

A Perspective Plan

VISION – 2020 and BEYOND....



UNIVERSITY OF HORTICULTURAL SCIENCES, BAGALKOT

Karnataka, India - 587102



Master Plan UHS Campus, Bagalkot

VISION – 2020 AND BEYOND....

A PERSPECTIVE PLAN



**UNIVERSITY OF HORTICULTURAL SCIENCES,
BAGALKOT**

Karnataka, INDIA - 587 102

2010



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FOREWORD

It gives me an immense pleasure to write foreword to this 'Vision 2020 and beyond.....' document which has been prepared after a long time to provide a road map for the orderly and systematic growth of the horticulture industry in general and the University of Horticultural Sciences in particular. This vision document which has been prepared over a period of last six months by getting views of Farmers, Extension Officers, Entrepreneurs, Scientists and also the opinion of several others involved in the production chain of various horticultural crops.

I sincerely hope this document would serve as a guideline and also provides directions for future development of the horticulture industry. I thank Vice Chancellor and all Scientists of University of Horticultural Sciences, Bagalkot for taking keen interest in developing this document. I sincerely hope that the perspectives enumerated in the document are keenly implemented with facilitation from State, Central Government, ICAR and other agencies.

Finally, I place this as a guideline reference for all horticulture functionaries whose suggestions and comments shall be incorporated in the next improved version.

Sd/-

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DR. S. B. DANDIN
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PREFACE

Horticulture has attained the status of major industry in India, because, it offers three major securities viz., Health Security, Income Security and Employment Security. Though, it is a component of agriculture, it contributes immensely to the GDP of the country. Horticulture has become a major livelihood of the Indian peasant population because of its versatility to suit to various places, conditions, soil types and also the socio-economic situations, besides providing income throughout the year. Horticulture crops are more suitable for cultivation under humid weather, high rain fall areas including dry land conditions. They are also good candidates for marginal and waste land utilization.

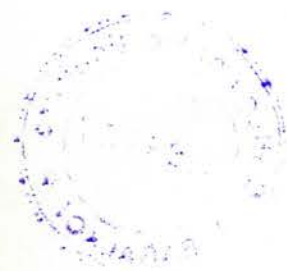
Karnataka is a pioneer state in cultivation of horticultural crops. It is the first state to establish full-fledged State Department of Horticulture and 3rd state to commence an exclusive University for Horticultural Sciences signifying the importance of Horticulture. The Horticulture growth and productivity of Karnataka is above the national average. However, several inherent and new problems are encountered while cultivating different horticultural crops which need to be addressed scientifically and also systematically. Similarly, several technologies have been developed on various aspects like Crop improvement, INM, IPDM, besides introducing new crops and varieties. Moreover, because of the growing consciousness about the quality among the consumers for various products in general and for food products in particular, both nationally and internationally. The recent concept on export, demands premier quality products, with low or no residual toxicity. This is a main challenge for Indian horticultural farming to become competent globally. The post harvest losses are also high and just stopping of spoilage itself can become a boon to the country.

Human resources development is yet another area to be pursued for the production of quality graduates, both post graduates and skilled man power to work at grass root level to the highest level of policy making. Further, the recent technologies and accumulated know how has to be transmitted to the stake holders through a strong extension system. Keeping these facts in view, this document has been developed to guide the growth and development of horticulture activities in the state. We hope the information presented would serve as guide lines for the policy makers and other horticultural concerns for better understanding of the subject and make judicious decisions for the furthering of horticulture industry.

Sd/-
DR. S. B. DANDIN
VICE CHANCELLOR

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I. PREAMBLE

Horticulture has become the main stream activity occupying main stay of the country. Since it provides three major securities, namely, Health Security, Employment Security and Income Security, more and more farmers being attracted to start horticulture activities in the recent past. With meagre 20 per cent of the area in horticulture, it contributes more than 35 per cent to the national GDP of combined agriculture and supports the much needed foreign exchange earnings. Considering this fact large number of programmes for the promotion of horticulture in the country have been initiated both by ICAR and State Agriculture Universities across the country.

