optimal utilization of these developments, it is essential that the agricultural scientist have access to information at local, national and international level. Efficient library and information systems are very crucial for research and development. Six constituent colleges, six RARs and 16 research stations have separate libraries. All the libraries have required minimum infrastructure like buildings, equipments and collections of print and non-print documents. Various departments of the colleges are served by libraries having small collections of books on the subjects specific to those departments. RARs and Research Stations are served by libraries with collections on subjects specific to the agro-climatic region and projects managed by them.

Table 7.1 Libraries attached to different Colleges and list of holdings

	Books	Periodicals				Electronic
		Indian	Foreign	Bound Volume	Thesis	
Faculty of Agriculture						
COA Vellayani	27215	42	3000 Accessible through CERA	5062	1503	CAB abstract online
COH Vellanikkara	47000	89	3000 Accessible through CERA		1445	CAB abstract online
COA Padannakkad	8353	35	3000 Accessible through CERA			CAB abstract online
COF Vellanikkara	5645	40	3000 Accessible through CERA	185	305	CAB abstract online
CCBM Vellanikkara	15013	27	3000 Accessible through CERA		816	CAB abstract online
Faculty of Engineering						
KCAET Tavanur	23617		3000 Accessible through CERA	445	232	CAB abstract online

7.1.1 KAU Central Library

The Central Library is located in the main campus of the University. The three - storey building has a total plinth area of 4000 sq.m with adequate furniture and equipments of international standards suitable for advanced library and information services. The library has acquired all basic Hardware & Software Systems essential for modern library and Information Services. The total collection of the library is about 41,000 which includes books, Theses and bound Volumes. The collection also contains CD ROMs and DVD films on Environment and climate change. SOUL Software for University Libraries of INFLIBNET of UGC is adopted for total library operations and services.

Document Resources

The central library has databases in CD ROMs on different discipline which includes:

CAB Abstracts from the year 1972 – 2009

Tree CD from the year 1939 to 2004

Beast CD from the year 1973 to 2004

LISA CD 1969 – 2005

Biotechnology Abstract 1982 – 2002

EconLit1969- 2005

Food and Human Nutrition 1975 – 2005

Table 7.2 Particulars of books and journals in the Central Library

Sl.No.	Items	Nos.
1	Books	28848
2	e-journals	Around 3000 (accessible through cera)
3	Indian Journals	32
4	Bound Volume of Journals	7069
5	Theses	3136
6	e-books	Around 700
7	Databases in CD ROM	7

7.1.2 DISC from Department of Biotechnology

Department of Biotechnology, Govt. of India supported KAU in 1995 by providing a Bio-informatics Centre (Distribution Information Sub Centre) under Biotechnology

Information System for harnessing the scientific knowledge in various interdisciplinary areas of Biotechnology and its dissemination to the scientists.

7.1.3 Tie up with IDRC

International Development Research Centre (IDRC) Ottawa has developed electronic library containing information on development research on all over the world supported by World Bank, FAO and other international organisations. IDRC has given this database to KAU library and agreed to update it continuously under a resource-sharing programme.

7.1.4 CAB services

Centre for Agriculture and Biosciences International (CABI) which contains database on agriculture and allied subjects covering the periods from 1973 to present consisting of 3.0 million records is available at the Electronic Library Division of KAU.

7.1.5 Information and Library Network Programme (INFLIBNET)

Information and Library Network programme of the University Grants Commission (UGC) has signed a MOU with KAU and has already provided the system configuration, specification and technical assistants and software standard for automating KAU Library and information system. The details of libraries attached to different Colleges are given in Table 7.2

All libraries under KAU has computerized using SOUL software developed by INFLIBNET. The Library also offers OPAC (Online Public Access Catalogue) of the databases. Facility for Internet to users for their literature search and e-mail purpose is also available. All the libraries are offering reprographic services at a subsidized rate.

7.2. Photocopying Facilities

Central Library provides reprographic services at nominal rate to beneficiaries without violating any copyright rules.

7.3. Availability of Computers and Access to Internet

The following e-resources are provided to the users of the library through online. All the colleges under KAU can access these facilities from their own institution.

e-journals

Cera (Consortium for e-resources in Agriculture) provided by NAIP (National Agricultural Innovation Project), IARI as lead institute and around 3000 journals both indian and foreign are available through it. The major scientific journal publishers like Elsevier, Springer, Taylor and Francis, Annual Reviews and indian journals.com are available through Cera.

CAB Abstracts

CAB Abstracts 1972+ (online) has been subscribed for the year 2012-13 and it is accessible to all colleges under KAU. CAB abstracts give researchers instant access to over 6.3 million records from 1973 onwards. Its coverage of the applied life sciences includes agriculture, environment, veterinary sciences, applied economics, food science and nutrition. With publications from over 116 countries in 50 languages, including English abstracts for most articles. The scientists and researchers get the fullest global picture for any subject using this database.

e-Books

Central Library has been subscribed CABI e-books for the year 2012-13. CABI (Centre for Agriculture and Biosciences International) is providing information of scientific expertise to solve problems in agriculture and the environment through their publications. CABI has started to publish their books as e-books. Teachers and students of all colleges under Kerala Agricultural University can access around 700 CABI e- books subscribed by Central Library from their own institution and more over the same book can refer by different people at a time and they can keep the copy of the books as their own by downloading the same.

Indiastat e - year book - 2012

Central Library procured Indiastat e-year book 2012 and user can access to www.Indiastat.com for one year. www.indiastat.com is a gateway to comprehensive and authentic socio-economic statistical data about India and its states. Our Researchers, students, Scientists and faculties can easily access the data covering all major parameters for research study, review and reference purpose. Indiastat.com has 50 associate sites which include 19 sector specific and 31 India/State/UTs specific sites.

Krishiprabha

Ph.D Theses submitted to KAU from the year 2000 onwards can access full text through Krishiprabha.

KrishiPrabha is a full-text electronic database of Indian Agricultural Doctoral Dissertations submitted by research scholars to the 45 State/Deemed Agricultural Universities from 1.1.2000.

All these resources can access to all colleges under KAU through the Central library website www.kaucentrallibrary.org.

7.4. Library borrowing including electronic borrowing arrangement with other institutions

Library circulation section has been automated using Software for University Libraries (SOUL). Barcode Technology is using for speedy transaction. Requested Articles will be collected from different libraries by the library staff and forwarded to teachers/ scientists through e-mail.

7.5 Audio-visual and Multimedia Support

Library has a good collection of audio-visual materials either in the form of CD s or DVDs. Central library procured some of the films on Climate Change, Ocean and marine life, alternative energy sources and Sanitation, twenty films on water, climate, Tsunami, Sustainable Energy and Environment and earth report films that analyse a wide array of issues closely related to global warming and its impact on every aspect of life. These DVDs cover issues like CO₂, Carbon-neutral biogas, dry toilets, and the impending threat to fish stocks, pollution, energy and a lot more. These films explain in simple terms how all these happenings affect our nature.

All the colleges of the University have facilities for Power point projections. Most of the undergraduate class rooms are modernized. Smart class rooms are also present in some of the colleges.

Table 7.3 A.V. Support available in the Colleges

AV Media	COA	COH	COAP	COF	CCB M	KCAET
Television	3	3	1	-	1	2
Multimedia projector	5	5	5	5	2	2

Plate 4 Audio-Visual Multimedia Support

Video Conferencing



7.6. Library Timings and Usages

Central Library of Kerala Agricultural University functions from 10 am to 6 pm. on all working days. The library is used by UG, PG, Ph.D. students, faculty members and other staff members. The library facilities are made available to Scientist from other institutions.

7.7. Other Learning Centres like Class rooms, Laboratories, Instructional Farms etc.

Central library have a well equipped INFOLAB for the access to e-resources. In addition to this central library has a seminar hall and exhibition room.

Separately given under (8) Physical facilities

7.8. Any Other Unique Instructional Material / Technique Adopted

The Agricultural Research Information System (ARIS) has been implemented in the KAU with the full assistance of the ICAR as part of the ICAR nation-wide network programme for building up a National Agricultural Information System Network. Local Area Networks were set up in the Main Campus, College campuses and the Zonal Research Stations (ZARs). ARIS computer rooms have been set up at the colleges and are maintained as central facilities. The KAU WAN was also established under ARIS. Two VSATs were procured for the Vellayani and Mannuthy campuses, which have now become obsolete and been replaced with better facilities.

The entire Main Campus has been fully networked. This network comprises three colleges, the Central Library, Administration Headquarters, the IT-BT building, ACCER, Central Auditorium, student hostels, international hostel, faculty residences, nursery and other buildings in the campus. This extends over a length of more than four km across. The entire backbone is fiber optic cabling with building LANs running on copper cabling and wireless. All the classrooms are networked and have data projections facilities. Multimedia facilities are used extensively in classroom instruction. Wireless Internet is available in all the hostels and some of the classrooms in the Main Campus. Internet is available round-the-clock over the entire network freely. This is in line with the Govt. of India policy of making available free Internet to faculty and students for quality enhancement in higher education.

7.9. Adoption of ICAR Norms

In the Colleges, all the departments, college library, seminar hall, audio-visual room, college office and the students' computer facility are linked through the College LANs. Internet is available to all the faculty and students in their own departments. Community printing has been implemented over the network thus reducing printer duplication to a great deal. File sharing over the network is used to transfer files among users. The free and increased availability of Internet has helped the students get admissions and fellowships in overseas universities/institutes.

The Library resources from CERA and other agencies are made available to the faculty and students through the networks. The quality and quantity of information and knowledge availability has tremendously increased as a result of this.

Software Platform

Microsoft Office is the approved office suite of the KAU. Following the ICAR policy of using only licensed software and discouraging the use of pirated software, software is procured from Microsoft Corporation, under Campus Agreement licensing scheme.

System security is implemented at both hardware and software levels. Campus networks are equipped with content and virus filtering gateways. In keeping with the directives of the ICAR, the computers in the Main Campus all college campuses are protected against malware attacks through a managed installation of corporate desktop antivirus solution. We have evolved a unique security enhanced software installation pack for the programmes normally required by our users, which makes a one-click installation of the entire softwares possible. Suitable techniques are included in the package to increase the security of the system. This software distribution is periodically updated to include the latest patches and updates and distributed to all the KAU institutions.

We have adopted Free and Open Source Software (FOSS) software to a large extent. Our standard software pack contains a large number of applications which are FOSS equivalents of commercial products. All our campus gateway servers, firewalls and Internet distribution servers are Linux devices. Our messaging system runs of FOSS.

The KAU Website

The website of the Kerala Agricultural University with the URL <http://www.kau.edu> was launched by Dr. R.S. Paroda, the then Director General of ICAR on 2nd February 2001. This site is a storehouse of information in agricultural sciences and will be useful in one way or other to the scientists, farmers, students, academics, extension workers, policy makers, administrators, industrialists etc.

The site is organized with a home page linked to six lead pages namely Institution, Education, Research, Extension, News & Events and Contact Us, each of which in turn is linked to an array of inter-linked sub-pages. This site was designed and created exclusively in-house using the data provided by the various Heads of Institutions. The site is kept regularly updated. Since its inception, it has received around 12 lakhs hits over a period of 11 years.

Computer Literacy

The percentage of individuals with computer literacy, access to Internet, E_mail IDs and personal home pages on the Web can be taken as a rightful index of the penetration of IT in a society. But due to the highly capital intensive nature of IT, these facilities can be provided to all individuals only through common access points.

With this vision, the ICAR has helped the SAUs build up good infrastructure in the Colleges/ZARSS by way of ARIS Computer Centers under ARIS/NATP. These Centers are being maintained as common facilities accessible to everybody irrespective of staff or student. These facilities are managed and maintained through semi-official channels by adopting the time-tested method of participatory approach of the beneficiaries involved, by constituting Computer Clubs in the Colleges. These Clubs are run as purely self-sustaining on a non-commercial basis and without profit motive. Nominal amounts are collected as membership fees and subscription to meet the running expenses of the facility. These Clubs act as spearheading centres of non-curricular instruction to its members (staff, students and employees) by conducting IT courses during off-hours, enabling the users to take advantage of the facility during their free time. This is in tune with the recommendations of the National Task Force on Information Technology. The project has been highly helpful in achieving our goals of cent-percent computer literacy and bringing IT closer to the members of our community. Since there is a sense of participation, the members are also not hesitant in using the facilities thereby increasing user acceptance through technology demystification. This

initiative has met with tremendous response from the faculty and students. This system was very much appreciated by the ICAR Accreditation Team during their last visit.

Universal E-mail

The KAU have taken a policy decision to provide mail-IDs to the entire members of our community to facilitate easier information-interchange and collaboration. We have adopted Google Apps for our collaboration services. Institutional mail-IDs have been provided to all offices. Organisational mail-IDs have been provided to the entire faculty and non-teaching staff down to the level of class 3 employees. Mail IDs will be provided to everybody in due course.

Connectivity to NKN

The KAU Main Campus is connected to the National Knowledge Network with a VPN bandwidth of 1 Gbps under the auspices of the NMEICT programme. All the colleges have also been connected to the national network under the NME-ICT project. We have dedicated Internet connectivity of 20 Mbps in the Main Campus. All the teaching campuses have Internet connectivity of minimum 10 Mbps.

Voice Networking

The entire Main Campus is covered by a state-of-the-art EPABX with more than 400 installed lines. All the extensions are directly diallable from the outside through the implementation of DID through BSNL PRI. The availability of voice lines between the student hostels and the faculty residences help in student-faculty interaction after classroom hours.

Inter-campus Connectivity

The Main Campus and Mannuthy campus have been connected through dedicated connectivity. So the entire Main Campus data network is accessible from Mannuthy also.

IT Organization

The institutions under KAU are grouped into geographical clusters identified as IT clusters, with cluster lead centers located at the Colleges and the ZARSSs. Two IT Nodal Officers are identified at each of these centers. These IT Nodal Officers are responsible for providing immediate technology support for the management of the regional LANs. The IT

Nodal Officers and the Director, CITI comprise the Information Systems Management (ISM) Group, which looks after the management of the KAU WAN.

The Computer Clearance Committee (CCC) examines the proposals from the various offices for procurement of hardware and software and also finalizes the specifications of computerware to be sourced. Hardware specifications are fixed centrally at the University level to ensure hardware and software standardization and inter-operability.

e-governance

We have implemented an academic management software to automate the academic management activities. The server is maintained in-house using our own connectivity. We have already set up a platform for e-learning and content creation is being undertaken.

The availability of computers for management purposes has increased significantly. We are in the process of implementing a fully computerized ERP solution for governance and management. This solution is being developed in-house. The Financial Management module which handles budget, fund distribution and accounting, the pension management module and a point-of-sale application to handle the sales and stock management at our sales centres have already been developed and deployed. All these are totally web-enabled applications.

Centre for e-Learning

The **Centre for e-learning (CEL)** of the Kerala Agricultural University, started functioning in 2010-2011.

The CEL aims to strengthen research, extension education and transfer of technology utilizing the potential of ICT. The centre has already developed a Agrotech portal and many agricultural advisory cum decision support systems like the KAU Fertulator, E-Crop Doctor and *E-Karshaka Jalakam (E-Kisaan knowledge portal)* to help farmers to diagnose and find solutions for their field problems at the fingertips. All the tools are made available in English and Malayalam. The CEL is also planning to introduce three e-courses on organic farming, processing of fruits and vegetables and plant propagation. "These efforts will attract young educated minds to farming".



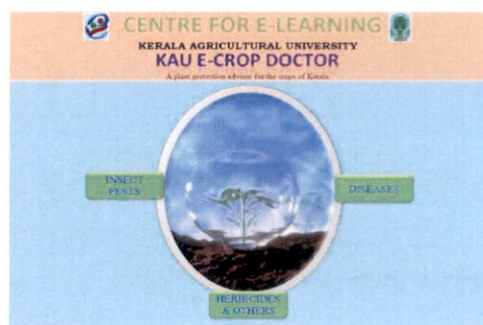
Agrotech portal for Kerala is an agricultural technology hub. All the technologies developed by the agricultural research system in Kerala are made available through this ICT enabled tool. This provides the stakeholders with all the information on major crops of Kerala from seed to harvesting in an interactive manner.

The 'KAU Fertulator' is yet another innovation by the centre, the first of its kind in the state, which would simplify the time consuming calculation of the rate of fertilizer for field application. The data for this calculator is based on the recommendations of the Agricultural Research Centers in Kerala. The fertilizer rate of major crops



can be obtained for different crop growth stages with a few mouse clicks. Being bilingual, this will be highly useful to the farmers, extension workers and students.

The bilingual 'E-Crop Doctor' is another user-friendly and time saving decision support system which helps to find out accurately the quantity and accurate dilution of insecticides, fungicides, antibiotics, and weedicides required for a unit crop area, for all the crops of Kerala. The non-judicious use of plant protection chemicals leads to many ecological



and health issues. This decision support system is also enriched with a detailed knowledge bank on plant protection, including the organic ways of prevention and control of crop pests and diseases.

The interactive web portal named *E-Karshakajalam* (*E-Kisaan knowledge portal*) is an interactive web portal in Malayalam. It will help farmers to easily access agricultural information leading to quick farming decisions.

The centre propose to launch three new online courses viz; Organic Agricultural Management; Plant Propagation and Nursery Management; Post Harvest Management and Marketing of Fruits and Vegetables.

The website of Centre for E- learning is loaded with much more agricultural information like web-links of different agricultural agencies, farm services, and different farm allied enterprises, etc.

Plate 5. Central Library & Central Auditorium



8. PHYSICAL FACILITIES

The University had a head start at the time of its establishment as the two colleges and 21 research stations, which were transferred to the University from the control of the Department of Agriculture and Animal Husbandry, were fairly well equipped. This helped the University to conduct research and teaching without any time lag. Over the years, marked improvement in the infrastructure was made with the financial help received from the State Government, ICAR, Central Government, and Foreign Agencies etc.

8.1 Institutional Area and Farm Land

Table 8.1

Land area of Institution and Farms

1	<u>College of Agriculture Padannakkad</u>		
	Land area of Institution	-	7.95 Hectares
	Land area of Farm	-	19.28 Hectares
	Total land area	-	27.23 Hectares
2	<u>KCEAT Tavanur</u>		
	Land area of Institution	-	10.00 Hectares
	Land area of Farm	-	30.06 Hectares
	Total land area	-	40.06 Hectares
3	<u>Main Campus (College of Horticulture/ College of Forestry/College of Co-operation, Banking and Management), Vellanikkara</u>		
	Land area of Institution	-	309.00 Hectares
	Land area of Farm	-	60.00 Hectares
	Total land area	-	369.00 Hectares
	Land area of Institution (Dry land)	-	78.00 Hectares
	Land area of Farm (kayal land)	-	173.00 Hectares
	Total land area	-	251.00 Hectares

8.2 Administrative Buildings / Bolcks/ Space

The administrative block at the HQ is housing Vice-chancellor, Registrar, Director of Research, Director (Academic & PG students), Director (Planning) and their offices.

8.3 Class Room and Laboratories

All the colleges are having adequate number of class rooms and laboratory facilities. The pesticide residue laboratory at College of Agriculture Vellayani is having national accreditation. The Radio Tracer Laboratory, Biotechnology and molecular biology lab at the College of Horticulture are of International standards.

8.4 Students Hostels for Men and Women

All the campuses are having separate hostels for boys and girls. Shared accommodation is provided. The main campus is having an international students hostel with AC rooms. The details of the hostel facilities are shown in Table. The hostels are having mess, reading room etc. Most hostels are having computer rooms with internet facilities. The hostels have separate reading rooms with television. Computers with Internet facilities are also available in some of the hostels.

8.5 Instructional Farm (Agriculture/ Horticulture/ Animals/ Poultry/ Fisheries etc.

All the colleges are having instructional farm with adequate land area. The areas of the farms in the colleges are shown in Table.8.1. The details are shown in the reports from colleges.

8.6 Green House, Glass House, Polyhouse etc.

All colleges are having green houses, glass houses, poly houses, etc. for instructional and research purposes.

Plate 6. Students' Hostels



International students' Hostel



8.7 Farm Power, Farm Machines, equipment and irrigation infrastructure

All the instructional farms and regional farms are having provisions for electricity. Essential farm machinery and equipments are also available in these farms. All farms are having irrigation facilities.

8.8 Facilities for Sports, Games, Cultural and Literary Activities

All the colleges are having adequate playgrounds for sports and games activities. Auditoriums and seminar halls are provided for cultural and literary activities.

8.9 Any Other Important Facility

The 800 seated fully air-conditioned Central Auditorium in the Main Campus equipped with one of the finest acoustic systems and an Indoor Stadium at Vellayani campus add to the basic infrastructure for the full development of the potentials of the students and the faculty.

Table 8.1 Physical facilities available in the Faculty of Agriculture

Sl. No.	Facility	Colleges						ACCER
		COA Vellayani	College of Agriculture, Bio-Technology building, Vellayani	COH Vellanikkara	COA Padanakkad	COF Vellanikkara	CCB&M Vellanikkara	
		Existing- 8482m ²			4879m ²			
	Academic Building	PG block- 1152 m ² (Under construction) UG block 1224 m ² (work to be tendered)	572 m ²	7475m ²	PG block 867.90 m ² (work to be tendered)	2808m ²	3254 m ²	330 m ²

2	Student Hostel	Existing- 8482m ²	11503m ²	P.G.Hostel 628.94 m ² (Under construction)	4950m ²	2225 m ² (Boys) 472 m ² (Girls)	550 m ²	550 m ²
		Ladies hostel 4736.00 m ² Ladies hostel annex- 724 m ² (Under construction)						
		UG Men's hostel 1994.64 UG Men's hostel II nd floor- <u>360 m²</u> (Under construction)						
3	Housing for staff	7647m ²		Central facility of the University	1600m ²	1000m ²	Central facilities of the University	-
4	Play grounds	27600m ²		2.5ha	9800m ²	Common facility	Common facility	-
5	Administrative Building	1063.28m ²		255m ²	628m ²	200m ²	-	
6	Gardens & farms	78.23ha		105.6ha	27.22ha	25ha	-	
7	Health facilities	Common facility 338 m ²		Common facility	-	100m ²	-	
8	Library	1060m ²		512m ²	394m ²	250m ²	300 m ²	
9	Auditorium	Indoor		Central Auditorium	1 No. to accommodate	Central Auditorium	Central Auditorium	

					250 people			
10	Indoor Stadium	300000 m ² 4000m ²		-	-	-	-	
11	Farm Office	468m ²			1 farm house 390 m ²	-	-	
	Store	1077m ²			Coconut store room			
13	Green house	1660m ²		99.56 m ²	7 green houses			
14	Irrigation facilities	Pump set 15 (163 HP) Ground level tank 7 (8 lakhs litres) Overhead tank - 2nos (43,000 M L)		40 ha irrigated 2 open ponds 2 tube wells with pipeline network	7 pump houses 2 filter points	-	-	
15	Mist chamber	524m ²						
16	Bank building	188 m ²						
17	Cattle shed	245 m ²						
21	BCCP &W building	1400 m ²		254 m ²				
23	Mushroom unit	26.50m ²		56.53 m ²				

Table 8.2 Physical facilities available in the Faculty of Agricultural Engineering

Facilities	KCAET Tavanur
1. Academic Building	9901m ²
2. Students hostel	5455m ²
3. Housing for staff	5805m ²
4. Administrative building	1103m ²
5. Cattle shed	608m ²
6. Hatcheries shed	
7. Health facilities (animals)	-
8. Library	620m ²

9. Farms (Pigs, Poultry etc)/ Dairying yard	1698m ²
10. Store	675m ²
11. Play ground	10692
12. Open space	2 ha
13. Gardens and Farms	30 ha
14. Irrigation facilities	20 ha
15. Pump House	4Nos. 23m ²
16. Generator Room	30 m ²

Table 8.3. Central facilities available in the University

Sl. No.	Particulars	Area (m ²)
1	Administrative Building	3863
2	Central Auditorium	1392
3	Central Library	4019
4	Radiotracer Laboratory	1099
5	Kerala Agricultural University High School	1608
6	Guest House	673.26 (Under construction)
7	Quarters	10268
8	Directorate of Extension	2547.32
9	Estate area	39.44 ha
10	Sales Counter	8
11	KAU Press	878.12
12	ATIC	(Under construction)
13	Stadium	30000
14	KAU Crèche	649
15	Staff Club	584
16	KAU Co-operative Society - Canteen	50.575
17	KAU Co-operative Society - Office	123.75
18	Canteen Building	262
19	Seminar hall CTI Mannuthy	220
20	International hostel	953
21	KVK Farmers Training hostel	300
22	Farmers Training hostel	1793 (Under construction)
23	Museum	445 (Under construction)



Plate 8. Other facilities

Centre for e-learning:



TRANSPORT

The transport facilities available in different educational institutions of the University are furnished in table below.

Table 8.4 Transport facilities available in different institutions

Sl. No	Campus	Bus No.	Van No.	Car No.	Jeep No.	Lorry No.	Tract or No.	Trailer		Others
								Jeep	Tract or	
Faculty of Agriculture										
1	COA, Vellayani	3	1	1	1	1	2	-	2	Power Tiller 2 Mini Tiller 3
2	COH, Vellanikkara	4	-	1	5	-	1	-	1	Tiller 1
3	COA, Padannakkad	1		1	-	-	-	-	1	Power Tiller 1
4	COF, Vellanikkara	1	-	1	-	-	-	-	1	-
5	CCB&M Vellanikkara	-	-	1	-	-	-	-	-	-
Faculty of Agricultural Engineering										
7	KCAET Tavanur	1	1	1	-	Trailor 1	7	-	-	Motor Cycle 1 Power Tiller 3

9. FINANCIAL RESOURCES

9.1 Total Budget (Plan, non-plan) and Source of funding

The sources of funding for KAU include grants from the State Government, ICAR, External Funding Agencies and domestic resources. The details of the budget for the last five years are given in Table 9.1. The Statement of Government fund is classified as non-plan and plan expenditure. While non-plan fund is committed expenditure meant for salary and overhead costs, plan fund is intended to take care of projects funding including creation of capital assets. The comptroller is in-charge of the University funds and accounts.

The ICAR funding is in the form of developmental grants for educational institutions and also for implementing co-ordinated projects, NATP, NAIP projects etc. The University also takes up ad-hoc research schemes financed by the State, National and International agencies, Commodity Boards and Private agencies.

The budget expenditure on education, research extension, management and administration are given in Tables 9.1 to 9.6.

The organisational chart for finance management in KAU is given in Fig. 11.5.

Table 9.1 Year-wise details of income and expenditure

Details	2007-08	2008-09	2009-10	2010-11	2011-12
Income	(Rs. in crores)				
Non-plan	62.960	67.370	117.580	96.340	128.128
Plan	23.240	30.250	32.750	43.938	44.430
ICAR	17.179	18.962	19.293	22.147	37.812
OEAP	9.592	17.270	18.844	34.072	33.266
Internal Receipts	7.301	8.706	9.831	19.992	7.395
Interest Receipts					0.218
* (A) Pension Fund					
Total	120.272	142.558	198.298	216.489	251.249
Expenditure	(Rs. in lakhs)				
Non-Plan					
Salaries	4566.158	5274.860	5575.038	6576.846	10535.407
Contingencies	1354.308	1386.436	1851.766	1133.434	659.405
Pension	2635.000	3226.020	5988.283	3770.261	5763.788

Total	8555.466	9887.316	13415.087	11480.541	16958.600
Plan					
Salaries	690.151	726.286	839.658	1307.080	1934.412
Contingencies	1283.689	1189.368	1606.918	1686.567	1290.640
Civil Works	54.446	29.361	167.237	2.040	971.787
Total	2028.286	1945.015	2613.813	2995.687	4196.839
ICAR					
Salaries	841.177	987.065	1051.151	1070.720	2356.896
Recurring	193.371	244.286	351.637	740.214	757.731
Non-recurring	157.990	353.137	310.046	302.178	269.814
Total	1192.538	1584.488	1712.834	2113.112	3384.441
OEAP					
Salaries	167.264	226.157	225.773	227.445	248.318
Recurring	274.306	392.318	661.460	999.055	1087.009
Non-recurring	280.191	842.921	560.686	500.381	858.252
Total	721.761	1461.396	1447.919	1726.881	2193.579
* (B) Pension					
Revolving Fund					
Recurring					557.814
Non-recurring					32.458
Total					590.272
Expenditure Total	12498.051	14878.215	19189.653	18316.221	27323.731

* (A) Pension fund not constituted at Kerala Agricultural University.

* (B) For monthly pension an amount of Rs.475.00 lakhs is necessary and this is being met from non-plan grant-in-aid. Non-plan expenditure includes pension expenditure also.

9.2 Expenditure statement indicating percentage spent on teaching, research, extension education, administration, infrastructure development

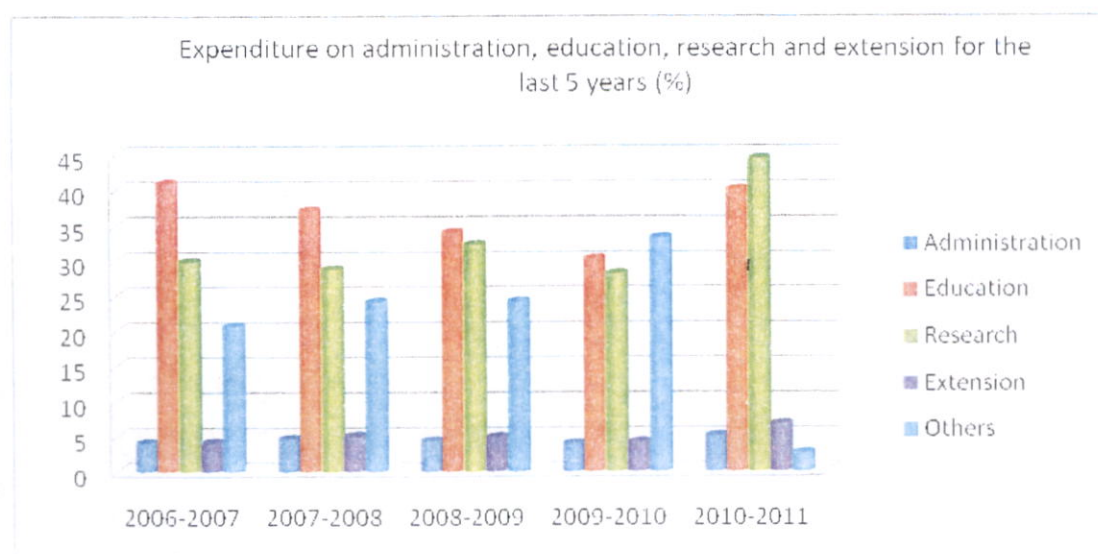
The major sources of funding for the University are State Government and the ICAR. Ever since the inception of the University in 1972, sufficient funds were being provided by the State Government and other funding agencies. Recently the University is not getting sufficient funds to meet its non-plan expenditure, resulting in deficit budget. From the Table 9.2, it is clear that the University is running on a deficit budget for the last five years.