Horticulture Scenario in India

Total geographical area of the country is 3.3 million sq km with a total coastal line of 7516.6 km. The total gross cropped area is 193.7 million ha. The total area of horticulture crops in India is 200.87 lakh ha comprising vegetables (38%), fruits (29%), plantation crops (16%), spices (13%), medicinal and aromatic crops (2%), flowers (1%) and almond and walnut (1%). The total production is 2070.12 lakh tones having vegetables (61%), fruits (31%), plantation crops (5.82%), spices (1.98%), flowers (0.42%), medicinal and aromatic plants (0.16%) and, almond and walnut (0.09%). The data indicates that the trend in the production of horticulture crops is increasing every year, correspondingly the export is also increased.

Horticulture Scenario in Karnataka

Karnataka is the fore - runner in the cultivation and production of horticulture crops in India. It has 10 vivid agro climatic regions, congenial for cultivation of almost all types of valuable horticulture crops. The total Geographical Area of Karnataka is 190.5 lakh ha, out of which 121.86 lakh ha (63.97%) is cultivable. Karnataka, blessed with varied agro climate, topography and soil conditions, offers immense scope for cultivation of many horticultural crops. Horticulture which proved to be an economically viable enterprise with good employment opportunity. It is the best option both for irrigated areas and also for dry land farming situations. With meagre 14 per cent of land under Horticulture crops, contributes to 40 per cent of the combined agricultural sector income and 17 per cent to GDP of the State. This shows the tremendous potentiality of horticulture in enhancing the income levels of the farmers and in turn the state economy.

The horticulture cropped area is 17.64 lakh ha (14.47 %), comprising 7.63 lakh ha plantation crops (43.25%), 4.27 lakh ha (24.21 %) vegetables, 2.99 lakh ha (16.95%) fruits, 2.46 lakh ha (13.95%) spices and 0.27 lakh ha (1.53 %) commercial flowers as well as medicinal and aromatic plants.

The details of cultivation area, production and productivity *etc.*, for important horticultural crops are given in Table-1 and Table-2



Table 1: Area under Horticulture Crops

	Area(ha)	Production (t)	Major areas of production (Districts) *
A) Fruits			
Mango	134567	1223258	Kolar, Ramnagar, Tumkur, Chikkaballapur, Dharwad, Gadag, Haveri, Bagalkot
Banana	70472	1793284	Tumkur, Chitradurga, Koppal, Bagalkot, Chamarajanagar, Chikkamagalur (Throughout Karnataka)
Sapota	26199	283590	Kolar, Chikkaballapur, Belgaum, Bellary, Bagalkot, Dharwad
Grapes	14310	258814	Bijapur, Chikkaballapur, Bangalore (R), Bagalkot
Pomegranate	13858	134109	Koppal, Bagalkot, Bijapur, Bellary, Chitradurga
Acid lime	8159	192108	Bijapur, Bagalkot, Gulbarga, Chikkamagalur
Guava	6871	134783	Chikkaballapur, Bangalore(U), Bangalore (R), Dharwad, Gadag
Papaya	5214	389540	Bellary, Chitradurga, Koppal, Mandya
B) Flowers			
Marigold	6859	64179	Chamarajanagar, Mandya, Haveri
Chrysanthemum	4810	58648	Tumkur, Belgaum, Davanagere, Gadag
Jasmine	4587	30758	Bellary, Ramanagar, Chitradurga, Haveri
Crossandra	2214	11274	Chikkaballapur, Chitradurga, Haveri
Rose (No. in lakhs)	2013	4266	Kolar, Chikkaballapur, Ramanagar
Tuberose (No. in lakhs)	1138	7494	Chitradurga, Mysore, Chikkaballapur
Gladiolous (No. in lakhs)	251	528	Chikkaballapur, Kolar, Bangalore
C) Vegetables			
Onion	157270	2887392	Dharwad, Gadag, Chitradurga, Bijapur, Bagalkot
Potato	67891	572442	Hassan, Kolar, Belgaum, Dharwad
Tomato	50857	1498842	Kolar, Chikkaballapur, Bangalore(R), Bagalkot
Green chilies	37834	554081	Belgaum, Haveri, Raichur, Chitradurga
Brinjal	14870	362043	Belgaum, Kolar, Hassan
Cole crops	14649	287457	Kolar, Belgaum, Bidar
Beans	9645	102840	Ramnagar, Chikkaballapur, Mandya
Ladies finger	7687	60608	Haveri, Belgaum, Bijapur
D) Plantation Crops and Spices			
Coconut (lakh nuts)	460201	94602	Tumkur, Hassan, Dharwad, Gadag, Chitradurga, D. Kannada, Udupi
Arecanut	205223	312944	Chikkamagalur, Shimoga, D. Kannada, U.Kannada, Davanagere
Cashew	70056	115218	D. Kannada, Udupi, Chikmagalur, Chikkaballapur, U. Kannada, Kolar
Cardamom	22018	1828	Coorg, Hassan, Chikkamagalur, U.Kannada
Ginger	19010	182706	Hassan, Shimoga, Coorg
Pepper	17612	5526	Coorg, Chikkamagalur, Hassan, U. Kannada
Turmeric	13819	93945	Chamarajanagar, Mysore, Bagalkot, Belgaum
Coriander	7497	8868	Bellary, Bijapur, Dharwad
Medicinal plants	1986	3175	Bellary, Gadag, Koppal, D. Kannada
Aromatic plants	1683	18562	Kolar, Gadag, Udupi, Bangalore (R)