Table 9.2 Abstract of Budget for the last ten years

YEAR	BUDGET ALLOTMENT (IN LAKHS)	EXPENDITURE (IN LAKHS)	BALANCE / DEFICIT
2002-03	8770.521	9788.890	-1018.369
2003-04	10464.376	10333.498	130.878
2004-05	10048.303	10390.644	-342.341
2005-06	11080.637	12676.876	-1596.239
2006-07	12064.795	13631.664	-1566.869
2007-08	12141.761	12498.051	-356.29
2008-09	14737.788	14878.215	-140.427
2009-10	22215.899	19189.653	3026.246
2010-11	24830.350	18316.221	6514.129
2011-12	27860.983	27323.731	537.252

Table 9.3 Expenditure on administration, education, research and extension for the last 5 years (%)

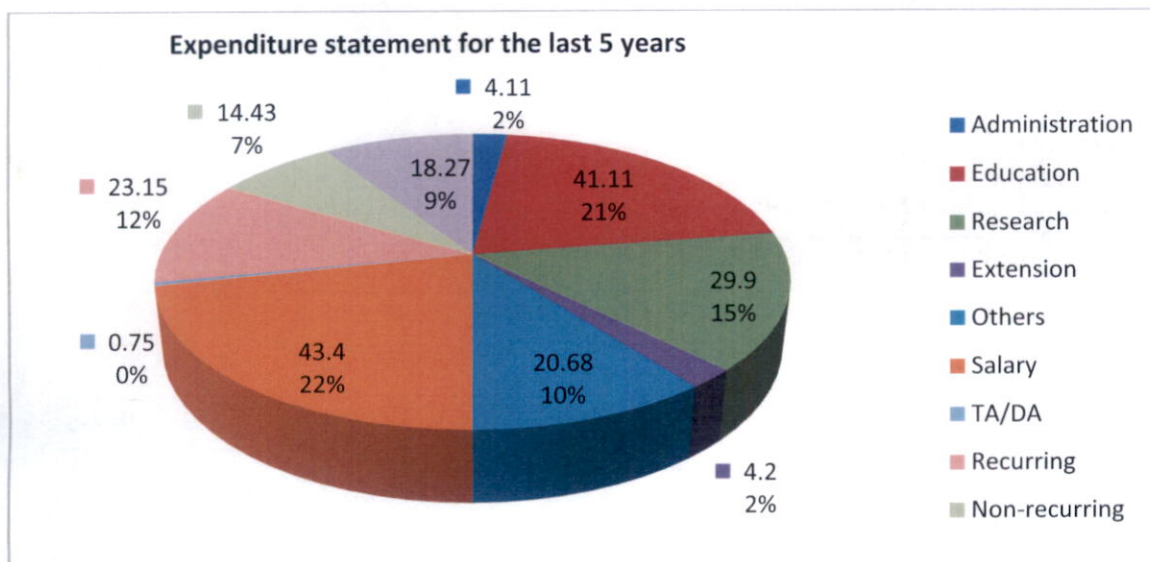
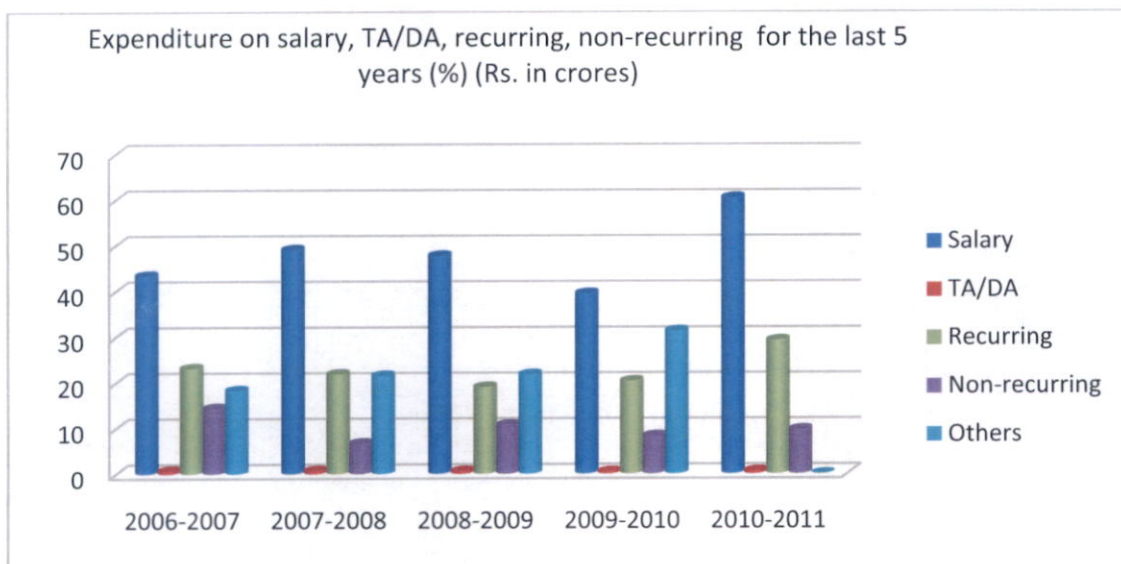
Category	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
Administration	4.11	4.72	4.39	3.99	5.08
Education	41.11	37.25	34.11	30.35	40.13
Research	29.9	28.83	32.36	28.16	44.49
Extension	4.2	5.09	4.94	4.21	6.75
Others	20.68	24.13	24.2	33.29	2.63



9.3 Expenditure Statement Showing percentage amount spent on salary, TA/DA, recurring and non-recurring contingencies (with their major heads)

Table 9.4 Expenditure on salary, TA/DA, recurring, non-recurring and others for the last 5 years (in crores)

Category	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
Salary	43.4	49.08	47.75	39.51	60.44
TA/DA	0.75	0.76	0.67	0.52	0.63
Recurring	23.15	21.86	19	20.3	29.21
Non-recurring	14.43	6.77	10.79	8.38	9.72
Others	18.27	21.53	21.79	31.29	0



9.4 Non-Governmental endowment and Large Contributions

Table 9.5 Non-governmental endowment and Large Contributions including corpus fund

Sl. No.	Name of endowment	Amount (Rs.)
1	Dr. I.P. Sreedharan Nambiar Endowment	10000
2	PPIC Scholarship	150000
3	The Federal Bank Endowment Fund	5250
4	RKSD Jain Endowment prize in Fisheries (Addnl. Deposit)	68200
5	Trivandrum live stock improvement Association Award	2867
6	RVC Rolling trophy	5261
7	M.N. Parameswaran Memorial Endowment	6100
8	Late Abraham Thomas Endowment	5000
9	Lalitha Kaleeswaran Endowment	25000
10	Dr. K.N. Shyamasundaran Nair Memorial Endowment	200000
11	VIII Dairy Industry Conference Gold Medal	5500
12	Dr. T.P. Mohandas Memorial Endowment	50000
13	E.P. Madhavan Nair Memorial Endowment (Agri.)	10000
14	Dr. N. Kunjan Pillai Memorial Endowment	2500
15	Dr N. Kunjan Pillai Memorial Endowment (Fisheries Branch)	3400
16	ASPEE Gold medal	7800
17	Dr. Kaleeswaran Memorial Endowment	20000
18	Pandalam P.R. Madhavan Pillai Memorial Endowment (Corpus Deposit)	13500
19	Kerala Vety. College Alumni Association prize	10000
20	Kerala Vety. College Alumni Association prize	2500
21	Dr. Renji P. George Memorial Endowment	5000
22	Fish processing best student award	1000
23	Kerala Vety. College Alumni Association prize (Addl. Deposit)	12250
24	Dr. Renji P. George Memorial Endowment (Addl. Deposit)	6275
25	KAU Award for Tribal Farmer Trainees	2000
26	RKSD Jain Endowment prize in Fisheries	31800

27	Chinnamma Thomas Memorial Endowment	10600
28	Mrs. Devaki Nair Endowment	1000
29	Sardar Patel Award	500000
30	Dr. Lalitha Prema Award	10800
31	Kerala Sate Co-operation Diamond Jubilee Endowment (Permanent Deposit)	1000000
32	Dr. N.P. Kumari Sushama Memorial Award	100000

9.5 Fund raising campaign and targets for current and subsequent five year plans

Proposals are sent to the Government of Kerala for special grants to tide over the deficiency in the budget. Project proposals are submitted to various funding agencies. The budget proposal for 2012-13 is shown in table 9.6.

Table 9.6 Budget proposal for 2012-13

Details	2012-13 (Rs in Lakhs)
Non-plan Schemes	18610.958
Plan Schemes	6812.707
ICAR projects – 100 percent	1092.875
ICAR Adhoc Schemes	0.500
NARP – ICAR Assisted	9.560
ICAR Co-ordinated Projects	1267.422
ICAR Revolving Fund	243.097
Other Externally Aided Projects	4537.343
KAU Revolving Fund	544.753
OEAP Revolving Fund	173.565
Total	33292.78

10. RESEARCH

The research activities of the University are planned, implemented and monitored by the Director of Research while that of the community services (Extension activities) are managed by the Director of Extension.

Research on farm issues is the prime mandate of Kerala Agricultural University unlike other traditional universities in the state. The research results generated are transferred directly through Krishi Vignan Kendras and through development Departments to the farming community. The research programmes funded by ICAR, Govt. of Kerala and other agencies are implemented through 6 Regional Agricultural Research Stations and six colleges spread across the state. Till date the University has developed 233 varieties in different crops viz. rice (113), coconut(6), vegetables(57), cashew(16), cocoa(10), pepper(7), turmeric(4), cardamom(2), cassava(3), coleus(2) medicinal plants(8), and orchids(5). The scientific crop production and crop protection practices are also standardized in major crops in the state. The University also undertakes production of seeds and planting materials of elite varieties. During 2010-11, seeds, planting materials, organic manures, biocontrol agents etc. worth Rs.557.60 lakhs were produced in 35 production centers of Kerala Agricultural University as follows:

- Paddy seeds - 439 tonnes
- Coconut seedlings - 1,23,527
- Arecanut - 1,17,644 seedlings
- Vegetable seeds - 4662 kg
- Pepper - 6,90,286 rooted cuttings
- Mango - 1,19,715 grafts
- Banana - 1,15,204 suckers
- Cashew - 1,23,476 grafts
- Biocontrol agents - 44702 kg

10.1 Number, location and lead functions of various research stations

Research Stations

Kerala has six agro-ecological zones viz. South, Onattukara, Special Zone of Problem Areas, Central, High range and Northern, spread over 14 districts of the State. In order to strengthen and take up location specific research activities, Regional Agricultural Research

Stations (RARS) of each zone headed by an Associate Director of Research are established. Teaching campuses, Research Stations and Transfer of Technology Centres are located across all the zones where zonal and location specific problems are addressed to research activities. The lead functions and major research findings of all Research Stations under KAU are detailed in the Table 10.1.

Table 10.1 Lead functions and important research findings of research stations

South zone		
Institute	Lead functions	Major research achievements
1. RARS, Vellayani (1982)	Lead functions are research under partially shade conditions, export oriented vegetables and cut flower production. The Centre has verification functions for rice, fruits, homestead farming, coconut, tuber crops, vegetables, farm machinery for garden lands, AICRPS on forage crops, nematodes, honeybees, mushrooms and pesticide residues	The station implemented 64 externally aided projects, comprising of AICRP - 4, ICAR- 4, RKVY- 10, KSCSTE-10,WHO-1, NABARD - 1, WGDP- 9, SHM-9, DBT - 5, AHADS - 1,SPB-3, IFS-1, VSSC- 1, IMD - 1, VHSE -1, NPMSH - 2, ICMR - 1 The centre has released the following varieties Rice-2,Coconut- 1, Jackfruit -1,Bhindi-3, Amaranthus- 1,Sweet potato -1, Groundnut -4, Blackgram- 2, Sesamum-3, Grain cowpea-3, Coleus-2, Guinea grass-3, Napier grass-2, Orchids-5, Anthurium- 2, Vegetable cowpea-3, Tomato -1, Cassava-1, Chilli- 4
2.Farming System Research Station, Sadanandapuram (1986)	Lead functions are homestead farming, soil and water conservation and management. Verification functions are on tuber crops, coconut, rice, horticulture, agro-forestry, cashewnut. Krishi Vignan Kendra is also functioning here.	Centre came up with several recommendations to improve the productivity of homestead farming systems. It maintains 144 cheradi type of rice. The Centre also standardised pots and potting mixture for bush pepper.
3.Cropping Systems Research Centre, Karamana (1955)	Rice and rice based integrated farming system, developing and validating region- specific integrated farming systems models for enhanced system productivity, profitability and sustainability. Multi-location trials and integrated	Biofertilization of wetland rice with Azospirillum, Integrated nutrient management in rice - cucumber-okra cropping sequence, Rice-rice-amaranthus and rice-rice-sweet potato are the best cropping sequences in peri-urban areas.

	production trials, bio- energy conversion and organic recycling, and water requirement of crops	
4.Coconut Research Station, Balaramapuram(1948)	Agro-technique for coconut and coconut based farming system in red soils. Production and distribution of quality coconut seedling including T xD hybrids and quality planting materials of blackpepper, banana and vegetables.	Standardised the agro technique for coconut. Progeny evaluation studies in this station has given the result of superiority of WCT x COD in red loam soils of Southern Kerala. Developed coconut based Integrated Farming System Model.
Special zone for problem soils		
5.RARS Kumarakom (1947 / 1982)	Lead function - To solve the location specific problems in the special zones comprising Kuttanad, Onattukara, Kole and Pokkali tracts and to integrate farming systems incorporating crops, livestock and fish to coordinate the research efforts for management of root wilt of coconut.	Six ICAR, 8 NWDPPRA, 27 KAU Research projects are in operation. Biological control of salvinia using <i>Cyrtobagous salviniae</i> . Popularization of garcinia through vegetative propagation and breeding its seed dormancy. Root wilts disease management technique. Management of leaf rots of coconut and red palm weevil. Developed two varieties of casava and yams. Usefulness of VAM in cultivation of cassava. Indigenous carp and hatchery. Reducing the hatching time from 27 to 20 hrs. Rice fish farming system. Pig-fish farming system.
6. Rice Research Station, Moncompu (1940)	To undertake research on rice in Kuttanad ecosystem	The Centre was instrumental in developing and disseminating technologies for rice farming in below sea level areas such as Kuttanad and also solving several problems associated with rice farming in such problem areas. The Centre has released 21 rice cultivars, of which Mo. 16 (Uma) is the most widely cultivated variety of the State. The station has developed several crop management and crop protection strategies for rice viz., acidity

		management, site specific nutrient management, management of wild rice, integrated management of important pests and diseases of rice in Kuttanad etc. Worked out the relationship between weather variables and incidence of pests like BPH, Black bug etc., and diseases like blast and sheathblight of rice. Efficient rat trap (Moncompu trap) was developed.
7.RRS Vyttila (1958/ 1963)	Rice cultivation in Pokkali. (Saline areas) and rice-fish farming system.	Eight saline tolerant high yielding rice cultivars suited to Pokkali ecosystem have been evolved. Technology for simultaneous culture of rice and fish and Technology for raising prawns as a follow up crop after rice has been developed.
8.Agricultural Research Station, Thiruvalla (1976)	Lead function -research on sugarcane Verification function - research on vegetables,banana and tubers	Four high yielding, red rot resistant sugarcane hybrids were released. Developed suitable agro-techniques for cultivation of sugarcane in central Travancore as well as in the semi arid tracts of Palakkad, Released two highly promising vegetable varieties ie., Kaumudi (snake gourd) and Priyanka (bitter gourd), well accepted by farmers throughout Kerala, G.I.certification was accorded for the Central Travancore jaggery under the aegis of the station, Standardised technologies for preparation of different forms of GI jaggery.
9.Onattukkara Regional Agricultural Research Station Kayamkulam (1937/ 1958/ 1972/ 2000)	Lead function: Research on rice, sesamum, groundnut, pulses and banana in Onattukkara. Verification functions: Vegetables in homestead, mushrooms and orchids.	Seven rice varieties suited to Onattukkara tracts and three varieties suited to eastern lateritic areas were released. Five varieties of sesame, one each of black gram and cassava, three varieties of cowpea have been released. Several crop management and crops protection recommendations have been evolved for rice, sesame, groundnut, coconut, cowpea, black gram, green gram, banana and vegetables. Station is implementing comprehensive coconut care programme (CCCP) in the root (wilt) affected areas in Onattukkara.

		Low cost micro propagation techniques in orchids were standardized
CENTRAL ZONE		
10.RARS, Pattambi (1927/1971)	Lead function - Generation and transfer of technology related to rice and rice-based cropping systems, pulses, vegetables, organic farming and seed technology	<p>Sixty rice varieties have been released so far from the station.</p> <p>The rice variety (<i>Annapurna</i>) released in 1966 from this station was the first ever dwarf high yielding rice in South Asia.</p> <p>The predominant rice variety of Kerala, <i>Jyothi</i> was released from the station in 1974.</p> <p>Developed packages of crop establishment, nutrient management, pest, disease and weed management for rice and pulses.</p> <p>Developed packages for organic farming in rice</p> <p>Released two high yielding cowpea varieties.- Kanakamony and Krishnamony</p> <p>Released high yielding variety of ash gourd, Indu.</p> <p>Released high yielding variety of coleus-Nidhi.</p> <p>Started the course-Diploma in Agricultural Sciences during 2011.</p> <p>State seed testing laboratory is functioning at the station.</p> <p>Rice knowledge centre and museum has been established in 2011 at the station</p>
11.Agronomic Research Station, Chalakudy (1972)	<p>Lead function: Research on water management to develop low cost, high tech water use and high profit land use pattern by evolving production technologies for utilizing scarce moisture resources and to serve as a model centre of crop production.</p> <p>Verification function - To conduct farm advisory and extension services, To conduct research on soil nutrient management, Soil testing</p>	<p>Developed irrigation scheduling for various crops growing in Kerala, Demonstrated group farming technology in paddy fields, Developed new rice production technology by use of silica and higher doses of potassium, Developed low cost, clog free KAU micro sprinkler which can be fabricated by farmers, Developed technology for powdering of cured vanilla beans without loss of volatile constituents, Standardized surge irrigation system and developed semi-automization system for surge irrigation</p>

12. Aromatic and Medicinal Plants Research Station, Odakkali (1951/ 1972)	Lead Function: Research and development activities on medicinal and aromatic plants. Verification Function: Technologies on medicinal and aromatic plants.	Released nationally accepted lemongrass variety <i>Sugandhi</i> (OD-19), cinnamon variety <i>Sugandhini</i> - ODC 130, Palmarosa varieties - ODP 1&2 and vetiver variety - ODV-3. The phytochemical laboratory of the station is a recognized analytical laboratory for Medicinal and Aromatic plants.
13. Pineapple Research Station, Vazhakulam (1995)	Lead function: To Give research and development support to the pineapple growers, provide quality technology, products and services to the pineapple sector and undertake basic and applied research in pineapple and other fruit crops of Kerala	Identified pineapple and passion fruit varieties suitable for Kerala. Developed scientific and organic production technologies for Kew and Mauritius varieties of pineapple in pure cropping, intercropping in rubber and coconut plantations and in paddy lands. Developed tissue culture protocols for various varieties of pineapple, passion fruit and banana.
14. Banana Research Station, Kannara (1970)	Lead function on banana and banana based cropping systems. Verification functions on vegetables.	This Centre maintains 212 accessions of banana hybrids H1 and H2 were recommended for cultivation in Kerala. Recommendations on of integrated management of banana pest including nematode have been evolved. A sub centre for Pineapple Research is also functioning at Vellanikkara
15. Agricultural Research Station, Mannuthy (1957)	Lead function - Rice for Kole management system and on coconut. Verification function includes vegetable and organic farming.	Developed an extra short duration red kernelled rice cultivar <i>Hraswa</i> maturing in 75-80 days. Released a new variety <i>Ahalya</i> suitable for Kole lands.
16. Cashew Research Station, Madakkathara (1973)	Research on cashew	Eleven varieties of cashew released. Techniques for epicotyl and soft wood grafting standardized. Schedule for fertilizer perfected. Formulated planting, inter cropping, organic farming and pruning techniques for cashew. Developed technologies for the removal of astringency from cashew apple juice, ripe apple and green mature apple. Methods were standardised for the effective off season storage of cashew apple juice, pulp and green mature cashew apple pieces. Developed the

		technologies for the production of value added products from cashew apple like syrup, jam, pickle, candy, drink, soda, vinegar, chocolate and wine. A commercialised technology for the production of eight cashew apple products and a commercial cashew apple processing unit with FPO license is being operated. Management schedule for tea mosquito and root and stem borer evolved
17.Cashew Research station, Anakayam (1963)	Verification function is done on cashew and vegetables.	Maintains 216 hybrids of 18 parental combinations. Three cultivars of cashew namely Anakayam-1, <i>Dharasree</i> and <i>Mrudula</i> were released for cultivation.
HIGH RANGE ZONE		
18.Regional Agricultural Research Station, Ambalavayal (1946)	Lead function – Pepper and pepper based cropping in high ranges, cool season vegetables, hill paddy, soil and water management sub-tropical fruits and tree spices, coffee based cropping system. Verification function – Essential oils, medicinal plants and ginger.	Identified high yielding ginger varieties for rain fed conditions. Developed organic methods of management of soft rot disease of ginger. Standardised pollination technique for vanilla. Perfected rooting techniques for black pepper. Released rice varieties suitable for high range regions. Perfected the pruning system of Eucalyptus. Maintains germplasm of rice, pepper, ginger and turmeric.
19.Cardamom Research Station, Pampadumpara (1956)	Lead function Research on cardamom Verification functions- Pepper and ornamental plants	Maintains a germ plasm of 163 accessions, Released two cardamom varieties viz., PV1 and PV2, Nutrient management techniques for cardamom were standardised and recommended to farmers, Management of pest and diseases affecting cardamom and pepper through chemicals, organic and biocontrol methods were standardised and recommended to farmers, Supply of various biocontrol agents through biocontrol lab
NORTHERN ZONE		
20.Regional Agrl. Research Station, Pilicode (1916)	Research on coconut and commodity verification and testing centre for rice, pulses and oil seeds.	Maintains 35 exotic and 40 indigenous types of coconut. Coconut hybrids WCT x CGD, <i>Lakshaganga</i> ,

		<p><i>Keraganga</i>, <i>Anandaganga</i>, <i>Kerasree</i> and <i>Kerasoubhagya</i> were released. <i>Kerasagara</i>, a new variety was also released. <i>Kerasree</i> rank first among the coconut varieties in copra yield</p> <p>Maintains 23 bold nut cashew and 87 pickling mango types. Released <i>Jayathi</i>, a high yielding rice variety suitable for northern zone of Kerala.</p> <p>Released the vegetable varieties, <i>Arunima</i> in oriental pickling melon and <i>Haritham</i> in ridge gourd.</p> <p>Standardized nutrient application for coconut. Perfected management techniques for stem bleeding of coconut. Irrigation requirement of coconut was worked out using CROPWAT. Developed models for predicting the annual yield in coconut, 7 months ahead using agro-climatic indices with predictability of 0.94. Suitability of CERES rice model to assess grain yield during kharif was confirmed.</p>
21. Pepper Research Station, Panniyur (1952)	Lead function - Research on pepper	<p>Released 7 high yielding varieties of pepper. (Panniyur 1 to Panniyur 7). New promising hybrid is proposed for release as Panniyur 8. Promising cultures from CVT are Cul 5489, Cul 5308, PRS 88 and PRS 64. Germplasm consisting of 227 cultivated and 72 wild accessions are being maintained. Scientific management practices including agronomic and plant protection measures of pepper were evolved. Large scale production procedure of rooted cuttings from runner vines and laterals were perfected. In addition medicinal plant nursery, pineapple nursery vegetable seed production, and paddy seed production are being undertaken.</p>

10.2 Process of identification of research problems and their prioritization

Identification of research problems and its prioritization are done by the statutory provisions as shown below.

10.2.1 Problem Identification

Research agenda are identified during the discussions in Zonal Research and Extension Advisory Committee meetings of each zone where the research workers of the University and extension workers of the Agricultural Department and selected farmers meet. Interaction with farmers during field visits and seminars and symposia organized for them, conferences of the scientists of the University and Department, Research and Extension Council meetings etc. are some of the other sources from where the research gaps are identified. On understanding the problems, the scientists in the relevant disciplines prepare a research project proposal to address the field problems.

10.2.2 Research project approval

The scientist who prepares a project submits the report to the respective Co-ordination Committee. The Project Co-ordination Committee consists of the Project Co-ordinator and the scientists involved in conducting research in that field of specialisation. The project will be scrutinized by the Committee and if there is any modification, it will be sent back to the project leader for modifications. The modified project is then placed before the Faculty Research Committee (FRC) for approval. FRC may accept with modifications or accept without any modifications or reject the proposal and based on the decision of the FRC, Director of Research accords sanction for implementation of the project.

10.2.3 Monitoring and Evaluation

The progress of ongoing research projects is constantly monitored by the Head of the Station/Department/Zonal Associate Director of Research and by the Project Coordinator. The half yearly and annual progress report of projects prepared by the project leaders are sent to the Project Coordinator and to the Directorate of Research. The suggestions offered by the Project coordinators and the Director of Research are communicated to the project leaders for further action.

10.2.4 Research Council is the supreme policy making body of the University in matters relating to research in the constituent Faculties. The Vice-Chancellor is the Chairman and the Director of Research is the Member-Secretary of the Research Council.

10.2.5 Research Advisory Committee with a broad representation of the Institutions and farming community of the State provides feedback information on Research prioritization, Project formulation and implementation, technology generation and refinement.

10.2.6 Faculty Research Committees are functioning in each of the constituent Faculty. The main function of the Faculty Research Committee is to advise the University on the implementation of research projects. The Committee consists of Faculty Dean, Associate Deans, all Heads of Departments, Associate Directors, Project Co-ordinators and selected scientists nominated by the Director of Research. It provides advice on the research policy for the Faculty, fixation of priorities for research programmes and directions to Project Co-ordinators and scientists on research project formulation, besides reviewing the output from the research projects. All the research schemes are to be approved by the Faculty Research Committee before implementation.

10.2.7 Project Co-ordination Groups are functioning in the Faculties in identified areas to serve as Sub Committees of the Faculty Research Committee. These groups consist of scientists from different related disciplines. There are 25 Project Co-ordination Groups in the Faculty of Agriculture and three in the Faculty of Agricultural Engineering. The primary task of the Project Co-ordination Group is to process, scrutinise and suggest modifications, wherever necessary, in the technical programmes of research projects. Project Co-ordinators have also been identified to co-ordinate research activities in each discipline/field. The organizational chart for research management in KAU is given in Fig. 8.1.

10.3 Funding sources

There are four major sources, which contribute funds for the research activities in KAU namely State Government (plan and non-plan expenditure), ICAR (Partly and fully financed schemes), Govt. of India and private and foreign agencies. The budgetary expenditure on research during 2011-12 was Rs. 114.32 crores.

10.4 Faculty and Student's involvement in Research

Most of the faculty members are involved in research through external Aided Projects. The Masters and Ph.D. students are doing research as part of their curriculum.

Table 10.2 Ongoing Research Projects 2010-11

Sl. No	Title of the Project	Out lay (Rs. in lakhs)	Duration (Months)
	Kerala State Council for science, Technology and Environment (KSCSTE)Projects		
1	Induction of invitro flowering of dendrobium	7.20	36
2	Demonstration studies on Jeevakom (Seidenfia reedii) Part II	6.87	36
3	Standardisation of planting material and regulation of flowering in bush jasmine (Jasminum sambac.L)	5.78	36
4	Investigation on the role of dogs in the transmission of brugian filarian infection to humans and molecular epidemiology of filarian infections	7.04	36
5	Investigations on anti-inflammatory properties of selected under exploited medicinal plants	10.98	36
6	Biology and management of root mealy bug of banana cultivars	3.68	36
7	An investigation on ergonomic evaluation and improvement of selected rice farming implements for women	9.98	36
8	Evaluation of phenologic growth pattern and phytochemistry of Loranthus Spp.	8.19	36
9	Diagnosis and recommendation of micro nutrient fertilization in Banana		36
10	Evaluation of resistance inducing substances for management of bitter gourd	6.82	36
11	Developing consortia of Bio Control agents for the management of capsule rot and clump rot disease of cardamom	7.64	36
12	Utilization of microbial enzymes of dairy origin for quality assurance in dairy industry	5.94	36
13	Generation and evaluation of vanilla hybrids through intraspecific and interspecific hybridisation and embryo culture	5.61	36
14	Impact of nutritional counseling and life style intervention on obese adults	3.59	36
15	Regulation of cropping in mango	4.45	36
16	Standardization of quality vegetable seed production technology for South Kerala and promotion through group approach	8.28	36

17	Developing seedless watermelon suitable to Kerala through polyploidy and mutation breeding	9.43	36
18	Homestead herbal farming and value addition in medicinal plants	5.58	36
19	Exploitation of bisexual variants for developing through yielding varieties in Piper longum	4.51	36
20	Studies on host plants of flea beetles	8.94	36
21	Evaluation of microsprinkler developed by Avaran at KCAET Tavanur	2.65	18
22	Development of black gram varieties suitable for central zone of Kerala	7.73	36
23	Development of low cost manually operated milking machine	3.79	12
24	Developing green environment and adaptive techniques of horticulture therapy for challenged children	5.99	36
25	Coprological survey on endoparasites causing gastroenteritis in cattle of Wayanad District of Kerala	0.80	12
26	Genetic analysis and marker assisted selection in malabari goats using micro satellite markers	7.62	36
27	Process standardisation for developing novel product based on select tropical fruits	6.02	36
28	Characterisation and identification of superiod genotypes of Thippali (Piper longum)	7.07	36
29	Osmotic dehydration of cashew apple for development of 'ready to eat' value added food, preserving with natural qualities.	9.71	36
30	Corrective breeding of rice variety Jyothi to incorporate moderate panicle shattering	9.16	36
31	Mass Production....Pseudomonas		
32	New revolving fund		
33	Screening for the drought adaptive wax biosynthesis cere gene in Nenthran banana clones	15.10	
34	Marker assisted transfer of thermo sensitive genic male sterile gene to red rice background for hybrid rice production	14.66	
35	Locating resistant gene donors to major pests and diseases in traditional rice varieties of Kerala using marker assisted selection	10.37	36
36	Investigation on agricultural spray charging leading to the development of an electrostatic charging attachment compatible to a knapsack mist blower	6.60	12
37	Panel Guard Rubber Tapping Tool	1.40	12

38	Development of Rotary banana slicer		
39	Identification of micro stellite ...traits in rice	16.37	36
40	Young Investigators programme in biotech	16.50	36
41	One day awareness programme Technological advances.....lives	28.00	
42	Utilization of microbial enzymes of dairy orgin for quality assuarance in dairy industry		
43	Utilisation of Red and Ant of Pest Management	7.70	36
	Total	307.75	
	State Horticulture Mission (SHM)		
	College of Agriculture, Vellayani		
44	Establishment of a fullfledged seed processing unit and seed testing lab.	125.00	
45	Estt. of biocontrol lab and bio fertilizer production unit	80.00	
46	Estt. of Leaf Tissue Analytical Laboratory at Dept. of Agronomy, College of Agriculture, Vellayani.	20.00	
47	Imparting training for Horticulture production through horticulture therapy for physically and mentally challenged children	3.59	
48	Establishment of small nursery mango, College of Agriculture, Vellayani	18.00	
49	Establishment of small nursery - minor horticultural Crops - jack, College of Agriculture, Vellayani	18.00	
50	Two days mushroom fair at kanakakkunnu palace	1.00	
51	Training Farmers on Farm mechanisation in Horticulture		
52	Supervisors training pgrm.for value addition ethnic fruits crops of Kerala	8.13	
	College of Agriculture, Padannakkad		
53	Establishment of small nursery for medicinal plants	4.00	
54	Strengthening of tissue culture lab for Micro Propagation of banana at College of Agriculture, Padannakkad.	8.00	
55	Establishment of a model Mango nursery	18.00	
56	Two days mushroom fair at kanakakkunnu palace	1.00	
57	Est.of small nursery minor horti crops under public sector	3.00	
	PPNMU, Vellanikkara		
58	Rehabilitation of existing tissue culture lab at Plant Propagation and Nursery Management Unit-PPNMU Vellanikkara	8.00	