Table 2: Productivity of Horticultural Crops

Crops	2006-07	2007-08	2008-09 (Estimated) (t/ha)	National Average (t/ha)
Fruit Crops	17.04	16.67	16.73	11.00 (13.09)
Vegetable Crops	17.03	17.22	17.23	16.10 (23.45)
Spice crops	02.47	02.54	02.52	01.60
Garden / Plantation crops	00.61	00.61	00.62	03.70
Commercial Flowers	08.35	07.82	07.85	05.40
Medicinal Plants	02.00	02.48	03.00	00.80
Aromatic Plants	08.00	08.53	10.00	
Productivity in tons/ha (Figures in parenthesis indicate global average)				
Source- NHB (2009)				

Source- NHB (2009)



II. UNIVERSITY OF HORTICULTURAL SCIENCES SCENARIO

Karnataka being a leader in the production of flowers (2nd), Cut flowers (2nd), Plantation crops (3rd), Spices (4th), Fruits (5th) and Vegetables (8th) richly deserves the establishment of Horticulture University to increase and sustain productivity, and commercialisation of horticulture in the State.

Realising the importance and foresightedness the State Government of Karnataka has approved the establishment of the University of Horticultural Sciences (UHS) at Bagalkot through a Special Ordinance No. 2 of 2008 dated: 22-11-2008. The University was formed at Bagalkot as the head quarters in northern Karnataka considering the rich horticultural production base of grapes, pomegranate, sapota, fig, lime, ber, varieties of vegetables, spices, medicinal and aromatic plants, which is supported by congenial agro climatic conditions for horticulture crops prevailing in the area. The other reason being the location of historical places like Badami (cave temples and capital of Chalukya Kingdom), Pattadakallu, Aihole (the places known for temples of stone sculptures), Kudalasangama a centre of religious preaching and teaching and the mighty Alamatti Dam as a back bone for agriculture are situated within the radius of 50 km from Bagalkot town.

The newly formed University of Horticultural Sciences inherited four teaching campuses (Arabhavi, Mudigere, Bidar and Bagalkot) and 10 Research Stations from the erst while University of Agricultural Sciences, Bangalore and University of Agricultural Sciences, Dharwad. The University has its jurisdiction all over the 30 districts of the State and caters to the needs of the farming community spread over entire State. All 10 agro-climatic zones of Karnataka fall in the jurisdiction of the University. Greater diversity exists in soil types, climate, topography, cropping and farming situations. It includes dry land area to heavy rain fall area and irrigated area including coastal regions.

VISION

Attaining new heights in horticulture education, research and extension, shaping into a premier university for creation of horticultural wealth ensuring food and nutrition security.

THE MISSION

- Enhancing the growth of horticulture sector by providing quality man power to undertake teaching, research and extension services



- Assimilation of emerging paradigm concepts and technology developments
- Administering end to end approaches for production, processing, value addition and marketing
- Accomplish the tasks involving compatible stake holders on Public Private Participation mode.