	C.o.H, Vellanikkara		
59	Setting up of a central laboratory for soil and leaf analysis laboratory	20.00	
60	Establishment of Bio control laboratory at Biological Control of Crop Pests,CoH Vellanikkara,	50.00	
61	Enhancement of productivity of horticultural crops through water harvesting and ground water recharging	10.00	
62	Production of hybrid pods, hybrid seedlings and budded plants of cocoa	18.00	
	ARS,Mannuthy		
63	Upgradation of tissue culture facilities for large scale production of quality planting materials	8.00	
64	Demonstration of vermi compost production from coconut leaves	4.50	
65	Estt. of a model nursery (mango) under public sector	18.00	
	CBF THUMBURMUZHY		
66	Vegetable seed production programme	14.33	
	BRS, Kannara		
67	Estt. Of model Banana nursery for large scale production of suckers at BRS Kannara	18.00	
68	Establishment of plant health clinic	20.00	
69	Establishment of Bio control laboratory for Mass Production of Bio control agents for pest & Disease Management in Banana	31.39	
70	Conducting training programme for gardeners	15.00	
71	Banana fibre extraction unit and utilizaton for income generation and women empowerment	10.35	
	CRS, Pampadumpara		
72	Estt. of model floriculture unit at CRS, P'mpara	18.00	
73	Estt. of Biocontrl lab	18.00	
	CRS, Balaramapuram		
74	Establishment of small nursery - Mushroom spawn production unit at CRS, Balaramapuram	3.00	
75	Establishmnet of small nursery Black Pepper at CRS, Balaramapuram	3.00	
76	Establishment of small nursery banana-CRS Balaramapuram	3.00	
77	Establishment of coconut based compost unit-CRS Balaramapuram	0.60	
	CRS, Anakkayam		
78	Establishment of a Model nursery for cashew at Cashew Research	18.00	

	Station, Anakkayam.		
79	Laying out a small for pepper at Cashew Research Station, Anakkayam	3.00	
80	Setting up of a high-tech poly house at CRS, Anakkayam,	3.25	
	R.A.R.S. Ambalavayal		
81	Estt. Of Biocontrol lab at Regional Agricultural Research Station, Ambalavayal	18.00	
82	Rehabilitation of existing tissue culture lab	15.00	
83	Setting up of Leaf/Tissue analytical lab	20.00	
	KVK, Sadanandapuram		
84	Establishment of Plant Health Clinic at Krishi Vigyan Kendra, Sadanandapuram.	12.46	
	R.A.R.S, Kumarakom		
85	Establishment of vermicompost Demonstration units in the problem zone of Kerala for effective recycling of aquatic weeds and crop residues-RRS Kumarakom	3.00	
86	Estt. of organic pepper plots in idukki Dt.	4.25	
87	Establishment of a Model nursery pepper at Regional Agricultural Research Station, Kumarakom,	18.00	
88	Establishment of Pest and disease forecasting unit at RARS, Kumarakom	4.00	
	R.A.R.S., Pattambi		
89	Establishment of Plant Health Clinic for Horticultural crops at Regional Agricultural Research Station, Pattambi,	12.12	
90	Estt. of Leaf/tissue analysis and crop management advisory facility for Hort. Crops	20.00	
	ORARS, Kayamkulam		
91	Establishment of Leaf/ Tissue analytical Laboratory at Onattukkara Regional Agricultural Research Station, Kayamkulam,	20.00	
92	Rehabilitation of existing tissue culture lab	8.00	
	AMPRS ODAKKALI		
93	Augmenting tissue culture facilities for mass production of quality planting materials	15.00	
94	Establishment of vermicompost unit	1.50	
95	Est. of high tech model medicinal plant nursery	20.00	
	ARS CHALAKUDY		

96	Establishment of small nursery Nutmeg	3.00	
97	Establishment of vermicompost unit at ARS chalakudy	0.30	
98	Mass hardening unit for orchids and gereberas	3.00	
99	Establishment of small nursery mangosteen	3.00	
	Demonstration Unit for Cool Season Vegetables under Protected Cultivation	5.00	
	PRS PANNIYUR		
100	Model Nursery for Medicinal Plants	20.00	
101	Establishment of Pineapple Small Nursery	3.00	
	RRS, Vyttila		
102	Identification & Popularisation of Mushroom varieties -RRS Vyttila	5.12	
103	Strengthening of nursery facilities at RRS Vyttila for micropropagation of important horticultural crops of Ernakulam DT.	15.00	
	COLLABERATIVE PROGRAMME		
104	ISRO - KAU - CUSAT Collaborative project on "Integrated Agro - Materiological Advisory Service	70.00	
105	Dimensions of water conservation in paddy lands of Kerala	17.87	
106	cadbury cocoa co.op. research project	227.17	
	National Horticulture Mission		
107	Spices & Aromatic Component	83.40	
	ICAR		
	All India Co-ordinated Projects		
	NARP SR, Vellayani		
108	AICRP on Mushroom	22.80	60
109	AICRP on Honey bee	35.25	120
110	AICRP on Nematode Pests		120
111	AICRP on pesticide residues	140.93	120
112	AICRP on forage crops	37.19	120
	College of Horticulture		
113	AICRP on Weed Control	35.25	120
114	AICRP on Soil test Crop response correlation	9.60	60
115	AINP on Agricultural Ornithology	26.16	12
116	AICRP on BCCP	26.37	12
117	AICRP on Agrometerology	24.96	60
118	AICRP on Medicinal & Aromatic Plants	29.71	120

119	AIC Vegetable Improvement Project	39.12	120
120	AIC Floriculture Improvement Project	40.14	120
121	AINP on Agricultural Acarology	26.16	60
	KCAE&T, Tavanur		
122	AICRP on post harvest technology	147.29	60
123	AICRP on Farm Implements & Machinery	30.53	120
	College of Vety. An. Sc., Mannuthy		
124	AINP on Haemorrhagic Septicaemia	51.34	60
125	AICRP on Poultry	86.53	60
126	AICRP on Goat Improvement	75.50	60
127	AICRP on improvement of feed resources and nutrient utilization for raising animal production	69.21	120
128	AICRP on Pigs	30.00	12
	ARS, Chalakudy		
129	AICRP on Water Management	89.75	120
	BRS, Kannara		
130	AICRP on tropical fruits (Banana)	20.26	60
	CRS, Madakkathara		
131	AICRP on Cashew (Madakkathara & Pilicode)	56.25	96
	CRS, Pampadumpara		
132	AICRP on Spices	40.58	120
	PRS, Panniyur		
133	AICRP on Spices	67.69	60
	RARS, Ambalavayal		
134	AICRP on Spices	45.39	60
	CSRC, Karamana		
135	AICRP - IFS-- Karamana & ECF Unit, Thiruvalla sub centre	47.05	60
	RARS, Pattambi		
136	AICRIP - Double Cropping Main Centre	37.28	120
137	AICRP on Arid Legumes (Guar)	28.40	120
138	AICRP on Long term fertilizer experiment	44.86	60
	Onattukara RARS, Kayamkulam		
139	AICRP on sesame and niger	5.72	12
	RRS, Moncompu		
140	AICRIP - Double Cropping Main Centre	23.85	60

	SRS, Thiruvalla		
141	AICRP on Sugarcane	36.95	12
	LRS, Thiruvazhamkunnu		
142	AICRP on Agroforestry (Functioning at LRS, Thiruvazhamkunnu)	78.52	120
143	NWP on Buffalo Improvement	175.00	60
	COVAS, Pookot		
144	Hands on Training under Vety polylinic & disease diagnostic centre	75.00	24
	ICAR RF		
	KAU Headquarters, Vellanikkara		
145	Seed production in agricultural crops and fisheries	23.38	24
	College of Horticulture, Vellanikkara		
146	Establishment of a centre for large scale production of vegetable seeds	16.00	84
	College of Vety. An. Sc., Mannuthy		
147	Establishment of a commercial broiler hatchery	25.00	84
	NAIP		
	College of Veterinary & A.S., Pookot		
148	Study of herbal acaricides as means to overcome the development of resistance in ticks to conventional acaricides	11.58	48
	RARS, Ambalavayal		
149	Multi Enterprise Farming Models to Address the Agrarian Crisis of Wayanad District of Kerala	117.91	60
	College of Horticulture, Vellanikkara		
150	Regional Market Intelligence centres	13.09	36
	Other ICAR projects		
151	Niche Area	30.00	60
152	Disaster Management-Contingency plan	1.00	12
153	Insect Biosystematics	6.68	24
154	Gender Issues of Rice Based Production system and Refinement of Selected Technologies in Woment Perspective	2.50	48
155	Application of MAP in the storability of high value seed of vegetables	49.92	36
156	NWP on Under Utilised Vegetable Crops	11.80	36
157	Public Private Partnership on Gender ,CGSAFED	2.50	24
158	GIS GPS based Fertility Mapping	9.95	24
159	NICRA	3.05	24

160	Front line demonstration of agricultural implements and machinery in selected regions of the country.	3.00	24
161	NWP on Ethno Veterinary Medicine	12.50	36
162	Field Progeny Testing Scheme	28.65	60
163	NWP on Zoonotic Diseases	73.04	60
	Rashtriya Krishi Vikas Yojana (RKVY) Projects		
164	Establishing a biocontrol lab for crop pests management	50.00	
165	Setting a spawn production and commercial mushroom cultivation	20.00	
166	Establishing a research centre for green farming and sustainable agriculture	8.00	
167	Establishing a polyclonal progeny orchard	11.20	
168	Hybrid coconut seedling production unit	20.00	
169	Establishing planting material production unit	3.00	
170	Establishment of a goat unit	3.00	
171	Comprehensive coconut care programme for root wilt affected area at Onattukara	20.00	
172	Strengthening of rice cultivation in Onattukara	7.00	
173	Establishment of a sugarcane processing unit	10.00	
174	Centre for bio-waste recycling	15.00	
175	Developing Protocol for organic cultivation of cardamom	15.00	
176	Developing protocol for organic rice production in Pokkali tracts	25.00	
177	Establishing Hatchery Unit for brackish water fishes	20.00	
178	Establishment of an aquaclinic	15.00	
179	Strengthening of analytical laboratory for quality testing and certification of produce of medicinal plants	22.00	
180	Field testing, training and service centre for agro machinery at Mannuthy	25.00	
181	Cashew apple processing unit at Madakkathara	22.00	
182	Centre for processing and product development in fruit crops	15.00	
183	Vermi compost production unit	10.00	
184	Establishing of gene sanctuary of fodder crops	20.00	
185	Establishing a progeny orchard for mass production of banana suckers	20.00	
186	Establishing of a polyclonal progeny orchard of cashew	20.00	
187	Strengthening of soil testing lab	20.00	

188	Establishing a Rural Bio Resource Complex	15.00	
189	Developing protocol for organic pepper cultivation	10.00	
190	Genetic improvement of desert mangoes of Malabar region	10.00	
191	Evolving hybrid coconut suitable for Kerala	10.00	
192	Augmenting production and distribution of planting materials of elite varieties of selected crops of commercial importance	50.00	
193	Centre for development of microbial inoculant technology for organic farming system	34.75	
194	Establishment of the Centre for Organic Farming of Kerala Agricultural University at Vellayani, Tvpm.	20.00	
195	Participatory Integrated Management of fruit flies infesting fruits and vegetables	13.50	
196	A sustainable fodder production model for Kerala	6.70	
197	Multidisciplinary diagnostic support to address field problems of farmers in southern district of Kerala	12.50	
198	Refinement, validation and implementation of Integrated Pest Management in Paddy of Onattukara through farmers participatory approach	12.00	
199	Breeding for High Yielding rice varieties having short duration, seed dormancy and resistance to biotic and abiotic stresses suitable for Kuttanad	16.72	
200	Enhancing rice production in Kari lands of Northern Kuttanad	17.50	
201	Boosting organic rice production of Kerala through marker assisted selection and high quality seed production programme	35.09	
202	Eco friendly high yielding technologies for increased production from fresh water fish farming through farmer participatory approach	12.66	
203	Research and extension strategies for self sufficiency in fodder production.	46.09	
204	Enhancing rice production in Kerala and attaining partial self sufficiency	65.00	
205	Controlled breeding in goats for increasing meat production potential at KVK, Malappuram	3.16	
206	Increasing production and availability of quality seeds of high yielding and traditional varieties of paddy in Wayanad district	38.70	
207	Introduction of Emu to Wayanad - as an alternate poultry for egg and meat production	7.51	

208	Grassland development and establishment of fodder nursery for fodder security of Wayanad district	7.24	
209	Production and distribution of coconut seedlings and other planting materials adopting seed village concept	26.20	
210	Conservation, multiplication and distribution of Malabari breeds of goats	20.60	
211	Women empowerment through organic cultivation of vegetables	17.00	
212	Development of production units for hybrid coconut seedlings and other planting materials in three Southern districts of Kerala	130.02	
213	Multidisciplinary diagnostic support to address field problems of farmers in the Southern districts of Kerala (Karshaka Santhwanam)	15.00	
214	Establishment of a hybrid coconut seedling production unit at Coconut research Station, Balaramapura,	16.00	
215	Popularization of meliponiculture in Kerala	12.00	
216	Developing protocol for organic rice production for pokkali tracts	25.00	
217	Augmentation of vegetable production through technological intervention	450.25	
218	Food Security Army Service Centre Development Programme (FSASCDP) KERALAM	86.20	
219	Centre for e- learning in Agriculture	74.00	
	State Planning Board Projects		
220	KAU- CDIT Joint proposal on Farming System Informatics	7.71	1
221	Validation of Indigenous Technical Knowledge and Farmer Innovation in Northern Kerala	10.00	1
222	ISRO- ANTARIKSH project on "Development of weather based agro-advisory in relation to cardamom and black pepper over the high ranges of Kerala"	5.51	2
223	Assessment of crop-weather relations and formulation of crop weather advisories for the Southern Region of Kerala	27.50	4
224	Classification and characterization of farming systems in District Wise Agroecological Zones of Kerala	21.34	2
225	Development of crop weather information system and forewarning models for sheath blight and BPH in rice in the problem zone of Kerala	20.00	3
226	Exploration, identification and characterization of various livestock	11.04	2

	rearing systems and agriculture linkages in district wise agro ecological zones of Kerala		
227	Soil based nutrient management plan for agro ecosystems of Kerala	249.51	2
	Hariyali projects		
228	Hariyali Watershed Development project of Pazhayannur Block Panchayat	3.30	3
229	Hariyali Watershed Development project of Nileswar Block Panchayat	16.37	
230	Hariyali Watershed Development project of Madappally Block Panchayat (East Watershed)	7.12	3
231	Hariyali Watershed Development project of Madappally Block Panchayat (West Watershed)	8.97	
232	Hariyali Watershed Development project of Veliyanadu Block Panchayat	2.93	3
233	Hariyali Watershed Development project of Eranad Taluk	16.15	3
234	Hariyali Watershed Development project of Anchal Block Panchayat	11.39	3
	Other Projects		
235	One day work shop on " Attaining millennium development Goal Number -1-Eradicate extreme poverty on stretegic planning for monitoring	2.39	12
236	Morphometry and phylogeography of honey bees and stingless bees in India	23.17	36
237	Development of agricultural decision support system software	17.62	36
238	Exploration into indigenous plant dyes of the western ghats with commercial potential as natural dyestuffs	10.18	36
239	Empowering farm women for enhancing quality of life through skill development and income generation by food processing	9.53	36
240	Development of INM package for commercially important plantation crops	15.16	36
241	Exploiting Western ghat Biodiversity for anti fungal metabolites for plant disease control	17.06	36
242	Strengthening of life supporting system of the poor and marginalized people through conservation and utilization of rare and endangered mango varieties /ecotypes in the forest ecosystem through participatory approach	10.11	36

243	RNAi approaches for validation of defense related genes from resistant wild pepper-piper colubrinum	20.06	36
244	Sceheme for the development, testing and implementation of a farming system based cyber - extension model for Wayanad district of Kerala State	15.00	18
245	Entrepreneurship development and sustainable livelihoods for scheduled caste/tribe women through floriculture	32.86	36
246	Evaluation anti-cancer for properties of crystal protiens of Bacillus Thuringiensis isolates form the Western ghats .	32.07	36
247	National symposium on "waste management experiences and strategies	0.50	12
248	A supply side constrains in organic agricultural production- A supply of organic input markets of Kerala	15.96	36
249	Is farm labour compensated for the occupational risks,An attempt employing Hedonic wage model	3.23	24
250	UNESCO Programmes and activities -conducting a seminar on "conserving biodiverity tools and approaches"	1.40	12
251	Sustainable livelihood options for rural women by utilization of underexploited crop plants	12.58	36
252	Empowering tribal women through domestication of medicinal plants	4.90	36
253	Development and strengthening of infrastructure facilities for production and distribution of quality seeds	3.00	12
254	Forecasting agricultural output using space agrometeorology and land based observations(FASAL)	1.18	24
255	Collection and characterisation of cucurbit and legume vegetables	7.80	36
256	Gene pyramiding to develop cultivars with durable resistance to bacterial leaf blight through marker assisted selection	37.30	36
257	National Project on Management of Soil Health and fertility "setting up of soil testing laboratories"	150.00	24
258	Chemotyping and gene expression profiling in black pepper (Piper nigrum L) with special reference to quality attributes.	47.80	36
259	Stock assessment and development of captive breeding technology of PUNTIUS Denisonii		

260	Ornamental fish culture for income and employment generation and to enhance socio-economic status of rural population of Kumbalam Panchayat, Kanayannur Taluk, Ernakulam district, Kerala State, India	20.00	36
261	Fish seed production and ranching in chalakudy river for improving the tribal livelihood of vazhachal forest division	15.33	36
262	Impact of one crop paddy - one crop prawn rotational farming on environment and socio economics in Kuttanad	5.06	24
263	Study and documentation of successful commercial dairy unit in kerala state and dissemination of their innovative practices for new entrepreneurs	3.37	12
264	DST-FIST Project	8.30	60
265	Evaluation of the efficacy of AC/CRP/11 as co-therapy in case of chronic respiratory disease(CRD)of chicken	0.74	6
266	Design fabrication and testing of low cost fluid milk processing system	9.90	12
267	Facilitation centre for medicinal plants	30.00	36
268	Preparation of Web based interactive packages for selected medicinal crops	8.90	24
269	Development of good agricultural practices and GAP monograph of bacopa monnieri	6.00	36
270	Study of selected adaptogenic plants and ayurvedic drugs with special reference to polyphenolic composition and antioxidant activity	30.00	36
271	KAU Rubbermark Collaborative Project Centre for Crop Nutrition	21.17	60
272	Farmers participatory approaches to assess the impact of integrated plant nutrient system on soil health & crop yield in a typical laterite soil of western ghats region	6.27	36
273	Bio resource recycling for sustainable livelihood in rural areas	5.79	36
274	Impact assessment of land use practices and studies on sustainable development in western ghats of Kerala	5.50	36
275	Collection, identification, evaluation and popularization of edible/medicinal mushrooms of western ghats of Kerala	5.50	60
276	Strategies for eco friendly exploitation of arrow root in the western ghat region of Kerala for mini agri business	5.50	36
277	Analysis of homestead based fodder production system and intervention for economic milk production in Trivandrum district of	5.10	36

	the western ghat region of Kerala		
278	Exploration of western ghat tract for diazotrophs of P solubilizers	5.20	36
279	Effect of micro gravity and high energy radiation at the outer space on growth ,development and quality of crop plants	15.57	36
280	Development of Water stress tolerant coconut hybrids through selected fertilization	5.80	36
281	Source efficacy of organic manures and microbial inoculants for nutrient scheduling in vegetable based cropping systems of western ghats	7.00	36
282	Crop productivity enhancement through capacity building of members of farmers club in Thiruvananthapuram district.	4.13	24
283	Developing on participatory settlement based animal farming model to enhance the income and employment opportunity of tribal women folk of western ghat regions of Kerala	5.17	36
284	New Agroment Field Unit (AMFU) at Kumarakom	3.40	36
285	FPARP project on system of rice intensification and micro irrigation technology	30.00	36
286	Promoting bio-resource based pilgrim need as a livelihood option by the rural women of Kerala	15.99	36
287	Improving awareness level in rural livestock community utilizing modern communication tools	3.80	12
288	Establishment and maintenance of a herbal garden	1.80	36
289	Characterisation of different stocks of Macrobrachium resenberggii and development of genetically improved strain through selective breeding	9.55	36
290	Bio-diversity of cultivable air breathing fishers in Kerala and development of appropriate culture strategies for Heferopneustes and claring SPP	20.78	36
291	Effective use of solid municipal and industrial waste as a compost of potting media for production of tree seedlings	7.90	36
292	Dimensions of water conservation in paddy lands of Kerala	17.87	
293	Food Safety through Crop Management - Developing a Management Plan	9.36	24
294	Design & Development of new farm machines and tools	3.00	12
295	Development of mechanical Pneumatic hoist for the management	0.25	6

	Dower Cows		
296	Pilot study on nutrient status		
297	Investigation on the role of anthelmintic treatment in enhancing milk production in the dairy cattle	1.98	12
298	Strengthening VHSE in Agriculture in Kerala	2.65	12
299	" An Assessment of Human Resource Requirement and Career Planning of Vocational Higher Secondary Education Certificate holders (Agriculture) in Agri-based and Other Rural Enterprises in Kerala	4.00	12
300	Finishing school for VHSC Certificate holders (Agri) to enhance employability	10.00	12
301	A perspective of challenges and problems faced by Adivasi Women	0.50	5
302	Development of innovative farm mechanization package for Kerala	300.00	36
303	SUGANDHI - Intergrated Pepper Development project for Wayanad District	150.00	12
304	Inter and Intra provenance variatin in wood quality of acacias grown in Kerala	4.18	36
305	Establishment of gene sanctuary for jack in Kerala	14.92	36
306	Survey of Mammals of Chimney wild life sanctuary with particular emphasis on the less known mammals	2.42	24
307	Wood quality evaluation of tree species raised in research trails of Keral Forest department at various localities	4.95	24
308	Socio-economic impact of eco-tourism initiative in Periyar Tiger reserve and Thenmala	2.95	12
309	Preparation of Bio-diversity conservation Plan for Kole Wet Land	2.04	4
310	Rapid Biodiversity Assessment of Peechi-Vazhani Wildlife Sanctuary	1.00	4
311	Faunal Biodiversity Assessment of Silent Valley Nation Park	1.00	4
312	Rapid Biodiversity assessment of Chimney Wildlife Sanctuary	1.00	4
313	Management of Tea-mosquito bug in cashew using red ants	6.00	36
314	Developing Gardening tools of Horticulture Therapy for physically Challenged Children	1.00	12
315	Landscaping and establishment of an arboretum of endangered species in the proposed Planetarium campus at Ramavarmapuram	3.56	24
316	Large scale production and distribution of annual drumstick (Moringa) seedlings	20.00	
317	Aid to government approved/registered private coconut nurseries	0.91	

318	Sustainable Management of proven technology on control of insect pests & disease in coconut and establishment of demonstration cum seed production technology.	25.00	36
319	Survey & identification of Rootwilt Disease free plants in Coconut & evolution of tolerant genotypes through selection & hybridisation	34.87	60
320	Demonstration - cum - seminar at Vazhakulam & Pookode	3.00	
321	Refinement of Technological innovations in vegetable production through experiments in cultivators fields for attaining food security	15.00	12
322	New project on production and distribution of elite seeds and planting materials.	50.00	12
323	R&D Project on Germplasm collection, evaluation & standardization of nursery development of plantation of Jatropha & Karanj.	9.76	36
324	Network Project on production and distribution of quality planting materials Tissue culture Plants.	50.00	
325	Sustainable agricultural development through decentralized planning: A study on the initiatives of local self government institutions for watershed development and conservation of natural resources	0.50	

10.5 Salient Accomplishments

Table 10.3 Improved varieties of crops

	Total varieties released	Years of release	Name of varieties
A. Crop			
Coconut	6	1989	Lakshaganga, Keraganga,
		1992	Ananthaganga
		1993	Kerasree
		2006	Kerasoubhagya Kerasagara
Rice	61	1974	Jyothi, Sabari, Bharathi
		1976	Suvarnamodan
		1978	Bhadra
		1981	Asha, Lakshmi
		1985	Swarnaprabha, Reshmi, Onam,

		1987	Pavizham, Bhagya
		1990	Karthika, Vyttila-3
		1992	Mattathriveni, Jayathi, Remya, Aruna,
		1993	Makam, Kanakom, Neeraja
		1996	Kairali, Kanchana, Aathira, Aiswarya,
		1998	Sagara, Vyttila-4, Bharathi, Harswa
		2002	Vyttila-5, Ranjani
		2010	Ahalya, Kumbam, Makaram, Deepthi,
		2011	Krishnanjana, Karishma, Revathi, Uma,
			Ramanika, Panjami, Pavithra, Karuna,
			Mangamashuri
			Chingam, Dhanu ,
			Vyttila 5, VTL 6, Ahalya, Deepthi,
			Kunjukunju Varna, Kunjukunju Priya
			Samyuktha, Vaishakh VTL-8, Thulam
			Prathyasa, Ezhome-1 Ezhome-2
Cashew	16	1987	Anakkayam-1, Madakkathara-1
		1990	Madakkathara-2
		1993	Kanaka, Dhana
		1996	Dharasree, Sulabha, Mrudula, Priyanka
		1998	Anagha, Amrutha, Akshaya
		2000	Damodar, Raghav
		2006	Poornima
		2010	Sree
Pepper	6	1990	Panniyur-2, Panniyur-3, Panniyur-4
		1996	Panniyur-5
		2000	Panniyur-6, Panniyur-7
Cardamom	2	1987	PV-1
		2000	PV-2
Turmeric	4	1996	Kanthi, Shobha
		2000	Sona, Varna
Ginger	2	2010	Athira, Karthika
Lemongrass	1	1988	OD-19
Cinnamon	1	2000	Sugandhi
Thipali	1	1996	Viswam
Kacholam	2	2000	Rajani, Kasthuri

Chethikoduveli	2	2006	Mridula, Agni
Atalotakam	2	2006	Ajagandhi, Vasika
Adapathiyan	1	2006	Jeeva
Sugarcane	4	1990 1992 1996 1998	Mathuri Thirumadhuram Mathurima Mathumathi
Cocoa	10	1998 2000 2002	CCRP-1, CCRP-4, CCRP-5, CCRP-6, CCRP-7 CCRP-2, CCRP-3 CCRP-8, CCRP-9, CCRP-10
Guinea grass	3	1990 1993 2006	Haritha Marathakom Harithasree
Bajra-Napier hybrid	2	2006	Suguna, Supriya
Cassava	3	1996 2000	Nidhi, Kalpaka Vellayani Hraswa
Sweet potato	1	1992	Kanjangad
Coleus	2	2000 2010	Nidhi Suphala
Greater yam	1	1998	Jude
Sesame	7	1972 1987 1985 1993 1998 2000	Kayamkulam-1 Thilothama Soma, Surya Tilak Tilothara Thilarani
Banana	2	1998	BRS-1, BRS-2
Pineapple	1	2004	Amritha
Groundnut	2	1998	Sneha, Snigdha
Bittergourd	3	1976 1996	Priya Priyanka, Preethi
Snakegourd	3	1996 2002	Kaumudi Baby

		2004	Manusree
Ashgourd	2	2000	KAU Local, Indu
Ridgegourd	2	2000 2004	Haritham Deepthi
Pumpkin	4	1988 1998 2002	Ambili Suvarna Saras, Suraj
Bhindi	6	1990 1998 2002 2006	Kiran Salkeerthi, Aruna Susthira Anjitha, Manjima
Amaranthus	4	1992 2000 2006	Arun Mohini Krishnasree, Renusree
Winged bean	1	1996	Revathi
Vegetable Cowpea	11	1992 1993 1996 1998 2000 2002 2006	Malika Sharika KMU-1 Vyjayanthi Lola, Bhagyalakshmi, Kairali Anaswara, Varun Vellayani ,Jyothika
Vegetable chilli	6	1990 1996 2000 2006 2010	Jwalamukhi, Jwalasakhi Ujwala Anugraha Vellayani Athulya, Vellayani Samrudhi
Tomato	4	1993 1998 2002 2006	Sakthi Mukthi Anagha Vellayani Vijay
Brinjal	4	1990 1996 1998	Surya Swetha Haritha, Neelima
Oriental pickling	3	1998	Sowbhagya

melon		2000	Mudicode, Arunima
Grain cowpea	6	1977	Kanakamony
		1991	Krishnamony
		1993	Pournami
		2000	Subhra
		2006	Sreya, Hridya
Dolichos bean	2	2006	Hima, Grace
Drumstick	1	2010	Anupama
Blackgram	2	1993	Syama
		2000	Sumanjana
Orchid	6	2006	Deep Blush , Lemon Glow, Master Delight, Pink Cascade, Velvet Soft
Mushroom	1	1996	Ananthan
B. Animals			
Poultry	2		Gramalakshmi, Athulya
Fish	1		Veil tailed variety of Angel Fish

10.5.1 Standardised technologies for agro techniques / crop management and crop protection

In order to achieve the potential yield of high yield varieties recommended by KAU technologies were developed for fertilizer application, water management, pest and disease management for all crops and the package of Practices recommendations are published periodically.

10.5.2 Farm Machinery Developed

- Manually operated paddy transplanter
- 5HP Self-propelled paddy reaper
- Tractor operated paddy reaper
- Portable power operated paddy thrasher-cum-winnover
- Jackfruit harvester
- Coconut de-husking tool named Keramithra
- Tender coconut punch
- Improved Petti and Para dewatering pumps
- Sand Drudger
- Pineapple Peeler, corer cum slicer
- Ashgourd seed extractor

- Pepper Thresher
- Black Pepper Decorticator
- Vanilla oleoresin Plant
- Tractor operated Kaipad bed former
- Continuous power operated coconut dehusker
- Herbicide applicator as an attachment to Redlands transplanter
- Coleus peeler
- KAU Coconut palm climber
- Copra separator
- Goat fecal pellet pulverizer
- Tractor operated mulching sheet lying machine
- Thorny bush uprooter
- Seedling plucker cum transplanter
- Nut meg sheller
- Arecanut dehusker
- Coconut splitter
- Motorized conoweeder

10.5.3 Enterprises established in Kerala using KAU technologies

Some of the technologies developed by the University have been instrumental in the establishment of enterprises in the State. All these enterprises are making profit and are very popular in Kerala.

- Banana based baby food
- Cashew apple processing
- Coconut de-husking tool named Keramithra
- *Trichoderma* and *Pseudomonas* as bio-pesticides
- Conversion of town wastes to bio-fertiliser

More than 25 enterprises are using the strains of *Trichoderma* and *Pseudomonas* identified by Kerala Agricultural University for large scale production and distribution of bio control agents in the state.

Using the KAU technology of processing and value addition of crops, 14 firms are established to make different value added products from cashew, pine apple, pepper, mango, lemon, banana, coconut and mushroom.

10.5.4 GI registration

The University as a co-applicant, assisted the farmer groups to file applications and secured GI registration for "*Palkkadan- Matta*", "*Wayanad-Jeerakasala-Rice*", "*Wayanad-Gandhakasala-Rice*", "*Pokkali-Rice*" and "*Central-Travancore-Jaggery*" "*Pathiyankara*".

10.6 Impact Statement

The research results obtained out of various experiments implemented in KAU helped the farming community a lot in improving productivity of field crops, horticultural crops, livestock, poultry and fishes popular in the farming sector. Some of the technologies in terms of productivity improvement and sustainable agriculture are listed below:

Unlike the industrial inventions, quantification of the impact of research the findings of agricultural research is difficult task. It becomes more difficult if the research finding is one, which bears fruit after an extended period. In Kerala, where majority of the crops are of perennial nature, quantification becomes all the more difficult. KAU has released over 271 improved varieties of crops all of them being capable of yielding several times that of the existing cultivars. *Jyothi* and *Uma* released by KAU are the most popular rice varieties in Kerala. Saline tolerant varieties like *Vytila-6*, *Ezhome-1* and *Ezhome-2* are in high demand in saline prone areas. The high yielding vegetable varieties namely *Preethi* (bittergourd), *Koumudi* (snake gourd), *Ambili* (pumpkin), *Mudicode* (Oriental pickling melon), *Lola* and *Anaswara* (cowpea), *Arun* (Amaranth) and *Haritha* (brinjal) released from KAU are now ruling in the state. *Panniyur* variety of pepper released by KAU is popular throughout India and other pepper growing countries. The hybrids of coconut, sugarcane and cocoa released by KAU are high yielders, capable of withstanding biotic and abiotic stress under a variety of conditions.

Salvinia, the aquatic weed, which rendered rice production impossible in vast areas of Kuttanad was controlled biologically using a weevil, *Cyrtobagus salviniae*. This technology is estimated to have annual savings of Rs. 68 lakhs. The Package of Practice Recommendations for the rehabilitation of coconut in the coconut root-wilt affected areas has helped farmers to get reasonable levels of income even from diseased plantations. Some of the low cost technologies developed by KAU, like coconut de-husking tool have become an indispensable item in every Kerala household.

I. AGRICULTURE

i. Rice

Rice varieties evolved by KAU were found highly accepted by Kerala farmers. Many of the early varieties combined high yield as well as the special traits of their parents like resistance to pests and diseases, quality attributes, physiological attributes, adaptability to different ecological situations and systems of cultivation. These varieties also act as genetic material profusely used in crop improvement programmes. Most of the varieties developed at Pattambi are internationally acclaimed for their performance and are accepted as donors for biotic and abiotic stress breeding.

The University also produces seeds of high yielding varieties for the benefit of the farmers. The annual rice seed production and supply in KAU is 439 tonnes.

10.6.I.i Impact of improved rice varieties of KAU

Total area under rice in Kerala	2.34 lakh ha
High yielding variety coverage	90 %
Area covered by KAU varieties	2.1lakh ha
Increased yield obtained from one ha	2 t
Increased yield from 2.32 lakh ha	4.212 lakh tons

The productivity of rice in Kerala was increased from 1575 kg/ha in 1971-72, 2301 kg/ha in 2004-05 and to 2510 kg/ha in 2009-10, though there is a reduction in area and production of the crop.

In Wyanad district productivity of paddy increased by 20% by adopting scientific management practices, and by introducing high yielding varieties and IPM practices. The area under paddy cultivation increased by 6%.

KAU produced 73.755 tons of breeder seeds, 75.946 tons of foundation seeds and 282.3 tonnes of truthfully labeled seeds during 2010-11.

The varieties developed by KAU are well accepted by the farming community. About 90% of area in rice in the state is covered by high yielding KAU varieties. Among the rice varieties, Uma ranks first in the area coverage closely followed by Jyothi. Varieties like

Kanchana, Aiswarya, VTL-6 etc. are also well accepted by the farmers. The remaining varieties also have location and season specific demand.

Impact analysis of some of the technologies developed by KAU in rice and rice based cropping system is given below:

Technology	Expected advantage over the existing practice
Rice variety Harsha/other HYV for dry sowing	50%
HYV for I crop	60%
Green manure with dry sown rice	Soil enriching
Herbicide in dry sown rice	Rs.650/ha
Mechanisation in rice culture	Rs.1500-2000/ha
Optimum plant population in transplanted rice	18-20%
Biocontrol of rice pests	Ecofriendly
Biocontrol of rice diseases	Ecofriendly
Green manure crop in summer fallow rice lands	Soil enrichment
Summer fallow pulses/ oilseeds	Cropping intensity
Summer fallow vegetables	Cropping intensity
New combinations of Koottumundakan	18%
IPNM in Koottumundakan	22%
Vermicomposting farm wastes	Recycling
HYV in vegetables	50-70%
IPM / IPNM in vegetables	Ecofriendly

“Food security Army” was launched to address severe shortage of agricultural workers in Kerala which is more severe in the kole lands and create problem in completing various activities in a time bound manner due to lack of labour and high cost of labour. This programme is expected to have major impact on farming sector in Kerala.

An “Agromachinery Service Centre” and training unit was initiated to mould Agromachinery Service Executives. Trainings and demonstrations have also been conducted in Kerala and in several States and Union territories. Machines are being rented out to farmers/ trained AMOSE on nominal rates for working within and outside the district. This has led to large scale adoption and popularisation of mechanised agriculture in the state. A

Plate 9. High yielding Varieties developed by KAU

High yielding varieties developed: 271

Crop	Varieties developed
Rice	113
Coconut	6
Vegetables	57
Cashew	16
Cocoa	10
Cardamom	2
Cassava	3
Coleus	2
Turmeric	4
Pepper	7
Orchid	5
Medicinal Plants	8

Plate 10. IPR support to Farmers – Geographical Indicators (GI)

GI Registration

- Pokkali rice
- Jeerakasala rice
- Gandakasala rice
- Central Travancore jaggery
- Vazhakkulam Pineapple

Farm Machinery Facilitation Centre was established for comprehensive solution for all the agro machinery related problems of the farmers of the State.

Mobile Agro Machinery Repair and Service Unit (MAMRSU) was established to provide mobile and on-site repair and maintenance facilities to the farmers. The University set up Agro Machinery Service Centres at Panchayath level and 15 registered centres are functioning so far.

Comparison of cost of rice cultivation through mechanization

Item	Mechanization	Manual	Saving by the farmer
Transplanting	Rs. 3000/- per acre	Rs.6000/-per acre	Rs.3000/-
Paddy cultivation including all basic operations	Rs. 9500/- per acre	Rs.14000/-per acre	Rs.4500/-

The training creates opportunity for entrepreneurship development and trained service providers can generate income. The trained service providers who participated in the collective action in *kole* lands earned Rs. 45.00 lakhs as service charges @ Rs. 2600/- per acre and Rs. 6.94 lakhs as rent for machines.

Integrated Rice based farming systems

An 'economic analysis of the major rice-based cropping systems of southern and central Kerala' indicates complimentary relationships of rice and integrating farming enterprises. The integrated systems were more desirable than the monocrop systems both economically and socially as evidenced by the higher net returns and increased labour intake per unit area.

Rice – fish integration

In rice-fish sequential farming system of Kuttanad, a research finding of the KAU, the net return per hectare in the sequential system was 3.3 times more than that of monocrop system. The cost of production per quintal of paddy was reduced to Rs. 420 /- from Rs. 566 /- in the monocrop system, in addition to creating an additional employment potential of 14 man-days / ha. "AAA farming" a model mixed farming protocol designed by KAU with agriculture, aquaculture and animal husbandry components has got wide acceptance and as a scientific module this was highly appreciated.

Rice-prawn integration

In the saline situation of Pokkali fields, rice monocrop yielded a net loss to the tune of Rs. 2993 /- per ha, whereas rice-prawn integration fetched a net profit of Rs. 37328 /- per hectare. The additional employment potential of the rotational system was about 227 man days per hectare.

Rice-Vegetable sequential farming

Fields where rice-vegetable rotational system was practiced, net returns per ha was Rs. 37420 /- as against Rs. 9158 /- in monocrop. Labour use per hectare also increased considerably in the rotational system from 86 mandays to 141 mandays per hectare.

Rice-Fish-Duck farming

Integrated farm models involving crop, fish and ducks were developed for the problem zone characterized by homesteads with adjoining backwaters. The models could generate an additional income of Rs 15000/- and 188 man-days of additional employment from an area of 0.7 ha (0.5 ha upland and 0.2 ha pond).

ii. COCONUT

KAU has developed 6 varieties of coconut of which 5 are hybrids.

Annual supply of improved elite coconut seedlings by KAU is to the tune of 1.23 lakhs of which 28824 were hybrids and the seedlings produced expected to cover an area of 787 ha.

Productivity increase over years

Year	Area (lakh ha)	Production (Million nuts)	Productivity(no./ha)
1971-72	7.30	4054	5539
2009-10	7.78	5667	7278
Increase (%)	6.5%	39.8%	31.4%

Comprehensive Coconut Care Programme (CCCP)

Coconut root wilt is a debilitating disease affecting coconut productivity in Kerala. The disease is severe in the southern six districts of Kerala, where the productivity of coconut in the root wilt affected area is 26 nuts/tree/annum, it is 36 nuts in the other area. The

studies at Regional Agricultural Research Station, Kumarakom has shown that by scientific management, the health and productivity can be improved. A demonstration in 35 ha area in Alappuzha district, where the 48 per cent of the population is affected by root wilt, was taken by KAU. The productivity of coconut improved from 26 nuts/ tree/ annum to 47 nuts after three years of intervention. This programme is extended to other areas also for improving coconut productivity.

iii. BLACK PEPPER

KAU has produced 7 pepper varieties, viz., Panniyur -1 (P1) to Panniyur -7. The varieties produced by KAU have average yield ranging from 1410 to 3850 kg/ha whereas the average productivity of Pepper in India is only 322 kg/ha.

In India 40-60% of the pepper areas are covered by KAU varieties. All the released varieties of black pepper are being cultivated throughout the state and neighbouring states. The first hybrid variety, Panniyur-1 is being cultivated worldwide and is highly acclaimed by farmers. It is giving excellent yield in all pepper growing tracts. Farmers from Karnataka have reported excellent yield of 90 kg per vine from scientifically managed Panniyur 1 gardens. Panniyur 5 is the variety which is most suited to shaded condition. The varieties Panniyur 4 and Panniyur 6 are suited for adverse climatic conditions. Scientific crop management and crop protection methods recommended from the station had a good impact among the farmers. Application of Potassium phosphonate 0.3% and *Trichoderma harzianum* 50g/vine as recommended from the station is an effective technology adopted by many progressive farmers for the control of *Phytophthora* foot rot.

More over KAU pepper varieties are popular in Brazil (10-25%), Indonesia (10-25%), Malaysia (10-25%), Sri Lanka (30-50%) and Vietnam (10-20%). This is an international recognition and evidence to the superiority of our varieties.

Annual production and supply of elite planting material of pepper by KAU is 7.1 lakh cuttings which is expected to cover an area of 154 ha.

Bush pepper technology, the practice of raising black-pepper in pots by using plagiotropic branches (fruiting branches) for propagation was developed and standardised by KAU.

iv. CASHEW

KAU released 16 HYV of cashew suited for different agro-climatic regions. All varieties are in great demand and we are not in a position to meet the demand. The impact of our varieties are evident from the following figures.

Total area under cashew = 48,972 ha

Percentage of area under HYV = 80% . These HYV are from KAU.

Area of cashew under KAU HYV = 39177 ha.

Increase in productivity under HYV = 552 kg/ha.

Total increase in production in 39177ha = 21625 tonnes

KAU annually produces and supply elite cashew grafts i.e. about 123476 nos. which is expected to cover an area of 695 ha.

Value added products

Patents were obtained for Cashew Brandy, Cashew Wine and Cashew Syrup.

Protocol for preparation of cashew apple RTS beverage, cashew apple- pine apple squash, cashew apple- pineapple blended RTS, cashew apple - mango mixed fruit jam, cashew apple pickle, cashew apple candy, cashew apple vine, cashew apple vinegar were developed and imparting consultancy to many entrepreneurs of the state.

v. COCOA

Cocoa has become one of the most remunerative intercrops in coconut and arecanut plantations of Kerala providing an additional income of about Rs.1,00,000- 1,50,000/- per ha. Kerala Agricultural University has been instrumental for production of high quality hybrid seeds/ seedlings and budded plants for the past 25 years. KAU has standardized the agrotechniques for successful cultivation, plant protection measures, post harvest handling and value addition at farm level. Exploitation of KAU cocoa production technology for commercial cultivation of cocoa has doubled the yield from unit area, enriched farm soils with organic matter and nutrients, reduced weeding costs of the plantation, enabled year round income and empowered women in cocoa growing areas. It is mainly due to

development of farm level processing techniques which provided livelihood for more than 20,000 farm families.

In view of the high yield, resistance to pests and diseases, the KAU varieties have high demand from both within and outside the state and thus about 90% of the cocoa produced in the country are KAU varieties.

Yield of local varieties - 1kg dry beans/plant/year

Yield of KAU clones and hybrids - 2.5kg /plant/year

In well managed gardens the yield level is upto 5 kg/pl/year. The income from cocoa has helped the growers in Idukki, Kottayam and High Ranges of Kerala to tide over the periods of low demand and low price of coconut and arecanut in Kerala in recent years.

During the last seven years, 9.39 lakh hybrid seed pods were distributed to Cadbury India Ltd for seedling production and distribution in Kerala, Tamil Nadu, Karnataka and Andhra Pradesh. Total area increase in acre during the period comes to 40,000 ha in the four south Indian states and 6000 ha. in Kerala.

With the standardization of technology for value addition of cocoa, KAU could empower 28 self help groups of farm women in Kerala. The number of SHGs is expected to increase in the coming years.

vi. BANANA

KAU has developed 2 banana hybrids and the suckers of the improved varieties are being supplied to the farmers. Annual supply of elite banana suckers by KAU comes to 1.15 lak suckers and it is expected to cover an area of 46 ha.

High density planting including 2-3 suckers /pit developed by KAU was found to be very profitable in banana.

Virus indexing and a Plant Health Clinic are established at Banana Research Station, Kannara. Virus indexing helps the farmers to get disease free suckers. Supply of tissue culture plants reduced the incidence of bunchy top disease in banana. KAU produced and distributed 1.6 lakh tissue culture plants during 2010-11.

A woman based SHG was empowered and sustained in scientific Kadali Banana production and is supplying banana bunches to Guruvayoor Temple in Thrissur.

vii. PINEAPPLE

One hybrid variety of pineapple has been developed and released by KAU.

As a result of the trainings and transfer of technology, the area under pine-apple has increased from 7490 ha. in 1995 to 9827 ha. in 2010. KAU produced 12000 nos of suckers including tissue culture plants during 2010-11 depending on the demand.

viii. VEGETABLES

KAU has developed 57 high yielding varieties in different vegetable crops. About 7.394 tons of high quality vegetable seeds are produced and supplied by KAU and it is expected to cover an area of 90000 ha in the state. Among the vegetable varieties grown in Kerala, almost entire share is that of KAU varieties like *Preethi* (bittergourd), *Koumudi* (snakegourd), *Lola* (cowpea), *Mudicode Local* (Oriental pickling melon), *Ambili* (pumpkin), *KAU local* (Ashgourd), *Arun* (amaranthus), etc. VFPCCK and state Department of Agriculture are also taken seed production and seed distribution with KAU varieties.

Productivity increase over years

Year	Productivity (t/ha)
1991-92	16.0
2009-10	26
Increase (%)	63%

Identified varieties/hybrids like NS-183, NS-180 and NS-43 in cabbage and cauliflower varieties/hybrids NS-60, Basant, Pusa Magna suited to tropical conditions of Kerala during winter season. Standardized production technology for cultivation of cool season vegetables like cabbage and cauliflower in plains of Kerala. This technology has wide spread adoption in Kerala so that each house hold is cultivating cabbage and cauliflower as per their demand.

Developed an ideal model of rain shelter suitable for cultivation of vegetables and ventilated poly house suitable for seedling production and cultivation of high value crops in Kerala in Kerala. This has helped the farmers for commercialization of vegetable cultivation.

Value Addition

Processing methods have been developed for the '**preservation and product diversification of coconut inflorescence sap**'. The products developed are soft drink (RTS), concentrated coconut inflorescence sap, granules, coconut inflorescence sap jam and coconut inflorescence sap toffee. The method of processing of palm-gur was improved to increase the organoleptic qualities and shelf life. A modified method of collection of coconut inflorescence sap was developed to minimize the post harvest deterioration of sap quality. Farmers will be able to generate a net return of Rs. 3.00 ha / year, if the above technologies are commercialized and popularized. These technologies will create additional employment opportunities to the tune of 2500 mandays / ha / year.

Technology was developed for production of different processed food products from like pickles (20 types), dehydrated products (40 types), jams (3 types), Osmo- dehydrated products (3 types), squashes (10 types) and wine (10 types) from underexploited fruits and vegetables.

Fruits and vegetable processing units were established in rural areas of Thrissur (4), Palakkad (2), Malappuram (1), Ernakulam (6) districts based on the training programmes conducted and consultancy services rendered by KAU.

A biowaste management strategy for house hold level adoption was perfected. The clean energy and organic manure thus produced can partially replace LPG and fertilizers, resulting reduction in carbon emission. This technology can be adopted at housed hold level for waste management.

xi. MUSHROOM PRODUCTION

A total of 26911 kg of spawn, 25 bottles of mushroom wine, 33 kg mushroom and 200 bottles of mother spawn are produced and distributed to the farmers. The technology for producing value added products like mushroom wine (Koonamruthu), dried mushroom powder and mushroom sauce were standardized and popularized from Oyster mushroom.

Trainings were conducted for mushroom production and consultancy services were rendered to processing units.

xii. BIOCONTROL AGENTS

Control of salvinia and water hyacinth, the troublesome aquatic weeds of water bodies was achieved by the Scientists of KAU through the use of the biocontrol agents *Cyrtobagous salviniae* and *Fusarium pallidoroseum* respectively. The salvinia were spread over 60,000 ha of paddy fields and all lakes and canals in Kerala till 1985. By the introduction of *Cyrtobagous salviniae*, a small insect imported from Africa, most of the areas were cleared and there was an estimated annual savings of more than Rs.68 lakhs.

Beneficial micro organisms viz., *Pseudomonas*, *Trichoderma*, entomopathogenic fungi viz., *Beauveria* and *Metarrhizium* were identified as highly useful biocontrol agents against pests and diseases of various crop plants of Kerala. All the microbial inoculants developed have been successfully commercialized and are available to farmers, viz. *Pseudomonas*, *Trichoderma*, *Azospirillum* and mycorrhiza. Four Regional Research Stations in the University, State Biocontrol Laboratory, State Biofertilizer Centre, Spices Board, Myladumpara and 32 private entrepreneurs are involved in the commercial production of the microbial inoculants and they are producing 1200 t of biocontrol agents which can substitute 200 t fungicides worth Rs.6 crores using KAU cultures. Using the mother culture from KAU the firms are producing 100 t biofertilizers equal to 1000 t nitrogen worth Rs.2.5 crores. The technology is so potential and viable that all the centers including that of the other University and other units are running on profit.

Mass production and supply of biocontrol agents like *Pseudomonas* and *Trichoderma* and biofertilizers like *Azospirillum*, *Azotobacter*, *P*-solubilizers and AMF are undertaken in KAU and produced 44702 kg of bio control agents for distribution to the farmers during 2010-11. Commendable adoption was achieved among farmers particularly for management of serious diseases and promotion of growth of black pepper, vanilla, cardamom, betel vine, ginger, rice and vegetables. Betel vine farmers under their co-operatives in Trivandrum district are completely relying on *Pseudomonas* and *Trichoderma* for disease management without using chemicals

Facilities have been established for quality analysis of microbial inoculants and samples submitted by Department of Agriculture, farmers and entrepreneurs.

Plate 11. Varieties released

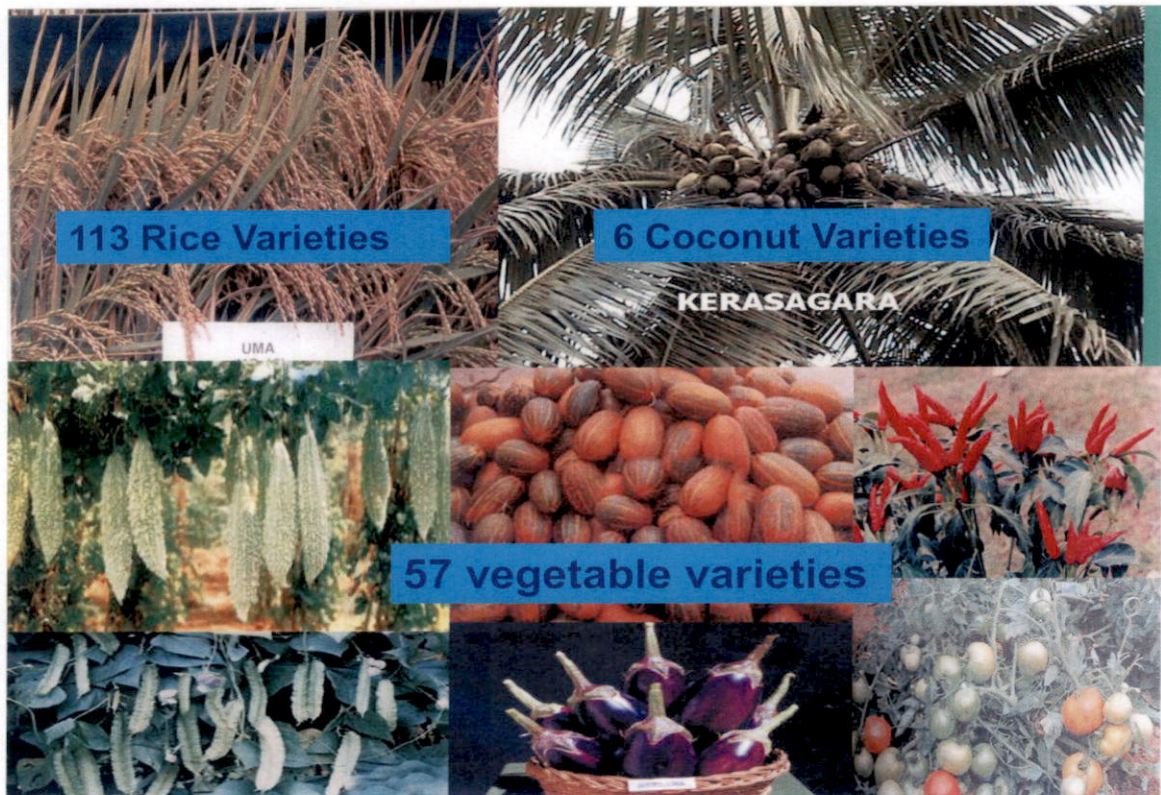


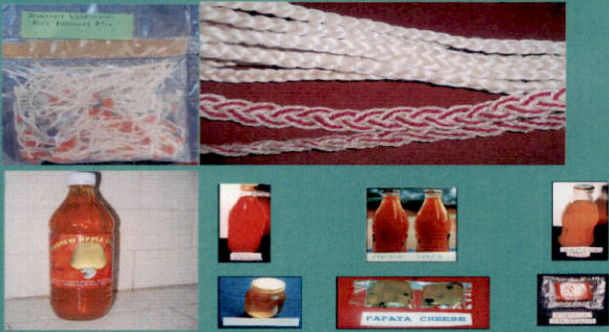
Plate 12. Protected Cultivation



Plate 13. Post Harvest Processing and Value Addition

Value Addition

- Rice
- Coconut
- Cashew
- Banana
- Jack
- Papaya
- Watermelon
- Sugarcane
- Cocoa



New Areas of Research

- Climate Change Research
- Farm mechanization
- Precision farming/Protected cultivation
- Cool season vegetables
- Biofertilizers, Biocontrol agents, Biopesticides and Organic farming
- Processing, value addition and marketing
- Farmer Participatory Research -PTD

Plate 14. Efforts to Maintain Biodiversity – College of Forestry



Plate 15. Support in Wildlife Crime investigations

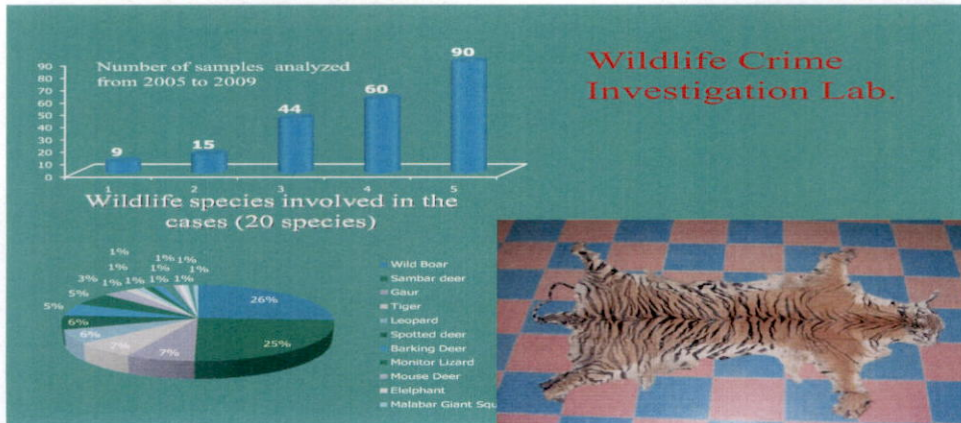
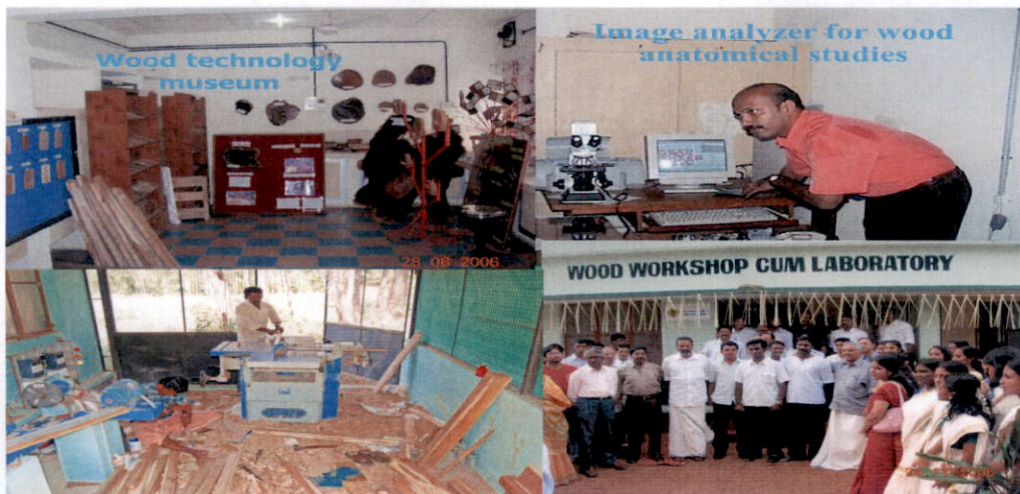


Plate 16. Wood technology Lab and Facilities



A formulation technology with emphasis to sustain virulence and higher shelf life of microbial inoculants including insect biocontrol agents-*Beauveria*, *Metarrhizium* and *Verticillium* have been developed, which help the farmers to sustain the advantage of application of microbial inoculants.

Kerala Agricultural University has recently announced plans to tie up with private partners for the manufacture of biological inoculants developed by its scientists, to combat fungal and bacterial diseases. A unique strain of bacteria, *Pseudomonas fluorescence* P-1, isolated by the scientists of Kerala Agricultural University was found to prevent many fungal and bacterial infection and aid crop growth. For the commercial multiplication of microbial strains, an agreement has been signed between Kerala Agricultural University and Agri Bio Input Manufacturers Association of Kerala, a consortium of 15 companies and State Bio control Lab under the Dept. of Agriculture, Kerala. 14 Companies/NGOs are producing bio-fertilizers with the inoculums supplied from KAU. This association will procure bacterial cultures from Kerala Agricultural University and market the inoculants. It is expected that the royalty from the sale of inoculants would result in annual revenue of more than Rs.10 lakh to KAU.

xiii. AGRICULTURAL MARKET INTELLIGENCE

The Agricultural Market Intelligence Centre (AMIC) provides price forecasts during main crop seasons for coconut, pepper and cardamom and product intelligence to all stakeholders. 8 commodity price forecasts for Pepper (3 Nos.), Coconut (2 Nos.), and Cardamom (3 Nos.) and 3 updates for Pepper (1 No.) and Cardamom (2 Nos.) were released. A Portal was developed and 97 News Paper releases, 17 TV telecasts and 11 Radio broadcasts were made for disseminating the price forecasts. This will have definite impact to the farmers for planning and selling at peak prices to get maximum profit.

xiv. OTHER TECHNOLOGIES

Soil based plant nutrient management plan was formulated for different agro ecosystems of Kerala and adhoc recommendation for management of secondary and micronutrients were made. The application of sulphur and Zn which are depleting from the laterite soils, will have specific and definite impact on improving the soil fertility and thereby

increasing productivity of crops. Soil fertility cards indicating nutrient requirements and application schedule for plots under each survey number had been distributed to Krishi bhavans.

The parasitoid *Acerophagus papaya* is found very effective for controlling infestation of mealy bug in papaya and the alarming incidence of papaya mealy bug is now under control.

Developed technologies for the commercial cultivation and management of virus diseases of honey bees.

Integrated Agromet Advisory Service – A multi – institutional programme was implemented in collaboration with IMD, ISRO, CUSAT, Planning Board and Department of Agriculture in all 14 districts with KAU expertise. Weekly agromet advisory services are being prepared and disseminated to the farming community.

Based on the study conducted by State Planning Board the over all Impact of KAU Varieties and Technologies is to the tune of Rs.840 crores/annum

II.AGRICULTURAL ENGINEERING

i. Developed the following machineries:

- Bed former suitable for Pokkali area with float unit as an attachment, Motorized pepper harvester, self propelled ginger harvester, coleus peeler, black pepper decorticator
- Cost effective method of extraction of natural vanilla from *Vanilla planifolia*
- Developed portable split biogas plant suitable for farmers with one cow or only small animals and portable light trap for pest monitoring in rice
- Tractor operated Kaipad bed former to make mounds in Kaipad field. The height of the bed varies from 35-43 cm. The field capacity of the bed former is 0.2 ha per hour. Field trials were conducted during April-May, 2010 and April 2011 for an area of 1.6 ha at Kannome, Ezhome Panchayat, Kannur. Farmers accepted the implement and are satisfied with the height and width of the beds formed.
- Continuous power operated coconut dehusker. It is found that the average husking time was 30s per nut for green coconuts and 25s per nut for the dry coconut. The capacity of this machine is 240 nuts per hour. The cost of the machine is Rs.50,000/-.

Plate 17. Innovations and initiatives in Farm Mechanization

Mechanisation in Agriculture – Developed Keramithra and 11 other machineries for agricultural operations

- Bed Former for kaipad
- Large Diameter Pit Digger
- Rotary Coconut Husking Machine
- White Pepper Decorticator
- Vegetable Seedling Transplanter-udyanamithra
- Arecanut dehuskar
- Micro Tiller
- Potato Slicer
- Fruit Grader
- Helical Plough
- Ash gourd Seed Extractor



“Kera Mitra” Coconut dehusking Tool-Patented



Food Security Army
& Mobile agro machinery training unit



**MOBILE AGRO
MACHINERY
REPAIR &
SERVICE UNIT**

Training in Coconut-Palm Climbing with Machine



**AGRO MACHINERY OPERATIONS by
SERVICE EXECUTIVES**

- Herbicide applicator as an attachment to Redlands transplanter to apply suitable herbicide in correct dosage between rows of transplanted seedlings.
- Coleus peeler was developed to peel the coleus. The cost of the peeling unit is Rs. 700/-
- KAU Coconut palm climber for easy climbing and harvest of nuts. The cost of the climber is Rs. 6600/-.
- Copra separator to separate copra out of shell
- Tractor operated mulching sheet lying machine with total cost of Rs. 35,000/-
- Thorny bush uprooter removes roots of thorny plants with a cost of Rs. 200/-
- Seedling plucker cum transplanter with cost of Rs. 200/-.
- Nut meg sheller: Shells the nut meg fruits. The overall profit from mechanical shelling was found to be more than 12 times that of manual shelling.
- Arecanut dehusker: Arecanut dehusker can husk around 20-25 arecanuts in one minute. The cost of the unit is Rs. 100/-.
- Coconut splitter: Coconut splitter (Model II) can split six coconuts in one minute.

ii. Patent obtained for the following

- Rotary Engine
- Variable torque converter
- A device for harnessing animal power
- Improvements in or relating to bicycle operated pump

iii. Reclamation of Kari land by sub surface drainage

Extensive studies in the farmer's field have shown that rice yield in the acid-sulphate soils could be enhanced by 50-100% by the use of tile drains. Plans for the adoption of this technology for the entire area are on the anvil.

iv. Plastic sub-surface dyke

A low cost technology for the conservation of water by way of sub-surface dyke using plastic sheet has been developed. This retains water on the upstream side by preventing the subsurface flow.

v. Improvements in "Petti & Para"

Studies revealed that the best speed of operation of a 15 hp unit was 330-340 rpm. Most of the manufacturers are now making their units adopting this recommendation.