THE MANDATE

The University has a threefold mandates namely

- To impart quality education in all branches of Horticulture and allied sciences.
- To conduct applied, strategic and basic research, in all branches of horticulture and related disciplines.
- To facilitate transfer of technology to the farming community through extension system and outreach.

2.1.1 Objectives

- To make provision for imparting education towards development of quality human resource in different branches of study
- To further the advancement of learning including distance education and conducting of research, particularly in horticulture and other allied sciences
- To undertake the extension education of such science and technologies, specially for the rural people of the State
- To promote partnership and linkages with national and international educational, Industries, research institutes of Semi Government / Government / Private and others
- Such other objects as the State Government may by notification in the official Gazette specify from time to time.

Dr. S. B. Dandin took charge as Special Officer on 12.12.2008 and subsequently appointed as the first Vice-Chancellor of UHS, Bagalkot from 20-04-2010.

After the formation of the university 4 more colleges and 5 Research Stations have been established in different agro climatic regions by getting the land transferred from State Horticulture Department.

The University of Horticultural Sciences offers B. Sc. (Horticulture) and PG programmes leading to M.Sc. (Horticulture) in various disciplines and Ph.D. in Horticulture.



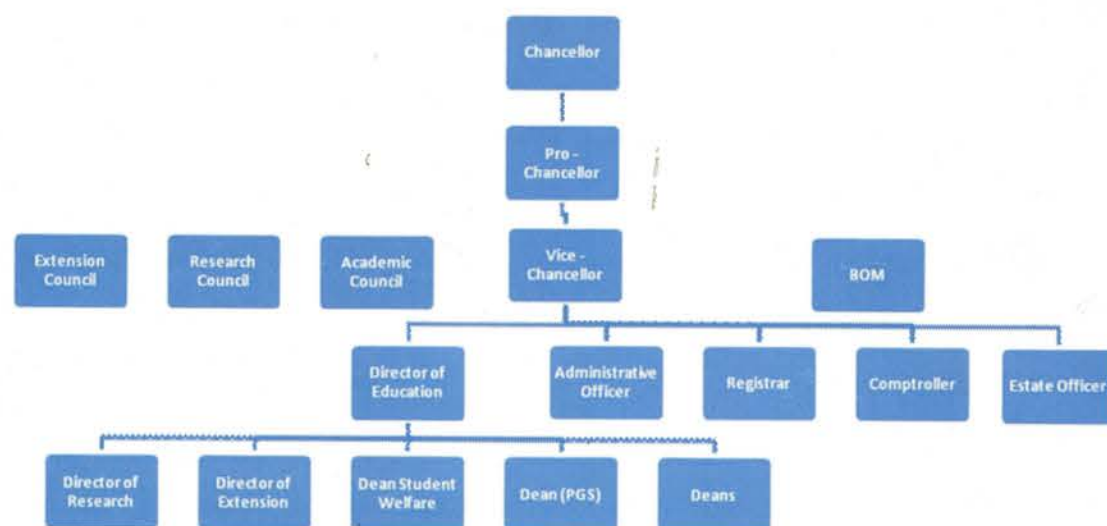
2.1.2 University Administration

The Vice-Chancellor supported by other officers namely Director of Education, Registrar, Comptroller, Director of Research, Director of Extension, Dean PG Studies, Director of Students Welfare, Deans of Colleges, Librarian, Administrative Officer, Estate Officer, teachers and other non teaching staff.



Administrative Building

2.1.3 Organisational Setup



2.1.4 MANPOWER

The University of Horticultural Sciences has limited human resources for Education, Research and Extension. Sufficient numbers of posts need to be created in all the faculties.

The University has been sanctioned six posts of Deans, 14 posts of Professors, 57 Associate Professors, 230 Assistant Professors, 11 Technical/Research Associate totalling to 318 technical positions and 580 Service personnel. Of the 900 total posts sanctioned 388 are filled and remaining 512 are yet to be filled.