11. EXTENSION EDUCATION

11.1 Number, location and lead functions of various extension centres

Extension education is an integral part of the mandatory activities of Kerala Agricultural University. It is planned, organised and conducted through the coordinating efforts of the Directorate of Extension, KAU. The Directorate has been instrumental in streamlining and implementing various extension strategies for the State of Kerala through on-farm technology assessment and refinement trials, analysis of the technology potentials for sustainable income and employment, studying technological, economical, and institutional infrastructure constraints that inhibit adoption and its impact on social equity. Human resource empowerment efforts through training, institutional and organisational innovations and providing quality planting and breeding materials to farmers also form part of the extension activities of the University.

The Extension Advisory Committee constituted by the University with the Hon. Vice Chancellor as the Chairperson and comprising representatives of various development agencies, farmers and other interest groups guides all extension policy decisions of the University. It helps in providing linkages with institutions engaged in extension and development and gives opportunities for sharing experience in setting the extension agenda and priorities. It has also made pioneering efforts to include marketing, credit and post-harvest techniques under extension in addition to the conventional role of technology and research services and input supply.

The major innovative extension approaches of the University can be conceptualised under the following heads:

- Participatory and Group approaches
- Farm advisory / diagnostic services
- Rural entrepreneurship development
- Single window services
- Human Resource Development in the field of farm sciences
- Awareness programmes
- Transfer of Technology innovations (through Package of Practices)
- Research – Extension interfaces
- Cyber Extension programmes

- Technology and society interface studies
- Research Into Use (RIU)

All the extension programmes of the University are carried out through a network of institutions consisting of the Communication Centre, Central Training Institute (CTI), Agricultural Technology Information Centre (ATIC), Krishi Vigyan Kendras (KVKs) and the KAU Press. The National Service Scheme (NSS) Units in 6 colleges of the University also carries out extension activities. In addition, the extension activities of the educational institutions and research stations are also coordinated at the Directorate of Extension. Public Relations Office of the University that manages the media relations of the University is also under the direct administrative control of the Director of Extension. Earn while you learn programmes, Rural Agricultural Work Experience programme, Village adoption programmes, participation in Television and AIR, agricultural seminars, etc. are some of the other extension activities from the University.

Table 11.1 Extension Activities of the Directorate of Extension*

No	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1	Field Visits	96	44	60	62	180
2	Seminars	97	71	49	109	295
3	Trainings	157	101	167	149	165
4	Farm science clubs	16	3	NA	2	UA
5	Film/Video shows	116	153	7	NA	NA
6	Exhibitions	18	10	8	9	15
7	Farm Advisory services (in person)	1030	1082	898	500	900
8	Replies to farmers queries	305	724	517	700	600

* - Figures related to Communication Centre, CTI, ATIC and KVKs.

UA - Unavailable

11.1.1 Communication Centre, Mannuthy, Thrissur

Communication Centre forms a central facility of the University entirely dedicated to fulfilling the extension mandate. It was started in 1972 and the centre provides technical information and support to the extension personnel of the state development departments and farmers and coordinates the farm awareness activities of the University through its various units viz. Information unit, Publication unit, Farm advisory service unit and

Exhibitions and graphics unit. Regular technology dissemination activities and field information services makes it the vanguard of technology transfer commitments of the University. It disseminates new and useful farm technologies to various line departments, voluntary agencies, cooperative societies, commodity boards and farmers through different media using various extension tools. An ABARD – Biodale unit for popularisation and training of women in use of eco-friendly products in agriculture is also operating here.

The *information unit* looks after the transfer of technology in farm sciences using various extension tools including the ICT tools. Queries from farmers are clarified and features on topical agricultural problems are also published in leading Malayalam and English dailies. The *farm advisory services unit* caters to diagnosing field problems, conducting field visits, planning and organising seminars, farm clinics, consultancy services on field problems and agri-enterprises. The *publication unit* brings out technical publications of the university including editing works related to the publication of periodicals, books, booklets, bulletins etc. to cater the need of the farming community and general public. A semi-technical quarterly farm magazine 'Kalpadhenu' in Malayalam is also published for the benefit of the farming community. It is involved with the regular technology update of the university research findings through technology workshops and publication of accepted results as *Package of Practices (Crops)*, the authenticated technical guide on all agricultural practices in crops for the state. The *exhibition unit* organises and participate in major and minor exhibitions on request from outside agencies and also at different stations of the University. Besides, the University regularly arranges exhibitions during flower, vegetable shows and the famous Thrissur Pooram festival.

It also under takes technology into use studies in the field through various research projects funded under plan and by external funding agencies like State Horticulture Mission, State Department of Agriculture, ICAR etc. Research on diversification in coconut homesteads for better livelihood sponsored by ICAR has been completed in Thrissur and neighbouring districts. Also a project on the Concurrent Evaluation and Monitoring of the Central sector Macro Management Schemes implemented by the State Department of agriculture in the 14 districts of Kerala was coordinated at the Centre. Results from these pioneering studies have been instrumental in providing guidelines for more effective utilization of resources and scheme implementation in the state. The Participatory technology development and dissemination model (PLEAD) (Participatory Learning Experimentation Action and Dissemination) model developed under the NATP project has been well appreciated and accepted.

11.1.2 Central Training Institute, Mannuthy, Thrissur

The Central Training Institute (CTI), established in October 1986, is the nodal point of KAU's training activity. The institute coordinates the training activities on agriculture and related subjects for the technical personnel of the state development departments, commodity boards, banks and such other agencies including the farming community. Trainings are organised at CTI and other institutions of the university throughout the state. The institute has been recognised by the Government of India as the centre for national training courses in specialised areas such as plantation crop, production technology, farm journalism, etc. Thrust is being given for the empowerment of stakeholders through various HRD interventions. Training programmes are conducted only on payment of full course fee in advance, which includes 20% institutional overheads.

The mandate of the CTI is [1] to identify the training needs and organise specialised training activity, [2] to coordinate, monitor and evaluate the training programmes undertaken by the KAU and [3] to strengthen the training capabilities of the research stations and educational institutions under the KAU. The training programmes undertaken by the institute are classified as *Sponsored Training, Vocational Training, and Stipendiary Training*.

The CTI has its sub-centre – Training Service Scheme (TSS) at College of Agriculture, Vellayani, Thiruvananthapuram; which also came into being in 1986. Both the CTI and TSS are conducting Agri-Clinic and Agri-Business (ACAB) training programmes since 2002 under the sponsorship of National Institute of Agricultural Extension Management (MANAGE), Hyderabad for the unemployed graduates in agriculture and allied subject so as to promote the establishment of agri-clinics and agri-business ventures.

Of late, a major initiative for the human resource development of internal faculty and administrative staff of KAU is being undertaken by the CTI. National programmes are also being conducted by the institute. Further, the CTI is preparing a project on "International Institute for Research and Development of Human Resources in Farm Sciences" (IIRD-HRFS)

11.1.3 Agricultural Technology Information Centre, Mannuthy

The Agricultural Technology Information Centre (ATIC) is a single window support system for providing agricultural technology information, value-added products, planting materials and diagnostic services to the farmers and other end users. Originally started as Information-cum-Sales Centre in 1993, the centre was upgraded to ATIC as a national model

in 2000 by ICAR. The model has been replicated in all states under ICAR funding as an innovative approach in technology transfer.

The rationale for the establishment of the ATIC at KAU is [1] to provide diagnostic services for plant and livestock health, soil and water testing; [2] to supply quality products such as seeds, planting materials, fish seed, fingerlings, poultry and livestock breeds as well as value-added products evolved from the various institutions under the KAU and [3] to provide information through published literature and audio-visual aids. The ATIC thus serves the twin goals of information dissemination and resource generation.

The mandate of the centre is [1] to provide a single window delivery system for agricultural information as well as products and technologies developed by the University with a view to deliver quality services to the clientele, [2] to strengthen the farm advisory services by adopting a multi-disciplinary approach to problem solving, [3] to provide mechanism for feedback from the end users to the research system, [4] to function as a repository for agricultural information pertaining to farming skills and practices, farm inputs and agricultural education, [5] to offer consultancy services to the different stakeholders in the state and [6] to offer training to unemployed youth to make them job providers, rather than job seekers as a part of the ABARD project.

The major functions of the ATIC are:

- Sale of quality plants and planting materials
- Supply of veterinary products and processed fruit products
- Farm advisory services
- Supply of books, booklets and leaflets of the University

The Centre has also a “Village Resource Expert Centre (VREC)” funded by the State Planning Board and technically guided by the ISRO. The VREC is a virtual classroom facility that handles sessions through video conferencing mode.

11.1.4 Krishi Vigyan Kendras

Krishi Vigyan Kendras, popularly known as KVKs, are the district nodal centres for training and technology transfer among the farming community and development departments & Non-Governmental Organisations. There are seven KVKs under the KAU that are fully financed by ICAR, which are at Palakkad, Wayanad, Kollam, Kottayam, Thrissur, Malappuram and Kannur districts. The KVK acts as knowledge centres and technological hub

for agricultural and rural development of the concerned district. Hence, it maintains a very cordial relationship with all the developmental departments, local self governance institutions and non-governmental organisations of the district. All the KVKs have soil and water testing laboratory facilities and e-connectivity. The KVKs have a major role in farm mechanisation and horizontal spread of the new technologies. The Kendras conduct "Technology Week" every year to create awareness on the latest developments of agriculture and allied fields.

The mandate of the KVK is:

1. Collaborate with the Subject Matter Specialists of the State Agricultural Universities / Scientists of the Regional Research Station, NAEP and the state extension personnel in "On Farm Testing", refining and documenting technologies for developing region – specific sustainable land use system.
2. Organise training to update the extension personnel within the area of operation with emerging advance in agricultural research on regular basis.
3. Organise long term vocational training courses in agriculture and allied vocations for the rural youths with emphasis on 'learning by doing' for generating self-employment through institutional financing.
4. Organise "Front Line Demonstrations" in various crops to generate production data and feedback information.

The **Krishi Vigyan Kendra, Palakkad** is located at Pattambi. It is the oldest KVK established under KAU in 1979 and since November 1982, the Kendra is fully sponsored by the ICAR. The Kendra celebrated its silver jubilee during 2004 and a national seminar on "Scaling up of extension methodologies for rice cultivation" was held as a part of the jubilee. Invited lectures, presentations and posters on the theme were presented and an exhibition was organised.

The **Krishi Vigyan Kendra, Wayanad** is situated at Ambalavayal, which was started in 1982 under the University and subsequently financed by ICAR from 1984. Wayanad being a tribal dominated district, this Kendra primarily caters to the need of the tribal population and its upliftment. It is worth mentioning that the KVK, Wayanad is the first Kendra at the national level to refund the entire seed money of the Revolving Fund (Rs. 1 lakh) provided by the ICAR. As an innovative extension approach, the Kendra has trained a tribal women youth group in bio-control agents production; who produce bio-control agents under the technical supervision of the Kendra and earn a revenue of 35 per cent from the sales. Another

significant feature is that the Kendra has got a financial assistance of about Rs. 150 lakhs from the project called "Rashtriya Sam Vikas Yojana (RSVY)" for various developmental activities. The Kendra has also a "Village Resource Expert Centre (VREC)" funded by the State Planning Board and technically guided by the ISRO.

The **Krishi Vigyan Kendra, Kollam**, located at Sadanandapuram began function from 1994. The agro-clinic started by the Kendra has received due recognition and appreciation from the farming community and other stake holders of the operational area.

The **Krishi Vigyan Kendra, Kottayam** is at Kumarakom, which came into existence during 2000 by remandating the Regional Agricultural Research Station to perform the duties and functions of the Krishi Vigyan Kendra. The Kendra has started an ATIC centre in July 2003 with the cooperation of the trained women SHG members that serves as the information cum sales centre of the remandated ZRS.

The **Krishi Vigyan Kendra, Thrissur** is located at the KAU Headquarters. It was established in 2004 and the Kendra is well known for its quality seed production.

The **Krishi Vigyan Kendra, Malappuram** is located at the premises of the Kelappaji College of Agricultural Engineering and Technology, Tavanur. It was also started in 2004. The Technology Week conducted by the Kendra in 2010 was well appreciated by the farming community and other stakeholders. Prof. K.V. Thomas, the then Minister of State for Agriculture, Govt. of India, and Dr. K.G. Kokate, Deputy Director General (Ag. Extn.) of ICAR graced the occasion.

The **Krishi Vigyan Kendra, Kannur** was established in 2004 at Panniyur. From the very inception of the Kendra, it undertook many innovative extension approaches like Compact Area Group Approach (CAGA) for tackling mite problem in coconut, producing value-added products from cashew and marketing under the brand name, production of video cassettes, establishing a loan window facility in collaboration with SBT, conducting the first ever "Farmers' Science Congress" at the national level and honouring the farming community for their innovation in various disciplines of agriculture, starting a farmers' museum; besides regular KVK activities. Due to these pioneering and novel efforts, the Kendra received the "**Best KVK Award**" at the national level in 2009. It is noteworthy to mention that this Kendra is the youngest Kendra in the country to bag the award; since the inception of KVK by the ICAR system in 1974.

11.1.5 KAU Press

The KAU press was established in 1976 and is renowned as one among the best of its kind in the country. It is pertinent to mention that this claim is founded on the fact that the KAU has bagged the prestigious "Excellence in Printing Award" at the national level during 1985. The press caters to the printing needs of the University and so far, about 100 Malayalam publications, 50 technical bulletins and 75 books on different subjects in English have been printed at the press for distribution to the public at a very reasonable price.

The mandate of the Press is:

1. Information support for transfer of technology to development departments, farmers and other potential clients.
2. Publication on quality information materials including manuals, handbooks, technical bulletins, textbooks, magazines, research journals, etc.
3. Documentation support through annual reports, agenda notes, budget estimate, handouts, catalogues, forms, status reports, etc.
4. Printing of glossy reports including research project proposals, package of practices recommendations (Agri. & Vety.)
5. Printing and supply of miscellaneous items, such as coupons, bus passes, receipt books, registers, application forms, prospectus, proforma, announcement notices, invitations, note leaves, writing pads, scribbling pads, letter heads, academic records, certificates, course curriculum, syllabus, field note books, file leaves, etc.

Besides the above, the KAU press also undertakes binding works related to files, documents, reports, training notes, workshop and seminar proceedings. The bulk volume of printing works received from Publication Unit consisting of technical bulletins, textbooks, pamphlets, booklets, farm magazines, newsletters and other non periodicals which are of scientific nature with the very short time periods are also executed by the KAU press.

11.2 Method of assessing extension education needs of the community

The extension needs are assessed through periodical zonal workshops, interaction with development department officers, farmers, social workers, politicians, etc.

Identifying innovative farmers in different regions and documenting their innovations will pave way for popularizing such successful models. Drawing inspiration from the farmers'

science congress organized at Kannur, KAU plans to make such conclaves a periodical affair. Projecting and promoting competent farmers and their competence, agricultural productivity, a key factor in food sovereignty, can be significantly enhanced.

Changes in marketing factors and unfamiliar shifts in agro-meteorological spheres are major constraints confronted by rural farmers. Advance information through a competent market intelligence system will help the farming community with alternate avenues to achieve financial stability. Similarly predictions on changes in climate will be invaluable for sustenance and enhancement of productivity.

Institutionalizing mechanisms to equip farmer community with extensive information in advanced technology and practical knowledge is another creative step envisaged. Farmer Schools in each agro-climatic region will lead to adoption of appropriate technologies as well as climate change adaptation techniques. An area specific and crop based e learning facility for farmers is a pragmatic proposal to enable them to convert the know-how in to do-how.

Exploiting the advantage of Distance learning mode to spread awareness on modern trends and technologies is an extremely enterprising prospect. By formulating distinct modules for Farmers, Researchers and Extension workers a system of continuing education can be established. Considering the absence of any noteworthy avenue for enriching knowledge for extension workers and departmental officials the distance learning mode instituted through an appropriate ICT enabled system is definite to make impact.

Interactive Agri portals equipped with ready to share knowledge on fertigation, plant protection and IPM will be another effective mode for ToT. The bi lingual e windows developed by KAU has been widely appreciated and such a mechanism, if instituted at national level in all Indian languages, will be a readily acceptable and appreciable model. KAU can take the lead in developing and propagating this mechanism

11.2.1 Planning of Extension Activities

Planning of innovative extension programmes under the Directorate of Extension has its inputs mostly from the field extension officers and farmers. The feed back on technologies from zonal research - extension interfaces are incorporated in technology adaptation trials and field programmes. Periodical evaluation of training content and training need assessments, conducted among different categories of trainees by the CTI, forms the basis for the training programmes of the University normally published as training calendar in

advance. The Scientific Advisory Committee of Krishi Vigyan Kendras (KVK) reviews and approve the programmes of each KVK based on district priorities. Annual pre action plan and review meetings of Zonal Project Directorate (ICAR) also reviews the programmes of KVKs annually.

11.3 Funding sources

The sources of funding for KAU include grants from the State Government, ICAR, other External Funding Agencies and domestic resources. The total outlay of the financial year 2011-2012 is Rs 225 crores. The State Government fund is classified as non-plan and plan grants. While non-plan grant is for committed expenditure like salary, pension and overhead costs, plan grant is intended to take care of project-costs. The comptroller manages the University financial resources.

The ICAR funding is in the form of developmental grants for educational institutions and also for implementing co-ordinated projects, NATP, NAIP projects etc. The University also takes up ad-hoc research schemes financed by the State, National and International agencies, Commodity Boards and Private agencies.

The major sources of funding for the University are State Government and the ICAR. Ever since the inception of the University in 1972, sufficient funds were being provided by the State Government and other funding agencies. Recently the University is not getting sufficient funds to meet its non-plan expenditure, resulting in deficit budget.

11.4 Faculty and Student involvement in Extension

Major activities of faculty and students in extension programmes are furnished below:

11.4.1 National Service Scheme

The overall aim of National Service Scheme (NSS) is to give an extension dimension to the higher education system and orient the student youth to community service while they are undergoing education. It is necessary to awake the social conscience of the students to provide them an opportunity to work with the rural folk and to expose them to realities of the life and bring about a desirable change in their social perception. The NSS programme is organised in all the colleges of the University with these objectives.

The Director of Extension is the Chief Coordinator of this programmes and every college has one or more Programme Officers to organise and supervise the NSS activities. Several social activities such as health camps, awareness camps on important issues, blood donation campaigns, tree planting campaigns, eco-sensitization camps, laying out of nutritional gardens in the homesteads, laying roads in socially backward areas, cleaning and sanitation activities, etc. are organised by NSS units. Besides, workshops and other extension activities on subjects of topical interest and current issues, charitable and relief works, vaccination and anti-rabies campaigns are also undertaken by the NSS units. In-house magazines are also circulated among the NSS volunteers. At the University level, a newsletter named "Mousam" is being published by the Director of Extension, who is also the Chief Coordinator of NSS. A ten—day Special camp is organised every year for the NSS volunteers. They are encouraged to go to the villages, live with them and learn from them and work for the development of the village with a holistic approach.

11.4.2 Haritholsavam 2011 COA,Vellayani

The Agri-Science Fair 'Haritholsavam 2011' was conducted during 19-24 September, 2011 for providing a platform for the farmers to share their experiences with researchers, extension personnel, planners and policy makers, to encourage the entrepreneurship in women and youth and to serve as an educational outreach programme for the school and college students. The 122 exhibition stalls arranged in this College showcased the recent advances in agricultural science and attracted more than 62,000 people from various walks of life. The total budget for the programme was Rs. 29 lakhs. The seminars and open forum became venue for transfer of technology and its proper assimilation. Good quality seeds and planting materials, vermicompost, mushroom spawn, bio-control agents were made available to the farmers.

11.4.3 South Indian Agricultural Fair

The fair with the central theme 'Product diversification / value addition for tapping market potential' was conducted during the last week of December 2007 involving selected farmers from all the South Indian states. The 3 day programme was inaugurated by His Excellency, the Hon. Vice President of India Sri. Mohammed Hamid Ansari. A series of agricultural seminars were organised as part of the programme and was attended by distinguished scientists and farmers from different south Indian states. A mega exhibition highlighting the latest technological developments in the field of agriculture was also arranged as part of the fair.

11.4.4 Koythulsavam

The Directorate of Extension took the lead in organising a harvest festival to benefit the farmers affected by natural calamity arising out of unpredicted summer rains. The students and the scientists of KAU under the leadership of Hon. VC led the programme that provided great relief to the farmers. It was a rare show of social commitment of the University that brought the different categories of the University from Vice Chancellor to the labour to address an agriculture distress in the state that attracted media and public.

11.4.5 Agri Food Technology Meet

The programme, conducted in 2009, provided a platform for the stakeholders to share their ideas and innovations in food processing and value addition. Seminars were arranged and an exhibition focussing on prospects of processing and value addition of products from agriculture, animal husbandry and fisheries showcasing the latest developments was organised. It provided an interaction platform for industrialist and technologists regarding the latest developments in the field.

11.4.6 Brinjal Fest at Mararikulam

A local initiative against the launch of controversial Bt Brinjal in the state launched through a farmer participatory exhibition and indigenous knowledge meet highlighting the benefits of conserving local brinjal varieties. The programme was organised in 2010 and the Directorate of Extension took the lead role as the main coordinator of the exhibition in which, more than 50 stalls were arranged. A germplasm collection of brinjal from the region was a highlight of the programme.

11.4.7 Mango Fest at Padannakad

MangoFest, first of its kind in the state was organized at College of Padannakad that brought the wide variety of indigenous mango breeds in the state especially from northern Kerala. The germ plasm collection of mango trees in the campus was also showcased for the show. It pioneered similar shows in other parts of the state also.

11.4.8 POP Workshop

A workshop that debated the latest technology developments in various crops from the various stations of the University and ICAR institutions in the state was organized that had participation from various input agencies, commercial Boards, state Department of Agriculture and progressive farmers. It was instrumental in deciding on the technologies to be included in the new edition of Package of Practices which was released in March 2012. An

inventory of recent agricultural technologies was also released by Directorate of Extension mainly for the use of KVKs.

11.4.9 Farmers' Science Congress

The first farmers' science congress organized by the KVK, Kannur was coordinated by the Directorate of Extension. It was one of its kind that got support from NABARD, National Innovation foundation and many other national and state agencies. It showcased the farmer innovations in different aspects of crop management and brought out the ingenuity of farmers in field problem solving. Best innovations of farmers were honoured in different categories and the University conferred a DIR – a honorary degree to selected farmer.

11.4.10 International Workshop on *Reaching the unreached*

An international workshop was organized by the Directorate of Extension at College of Fisheries, Panagad that was sponsored by the Pan Common Wealth Forum on education. It brought together the views of the scientists of national and international repute on strategies to reach the unreached farmers and streamlining the strategies of transfer of technology.

11.4.11 Convergence workshop

As desired by ICAR a workshop was held in 2011 inviting all the development departments, commodity boards and other stakeholders and KVKs in Kerala and the same was inaugurated by the Hon'ble Minister for Agriculture & Animal Husbandry. In the meeting it was decided to ensure convergence of different departments & KVKs while implementing various programmes for the benefit of farming community.

11.5 Salient Accomplishments

Concerted efforts were made by the Directorate to effectively co-ordinate the extension activities of the University through the network of KVKs and research stations spread throughout the state, Communication Centre, Central Training Institute(CTI), KAU Press and ATIC. The Directorate of Extension (DOE) also performed a pivotal role in the coordination of NSS activities under the six constituent colleges of KAU. Apart from the regular technology transfer programmes that include Farm advisory Services, participation and organization of exhibitions, training programmes for various stakeholders, seminars, mass media programs, front line demonstrations, on farm trials and technology out reach through publications, some innovative technology dissemination programmes were also organized during the period. Many of these programmes were acclaimed at national and

state level. Salient achievements and programmes organized during the tenure includes the following:-

11.5.1 Participatory Technology Development – Front Line demonstrations in rice (2007-2012)

Frontline Demonstrations in paddy was implemented through KVKs of the State funded by State Department of Agriculture. During the year 2007 a total amount of Rs. 25 lakhs was incurred for demonstrations in various aspects of rice production. Through timely monitoring and evaluation of the programme by the Directorate, the programme was implemented very successfully and the amount was enhanced to a total of Rs. 50 lakhs in the following two years and Rs. 1.25 crore in the year 2010. This is an ongoing programme implemented through out the state and coordinated by DOE.

11.5.2 Research-extension convergence workshop

A state Level Interface workshop of KVKs of Kerala and Lakhsdweep was organized by Kerala Agricultural University on 07.07.2011. Discussions for the convergence of agricultural research and extension were held as part of the workshop. Dignitaries including Vice Chancellors from KAU, KVASU and KFOU, Deputy Director General (AE), ICAR, Assistant Director General (AE), Agricultural Production Commissioner and Directors of ICAR institutes in Kerala participated.

11.5.3 State Level Workshop on 12th Plan

A workshop on Concerns and Priorities of Agriculture and Allied Sectors – Voluntary Perspective was organized by the Directorate of Extension in association with INFACE (Institute for Non- formal Adult and Continuing Education) during 28th and 29th October 2011. The programme was attended by Dr Sadamate, Advisor, Planning Commission of India. Based on discussions on the role of NGOs in the development of agricultural sector of Kerala as part of the workshop, policy guidelines were delineated and submitted to the National Planning Commission.

11.5.4 Farmers Science Congress

An innovative programme called Farmers' Science Congress, first one of its kind, was organized at KVK Kannur during 2008 with the financial assistance of National Innovation Foundation, NABARD and other leading agricultural agencies. It provided a platform for farmers to promote their field innovation and improve them through interaction with farm scientists. Best innovations were also awarded at the function. Thirty of the outstanding

innovations were exhibited in the "Dar M.J. Joseph Memorial Museum" with NABARD support which was inaugurated on 25.06.2010. 'SBI-KVK Loan Window' and "KVK Mall" to promote entrepreneurship, Farmers' Science Museum and Indoor Poultry are other exceptional innovations of KVK Kannur that received the award for best KVK at the national level in 2010. KVK Mall aims to promote entrepreneurship among farmers and self employment pursuers in agriculture through branding. The fully air conditioned Mall, with all the look of a modern shop, mainly displays the branded value added products produced by the Food Processing Unit of KVK.

11.5.5 Flower growers' meet

The flower growers meet organized by KVK, Thrissur was a successful initiative in entrepreneurship development in floriculture. A training programme in fodder cultivation funded by RKVY is also sanctioned during the year 2010 for KVK Thrissur.

11.5.6 Technology week

Technology week celebrations of all the KVKs were coordinated by Directorate of Extension by ensuring the participation of distinguished guests, national level delegates and innovative farmers.

11.5.7 Central Technology Museum

A museum to showcase the historical, cultural and technological evolution of agriculture in the state funded by Ministry of Agriculture, Government of India is under construction.

11.5.8 Publication of POP

The 14th edition of Package of Practices (Crops), the authenticated technology publication of the University on agricultural practices for the state was published. The technologies included in the POP were finalized based on a workshop conducted for the purpose organized by the DOE.

11.5.9 Other major workshops

International workshop on 'Reaching the unreached' in collaboration with Common Wealth of Learning, Vancouver was organized in 2010 and the 'State agriculture policy workshop' in 2012. These were attended by dignitaries and delegates of national and international repute.

11.6 Impact Statement

The Paddy Task Force (PTF), the novel initiative of KVK Kannur to address the alarming declining area under paddy due to labour shortage, is recommended by the State Planning Board for state-wide adoption. Compact Area Group Approach, popularly known by its acronym, CAGA, an innovative extension approach for combating endemic problems like coconut mite and bud rot disease of coconut is included in the organic farming policy of government of Kerala. The concept, PTF, has become synonymous with mechanization and has virtually created a wave among paddy farmers of the state for actualizing mechanization of paddy cultivation. The State Planning Board has now recommended the model for statewide adoption.

The innovative programme, Farmers' Science Congress, first one of its kind, organized at KVK Kannur during 2008 provided a platform for farmers to promote their field innovation and improve them through interaction with farm scientists. Thirty of the outstanding innovations were exhibited in the "Dar M.J. Joseph Memorial Museum" with NABARD support. KVK Mall has promoted entrepreneurship among farmers and self employment pursuers in agriculture through branding. The fully air conditioned Mall, with all the look of a modern shop, mainly displays the branded value added products produced by the Food Processing Unit of KVK.

Paddy – Mission programme and Frontline Demonstrations in paddy implemented by KAU through KVKs of the State helped to create awareness on the importance of wetland protection and food security issues.

Biocontrol of papaya mealybug *Paracoccus marginatus* in Kerala and Lakshadweep islands using the parasitoid *Acerophagus papaya*

Severe incidence of papaya mealybug *Paracoccus marginatus* was observed in Kerala mainly on papaya, mulberry and tapioca during 2009-10. It was also found infesting on brinjal, tomato, cowpea, jack, plumeria, hibiscus, oscimum, raulfia, teak, rubber, parthenium etc. In Lakshadweep islands also the incidence was very severe on papaya and many other plants. KAU scientist took up the project of rearing, multiplying and release of the tiny parasitoid *Acerophagus papayae*, which suppressed the mealybug population. The project was very successful and the menace from the mealybug was completely managed in Kerala and Lakshadweep. The impact of this technology is briefly discussed below.

Impact on savings

Papaya: In Kerala papaya is cultivated only in homesteads for vegetable and fruit purposes. Since papaya has not been grown on plantation scale exact monetary benefit could not be worked out. However, the social impact by the release of *Acerophagus* is much more than the economical impact. The general public realized the effectiveness of the parasitoid on the dreaded pest. People of Kerala were worried and afraid by seeing the mealybug infestation in garden plants and papaya plants. Now the situation changed and papaya plants are free from the mealybug.

Mulberry: Mulberry is cultivated in about 300 acres in Kerala, mainly in Idukki, Wyanad and Palakkad districts. During 2009-10 periods mulberry cultivation was severely infested by papaya mealybug. Suppression of papaya mealybug by the parasitoid saved the silk industry in Kerala. The income from 300 acres comes about 2.1 crores. Average cocoon production per year is 350 kg/ acre and from 300 acres, the production is 105000 per year and average cost of cocoon is Rs. 200/ kg. The estimated cost of production of cocoon is as Rs. 32000/ year/ acre and for 300 acres Rs. 96 lakhs per year. The net income is 1.1 crores/ year.

Tapioca: In Kerala total area for tapioca cultivation is 75000 ha and production 30t/ha. The mealybug infestation affected the tapioca production also. Approximate cost of cultivation is Rs.50,000/ ha and the income Rs.3 lakh/ha/year (@Rs.10000/t). Thus the net savings is 2.5 lakhs/ha and 1.8 crores/ year in Kerala.

Infestation of papaya mealybug was observed on rubber trees and in teak nurseries. Timely release of the parasitoid saved these plantation crops without much crop loss.

Papaya mealybug suppression in Lakshadweep islands:

The parasitoid was released in Kavarathi, Agathi, Androth, Kalpeni and many other islands and the mealybug menace in the island was solved.