2.1.5 BUDGET

The University has far long depended heavily on the funding by State Government which is a traditional and major source of funding. The flow of grants from the sources have to be ensured for the sustained development of the university. In addition, there is a need to explore the non-conventional sources of funding by encouraging the faculty to write winning research projects for funding from agencies like ICAR, DBT, DST, CSIR, APEDA, Ministry of Food Processing, NMPB, KAMPA, NABARD, NHB, State Departments



and other agencies like Department of Agriculture Marketing and Cooperation, etc. The institutions in the region like DCC banks, APMCs, Sugar factories and other public institutions will be persuaded to earmark funds for the University.

2.2 EDUCATION

Development of the trained manpower is one of the three main mandates of the University. The university is established to meet the manpower requirement of Horticulture industry of the State in particular and the other needy States in general.

2.2.1 ACADEMIC PROGRAMMES

The academic programmes of the University comprise of both Under Graduate and Post Graduate Degree Programmes as well as Diploma and Certificate courses to meet the human resource needs of technology, development service, teaching, extension and marketing sectors of Horticulture. The academic programme at UHSB is characterized by its unique emphasis on extending the education opportunities to students in the state and its efforts in curriculum development to bring in the much needed dynamism in horticultural education. The academic programme also lays emphasis on ensuring acquisition of specialized skills by students through hands-on- training and learning by doing through experiential learning.

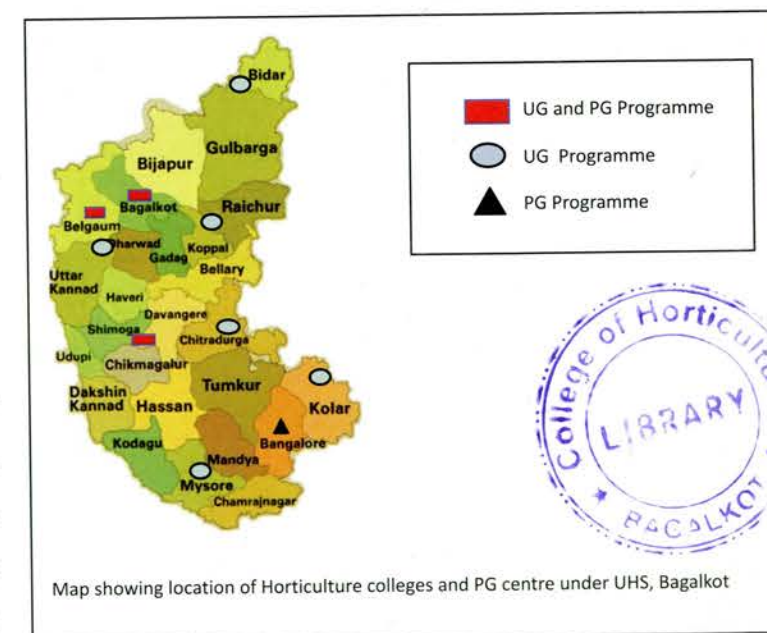
The University offers undergraduate and postgraduate programmes [(M.Sc (Hort). and Ph.D.)] as well as Diploma and Certificate courses. The semester system with 10 point scale of evaluation is followed.

2.2.1.1 GRADUATE PROGRAMME

Admission to various undergraduate programmes is given on merit basis. In addition, 15 per cent of the seats are reserved for the other States students allotted by ICAR through All India Entrance Examination.

Admission for Degree programmes begins in the month of May/June every year and the classes begin in the month of July-Aug in all the Horticultural Colleges.

There is a provision for admission of Foreign Nationals/Non Resident Indians/Children of NRI irrespective of the place of previous education under the special quota. Foreign Nationals should send their application to the Secretary, Department of Agricultural Research and Education, Krishi Bhavan, New Delhi, 110 001 with a copy to the Registrar, UHS, Navanagar, Bagalkot – 587 102.