12. OTHER UNITS AND INFORMATION SERVICES

12.1. Any other units not covered above

12.1.1 Agro-meteorological Advisory Services

The Department of Science and Technology, Government of India initiated a project "National Centre for Medium Range Weather Forecasting and Development of Agro-meteorological Advisory Services" in 1988 with a major objective of developing expertise for providing weather based agro-advisories to the farmers for planning day-to-day agricultural operations well in advance so that the adverse impact due to uneven behaviour of weather could be minimised. This project was taken up in collaboration with ICAR and Agricultural Universities with 127 Agro-meteorological Field Units, spread across India. Four such Agro-meteorological Field Units are in function under Kerala Agricultural University at College of Agriculture, Vellayani, College of Horticulture, Vellanikkara, RARS, Ambalavayal and RARS, Pilicode for the benefit of farmers in different agro-climatic zones of Kerala. The above four Agro-meteorological Field Units prepare weekly Agro-met Advisory every Tuesday based on Medium Range Weather Forecasting and directly disseminated to the selected farmers under the project.

12.1.2 Protection and Management of IPR

Realizing the prominence of IPR in Agriculture especially in the back drop of TRIPS Agreement and in accordance with the directives of the Indian Council of Agricultural Research, an IPR Cell was constituted in the Kerala Agricultural University during 2001, with the Hon'ble Vice Chancellor as its chairperson and the Director of Research as the co-chairperson. Scientists from different faculty in Kerala Agricultural University are members of the IPR Cell with Dr.C.R.Elsy, Professor, Plant Breeding & Genetics as the coordinator. The Cell is functioning as a constituent of the WTO Centre established in Kerala Agricultural University. The primary objective of the Cell is the protection and management of IPR in Kerala Agricultural University and is having the following objectives.

- Protection and Management of IPR in Kerala Agricultural University.
- Empowerment of faculty members and students to address IPR issues in their respective areas.
- Development of policy guidelines for IPR and Transfer of Technology (ToT) policy for Kerala Agricultural University.
- Compilation and storage of information on IPR related issues.

- Collaboration with Central and State Governments in issues related to IP protection and Technology Transfer.
- Organising awareness programmes and trainings for scientists, students, farmers, traders, media persons, legal experts and other stakeholders.
- Incorporation of elements of IPR in the Under-graduate and the Post-graduate curriculum.

The major activities for protection and management of IPR in KAU is provided below.

Awareness Programmes : Awareness about IPR and its significance in Agricultural Research and Education is the prime necessity and hence systematic efforts are taken for organizing awareness programmes and trainings to different stake holders. Till now KAU has organized 17 awareness programmes in the area of IPR. In addition to these members of IPR Cell are actively involved as resource persons in students/farmer seminars and training programmes.

Protection of Crop varieties including extinct varieties under PPV&FR Act: KAU is taking earnest efforts to register crop varieties released from the KAU and also farmers' varieties. Applications for registration of 27 extant rice varieties has been submitted to DRR, Hyderabad and two turmeric varieties to IIHR, Calicut for further necessary action. Action is taken to submit the applications for the remaining rice varieties, including promising farmers' varieties.

Protection of farmer's rights under PPV&FR Act : PPV&FR Authority, GOI instituted the Plant Genome Saviour Community Recognition in 2007. Kerala Agricultural University sponsored Palakkad rice farmers for this award and they grabbed the first Plant Genome Recognition. Kerala Agricultural University sponsored the application of Pokkali farmers for the Plant Genome Saviour Community Award and the group received the award during 2010. The award included Rs. 10 lakhs, a citation and a memento.

Protection of Geographical Indications of Goods from Kerala : Kerala is a treasure house of unique agricultural and handicraft goods that are to be protected as GIs of goods. Registration of these goods as GIs is the prime need of the day to protect IPR rights of the communities and to promote national and international trade of unique goods. IPR Cell organizes awareness programmes to sensitize stake holders about the significance of protection of GIs of goods originating in specific geographical areas.

As on today, Kerala Agricultural University has successfully completed the procedures for the GI registration of Pokkali Rice, Vazhakulam Pineapple, Central Travancore

jaggery, Wayanad Jeerakasala rice and Wayanad Gandhakasala rice. Applications for GI registration of Wayanad pepper, Kerala Nendran Banana, Kaipad rice and Kazhchakula are progressing. Efforts are also taken for user registration of the registered GI Goods from Kerala.

Patents : Patent applications for many technologies are in various stages of processing.

12.1.3 Centre for Gender Studies in Agriculture and Farm Entrepreneurship Development (CGSAFED)

This centre was initiated during 1999-2000. The aim of the centre is that of bringing about gender sensitivity and gender perspective in research, extension and educational efforts in agriculture and allied fields set in the larger context of natural resource management, thereby increasing and facilitating women's role and participation in agricultural development along with men and attaining gender justice in the context of the planned efforts in the socio-economic development in Kerala and the country at large.

12.1.4 Radiotracer Laboratory

The Radiotracer Laboratory at the Vellanikkara campus was established in 1982 with the financial assistance from the worldbank under the Kerala Agricultural Development Project. The centre offers a course on the fundamental and applications of isotopes and radiations at the post graduate level. The laboratory is a central facility for research employing radioisotopes and radiations for scientists and postgraduate students of all the faculties under the KAU. The research work carried out is primarily concerned with perennial crops of commercial importance and relevance to the state. The laboratory is the only centre in India where substantial research work with perennial crops employing nuclear techniques has been carried out. Research conducted with plantation crops, spices and agro-forestry systems has yield valuable information on soil health, nutrient management in relation to root architecture, root competition in multi species production systems etc. Several radio isotope methods for conducting research with perennial crops, particularly tree crops have been developed at this center.

12.1.5. Employment Information and Guidance Bureau

The Employment Information and Guidance Bureau attached to the Kerala Agricultural University were started in November 1979. This Bureau was established with a view to give all possible employment assistance and guidance to the students/ alumni of the University and other educated unemployed youths in the region. The Bureau is charged with responsibilities such as collection and dissemination of information on employment

Plate 18 . Extension Education activities/facilities

Mobile Rice clinics being flagged off by Hon'ble Minister



Farm Advisory Service Unit

- ❖ Advice to the farmers on field problems
- ❖ Soil and leaf sample analysis and interpretation



Kissan Call Centre, a toll free facility promoted by the Ministry of Agriculture, Government of India is functional in the Communication Centre. Farmers can access this facility in the number 1551 for information in agriculture and allied fields

Publication Unit

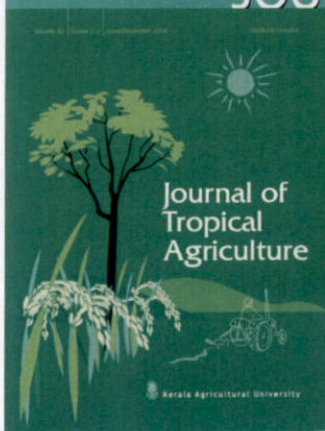
More than 300 publications in Agriculture and allied fields



JOURNAL PUBLISHING

- Scholarly journal published by the Kerala Agricultural University

- First agricultural sciences journal in India with an Online Manuscript Submission, Review, Tracking, and Retrieval System



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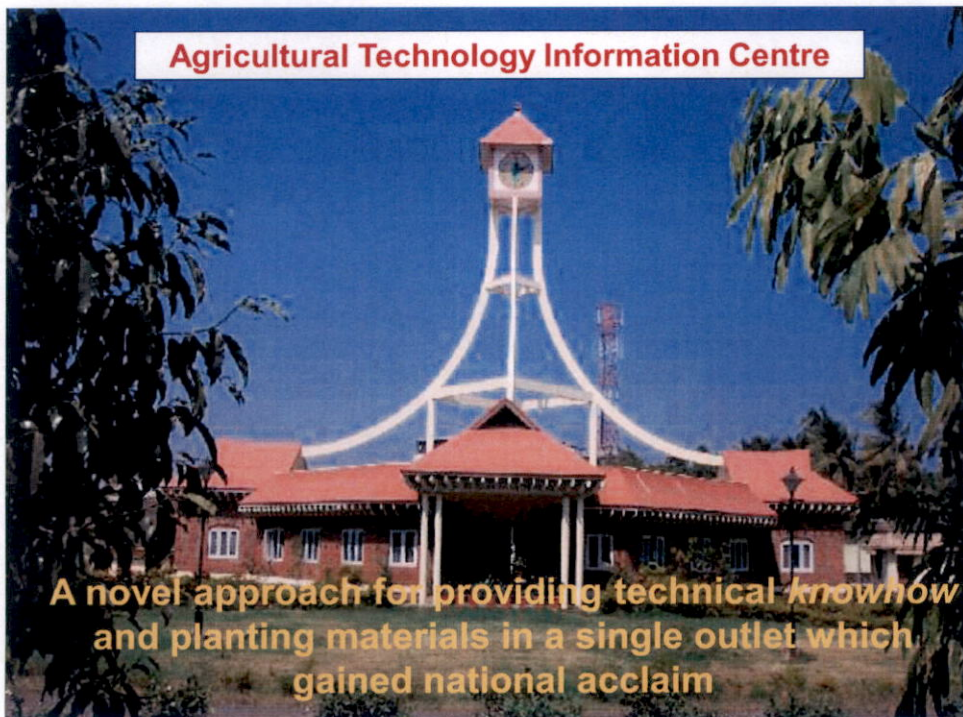
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Kerala Agri. Food Technology Meet 2009 & 2010



Agricultural Technology Information Centre



A novel approach for providing technical *knowhow* and planting materials in a single outlet which gained national acclaim

FRONT LINE DEMONSTRATIONS KVK, Thrissur



Production and sale of seeds/planting material/bio control agents etc. through which a revenue of Rs.2.08 lakhs has been generated.

Farmers Science Congress

EXHIBITION OF FARMERS' INVENTIONS



64 Farmers from all over the state presented 84 inventions – presented before an audience of cross section of researches, extensionists, farmers and administrators.

Best farmer scientist awarded Knight-hood "Dar" like "Sir"

Haritha SHG

BIO FUNGICIDE PRODUCTION UNIT

Trained a SHG Haritha (Reg No. K_105/2002) on commercial production of bio agents, started production of bio fungicides from July 2002 onwards. As per their MOU with KAU they will receive 20% of the sale proceeds as wages for labour.



opportunities, higher education opportunities available to the students of the University and renders necessary guidance to the students on employment, scholarships, fellowships and training facilities in India and abroad. Publication of a monthly newsletter containing relevant and up-to-date details on employment, educational facilities, fellowships, etc. plus other useful articles; arranging coaching classes for facing interviews and carrier talks by experts in agricultural sciences; arranging courses on public speaking, communication and personality development to the needy students are the other activities of this bureau.

12.2 Disseminations of information to stake holders and public about rules, regulation issues, policies etc. Related with academic, financial, administrative, developmental and other related issues.

The information to stake holders are disseminated through media, KAU – Website, brochures, palmphlets etc.

Technology dissemination is through the development departments of Government of Kerala, Krishi Vigyan Kendras etc.

13. SWOT

SWOT analysis is an examination of the University's internal strengths and weaknesses, opportunities and threats. This is a tool designed in the decision-making and as a precursor to strategic planning in various kinds of applications. An understanding of the external factors (comprised of threats and opportunities) coupled with an internal examination of strengths and weaknesses assist in forming a vision of the future.

Strength

- Clearly defined objectives consistent with the mission and goals
- A well-structured organizational set up Governing body of the University (General Council) consists of leaders in the field of politics, education, research, extension and administration. Adequate representation is also given to the students, administrative staff and labourers.
- Transparency in administration
- Faculty with high academic credentials
- Open and merit oriented faculty recruitment
- Provision for continued training of the faculty
- Reasonably good laboratory and infrastructural facilities for conducting research work
- Sufficient experiment fields with irrigation facilities for conducting research activities under different agro ecological situations
- Research and extension institutions spread over all the 14 districts of the State
- Best quality students are admitted to various courses because of the well defined student admission policy – The students are selected for admission based on merit / competitive examination.
- Well designed academic curricula, which are revised from time to time based on emerging technological and socio-ecological changes.
- A central library and libraries in all the constituent colleges and research stations with reasonably good collection of books and journals.
- Good IT infrastructure facilities with free internet access to students and faculty and adequate computer support
- Farmer acceptance of the varieties and technologies developed by the University
- Creditable performance of the students of the University in all India examinations
- Alumni in responsible positions in national and international institutions, private and public organisations

- Continued financial support by the State and Central Governments
- A strong reputation for providing the training required to get entry level employment
- Diversity among student population
- High rate of retention of students
- Presence of statutory committees to oversee the various programmes of the University
- Interaction with institutions in India and abroad in academic, extension and research activities

Weakness

- Deficit budget
- Insufficiency of infrastructure facilities in newly set up colleges and research stations
- Skewed development of constituent institutions because of the uneven availability of finance
- Low staff and faculty motivation
- Dearth of staff to man remote stations
- Resources crunch faced by a few constituent institutions
- Lack of regular maintenance of building and infrastructural facilities
- Disproportionately excessive management overhead
- Reduced acceptance of certain released varieties and technologies
- Paucity of funds to invest in high technology programmes
- Paucity of funds in plan expenditure like salary, retirement benefits, pension etc.

Opportunities

- Strengthening consultancy services
- Patenting of research findings
- Starting self sustainable undergraduate and postgraduate programme
- Gearing up to face the challenges raised by globalisation by shifting the thrust towards high-tech agriculture
- Reducing the management overhead by adopting e-governance.
- Market-oriented agriculture with emphasis on export or import substitution
- Strengthening biodiversity conservation activities

Threats

- Globalisation necessitates changes in the concept of conventional agriculture

- Restrictive funding from Government to commensurate with the increasing operational cost
- Reduced student demand for some of the PG programmes
- Alarming price decline of agricultural commodities and consequent fall in agricultural activities in the State
- Youths not attracted to agriculture
- Lack of farm labourers
- Reducing land area under agriculture, due to diverting land for other non-agricultural purposes, absentee land-boards etc.
- Lack of suitable farm machinery
- Mushrooming of State Agricultural Universities, starting of affiliated colleges by some SAU, which may harm the quality of education.

14. Summary

14.1 History and Development of the University

The Kerala Agricultural University (KAU) was established on 24th February 1971 by virtue of the Act 33 of 1971 and started functioning from 1-2-1972. The Kerala Agricultural University is the 15th in the series of the State Agricultural Universities of India. Sri. N. Chandrabhanu, I.A.S., was the first Vice-Chancellor of the University. An important milestone in the history of the KAU is the formal inauguration of the University by the then Prime Minister of India, Sri. Morarji Desai on 25.7.1977. The headquarters of the University was shifted from Mannuthy to Vellanikkara in March 1978.

At the time of inception of the University, there were two colleges and 21 research stations, which grew to 10 colleges, 36 research stations, seven Krishi Vignan Kendras (KVK) and a few other institutions of specific objectives. The Kerala Agricultural University was divided to form two new universities viz., Kerala Veterinary and Animal Sciences University (KVASU) and Kerala University of Fisheries and Ocean Studies (KUFOS), during 2010-11.

At present, the Kerala Agricultural University is having six Colleges, six Regional Agricultural Research Stations (RARS), 16 Research Stations, seven Krishi Vigyan Kendra (KVK), 16 other units such as Central Library, Instructional Farms, Training Service Units, Information-cum-Sales Centres, Radio Tracer laboratory, High School, Press, etc., One Institute of Agricultural Technology is started at RARS, Pattambi during 2011, offering two year – diploma in agricultural sciences.

14.2 University's Mission and Goals

Excellence in Agricultural Education, Research and Extension for Sustainable Agricultural Development and Livelihood security of farming community are the mission of the University.

14.2.1 Goals

To provide human resources, skills and technology required for sustainable development of agriculture, including crop production, Forestry, Co-operation, Agricultural Engineering, Home Science and other allied disciplines by integrating education, research and extension.

14.3 Organisation and Governance

The Kerala Agricultural University was established by the Act 33 of 1971 of the Kerala Legislative Assembly. The General Council, Executive Committee, Academic Council and Board of Studies of each Faculty are the statutory bodies of the University. The supreme authority of the University is the General Council. The General Council is reconstituted every three years. There are 49 members in the General Council.

The Executive Committee is the Chief Executive Authority of the University. The committee consists of three ex-officio members and 12 other members elected by the General Council, with Vice-Chancellor as the Chairman. One member representing the Indian Council of Agricultural Research in the General Council shall be a member of EC. The executive powers of the University including the general superintendence and control over the institutions of the University are with the Executive Committee.

The Academic council is responsible for the maintenance of standards of instruction, education and examinations in the University. The Academic Council consists of 34 members, including two elected representatives of PG students and one elected from among the PhD students.

The University has now three faculties' viz., Agriculture, Agricultural Engineering & Technology and Forestry.

Each faculty has separate Board of Studies to formulate and recommend to the Academic Council the academic programme, its course – curricula, regulations etc.

The Vice-Chancellor is the Principal Executive and Academic Head exercising general control over all aspects of functioning of the University. He is the ex-officio chairman of the Executive Committee and Academic Council and presides over the General Council. He is appointed by the Chancellor on the advice of the selection committee consisting of the nominee of the Chancellor, the Director General of ICAR and one nominee of the General Council (Chairman). The Vice-Chancellor is appointed for a period not exceeding five years or till completion of 65 years of age.

The institutional planning is done by the respective Directors. The Director (Planning) is responsible for co-ordinating this activity. Registrar, Comptroller, Director (Research), Director (Extension) and Director (Academic & Post Graduate studies) are responsible to the Vice Chancellor in planning and monitoring of general administration, financial, research, extension and academic matters respectively.

ICAR Model Act is not adopted so far and the old KAU Act prevails.

14.4 Academic Programmes and Curricula

Among the three faculties (Agriculture , Agricultural Engineering and Forestry), six constituent colleges (three for Agriculture, one each for Agricultural Engineering, Forestry, and Cooperation, Banking & Management) and 31 departments, the University offers graduate and post-graduate programmes at Masters as well as Doctoral levels, in almost all the disciplines and specialties related to agriculture, horticulture, forestry, co-operation & banking, agri-business management, agricultural engineering and allied sciences.

The five under graduate programmes offered are,

- B.Sc. (Honors) Agriculture
- B.Sc. (Honors) Forestry
- B.Sc. (Honors) Co-operation & Banking
- B.Tech. Agricultural Engineering and Technology
- B.Tech. Food Engineering

In 27 disciplines, the University offers eight post-graduate programmes leading to Masters' degree in,

- Agriculture
- Horticulture
- Forestry
- Agricultural Statistics
- Co-operation and Banking
- Home Science (Food and Nutrition)
- Agricultural Engineering and Technology

The University also offers five year, M.Sc. Integrated programme in,

- Biotechnology

- Climate Change Adaptations

And MBA programme in ,

- Agribusiness management

Doctoral programmes are offered in 25 disciplines leading to Ph. D degree in,

- Agriculture
- Horticulture
- Forestry
- Home Science (Food and Nutrition)
- Co-operation and Banking
- Agricultural Engineering and Technology

Every year the University admits, a maximum of 644 students: 355 under- graduates, 231 graduates (Masters) and 58 Doctorates (Ph D). On an average, the University has around 2000 students on its rolls, of which girl students constitute nearly 75 percent. The University has been providing professional education of best quality. During the year 2003, the Indian Council of Agricultural Research adjudged the KAU as the best State Agricultural University and awarded the Sardar Patel Award for the Outstanding ICAR Institution. The University won the Performance Award of ICAR continuously for the last six years, 2006, 2007, 2008, 2009, 2010 and 2011, of which last five were first places.

The University admits the students to UG programmes through the Commissioner of Entrance Examinations, Government of Kerala, based on the rank obtained in common entrance examination, their option and rules of communal and special reservations.

For post-graduate admissions a common entrance examination is conducted by KAU based on the syllabus of the relevant UG programme. The Ph. D scholars are admitted based on academic merit and their performance in the interview conducted by the selection committee.

The Academic Council of the University fixes the intake capacity for the different courses every year. Apart from this, 15 per cent seats for UG and 25 % seats for PG are reserved for ICAR candidates. Foreign nationals recommended by the Government of India, Department of Agricultural Research Education or Indian Council of Cultural Relations are also admitted to UG and PG programmes.

There are two non-degree granting programmes, viz., Diploma in Agricultural Sciences (DASc.) , offered at the Institute of Agricultural Technology & Regional Agricultural Research Station, Pattambi, Mele Pattambi P.O., Palakkad district and PG Diploma in Solid Waste Management, offered at the College of Agriculture, Vellayani.

14.5 Faculty and other Human Resources

The faculty members are designated as Professors, Associate Professors, Assistant Professors. More than 95 per cent of the Faculty members have Doctoral qualifications. A few are having post-doctoral qualifications also.

Since the implementation of the UGC/ICAR pay package, the guidelines issued by the UGC/ICAR are followed in the recruitment of teaching staff including the Deans and Directors. Recruitment of teachers/ scientists are done after nation-wide advertisement. All qualified Indian nationals are considered on par for the purpose of recruitment of faculty members / teachers.

Career Advancement as per the UGC (2006) package is being implemented in the University. The UGC/ICAR pay package was introduced in the University in 1986 and it was revised during 1996 and 2006. The teachers are eligible for DA and other allowances as per the State Govt. rules, issued from time to time. The HRA, leave, retirement age (Now 60 years), gratuity and pension are as per the State Government rules (KSR). As a part of the faculty improvement programme, faculty members are deputed to undergo several types of in-service programmes for various subjects. Teachers who possess only Masters Degree at the time of appointment by the University are encouraged to go for higher studies.

The entry grade of supporting staff is Assistant Grade I and they are appointed by the University based on state-wide advertisement and selection. Minimum qualification for this is any degree from a recognised University with knowledge of computer applications. There are several promotion avenues for them based on seniority and ratio. For supporting staff, State Government pay package is applicable. Their retirement age is 56 years.

The University has provided for grant of advance increment, grade promotions, good service entry awards, certificate of merit, citations at General Council meeting/ EC/ AC

meetings and best teacher / scientist/ extension worker award, for motivating the employees.

Employees' grievances and redressal through the normal administrative hierarchy with the Vice-Chancellor acting as an appellate authority is functioning in the University. Grievance cells have also been instituted for specific purposes from time to time. The University has appointed a permanent Women's Complaint redressal Committee.

Numerous Welfare Schemes are in operation in the KAU for the benefit of employees and their dependants. Housing loans, vehicle loan, festival advance, family benefit scheme, family welfare scheme, group insurance scheme, reimbursement of medical expenses, GPF, outstation allowance, hill tract allowance, dying in harness scheme, soft loans for purchase of computers, interest free medical advance, loans for marriage of the daughters of Class IV employees and permanent labourers, University school, University hospital, staff clubs, canteen service, Co-operative Societies, residential quarters, sports facilities, photocopy centres, computer center, sales counter etc are a few among these.

14.6 Student Development

The academic programmes are so designed to instill professionalism, skills in communication, critical thinking, ethics and teamwork in students. Curriculums also have provisions to improving the professional experience of students graduating from the University.

At the time of formation of the University, students were admitted to the under graduate and post graduate programmes based on the marks in their qualifying examinations. In 1981 Kerala Government rationalized the process of admission to the various under graduate professional degree programmes. Since then, admission to the graduate courses of the KAU is based on the Common Entrance Test conducted by the Commissioner of Entrance Examinations, Government of Kerala (CEE). Because of this the University is getting the best students. The admission to B.Sc. (C&B) course is based on merit/marks in qualifying examination and usually candidates with more than 80 % marks gets admitted in general category.

Student Placement Cell and Counselling units exist in all the colleges. One faculty member is nominated as Officer i/c of the College Placement Cell and Counselling Unit. An

Employment Information and Guidance Bureau is functioning under the DSW. Alumni Associations are functioning in the individual colleges. This provides an effective forum for getting information of the alumni after graduation. Majority of the alumni are employed in the State Departments of Agriculture, Veterinary, Co-operation, Forestry, Fisheries, Soil Survey Departments and the KAU. Alumni of the University are also occupying prestigious positions in various SAUs, ICAR, IVRI, National Institutes, Land Boards, Banks, plantation sectors, agribusiness houses and industries. Recently many of the graduates and postgraduates have started to branch off to non-agricultural fields like IT, film production, advertising and management. Some of the students are entering the All India Civil Services like IAS, IPS, IFS, IRS etc. Many of the students of the University have migrated to USA, UK, Canada, Brazil, Australia, etc. is occupying important positions. A website is being maintained by the Alumni of the University. This helps the members to know about each other and the University.

Ample opportunities are being provided to the students for co-curricular programmes such as NSS and NCC. To promote the participation of the students in extra and co-curricular activities, a Directorate of Students Welfare (DSW) is functioning.

Physical facilities like playgrounds, indoor stadia, gymnasiums, running tracks for athletics etc. are provided in all major teaching campuses. The cricket ground and indoor stadium at the College of Agriculture is of international standards. The indoor stadium in the campus has facilities for basketball court, volleyball court, shuttle and gymnasium. The Main Campus of the University also has spacious sports grounds.

The hostels have separate reading rooms and television. Computers with Internet facilities are also available in the hostels.

14.7 Library and Other Learning Resources

All institutions under KAU have separate libraries. All the libraries have required minimum infrastructure like buildings, equipments and collections of print and non-print documents. In addition a Central Library is functioning at the Main Campus, Vellanikkara, Thrissur.

The physical facilities provided in the library are of international standards. The three-storied building has a total plinth area of 4000 sq.m. The integrated library and

information system consists of the Central Library with a LAN connected to the Main Campus network and the libraries in the distant campuses of the University connected to the campus network. The LAN in turn is connected to a Campus Area Network, which in turn is linked to the outside world through internet.

Department of Biotechnology, Govt. of India supported KAU in 1995 by providing a Bio-informatics Centre (Distribution Information Sub Centre) under Biotechnology Information System for harnessing the scientific knowledge in various interdisciplinary areas of Biotechnology and its dissemination to the scientists.

Centre for Agriculture and Biosciences International (CABI) which contains database on agriculture and allied subjects covering the periods from 1973 to present consisting of 3.0 million records is available at the Electronic Library Division of KAU.

14.8 ICT Facilities

The entire Main Campus has been fully networked. This network comprises three colleges, the Central Library, Administrative Headquarters, the IT-BT building, ACCER, Central Auditorium, student hostels, international hostel, faculty residences, nursery and other buildings in the campus. This extends over a length of more than four km across. The entire backbone is fiber optic cabling with building LANs running on copper cabling and wireless. All the classrooms are networked and have data projections facilities. Multimedia facilities are used extensively in classroom instruction. Wireless Internet is available in all the hostels and some of the classrooms in the Main Campus. Internet is available round-the-clock over the entire network freely.

In the Colleges, all the departments, college library, seminar hall, audio-visual room, college office and the students' computer facility are linked through the College LANs. Internet is available to all the faculty and students in their own departments.

The Library resources from CERA and other agencies are made available to the faculty and students through the networks.

We have adopted Free and Open Source Software (FOSS) to a large extent.

The KAU Website : The website of the Kerala Agricultural University with the URL <http://www.kau.edu> was launched by Dr. R.S. Paroda, the then Director General of ICAR on 2nd February 2001.

Universal E-mail : The KAU have taken a policy decision to provide mail-IDs to the entire members of our community to facilitate easier information-interchange and collaboration. Institutional mail-IDs have been provided to all offices. Organisational mail-IDs have been provided to the entire faculty and non-teaching staff down to the level of class 3 employees. Mail IDs will be provided to everybody in due course.

Connectivity to NKN : The KAU Main Campus is connected to the National Knowledge Network with a VPN bandwidth of 1 Gbps under the auspices of the NMEICT programme. All the colleges have also been connected to the national network under the NME-ICT project. We have dedicated Internet connectivity of 20 Mbps in the Main Campus. All the teaching campuses have Internet connectivity of minimum 10 Mbps.

Voice Networking : The entire Main Campus is covered by a state-of-the-art EPABX with more than 400 installed lines. All the extensions are directly diallable from the outside through the implementation of DID through BSNL PRI. The availability of voice lines between the student hostels and the faculty residences help in student-faculty interaction after classroom hours.

Inter-campus Connectivity : The Main Campus and Mannuthy campus have been connected through dedicated connectivity. So the entire Main Campus data network is accessible from Mannuthy also.

E-governance : We have implemented academic management software to automate the academic management activities. The server is maintained in-house using our own connectivity. We have already set up a platform for e-learning and content creation is being undertaken.

A software developed by the University e-governance centre is being utilized for the total financial management of the University (U-FAST).

Centre for E-Learning : The Centre for E- learning (CEL) of the Kerala Agricultural University, started functioning in 2010-2011. The CEL aims to strengthen research,

extension education and transfer of technology utilizing the potential of ICT. The centre has already developed a Agrotech portal and many agricultural advisory cum decision support systems like the KAU Fertulator, E-Crop Doctor and *E-Karshaka Jalakam (E-Kisaan knowledge portal)* to help farmers to diagnose and find solutions for their field problems at the fingertips.

14.9 Financial Resources

The sources of funding for KAU include grants from the State Government, ICAR, other External Funding Agencies and domestic resources. The total outlay of the financial year 2011-2012 is Rs 225 crores. The State Government fund is classified as non-plan and plan grants. While non-plan grant is for committed expenditure like salary, pension and overhead costs, plan grant is intended to take care of project-costs. The comptroller manages the University financial resources.

The ICAR funding is in the form of developmental grants for educational institutions and also for implementing co-ordinated projects, NATP, NAIP projects etc. The University also takes up ad-hoc research schemes financed by the State, National and International agencies, Commodity Boards and Private agencies.

The major sources of funding for the University are State Government and the ICAR. Ever since the inception of the University in 1972, sufficient funds were being provided by the State Government and other funding agencies. Recently the University is not getting sufficient funds to meet its non-plan expenditure, resulting in deficit budget.

14.10 Research

The research activities of the University are planned, implemented and monitored by the Director of Research while that of the community services (Extension activities) are managed by the Director of Extension.

There are four major sources of funds for the research activities in KAU, viz., State Government (plan and non-plan grants), ICAR (Partly and fully financed schemes), Govt. of India and private – Indian/foreign agencies. The budgetary expenditure on research during 2011-12 was Rs. 114.32 crores (about 50% of total budget)

Kerala has six agro-ecological zones viz. South, Onattukara, Special Zone of Problem Areas, Central, High range and Northern, spread over 14 districts of the State. In order to strengthen and take up location specific research activities, Regional Agricultural Research Stations (RARS) of each zone headed by an Associate Director of Research are established. Teaching campuses, Research Stations and Transfer of Technology Centres are located across all the zones where zonal and location specific problems are addressed by research units.

In order to achieve the potential yield of high yield varieties recommended by KAU, technologies were developed for fertilizer application, water management, pest and disease management for all crops and the package of Practices recommendations are published periodically to address emerging field problems.

14.10.1 Farm Machinery Developed

- Manually operated paddy transplanter
- 5HP Self-propelled paddy reaper
- Tractor operated paddy reaper
- Portable power operated paddy thrasher-cum-winnover
- Jackfruit harvester
- Coconut de-husking tool named Keramithra
- Tender coconut punch
- Improved Petti and Para dewatering pumps
- Sand Drudger
- Pineapple Peeler, corer cum slicer
- Ashgourd seed extractor
- Pepper Thresher
- Black Pepper Decorticator
- Vanilla oleoresin Plant
- Tractor operated Kaipad bed former
- Continuous power operated coconut dehusker
- Herbicide applicator as an attachment to Redlands transplanter
- Coleus peeler
- KAU Coconut palm climber
- Copra separator
- Goat fecal pellet pulverizer
- Tractor operated mulching sheet lying machine
- Thorny bush uprooter

- Seedling plucker cum transplanter
- Nut meg sheller
- Arecanut dehusker
- Coconut splitter
- Motorized conoweeder

14.10.2 GI registration

The University as a co-applicant, assisted the farmer groups to file applications and secured GI registration for Palkkadan Matta, Wayanad Jeerakasala Rice, Wayanad Gandhakasala Rice, Pokkali Rice and Central Travancore Jaggery 'Pathiyankara'

Integrated farm models involving crop, fish and ducks were developed for the problem zone characterized by homesteads with adjoining backwaters.