Annual intake of different Horticultural Colleges

Sl. No	Colleges	Year of commencement	Annual intake	ICAR Quota (15%)	Total intake	Total students upto 2010-11
01	KRC, College of Horticulture, Arabhavi (Belgaum)	1994-95	48	07	55	229
02	College of Horticulture, Mudigere (Chikkamagalur)	1991-92	46	07	53	188
03	College of Horticulture, Bagalkot	2007-08	42	08	48	105
04	College of Horticulture, Bidar	2006-07	42	08	48	122
05	College of Horticulture, Kolar	2009-10	40	05	46	72
06	College of Horticulture, Mysore	2010-11	31	05	31	31
07	College of Horticulture, Hiriyur (Chitradurga)	2010-11	35	05	33	33
08	College of Horticulture, Koppal	2010-11	29	05	27	27
09	College of Horticulture, Sirsi (Uttara Kannada)	2010-11	35	05	32	32
	Total		348	55	373	849

2.2.1.2 POST GRADUATE DEGREE PROGRAMMES

Post-Graduate Programmes are aimed at training manpower for leadership in teaching, research and meeting the needs of managerial professionals in horticulture and allied sectors. The courses are designed to keep pace with the modern developments in Science and Technology and to meet the demands for experts in critical areas of horticulture and allied sciences.

The University currently offers Ph.D. Horticulture Programme and Masters degrees in 8 disciplines at College of Horticulture, Arabhavi. At GKVK Campus, Bangalore offers M.Sc (Hort) programme in 5 disciplines and Ph.D. in Horticulture from the academic year 2010-11. Similarly College of Horticulture, Mudigere has started PG Programme in four disciplines and College of Horticulture, Bagalkot is offering Master degree in one discipline from academic year 2010-11.

POST GRADUATE DEGREE PROGRAMMES						
Sl. No	Disciplines	Name of the Campus and Annual intake (No.)				Total
		KRCCH, Arabhavi	PG Centre, Bangalore	COH, Mudigere	COH, Bagalkot	
1	Floriculture and Land Scape Architecture	4	4	4	--	12
2	Plantation, Spices, Medicinal and Aromatic Crops	4	4	4	--	12
3	Vegetable Science	4	4	--	4	12
4	Fruit Science	4	4	--	--	08
5	Post Harvest Technology	4	4	--	--	08
6	Crop Improvement and Biotechnology	4	--	--	--	04
7	Horticulture Pathology	4	--	--	--	04
8	Horticulture Entomology	--	--	4	--	04
						64*
Ph.D. (Horticulture)						
1	Horticulture	5	5	--	--	10
						10

* Excluding ICAR quota

2.2.2 The profile of the existing colleges

The University has total 9 colleges and one exclusive PG centre spread over among major horticulture districts of the state. The brief profile of these colleges is as under



2.2.2.1 Kittur Rani Chennamma College of Horticulture, Arabhavi

The College was established at Arabhavi during 1994 as per the State Govt. Order KHD/172/UAS/92, dated 6.7.1994. The College was inaugurated on 11.09.1995 by the then Hon'ble Chief Minister of Karnataka, Shri M. Veerappa Mioly. This College has been transferred to this University in 2009 from UAS (D).

The College has good instructional and research facilities in 50 hectares of land with canal irrigation for eight months. During the rest of the period irrigation is met through open and bore wells.



The College during 1994-95 started with an admission strength of 26 students gradually increased to the present strength 60 students.

The college, has been accredited by the ICAR.. This College trains the manpower to take the responsibility of development of Horticulture in Northern Karnataka. The vast irrigation potential and varied agro-climatic situations provide ample scope for the development of horticulture in this region. At present, the college has seven major departments viz., Fruit Science, Vegetable Science, Floriculture, Spices and Plantation Crops, Medicinal and Aromatic Plants, Post Harvest Technology, and Plant Propagation and Biotechnology. The college is also supported by the Departments of Agricultural Sciences and Basic Sciences and Humanities. The college also offers Masters degree programmes in Floriculture, Fruit Science, Vegetable Science, Spices and Plantation Crops and Post Harvest Technology since 1998-99 and Crop Improvement and Bio technology, and Horticultural Pathology from 2010-11.

At present the students strength of the college is 299 comprising of UG, 28 M.Sc. and 5 Ph.D. The students of the College have excelled in the national level competitive examination securing a number of Junior Research Fellowships reflecting the quality of education imparted. The students have also performed well at the University and at the State level competitions in sports and cultural activities.

2.2.2.2 College of Horticulture, Mudigere

The College of Horticulture at Mudigere was established in the year 1991 under the jurisdiction of University of Agricultural Sciences, Bangalore and was transferred to University of Horticultural Sciences, Bagalkot during 2009. It is also accredited by ICAR.



The College has 32 ha area with good field instructional and research facilities for UG teaching. College was number one in inter collegiate sports and students were the Champions of Youth Festival in 2009-10. The College has good library with 11000 books and 23 journals, has model class rooms and laboratory with advanced equipments.

The annual intake of students is 55 besides 7 ICAR NET students. As on today (2010-11), the total number of students on roll is 296. The college so far produced 546 graduates of which 416 boys and 130 girls.

2.2.2.3 College of Horticulture, Bagalkot

The College of Horticulture, Bagalkot has been established in 2008 by the University of Agricultural Sciences, Dharwad and later it has been transferred to UHSB, during 2009-10

The College has an area of 109 hectares. The annual intake of students has been 42 besides 5 students from ICAR NET stream. The present total strength of students is 122.

2.2.2.4 College of Horticulture, Bidar

This College was established by University of Agricultural Sciences, Dharwad during 2007-08 and now transferred to UHSB. It has an area of 13 hectares. The annual intake of students is 42 in addition to 8 students of ICAR NET stream totalling to 50 students. The total strength of college is 122.



College of Horticulture, Mudigere



College of Horticulture, Bagalkot



College of Horticulture, Bidar



2.2.2.5 College of Horticulture, Kolar

The College of Horticulture at Tamaka, Kolar started in the year 2009 after the formation of University of Horticultural Sciences, Bagalkot.

The College has 16.2 ha with a satellite instructional farm in an area of 60.7 ha. at Hogalagere.

The annual intake of UG students is 40, in addition to 5 from ICAR NET stream totalling to 45 students. Presently 72 students are on roll.

2.2.2.6 College of Horticulture, Mysore

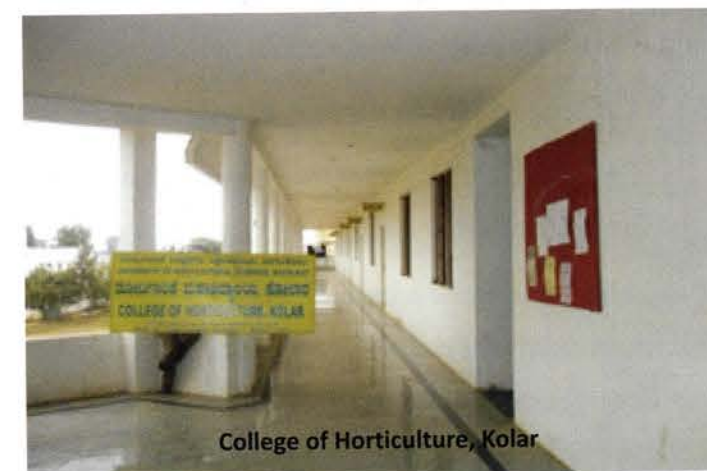
The College of Horticulture, Mysore was established during the year 2010. The college temporarily has been located at State Sericulture Farm, Tandavapura which is about 17 km away from Mysore city on Mysore – Nanjanagudu road. The sanctioned strength of the students annual intake is 30 besides ICAR nominees through NET. The academic programme started in the year 2010 with the intake of 31 students. The college has been given 9 acres of land and few existing buildings at Tandavapur farm. In addition to this, State Department of Horticulture has handed over 50 acres of land for establishment of Horticulture College at Yalechanahalli which is in the suburb of Mysore city.

2.2.2.7 College of Horticulture, Sirsi

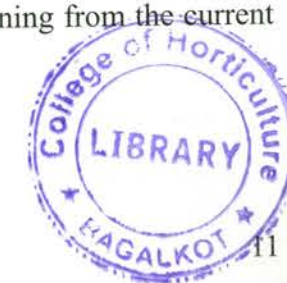
The College of Horticulture, Sirsi was started functioning from the academic year 2010-11. This college is also located at State Sericulture Farm on Banavasi road, which is about 5 km from Sirsi town. The Department of Sericulture has handed over temporarily 20 acres of land along with 5 buildings to start the college. The Horticultural Research Station of this University is also located 6 km. away from this college and college students will utilize the Research Station facilities for experimental and demonstration plots. Intake of students capacity of this college for I B.Sc. (Hort) under-graduate degree programme is 30 including ICAR quota. The Special Officer alongwith the teaching staff members have been posted and college is functioning from the academic year 2010-11.