Technology for rice-fish integration, rice-prawn integration, rice-vegetable sequential farming, rice-fish-duck farming, etc., was developed by the University.

KAU has developed 6 varieties of coconut of which 5 are hybrids, KAU has produced 7 pepper varieties, viz., Panniyur -1 (P1) to Panniyur -7. The varieties produced by KAU have average yield ranging from 1410 to 3850 kg/ha whereas the average Productivity of Pepper in India is only 322 kg/ha.

KAU pepper varieties are popular in Brazil (10-25%), Indonesia (10-25%), Malaysia (10-25%), Sri Lanka (30-50%), and Vietnam (10-20%). This is an international recognition and evidence to the superiority of our varieties.

Bush pepper technology, the practicing of growing pepper in pots under plagiotropic branches was developed and standardised by KAU. KAU released 16 HYV of cashew suited for different agro-climatic regions. Patent was obtained for Cashew Brandy, Cashew Wine and Cashew Syrup. Procedures for preparation of cashew apple RTS beverage, cashew apple-pine apple squash, cashew apple- pineapple blended RTS, cashew apple - mango mixed fruit jam, cashew apple pickle, cashew apple candy, cashew apple vine, cashew apple vinegar were developed and giving consultancy to many entrepreneurs of the state.

Cocoa has become one of the most remunerative intercrops in coconut and arecanut plantations of Kerala providing an additional income of about Rs.1,00,000- 1,50,000/- per ha.

The Kerala Agricultural University has been instrumental for production of high quality hybrid seeds/ seedlings and budded plants for the past 25 years.

During the last seven years, 9,39,057 hybrid seed pods were distributed to Cadbury India Ltd for seedling production and distribution in Kerala, Tamil Nadu, Karnataka and Andhra Pradesh. The total area increase during the period comes to 40,000 ha in four south Indian states and 6000 ha. in Kerala. With the standardization technology for value addition of cocoa KAU could empower 28 self help groups of farm women in Kerala.

KAU has developed 2 banana hybrids and the suckers of the improved varieties are being supplied to the farmers. High density planting including 2-3 suckers /pit developed by KAU was found to be very profitable in banana.

Virus indexing and a Plant Health Clinic is established at Banana Research Station, Kannara and along with virus indexing help the farmers to get disease free suckers of all varieties of banana. The supply of tissue culture plants reduced the incidence of bunchy top disease in banana.

One hybrid variety of pine apples has been developed and released by KAU.

KAU has developed 57 high yielding varieties in different vegetable crops. About 7.394 t of high quality vegetable seeds are produced and supplied by KAU and it is expected to cover an area of 90000 ha in the state. Among the vegetable varieties grown in Kerala, almost entire share contributed by KAU, (eg. Preethi (bittergourd), Koumudi (snakegourd), Lola (cowpea), Mudicode Local (Oriental pickling melon), Ambili (pumpkin), KAU local (Ashgourd), arun (amaranthus) etc). VFPCK and state Department of Agriculture has also taken up seed production and seed distribution with KAU varieties.

Processing methods have been developed for the 'preservation and product diversification of coconut inflorescence sap'. Technology was developed for production of different processed food products like pickles (20 types), dehydrated products (40 types) jams (3 types), Osmo- dehydrated products (3 types), squashes (10 types) and wine (10 types), from underexploited fruits and vegetables.

14.10.3 Mushroom Production

A total of 26911 kg of spawn, 25 bottles of mushroom wine, 33 kg mushroom and 200 bottles of mother spawn are produced and distributed to the farmers. The technology for value added products viz. mushroom wine (Koonamruthu), dried mushroom powder and mushroom sauce were standardized and popularized. Trainings are conducted for mushroom production and consultancy services were rendered to processing units.

14.10.4 Biocontrol Agents

Control of salvinia and water hyacinth, the troublesome aquatic weeds of water bodies were achieved by the Scientists of KAU through the use of the biocontrol agents *Cyrtobagous salviniae* and *Fusarium pallidoroseum* respectively'. The salvinia were spread over 60,000 ha of paddy fields and all lakes and canals in Kerala till 1985. By the introduction of *Cyrtobagous salviniae*, a small insect imported from Africa most of the areas were cleared and there was an estimated annual savings of more than Rs.68 lakhs.

Beneficial micro organisms' viz., *Pseudomonas*, *Trichoderma*, *entomopathogenic fungi* viz., *Beauveria* and *Metarrhizium* were identified as highly useful biocontrol agents against pests and diseases of various crop plants of Kerala. All the microbial inoculants developed have been successfully commercialized and are available to farmers, viz. *Pseudomonas*, *Trichoderma*, *Azospirillum* and *mycorrhiza*.

14.10.5 Agricultural Market Intelligence

The Agricultural Market Intelligence Centre (AMIC) provides price forecasts during main crop seasons for coconut, pepper and cardamom and product intelligence to all stakeholders.

Based on the study conducted by State Planning Board the overall Impact of KAU Varieties and Technologies is to the tune of Rs.840 crores/annum

14.10.6 Patent obtained for the following farm machineries

- Rotary Engine
- Variable torque converter
- A device for harnessing animal power
- Improvements in or relating to bicycle operated pump

14.11 Extension Education

Extension education is an integral part of the mandatory activities of Kerala Agricultural University. It is planned, organised and coordinated by the Directorate of Extension.

The major innovative extension approaches of the University are:

- Participatory and Group approaches
- Farm advisory / diagnostic services
- Rural entrepreneurship development
- Single window services
- Human Resource Development in the field of farm sciences
- Awareness programmes
- Transfer of Technology innovations (through Package of Practices)
- Research – Extension interfaces
- Cyber Extension programmes
- Technology and society interface studies
- Research Into Use (RIU)

All the extension programmes of the University are carried out through a network of institutions consisting of the Colleges, Research Stations, Communication Centre, Central Training Institute (CTI), Agricultural Technology Information Centre (ATIC), Krishi Vigyan Kendras (KVKs), etc. The National Service Scheme (NSS) Units in 9 colleges of the University also involves in extension activities. Public Relations Office of the University that manages the media relations of the University is also under the direct administrative control of the Director of Extension. Earn while you learn programmes, Rural Agricultural Work Experience programme, Village adoption programmes, participation in Television and AIR, agricultural seminars, etc. are some of the other extension activities from the University.

The University provides technical information and support to the extension personnel of the state development departments and farmers.

It also under takes technology into use studies in the field through various research projects funded under plan and by external funding agencies like State Horticulture Mission, State Department of Agriculture, ICAR etc.

The Central Training Institute (CTI), established in October 1986, is the nodal point of KAU's training activity. The institute coordinates the training activities on agriculture and related subjects for the technical personnel of the state development departments, commodity boards, banks and such other agencies including the farming community. The institute has been recognised by the Government of India as the centre for national training courses in specialised areas such as plantation crop, production technology, farm journalism, etc.

14.11.1 Agricultural Technology Information Centre, Mannuthy

The Agricultural Technology Information Centre (ATIC) is a single window support system for providing agricultural technology information, value-added products, planting materials and diagnostic services to the farmers and other end users. Originally started as Information-cum-Sales Centre in 1993, the centre was upgraded to ATIC as a national model in 2000 by ICAR. The model has been replicated in all states under ICAR funding as an innovative approach in technology transfer.

The Centre has also a "Village Resource Expert Centre (VREC)" funded by the State Planning Board and technically guided by the ISRO. The VREC is a virtual classroom facility that handles sessions through video conferencing mode.

14.11.2 Krishi Vigyan Kendras (KVKs)

Krishi Vigyan Kendras, popularly known as KVKs, are the district nodal centres for training and technology transfer among the farming community, development departments and Non-Governmental Organisations. There are seven KVKs under the KAU that are fully financed by ICAR, which are at Palakkad, Wayanad, Kollam, Kottayam, Thrissur, Malappuram and Kannur districts. The KVK acts as knowledge centres and technological hub for agricultural and rural development of the concerned district. All the KVKs have soil and water testing laboratory facilities and e-connectivity. The KVKs have a major role in farm mechanisation and horizontal spread of the new technologies. The Kendras conduct "Technology Week" every year to create awareness on the latest developments of agriculture and allied fields.

Due to several innovative schemes implemented the KVK, Kannur received the "Best KVK Award" at the national level in 2009.

14.11.3 KAU Press

The KAU press was established in 1976 and caters to the printing needs of the University and so far, about 100 Malayalam publications, 50 technical bulletins and 75 books on different subjects in English have been printed at the press for distribution to the public at a very reasonable price.

14.11.4 National Service Scheme

The overall aim of National Service Scheme (NSS) is to give an extension dimension to the higher education system and orient the student youth to community service while they are undergoing education. The NSS programme is organised in all the colleges of the University with these objectives.

Several social activities such as health camps, awareness camps on important issues, blood donation campaigns, tree planting campaigns, eco-sensitization camps, laying out of nutritional gardens in the homesteads, laying roads in socially backward areas, cleaning and sanitation activities, etc. are organised by NSS units. Besides, workshops and other extension activities on subjects of topical interest and current issues, charitable and relief works, vaccination and anti-rabies campaigns... are also undertaken by the NSS units. In-house magazines are also circulated among the NSS volunteers. At the University level, a newsletter named "Mousam" is being published by NSS. A ten—day Special camp is organised every year for the NSS volunteers at selected villages, the students live with them and learn from them and work for the development of the village with a holistic approach.

14.11.5 Agro-meteorological Advisory Services

The Department of Science and Technology, Government of India initiated a project "National Centre for Medium Range Weather Forecasting and Development of Agro-meteorological Advisory Services" in 1988 with a major objective of developing expertise for providing weather based agro-advisories to the farmers for planning day-to-day agricultural operations well in advance so that the adverse impact due to uneven behaviour of weather could be minimised.

14.11.6 Protection and Management of IPR

Realizing the prominence of IPR in Agriculture especially in the back drop of TRIPS Agreement and in accordance with the directives of the Indian Council of Agricultural Research, an IPR Cell was constituted in the Kerala Agricultural University during 2001, with the Hon'ble Vice Chancellor as its chairperson and the Director of Research as the co-chairperson.

14.11.7 Centre for Gender Studies in Agriculture and Farm Entrepreneurship Development (CGSAFED)

This centre was initiated during 1999 with the objective of bringing gender sensitivity and gender perspective in research, extension and educational efforts in agriculture and allied fields, thereby increasing and facilitating women's role and participation in agricultural development.

14.11.8 Radiotracer Laboratory

The Radiotracer Laboratory at the Main Campus, Vellanikkara was established in 1982 with the financial assistance from the world bank under the Kerala Agricultural Development Project. The centre offers a course on the fundamental and applications of isotopes and radiations at the post graduate level. The laboratory is a central facility for research employing radioisotopes and radiations for scientists and postgraduate students of all the faculties under the KAU.

KERALA AGRICULTURAL UNIVERSITY

STEERING COMMITTEE FOR INSTITUTIONAL ACCREDITATION

CO-ORDINATOR (UNIVERSITY LEVEL)

Chairman	Dr. P. Rajendran, Vice-Chancellor Sri. K.R. Jyothilal, I A S. Vice- Chancellor (Upto 31.10.2012) Dr. K.R. Viswambaran, Vice-Chancellor (Upto 28.03.2012)
Co-ordinator	Dr. P.K. Ashokan, Director (Academic & PG Studies)
Joint Co-ordinators	Dr. Lila Mathew K., Professor (Academic) Ms. Santhakumari V.R., Deputy Registrar (Academic)

Steering Committee

Members

1. Registrar	Dr. P.K. Rajeevan Dr. P.B. Pushpalatha (Upto 30.07.2012)
2. Comptroller	Dr. Joy Mathew Mr. T.S. Majeed (Upto 07.07.2012)
3. Dean (Agriculture)	Dr. Sverup John
4. Dean (Agricultural Engineering)	Dr. M. Sivaswamy
5. Director (Research)	Dr. T.R. Gopalakrishnan
6. Director (Extension)	Dr. P.V. Balachandran
7. Director (CITI)	Prof. K. Madhavan Nair
8. Director Physical Plant	Dr. V.R. Ramachandran Mr. K.Suresh Babu (Upto 23.08.2012)
9. Director (Students' Welfare)	Mr. E.U. Rajan

- | | |
|---|---|
| 10. Director (Planning) | Dr. Sajan Kurien |
| 11. University Librarian | Mr. K.P. Sathian |
| 12. Associate Dean (CCBM, Vellanikkara) | Dr. A. Sukumaran |
| 13. Associate Dean (CoF, Vellanikkara) | Dr. B. Mohan Kumar |
| 14. Associate Dean (CoH, Vellanikkara) | Dr. C.T. Abraham |
| 15. Associate Dean (CoA, Padannakkad) | Dr. M. Govindan |
| 16. Special Officer, ACCER, Vellanikkara | Dr. Ajith Kumar B. |
| | Dr. G.S.L.H.V.P. Rao (Upto 29.07.2012) |
| 17. Agriculture faculty representative | Dr. Jacob John |
| 18. Agrl. Engg. faculty representative | Dr. V.R. Ramachandran |
| 19. Academic Officers (CoA, Vellayani) | Dr. E. Komala Amma (UG studies), |
| | Dr. S. Chandini (PG Studies) |
| 20. Academic Officers (CoH, Vellanikkara) | Dr. M.V. Rajendran Pillai (UG Studies) |
| | Dr. Diji Bastin (PG Studies) |
| 21. Academic Officer (CoA, Padannakkad) | Dr. P.R. Suresh |
| 22. Academic Officer (CoF, Vellanikkara) | Dr. Jamaludheen |
| 23. Academic Officer (CCBM, Vellanikkara) | Mr. M. Mohanan |
| 24. Academic Officer (KCAET, Tavanur) | Dr. K.K. Sathyan |
| 25. PG Student Representatives | Mr. Vineeth V. Varma, CoA, Vellayani. |
| | Mr. Lino Davis, CCBM, Vellanikkara |
| 26. Ph. D. Student Representative | Ms. Gleena Mary C.F., CoH, Vellanikkara |
| 27. Deputy Registrar (Admn. I) | Ms. Sherly Mathew |
| 28. Deputy Registrar (Admn. II) | Ms. C. Usha |
| 29. Senior Deputy Comptroller (B&P) | Mr. K.K. Satheesan |

KERALA AGRICULTURAL UNIVERSITY

ACCREDITATION COMMITTEE

Task Force

Chairman	Dr. P. Rajendran, Vice-Chancellor
Co-ordinator	Dr. P.K. Ashokan, Director (Academic & PG Studies)
Joint Co-ordinator	1. Dr. Lila Mathew K., Professor (Academic, KAU Academic Wing) 2. Ms. Santhakumari V.R., Deputy Registrar (Academic) 3. Mr. Vineeth V. Varma PG Student Representative, CoA, Vellayani.

Task assigned

Registrar	Authorization, governance, mission and goals, administrative structure and planning
Director (Acad & PGS)	Faculty and Academic Programmes
Deans & Associate Deans	Information on individual colleges
Director of Research	Research
Director of Extension	Extension and Public Information
Director (CITI)	ICT Facilities, e-governance, e-learning
Director (Students Welfare)	Student Affairs
Director (Physical Plant)	Physical Facilities
Comptroller	Finance
University Librarian	Library and Learning Centres

Proforma for Institutional Profile

Name of the institution KERAALA AGRICULTURAL UNIVERSITY
 Location Vellanikkara, KAU P.O., Thrissur 680 656, Kerala
 Address Vellanikkara, KAU P.O., Thrissur 680 656, Kerala
 Telephone 0487-2348001, 0487-2348002,
 2348003,2348004,2348005
 Fax 91-487-2370019
 E-mail vc@kau.in; registrar@kau.in
 Name and Title of the Institutional Head Dr. P. Rajendran, Vice-Chancellor
 Date of the Institution's Establishment 1.2.1972
 Number of academic programmes
 1. Undergraduate 5
 2. Postgraduate
 M.Sc. 10
 Ph.D. 6
 Number of batches graduated for each programme List attached

General Institutional Requirements

I. Authorization

	Yes	No	Others
1) Has authorization to grant its degrees and meet requirements to operate as an institution of higher education?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Governance

- | | | | | |
|----|---|-------------------------------------|--------------------------|--------------------------|
| 1) | Has a Board of Management that possesses and exercises necessary power to establish and review basic policies that govern the institution? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) | Has a chief executive and other managerial officers been appointed in accordance with the provisions of the Model Act for Agrl Universities in India (as revised in 1994) to provide administrative leadership for the institution? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. Mission

- | | | | | |
|----|---|-------------------------------------|--------------------------|--------------------------|
| 1) | Has a mission statement, formally adopted by the Board of Management and made public that it is an institution of higher education? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) | Is it a degree-granting institution? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3) | Are there non-degree programmes offered? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. Faculty

- | | | | | |
|----|--|-------------------------------------|--------------------------|--------------------------|
| 1) | Do you advertise vacancies in National Papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) | Do you follow ICAR prescribed norms including NET for recruitment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | | | | |
|----|-----------------------------|---------------------------------|--------------------------------|--------------------------------|
| 3) | Percentage of faculty from: | State | Other States | Others |
| | | <input type="text" value="97"/> | <input type="text" value="3"/> | <input type="text" value="-"/> |

- | | | | | |
|----|--|-------------------------------------|--------------------------------|--------------------------------|
| 4) | Percentage with Doctorate degree in their field of instruction | <input type="text" value="76"/> | <input type="text" value="-"/> | <input type="text" value="-"/> |
| 5) | Percentage with M.Sc. degree | <input type="text" value="24"/> | <input type="text" value="-"/> | <input type="text" value="-"/> |
| 6) | Does the faculty have a significant role in developing and evaluation of all the educational programmes? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7) | Is there an established incentives and rewards system? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

5. Academic Programmes

- | | | | | |
|----|---|-------------------------------------|--------------------------|--------------------------|
| 1) | Does your institution follow academic regulations, course curricula, and courses recommended by Dean's Committee and accepted by ICAR with modification and duly accepted by SAUs ? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|----|---|-------------------------------------|--------------------------|--------------------------|

- | | | | |
|----|---|-------|-----|
| 2) | Degree programmes with number of students | Ph.D. | 58 |
| | | PG | 231 |
| | | UG | 355 |

- | | | | |
|----|---------------------------------|----------|----|
| 3) | Number of campuses and colleges | Campuses | 21 |
| | | Colleges | 6 |

6. Student Affairs

- | | | | | |
|----|---|-------------------------------------|--------------------------|--------------------------|
| 1) | Are student admission policies consistent with its institutional mission and appropriate to its educational programmes? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|----|---|-------------------------------------|--------------------------|--------------------------|

- | | | | | |
|----|-----------------------------|---------------------------------|-------------------------------------|--------------------------------|
| | | Qualifying Exam | Entrance Exam | Others |
| 2) | Basis for admission | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | | State | Other States | Others |
| 3) | Percentage of students from | <input type="text" value="90"/> | <input type="text" value="9"/> | <input type="text" value="1"/> |

		Internal	External	Others
4)	Percentage weight for student examinations	<input type="text" value="20"/>	<input type="text" value="80"/>	<input type="text" value="-"/>
		Yes	No	Others
5)	Is there a mechanism to redress student grievances?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Men		Women
6)	How many student hostels are available?	<input type="text" value="8"/>		<input type="text" value="7"/>
		Yes	No	Others
7)	Are students involved in management of hostel activities?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Are there students cultural, recreational, and sports facilities available?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9)	Name the sports facilities available	See Table 8.1		
10)	Are there students guidance and counseling able?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11)	Are there News Papers/News Letters/Magazines published by the students?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Library and Learning Centres				
		Inst	College	Dept.
1)	Are library facilities available and how many?	<input type="text" value="23"/>	<input type="text" value="6"/>	<input type="text"/>
		Admn.	Faculty	Students
2)	Are computer and photocopier services available to	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Books	Periodicals	Others
3)	Has an institutional library adequate holding? (please indicate numbers)	<input type="text" value="129691"/>	<input type="text" value="13001"/>	<input type="text" value="700"/>
		Yes	No	Others
4)	Are there E-mail and Internet facilities available?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Physical Facilities

	More than adequate	Adequate	Less than adequate
1) Are there enough central administrative buildings available?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2) Is there enough class room space available?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3) Is there enough laboratory space available	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4) Laboratory equipment availability	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5) Are there enough farmland, machinery and equipment available to meet institutional needs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Adequate Available	Less than adequate	Not
6) Faculty and staff residential facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

9. Finances

	Sate	ICAR	Internal Resources	Others
1) Share of financial support (Please give percentage) resources	68.7	15.1	4.3	12.1

	Yes	No	Others
2) Is present financial support sufficient?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3) Total Budget available: (In crores)	a) Non-Plan	115.60
	b) Plan	45.00
	c) Internal resources	8.98
	d) Others: ICAR	26.19

4)	Percentage of budget spent on central administration	Table 9.3		
		Yes	No	Others
5)	Are there adequate financial control mechanisms available?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6)	Do financial documents, practices, reports demonstrate fiscal viability?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Research and Extension Education

1)	Is there an Institutional Directorate of Research?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2)	Is there an Institutional Directorate of Extension Education?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3)	Annual Budget for: (In crores)	Research	a)	Non-Plan	34.91
			b)	Plan	17.04
		Extension	a)	Non-Plan	4.42
			b)	Plan	4.32
		Yes	No	Others	
4)	Does Institution has tripartite mission of Teaching, Research and Extension Education?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5)	Does faculty have responsibilities for Teaching/Research Extension?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6)	Is faculty evaluated on tripartite mission ties?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7)	Are post-graduate studies co-ordinated at level?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8)	Are there established mechanisms for student participation in Research and Extension?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9)	Are researchers and extension specialists' part of the academic departments?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

11. Public Information

- | | | | |
|--|-------------------------------------|--------------------------|--------------------------|
| 1) Is there a separate institutional Data Base centre? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) Is there a regularly updated publication that include: | | | |
| (i) Educational programme and Degree requirements | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| ii) Learning resource | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (iii) Admission policies | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (iv) Student policies | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (v) Fees, other charges and refund policies | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (vi) Academic qualifications of faculty and administrators | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3) Is there a publication office which prints and distributes institutional documents? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4) Is there updated information for student enrollment and retention available? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5) Is there student placement information available? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

12. Accomplishments

Details attached along with the constituent colleges

1. Education
2. Research
3. Extension

Information on individual colleges

IV.1 College of Agriculture, Vellayani, Thiruvananthapuram

- 1 Name of the college : College of Agriculture, Vellayani
- 2 Address : College of Agriculture
P.O. Vellayani, Thiruvananthapuram
695 522, Kerala
- Telephone : 0471-2381829
- Fax : 0471- 2381829
- Email : deanagri@kau.in
- 3 Name and title of the College Head : Dr. Sverup John, Dean
- 4 Total students enrollment
- | | |
|-----------------------|-----|
| Ph.D. | 69 |
| PG | 116 |
| UG | 400 |
| M.Sc. (Int.) Biotech. | 40 |
- 5 No. of Departments : 20
- 6 No. of faculty in each department : Attached as separate sheet
(Use separate sheet)
- 7 Disciplines offering P.G. programmes
- | | |
|----------------|-------|
| Discipline | : 12 |
| No. of faculty | : 124 |
| Ph.D. students | : 12 |
- 8 Total College budget : Rs. in lakhs
- | | |
|------------|----------|
| a Non-Plan | : 730.96 |
| b Plan | : 48.06 |

c	Internal resources	98.453
d	OEAP	
	Total	877.47

9 Indicate percentage of budget spent on:

Salary	:	315.06
Research	:	6.00
Extension Education	:	0.40
Student services	:	6.30
Physical facility maintenance	:	7.31
Others (Farm, labour welfare etc.)	:	-

10 Infrastructure available

	Adequate	Less than adequate	Not adequate
i. Computer facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii. Library facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii. Field Practical facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv. Teaching aid and media services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Sports facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vi. Hostel facilities			
	Men	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Women	<input checked="" type="checkbox"/>	<input type="checkbox"/>
vii. Other student services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Main accomplishments

Details of accomplishments made by College of Agriculture, Vellayani in areas of Teaching, Research and Extension are detailed in the main report. Some of the salient features alone are summarized below.

1. Teaching :

The main strength of College of Agriculture, Vellayani is its highly qualified faculty and good quality students. The students of the institution are having a very good academic background and are technically proficient in agriculture. This is amply reflected in their performance during competitive examinations at the national level including JRF, ARS & NET. The college has also produced many outstanding scientists, administrators and businessmen as evident in our Alumni database.

i. Status of graduates pursuing various careers (last five years)

Category	2007-08	2008-09	2009-10	2010-11	2011-12
TOTAL Students	42	59	37	37	54
ARS/IFS/IAS	-	4	2	-	-
Govt. Service/Central Govt.	3	5	-	1	
Nationalised Banks	24	30	20	11	15
Further Education	14	20	15	19	24
MBA				3	1
Private sector				2	4
Self employed/Temporary jobs	1	-	-	1	10

ii. Students achievements in national competitions during last four years

Year	JRF	SRF	Civil Service	ARS/NET	Others
2008	7		0	16	Jawaharlal Nehru Scholarship for doctoral studies -2 Young Scientists award in Kerala Environment Congress
2009	4		1	14	K.S.C.S.T.E fellowship - 1
2010	2		1	6	IPNI Scholar 2010 award instituted by International Plant Nutrition Institute, Hyderabad - 1 K.S.C.S.T.E fellowship-2
2011	1	2	1	4	K.S.C.S.T.E fellowship - 3

2. Research

Several important recommendations, innovations in farm practices and new technologies have resulted from the studies conducted in this institution and have become the official recommendations of the University (Package of Practices Recommendations). Such technologies have contributed to agricultural development in the state.

i. Crop Improvement

- During 2007-12 period, five high yielding varieties of the following crops were released and are widely cultivated in Kerala.
 1. Yard Long Bean- Vellayani Jyothika
 2. Tomato- Vellayani Vijay
 3. Chilli- Vellayani Athulya
 4. Bird chilli- Vellayani Samrudhi
 5. Tapioca - Vellayani Hraswa

ii Crop Production

- Two tons of quality seeds of 23 vegetables (including underexploited vegetables like jack bean, cluster bean, winged bean, clove bean, dolichos bean, hot chilli, bird chilli, ridge gourd and cuttings of coccinia and drumstick) were produced and sold to Department of Agriculture, farmers, schools, residential associations, KVKs, Krishi Bhavans and other Research and Development centres, covering an area of 1000 ha and enhancing production by 10-15%.
- Two lakh vegetable seed packets were sold to different beneficiaries, benefitting 20,000 homesteads of the state. Fifty thousand vegetable seedlings produced through 'pro trays' too were sold. An amount of Rs 22.0 lakhs was realized through sale of seeds and seedlings.
- Thirty hectares of waste land were located additionally for growing vegetables in the districts of Kasargod, Idukki, Thiruvananthapuram and Alapuzha. Inputs like Pseudomonas, Trichoderma, Cue lure traps and organic manures were supplied to the growers for boosting production.
- Adoption of improved mushroom production techniques in the state was to the extent of 25%.
- Apart from the existing ten lakh bee colonies in the State, 101 (covering 10 ha), 51 (covering 5ha) and 130 (covering 5ha) bee colonies were introduced additionally in the state during 2008-09, 2009-10 and 2010-11, respectively through the concerted activities of the AICRP on Honey bees and Pollinators Centre, Vellayani.

IV.2 College of Horticulture, Vellanikkara, Thrissur

1	Name of the college	: College of Horticulture, Vellanikkara	
2	Address	: College of Horticulture P.O. KAU, Thrissur 680 656, Kerala	
	Telephone	: 0487-370822	
	Fax	: 91-487-230790	
	Email	: cohvka@kau.in	
3	Name and title of the College Head	: Dr. C.T.Abraham, Associate Dean	
4	Total students enrollment	Ph.D: 81 PG: 120 UG: 236 M.Sc. (Int.) CCA: 40	
5	No. of Departments	: 20	
6	No. of faculty in each department (Use separate sheet)	: As per Annexure I	
7	Disciplines offering P.G. programmes	Discipline : 17 No. of faculty : 105 Ph.D. students : 24 M.Sc. students : 95	
8	Total College budget(2011-12)		Rs. in lakhs
	a Non-Plan	:	1917.40
	b Plan	:	128.50
	c Internal resources	:	47.00
	ICAR :		171.30

9 Indicate percentage of budget spent on:

Salary	:	66.2
Research	:	8.8
Extension Education	:	10.7
Student services	:	4.0
Physical facility maintenance	:	6.3
Others (Farm, labour welfare etc.)	:	4.0

10 Infrastructure available

	Adequate	Less than adequate	Not adequate
i. Computer facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. Library facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii. Field Practical facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv. Teaching aid and media services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Sports facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
vi. Hostel facilities			
	Men	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Women	<input type="checkbox"/>	<input checked="" type="checkbox"/>
vii. Other student services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

12. Main accomplishments

The College of Horticulture, ever since its establishment, has been providing high quality professional education. Since its inception, the College has produced 1688 graduates in Agriculture and Horticulture, 923 postgraduates in Agriculture, Horticulture, Agricultural

Statistics and Food Science and Nutrition and 138 doctorates. The alumni of the College are shouldering responsible positions in State Agricultural Universities, Agricultural Research Service, Indian Administrative Service, Indian Police Service, Indian Forest Service, Foreign Universities, State Department of Agriculture, Commodity Boards, Banks, Public Undertakings, Cooperative Sector, Plantations, Fertiliser Firms and Pesticide Firms and Non-Governmental Organizations.

The students of the College had performed creditably and consistently in the national examinations like JRF, SRF and ARS-NET. During the years of 2007, 2008, 2009, 2010 and 2011 this College stood first in the Country in the JRF examinations conducted by the Indian Council of Agricultural Research. The number of students who got JRF during 2007(12), 2008(8), 2009(20), 2010(17) and 2011(16). The students of this College had won several awards, prizes and recognitions at the State and National levels. Two students had bagged the Jawaharlal Nehru award for the best Ph.D. thesis and three students had won the Young Scientist Award instituted by STEC, Government of Kerala. One student had received the Jawaharlal Nehru Fellowship and two students had got the DBT postdoctoral fellowships. Besides, several students had received the ICAR Junior and Senior Fellowships and CSIR Fellowships.

The Faculty handling the various academic programmes in the College is of high academic credentials. Ninety per cent of the faculty is having Doctorate degree and some of them have postdoctoral qualifications as well. Nearly 30 per cent of the Faculty had received awards and recognitions at the State and National Levels such as Jawaharlal Nehru Award, Young Scientist Award, Krishi Vigyan Award, KRIBCO National Award, Deshmukh Young Agronomist Award, Award of the Indian Society of Plant Physiology, Award of Deseeya Sastra Veedi, Thakur Ram Autar Singh Award IARI Gold Medal, UAS Gold Medal, TNAU Gold Medal etc. The Faculty members of the College have a large number of publications to their credit. One hundred and sixty four books, booklets and technical bulletins have been published by the Faculty. The number of research papers, research notes and popular articles published comes to 1962, 154 and 1384 respectively.

Two hundred and fifty research projects are being carried out at the various Departments and units of the College of Horticulture during 2011-12. These include All India Coordinated projects (7), AINP (2), ICAR projects (6), DBT projects (9), KSCSTE (9), RKVY(11), NHM (4), state planning board (5) and others (19).Twenty nine KAU plan projects, 20 non-plan projects and 128 PG projects are also under operation in the college. Forty-nine

externally assisted major projects have already been completed successfully. The major research contributions made by the College in different areas are briefly furnished below:

- The College of Horticulture has developed and released 36 high yielding varieties of vegetable crops, 10 cocoa varieties, four turmeric varieties, two ginger varieties, five medicinal plant varieties, two rice varieties and two long pepper variety. Recently a seedless yellow fleshed variety of water melon was developed by Dr.T.Pradeepkumar, Associate Professor of department of Olericulture.
- Generated appropriate technologies in the fields of rice and rice based cropping systems, inter cropping in coconut gardens, nutrition of various crops like rice, tapioca, vegetables, banana etc., weed control and irrigation of different crops, agroforestry, agrotechniques for soil conservation, cropping patterns for different zones of Kerala and application of DRIS in coconut, pepper gardens etc.
- Extensive studies have been conducted on the morphological, physical and chemical characteristics of the major soil types of Kerala. Methods of foliar diagnosis were standardised for different crops.
- Successful investigations were conducted on insect physiology, ecology, toxicology morphology, parasitology, taxonomy and insect pest management. Survey on bird problems in Trichur, Malappuram, Palakkad and Calicut has been done.
- Various research projects were undertaken on diseases of rice, coconut, pepper, cocoa, banana, ginger, vegetables and medicinal plants. Many new crop diseases were identified and effective management practices for various destructive diseases were formulated.
- Technologies were developed for scientific vegetable cultivation and seed production.
- Standardised the hybridisation techniques and *in vitro* propagation techniques in banana, pineapple, orchids and bougainvilleas. Epicotyl and softwood grafting techniques were developed for mango, cashew, gummigutta, mangosteen, gooseberry, sapota, lovi lovi, caronda, bilimbi and jack. Standardized *in vitro* corm production in gladiolus.

- Studied the nutrient removal pattern and documented the artificially induced nutrient deficiency symptoms of crops such as pepper, nutmeg and clove. Standardized protocols for *in vitro* propagation of cashew, ginger, pepper, cardamom and medicinal plants. Reported the occurrence of somaclonal variations in pepper with respect to phytophthora foot rot disease for the first time in the world.
- Methods to prolong shelf life of fruits and vegetables under both ambient and refrigerated storage environments were developed. Technology was standardised for preparing a wide variety of value added products of papaya.
- Eighty three indigenous practices related to coconut cultivation and 80 indigenous practices and 20 indigenous beliefs related to rice cultivation were identified and documented. The most important consequences of conversion of marginal homesteads for planting rubber were identified as out migration of hired labour and family labour, soil loss and decrease in water availability, increase in social status and decrease in water table.
- Analysis of the impact of finance provided for various crops as well as schemes pointed out the necessity of enhancing the scale of finance and providing timely credit. Studies on the poverty alleviation programmes such as SFDA and IRDP revealed the deficiencies in the programme with respect to selection of beneficiaries as well as the achievements.
- Suitable experimental plans and subtle analytical procedures were developed for the reduction of heterogeneity and enhancing precision of treatment comparisons in perennial experimentation. A computer oriented interactive algorithm for clustering genotypes based on Mahalanobis D^2 was developed.
- A jet pump powered by diesel engine which could dredge four tonnes of sand per hour and a salvinia harvesting machine which can remove salvinia from one ha. in an hour were developed. An axial flow pump, equipment for small scale processing of cocoa and a modified IRRI type paddy winnower were fabricated.
- Scientists of the College could involve in the GI registration of Pokkali rice and Wayanadan Aromatic rice, Jeeragasala and Gandhakasala.

- Fertilizer prescription equations were developed as part of STCR project working in the college for rice, turmeric, sweet potato, ash gourd, bitter gourd, snake gourd, cucumber, amaranth, bhindi, chilli, pumpkin and water melon.
- Diversity of Agriculturally Important Microorganisms in the Western Ghats of Kerala was studied and recorded.
- A spectacular suppression of aquatic weed *Salvinia molesta* could be achieved using the biological control agent, *Cyrtobagous salviniae*.

The market intelligence scheme working in the department of agricultural Economics regularly forecasts market prices of coconut and pepper with more than 90 % accuracy.

The College of Horticulture, which has got a well, established Department of Agricultural Extension gets actively involved in all the extension and related activities of the University. All members of the faculty participated in various training programmes, farmer-scientist interactions, agricultural seminars, agro-clinics, radio talks, television programmes, agricultural exhibitions etc. The members also took part in the identification and investigation of problems in the farmers' fields. Agro-advisories are being issued regularly to the farmers of the region in both English and Malayalam. A series of training programmes are regularly being conducted for the benefit of Officers of State Department of Agriculture, Commodity Boards, Banks, Task Force members of Peoples' Planning Programme, unemployed youth, housewives etc. A remote sensing unit was established for identification, delineation and exploitation of the resources of the state. The Centre for Studies on Gender Concerns in Agriculture established in the Agricultural Extension Department of the College in October 1999 seeks to internalise gender perspective in agricultural development by building capacity in advocating gender concerns and in undertaking gender analysis. Large-scale production and distribution of planting materials of fruit plants, ornamentals, spices, medicinal plants, vegetable seeds, mushroom spawn etc. to farmers is a routine activity undertaken by the college.

IV.3 College of Agriculture, Padannakkad, Kasaragod

1	Name of the college	: College of Agriculture, Padannakkad		
2	Address	: College of Agriculture P.O. Padannakkad, Kasaragod, PIN: 671314, Kerala		
	Telephone	: 0467 2280616		
	Fax	: 0467- 2284099		
	Email	: adpad@kau.in		
3	Name and title of the College Head	: Dr. M.Govindan, Associate Dean		
4	Total students enrollment	Ph.D.	0	
		PG	12	
		UG	200	
5	No. of Departments	: 20		
6	No. of faculty in each department (Use separate sheet)	: Attached as separate sheet		
7	Disciplines offering P.G. programmes	Discipline	:	10
		No. of faculty	:	25
		Ph.D. students	:	0
		M.Sc. students	:	1
8	Total College budget			Rs. in lakhs
		a Non-Plan	:	37.89
		b Plan	:	589.41
		c Internal resources		67.16
		d OEAP		256.13
		e Revolving fund		36.13
		Total		986.72

9 Indicate percentage of budget spent :
on:

Teaching	:	342.81
Research	:	266.74
Extension Education	:	20.92
Administration	:	98.87
Physical facility	:	23.10
Maintenance	:	752.43

10 Infrastructure available

	Adequate	Less than adequate	Not adequate
i. Computer facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. Library facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii. Field Practical facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv. Teaching aid and media services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Sports facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vi. Hostel facilities			
	Men	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Women	<input checked="" type="checkbox"/>	<input type="checkbox"/>
vii. Other student services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Main accomplishments

Details of accomplishments made by College of Agriculture, Padannakkad in areas of Teaching, Research and Extension are detailed in the main report. Some of the salient features alone are summarized below.

- The students of the college excel in All India Competitive Examinations and many are recipients of JRFs. Three of our alumni secured coveted positions in IAS cadre, one in IPS and two in IAS. Six of our Alumni got positions in Central Revenue and Railway services.

3. Teaching :

The main strength of College of Agriculture, Padannakkad is its highly qualified faculty, quality students selected on the basis of a State level entrance test and the infrastructural facilities of the College. The quality of the students passing out of this College can be evidenced by the number of students reaching various higher avenues of the agricultural profession. They are technically competent and confident n taking up any venture they have been assigned in the field of agriculture.

iii. Status of graduates pursuing various careers (last five years)

Category	2007-08	2008-09	2009-10	2010-11	2011-12
TOTAL Students passed out	23	24	21	20	25
ARS/IFS/IAS	-	-	-	-	-
Govt. Service/Central Govt.	2	1	5	-	5
Nationalised Banks	6	4	-	3	-
Further Education	13	11	15	16	15
MBA	-	2	-	-	1
Private sector	2	6	-	-	4
Self employed/Temporary jobs	-	-	1	1	-

iv. Students achievements in national competitions during last four years

Year	JRF	SRF	Civil Service	ARS/NET	Others
2008	9	-	-	-	
2009	7	-	-	-	
2010	4	-	1	-	
2011	6	-	-	-	
2012	4	-	1	-	

- v. At present, the Association has more than 300 members who are in various walks of life spread all over the globe. The college has produced many outstanding scientists,

administrators and businessmen. the Association has started a scholarship scheme for helping financially backward students.

4. Research:

In line with the national policy, the focus of research by College of Agriculture Padannakkad has been largely on food crop technologies, driven by the immediate goal of increasing food production and reducing food insecurity. Livelihood security of the farming community of northern zone is also given due priority.

- Saline tolerant Kaipad varieties christened as 'Ezhome -1' and 'Ezhome -2' – The first high yielding varieties of saline prone Kaipad ecosystem of North Kerala was released for commercial farming in 2010. Included in the recently published Package of Practice recommendation of KAU -2011.
- After the release of two saline tolerant high yielding rice varieties of Kaipad namely, 'Ezhome -1' and 'Ezhome -2' in 2010, about 252 ha of Kaipad tracts in Kannur, Kasaragod and Kozhikode districts were cultivated with these high yielding varieties due to which there was 60 – 70 % yield increase of organic paddy production.
- 'One saline tolerant high yielding rice culture (Culture MK 22) christened as ' Ezhome - 3' for Kaipad tract, and one wetland rice culture, Culture MK 157 christened as ' Jaiva' developed for organic farming and conventional farming got approval of KAU variety release committee in 2012
- Formation of Food Security army and mechanization of deep water paddy field (kaippad area) has got a deep impact among the farmers, administrators, policy makers and researchers .
- The antifungal effect of cashew shell on polypathogenic fungi was validated.
- Entamopathogenic fungi (EPF) such as a new strain of *Metarrhizium anisopliae* isolated from the college campus and two new pathogens viz, Protozoan and *Fusarium* spp were found to cause mortality of coconut root grub.
- Zone wise review and documentation of nutrient management and soil fertility, assessment of the crop production potential , nutrient advisory card preparation were done.
- 'Sugandhi" Integrated Pepper Research and Development Project for Wayanad District was implemented to rehabilitate pepper gardens in Wayanad district in an ecologically and economically sustainable manner, to develop a scientific and biorational pepper production package suited to Wayanad, to impart knowledge on scientific and biorational management of pepper to the pepper growers and to equip the farmers in

managing biotic and abiotic stresses of pepper. Revitalising pepper samithies on a Compact Area Group Approach (CAGA) involving LSGs was done for the sustainability of the project findings.

- Validation of Indigenous technical knowledge collected from North Malabar and Scaling up of farmer innovations in North Malabar was done. Utilization of red ants *Oecophylla smaragdina* for pest management in cow pea was promising

5. Extension:

- 'Mango Fest' and 'Kissan Mela' is an annual regional fair organized by the institution for the promotion of cultivation of mango and other fruit crops in the State. During the year 2012 this fest was conducted as a one week programme comprising exhibitions, seminars, trainings, cultural programs etc.
- Established Agro clinic and Agro-Diagnostic team for the benefit of the farming community.
- Commercialization of microbial inoculants: The microbial inoculants namely *Trichoderma*, *Pseudomonas* have been successfully commercialized and are available to farmers.
- Cultivation methods for growing strains of edible mushrooms suited for cultivation under Kerala conditions like *Pleurotus*, *Volvariella*, *Calocybe* etc., have been standardized and the know how and spawn material are being distributed to the general public.
- Scientists of the college visit farmer's fields to tackle the problems on pest infestation of rice, vegetables, banana and coconut, pepper etc. and nematode problems of vegetable and banana and suggested scientific management through judicious use of pesticides.
- A project on women empowerment through organic cultivation of vegetables was implemented in collaboration with Kerala State Vanitha commission, Kudumbashree Mission Kasargod and Department of Agriculture.

IV.4 College of Forestry, Vellanikkara, Thrissur

1	Name of the college	:	College of Forestry
2	Address	:	College of Forestry, P.O.Kerala Agricultural University, Trichur - 680 656 Kerala
	Telephone	:	0487-2370050
	Fax	:	0487-2371040
	Email	:	adforestry@kau.in
3	Name and title of the College Head	:	Dr. B. Mohankumar, Associate Dean
4	Total students enrollment		Ph.D. : 15 PG : 30 UG : 120
5	No. of Departments	:	5
6	No. of faculty in each department		
	Department		Number of faculty positions
			Professors Assoc. Professors Asst. Professors
	1.Silviculture and Agroforestry		1 1 5
	2. Forest Management & Utilization		1 1 5
	3. Tree Physiology and Breeding		1 3 4
	4. Wood Science		1 1 3
	5. Wildlife Science		1 1 4
	6. AICRP		0 1 2
	Total		5 7 23
7	Disciplines offering P.G. programmes		
		Discipline	:
			5
		No. of faculty	:
			15
		Ph.D. students	:
			5
		M.Sc. students	:
			18
8	Total College budget		Rs. in lakhs
		Non-Plan	:
			164.67
		Plan	:
			76.92

Internal resources	:	0
ICAR	:	39.40
Other external sources	:	1.75
Total	:	282.74

9 Indicate percentage of budget spent on: Salary :

Research	:
Extension Education	:
Student services	:
Physical facility maintenance	:
Others (Farm, labour welfare etc.)	:

10 Infrastructure available

	Adequate	Less than adequate	Not adequate
i. Computer facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. Library facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii. Field Practical facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv. Teaching aid and media services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Sports facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vi. Hostel facilities			
	Men	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Women	<input type="checkbox"/>	<input checked="" type="checkbox"/>
vii. Other student services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Main accomplishments

Details of accomplishments made by College of Forestry in areas of Teaching, Research and Extension are detailed in the main report. Some of the salient features alone are summarized below:

Teaching :

The main strength of College of Forestry, Vellanikkara is its highly qualified faculty and good quality students. The students of the institution are having a very good academic background and are technically proficient in forestry. Students of the college have been exceptionally successful in entering into various fields of service related to forestry. Vast majority of the students are employed by the state forest department. There have been two alumni of the college who were awarded the best range officers of the Kerala Forest department. Twenty eight students of the college have joined Civil services. This includes an all India third rank in Civil service examination and First rank in IFS examination.

i.. Employment profile of forestry graduates

Position	Number	Percentage
Teaching / Research	16	4.47
IAS / IFS	28	7.82
Military / IB Officers	6	1.68
Range forest officers / ACFs IN KFD	78	21.79
Asst Managers / Managers in Plantations	17	4.75
Higher education	27	7.54
Employed abroad	36	10.06
Bank Offices	23	6.42
Business / others	51	14.25
TOTAL	282	78.78

Research:

Currently five externally aided research projects apart from KAU research projects are in operation. The scientists of the college have so far completed more than 30 externally aided research projects and over 60 KAU research projects. Apart from this about 150 research projects have also been guided at the under graduate level by the faculty.

Research projects of the college fall under the following broad areas:

- Silviculture of tree species
- Agroforestry studies such as agroforestry systems of Kerala, its diversity and potential to

reduce the pressure on existing natural forests etc.,

- Plantation Forestry research including fertilization, irrigation and thinning regime studies on the plantation forestry species,
- Seed Technology studies such as germination, storage of recalcitrant seeds etc.
- Biotechnology related topics including the *in vitro* propagation of economically important as well as endangered tree species of Western Ghats,
- Physiology and Eco physiology of trees and forests, tree genetics.
- Floristic richness and diversity, system dynamics,
- Man-forests interaction studies such as finding out the human utilisation on the natural forests of Western Ghats and how that affect the biodiversity, nursery techniques and management studies such as potting media, potting mixture, containers etc.
- Identification of the tree species from the wood samples, finding out the calorific values and anatomical peculiarities of several fast growing;
- Indigenous, multipurpose tree species that are seen in the home gardens of Kerala.
- Inventory, biology, management and documentation of the wildlife wealth of Western Ghats.

The scientists of College of Forestry have so far brought out more than 1000 scientific publications including books and chapters in book, research articles, popular articles, seminar/ conference papers, and technical reports.

VI.5 College of Co-operation, Banking and Management, Vellanikkara

1 Name of the college : **College of Co-operation, Banking and Management, Vellanikkara**

2 Address : College of Co-operation, Banking and Management
KAU P.O., Thrissur 680 656, Kerala

Telephone : 0487-2370367

Fax : 91 487 2370019
: 91 487 2372540

Email : adccbm@kau.in

3 Name and title of the College Head : Dr.A.Sukumaran, Associate Dean i/c

4 Total students enrollment

Ph.D.	0
M.Sc.+MBA	102
UG Programme	120

5 No. of Departments : 4

6 No. of faculty in each department (use separate sheet) : 1. Co-operative Management

Prof.	Assoc. Prof.	Asst. Prof.	Others
-	4	0	1

2. Development Economics

Prof.	Assoc. Prof.	Asst. Prof.	Others
1		0	2

3. Rural Banking Finance Management

Prof.	Assoc. Prof.	Asst. Prof.	Others
2	1	0	0

4. Rural Marketing Management

Prof.	Assoc. Prof.	Asst. Prof.	Others
1	3	0	0

7	Disciplines offering P.G. programmes	Discipline	: 3
		No. of faculty	: 17
		M.Sc. + MBA students	: 79
		Ph.D. students	: 0

8	Total College budget		Rs. in lakhs
	a Non-Plan	:	293.45
	b Plan	:	133.15
	c Internal resources	:	
	ICAR		35.86
	d Others	:	137.90
	(institutional Economic Fee)		11.54

9	Indicate percentage of budget spent on:	:	
	Salary	:	86
	Research	:	0.1
	Extension Education	:	1.6
	Student services	:	1.2
	Physical facility	:	2.5
	Maintenance	:	0.1
	Others	:	8.5

10	Infrastructure available	Adequate	Less than adequate	Not adequate
	i. Computer facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ii.	Library facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii.	Field Practical facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv.	Teaching aid and media services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
v.	Sports facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
vi.	Hostel facilities			
	Men	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Women	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
vii.	Other student services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

11. Main accomplishments

The College could accomplish high standards in teaching and learning which is reflected in the pattern of employment secured by the graduates. Around 50 percent of our graduates are working as Probationary Officers and Assistant Managers in various financial institutions, Insurance companies and Commercial Banks. Premier national level institutions like IDBI, Federal Bank, Axis Bank etc recruit our graduates and post graduates through campus interviews. Approximately a ten percent of the graduates are serving various co-operative institutions like Milk Marketing Societies, State Co-operative Banks, District Co-operative Banks, Primary Agricultural Credit Societies, Urban Banks and State and National level Co-operative Federations. The presence of our graduates at the Kerala State Milk Marketing Federation and its constituent Milk Producers Unions has certainly improved the quality of work in those institutions. Companies in Agricultural Marketing like Harrison Malayalam Ltd, Reliance Retail, Aditya Birla Big Bazar etc absorbed around 25 percent of our graduates and post graduates.

The presence of our graduates in National Federations on the one side and as Faculty in National management Institutions like Xavier Institute, IRMA and ICMs and as officers in Reserve Bank of India is a reflection of the quality of the graduates and post graduates.

Our students received Fellowships to undergo higher educations in national institutions like IIM, Ahemadabad, IRMA, Vikundh Mehta National Institute of Co-operative Management, Delhi School of Economics, JNU. A number of our students have cleared UGC NET/JRF and ICAR JRF examinations and many are undergoing Ph.D in Kerala University currently. Two of our graduate students attended International Conference on Student Co-

operatives organised by Asian Pacific Regional Committee of the International Co-operative alliance at Singapore and SreeLanka in 2007 and 2008 respectively. Miss Swetha Wilson who attended the meeting at Singapore was chosen as the Secretary of the Youth Steering Committee for participation in the next meeting. Our Faculty members also received distinctions through fellowships of ICSSR to undergo doctoral programmes.

Although findings of research of the institution do not lead to discovery of new technology, they have been very useful for streamlining and restructuring the activities of various support service institutions within the State. The findings of the study have been very useful for enhancing the organisational and managerial effectiveness of the support service institutions which indirectly benefitted the farming community through better services with greater cost effectiveness. Most of these studies were of evaluative and diagnostic in nature and were predominantly in the nature of impact of studies of various programmes and projects relating to agriculture and rural development.

The institution has made its mark in the University through the extension programmes. The various training programmes have been undertaken for the Co-operative sector, officers of the Gramin Banks, State Co-operative Bank and District Co-operative Banks which were useful in upgrading the skills of the trainees in areas such as Project planning and appraisal, funds management, asset liability management, portfolio management, financing of hitech agriculture and project approach to rural landing. The faculty members of the College have been invited by various outside agencies as resource persons in different areas. The faculties were deeply involved in all the training programmes that have been undertaken by the Kerala Institute of Local Administration, Dairy Development Departments, Rubber Board, SFAC etc. The faculty members have also served as members of national and state level committees and commissions like sub committees of Thirteenth Union Finance Commission, Forward Markets Commission, GOI. Task Force Members of State Planning Board, as Consultants State Finance Commissions of Kerala etc. The faculty also provided expertise in the preparation of 12th Plan of the State of Kerala.

The faculty and students have been involved in various community outreach programme of which most important one is the task of revitalisation and strengthening of the weak PACS in Trichur District, as part of Experiential Learning Programme, Village level surveys of various kinds as part of RAWE and NSS activities. The faculty and students visited different institutions and assisted the banks in preparing strategic plans for turnaround management.

They were also deeply involved in capacity building in the decentralised planning programmes in the state. The Faculty was associated as members of the task forces,

resource persons and members of the various committees, faculty for training programme etc.

The college organized a number of national level seminars/ workshops for the benefit of the students, faculty and farming community.

- **2006:** Silver Jubilee of CCBM. As part of it, the college organized three national seminars on the following themes:
 - National Seminar on 'Opportunities in Agribusiness'
 - National Seminar on 'Interventions in Agricultural Trade and Marketing.
 - National Seminar on 'Human Resource Development in Cooperatives: Vision 2020'.
- **2007:** HRD training for Middle, Senior level Executives & Non-academic staffs of KAU.
- **2009:** International Seminar on Students Co-operatives.
- **2010:** DHISHANA - 2010 National Management Meet.
- **2011:** All Kerala Business Plan contest organized jointly with Thrissur Management Association.
- **2011:** Foundation Day Celebrations. Two national seminars were organized.
 - National Seminar on Agri-Business Management for Inclusive Growth.
 - National Seminar on Co-operative Enterprises to Build a Better World.
- **2012:** Agri-Entrepreneurship Summit and Seminar on Enterprising Agriculture.
- **2012:** All India Business Plan contest for Hykon Young Entrepreneur Award organized jointly with Thrissur Management Association.
- **2012:** Workshop on Agro- Processing and Value Addition- Strategies and Action Plan for 12th Five Year

IV.6 Kelappaji College of Agricultural Engineering and Technology, Tavanur

1 Name of the college : **Kelappaji College of Agricultural Engineering and Technology, Tavanur**

2 Address : KCAET, Tavanur P.O. 679 573, Malappuram (Dt), Kerala

Telephone : 0494-2686214 and 2686009

Fax : 91-494-2686009

Email : kcaet@kau.in, deanengg@kau.in

3 Name and title of the College Head : Dr. M. Sivaswami, Dean

4 Total students enrollment

Ph.D.	9
PG	30
UG Programme	
B. Tech. (Ag. Engg.)	184
B. Tech. (Food Engg.)	60

5 No. of Departments : 5

6 No. of faculty in each department :
(use separate sheet)

	Prof.	Assoc. Prof.	Asst. Prof.	Others
1. Land & Water Resources & Conservation Engineering (LWRCE)	-	3	2	-
2. Irrigation & Drianage Engineering (IDE)	1	4	2	-
3. Post Harvest Technolooogy and Agricultural Processing (PHTAP)	1	2	2	-

4. Farm Power Machinery and Energy (FPME)	Prof.	Assoc. Prof.	Asst. Prof.	Others
	<input type="text" value="1"/>	<input type="text" value="4"/>	<input type="text" value="2"/>	<input type="text" value="-"/>
5. Supportive & Other Courses of Study(SAC)	Prof.	Assoc. Prof.	Asst. Prof.	Others
	<input type="text" value="-"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="-"/>
7 Disciplines offering P.G programmes:	Discipline			: 3
	No. of faculty			: 28
	Ph.D. students			: 1
	M.Tech. students			: 6
8 Total College budget				Rs. in lakhs
	a Non-Plan		:	615.42
	b Plan		:	131.65
	c Internal resources		:	
	ICAR			161.08
	d Others		:	9.50
	OEAP			186.80
9 Indicate percentage of budget spent on:	Administrative support		:	
	Faculty - Salary		:	506.15
	Research		:	3.85
	Extension Education		:	-
	Student services		:	0.15
	Physical facility maintenance		:	0.38
	Others		:	69.00
10 Infrastructure available	Adequate	Less than adequate		Not adequate
i. Computer facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
ii. Library facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>

iii.	Field Practical facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv.	Teaching aid and media services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v.	Sports facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vi.	Hostel facilities			
	Men	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Women	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
vii.	Other student services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Main accomplishments

Kelappaji College of Agricultural Engineering and Technology, Tavanur (KCAET) was started two decades ago. KCAET has justified its establishment in several ways. Firstly, it has produced adequate agricultural Engineering graduates for bridging the gap between demand and supply of Agricultural Engineering graduates in Kerala. Many of them are absorbed in the Agricultural and allied Departments. Besides, more than 60 postgraduate students have taken the M.Tech. (Agrl. Engg.) Degree from this Faculty since 1986.

The faculty has offered significant contributions to the agricultural sector of Kerala and to benefit the farming community. The members of the faculty are constantly in touch with the farming community to solve the problems associated with agriculture and allied fields. The services of the various faculty members are regularly made available to Govt., Cooperative, Public and private sector undertakings for solving their problems related to agriculture.

Some of the highlights of the research achievements of the faculty are listed below:

- Introduced efficient and economical rice transplanter first time in India
- Introduced walk behind paddy reapers in Kerala
- Introduced and evaluated mini tillers for different climatic zones of Kerala
- Popularized Combine harvesters in Kerala
- Developed technologies like:
 - An aerobic high rate reactor for energy production from Cassava Starch factory effluent
 - A solar cum biogas powered light trap

- A tractor operated helical blade tool
- A garden transplanting tool
- A power tiller operated bed former
- A Tender Coconut Punch
- A Soil Countersinking Attachment
- A Cashew nut Decorticator
- A Tender Coconut Splitter
- A 'Jab-type' Dibbling Mechanism
- A Black Pepper Thresher
- An Improved Fruit Pluckier
- A Papaya Plucker
- A cryogenic grinder for pepper
- A hand operated brush type ginger peeling machine
- A black pepper decorticator
- A power operated axial flow seed extractor
- A power operated ash gourd seed extractor
- A modified atmosphere storage technique for fruits using controlled ventilation system
- An alternate material for Rubber rolls in rice milling industries
- A multi fruit grader
- Fabricated inclined draper for separating cereals based on roundness
- Fabrication of a USG Applicator for rice fields
- Generated the technology of Design &Development of "MINI REAPER "widely used for Mowing lawn in many of the research stations under Kerala Agricultural University
- Tractor mounted 2.2 m paddy reaper was modified /demonstrated first time in South India, successfully.

List showing the courses offered, year of starting, colleges offering the courses and the total number of batches completed

Degree	College	Total No. of batches Completed
Undergraduate		
B.Sc. (Ag)	College of Agriculture, Vellayani 1. 1955-1971 (3 year course)	16
	2. 1972-2001 (4 year course)	35
	College of Horticulture, Vellanikkara 1977-2001 (4 year course)	30
	College of Agriculture, Padannakkad	14
B.Sc. (Hort)	College of Horticulture, Vellanikkara - 1972-1981	9
B.Sc. (Forestry)	College of Forestry, Vellanikkara 1986-2001 (4 year course)	21
B.Sc. (C&B) (From 1981 to 1986 it was attached to COH)	College of Co-operation, Banking and Management, Vellanikkara - 1981 (4 years)	19
B.Tech. (Ag. Engg)	KCAET, Tavanur - 1986	21
Post graduate		
M.Sc. (Ag)	College of Agriculture, Vellayani - 1962	48
	College of Horticulture, Vellanikkara - 1979	33
M.Sc. (Hort)	College of Agriculture, Vellayani - 1976	33
	College of Horticulture, Vellanikkara 1976	33
M.Sc. (FS&N)	College of Agriculture, Vellayani - 1984	26
	College of Horticulture, Vellanikkara - 1993	18
M.Sc. (Forestry)	College of Forestry, Vellanikkara - 1986	24
M.Sc. (C&B)	College of Co-operation, Banking and Management, Vellanikkara - 1986	25
M.Sc. (Ag. Engg)	KCAET, Tavanur - 1979-1985	17
M. Tech.	KCAET, Tavanur - 1986	24
Ph. D.		
Agriculture	College of Agriculture, Vellayani - 1956 & 1965	44
	College of Horticulture, Vellanikkara - 1979	31
Home Science	College of Agriculture, Vellayani - 1988	21
	College of Horticulture, Vellanikkara - 1998	10
Horticulture	College of Agriculture, Vellayani - 1979	29
	College of Horticulture, Vellanikkara - 1979	31
C&B	College of Co-operation, Banking and Management, Vellanikkara - 1995	3

Strength of Faculty, Administrative, Technical staff and labourers in constituent colleges and University (2011)

College/University	Faculty	Administrative staff	Technical staff	Permanent labourers	Ratio of teaching Vs non-teaching
Faculty of Agriculture					
College of Agriculture, Vellayani	124	100	19	40	1:1.3
College of Horticulture, Vellanikkara	105	51	13	38	1:1.5
College of Agriculture, Padannakkad	26	14	4	-	1:1.4
College of Forestry, Vellanikkara	15	7	3	4	1:1.1
College of Co-operation and Banking and Management, Vellanikkara	17	11	3	3	1:1
Faculty of Agricultural Engineering					
Kelappaji College of Agricultural Engineering and Technology, Tavanur	26	29	13	3	1:1.7
University					
Research Stations and Headquarters	207	541	50	553	1:5.5
Total	520	753	105	641	1:2.9

List of Endowments

- Dr. I.P. Sreedharan Nambiar Endowment
- PPIC Scholarship
- The Federal Bank Endowment Fund
- RKSD Jain Endowment prize in Fisheries (Addnl. Deposit)
- Trivandrum live stock improvement Association Award
- RVC Rolling trophy
- M.N. Parameswaran Memorial Endowment
- Late Abraham Thomas Endowment
- Lalitha Kaleeswaran Endowment
- Dr. K.N. Shyamasundaran Nair Memorial Endowment
- VIII Dairy Industry Conference Gold Medal
- Dr. T.P. Mohandas Memorial Endowment
- E.P. Madhavan Nair Memorial Endowment (Agri.)
- Dr. N. Kunjan Pillai Memorial Endowment
- Dr N. Kunjan Pillai Memorial Endowment (Fisheries Branch)
- ASPEE Gold medal
- Dr. Kaleeswaran Memorial Endowment
- Pandalam P.R. Madhavan Pillai Memorial Endowment (Corpus Deposit)
- Kerala Vety. College Alumni Association prize
- Kerala Vety. College Alumni Association prize
- Dr. Renji P. George Memorial Endowment
- Fish processing best student award
- Kerala Vety. College Alumni Association prize (Addl. Deposit)
- Dr. Renji P. George Memorial Endowment (Addl. Deposit)
- KAU Award for Tribal Farmer Trainees
- RKSD Jain Endowment prize in Fisheries
- Chinnamma Thomas Memorial Endowment
- Mrs. Devaki Nair Endowment
- Sardar Patel Award
- Dr. Lalitha Prema Award
- Kerala Sate Co-operation Diamond Jubilee Endowment (Permanent Deposit)
- Dr. N.P. Kumari Sushama Memorial Award

THE END