2.2.2.8 College of Horticulture, Hiriyur

The College of Horticulture, Hiriyur was established as per the Government order No. ತೋಇ 155 ತೋಇವಿ 2010, ಬೆಂಗಳೂರು, ದಿನಾಂಕ: 02.06.2010 in the year 2010. This college has started functioning from the current



College of Horticulture, Kolar





academic year 2010-11. The Vanivilasa Co-operative Sugar Factory Limited, Hiriya has temporarily provided about 10 acres of land alongwith administrative building. The Regional Horticultural Research Station known as Babbur Farm is utilized for the students practical sessions and hands on training programmes. The intake students capacity of this college for I B.Sc. (Hort) under-graduate degree programme for the academic year 2010-11 is 30 including ICAR quota.

2.2.2.9 College of Horticulture, Munirabad (Koppal)

The College of Horticulture, Munirabad was started functioning from the academic year 2010-11 as per the Government order No. ತೋಇ 155 ತೋಇವಿ 2010, ಬೆಂಗಳೂರು, ದಿನಾಂಕ: 02.06.2010. This college has located at Tungabhadra dam site area which is 30 km. away from the Koppal and just 10 km. from Hospet. The Department of Animal Husbandry and Veterinary Services has given 17 acres of land at Munirabad dam site area. The buildings belongs to Horticultural Training Centre have also been provided to run the college. The Special Officer and teaching staffs have been posted to college and college is started functioning with intake capacity of 30 students including ICAR quota from the current academic year 2010-11.

2.3 LIBRARY AND INFORMATION SERVICES

The University has nine colleges. Based on the policy of 'one campus, one library', all the nine teaching campuses have a library facility including the University library at the main campus. Similarly, all the research stations are also having need based library facilities.

The University library system is headed by the University librarian who is assisted by other staff. These libraries extend all the necessary services like Xeroxing, Internet, Homelending *etc.*, to the students.

2.4 STUDENTS WELFARE

The Directorate of Students Welfare is responsible for the extracurricular activities of the students viz., sports, cultural, literary, NCC, NSS, *etc.* The Directorate is also responsible for other students amenities like hostels, dispensaries, cafeteria, *etc.* The Directorate is headed by the Dean (Students Welfare) who is assisted by physical education teachers, staff advisors, wardens and other staff.

Physical Education, NCC and NSS

Physical Education, NSS and NCC are the regular extracurricular programmes for the students of first year of undergraduate degree programmes. The students are compulsorily register either physical education or NCC course during their first year of study.

National Service Scheme (NSS) programme is being organised at all the teaching campuses as a non load course for UG students. The programme is monitored by co-ordinators and programme officers.

2.5 RESEARCH

Karnataka is bestowed with varied agro climatic conditions congenial for cultivation of fruit crops, vegetables, plantation crops, spices and condiments, medicinal and aromatic plants. Area under fruit crops is



increasing both under irrigation and rainfed situations. Food crops are being replaced partly with fruit crops, medicinal and aromatic crops by some farmers due to higher income realised. Area under pomegranate, guava, citrus, mango, custard apple is increasing. Export of fruits, medicinal and aromatic plants is increasing. As a result, quality produce needs to be given prime importance. Greater interest has been seen in many farmers towards cultivation of horticultural crops due to high returns realised from these crops. At the same time problems are also increasing. Bacterial blight in pomegranate is a very serious problem being faced by farmers. Some farmers have even uprooted the plants because of its severity and have incurred heavy losses. Similarly, in other crops also many problems including marketing and price fluctuations are being faced by farmers. The problems of post harvest processing need to be addressed on priority. It is the new university that has to address these challenges and come out with answers to these and many problems being faced by the farmers and should support the farmers in many aspects. It has to have many need based programmes for all the 10 zones of Karnataka to tackle these problems. University has to develop short term, long term and medium term strategies for years to come. In this direction, University has developed this document comprising of the important problems both general and crop specific with sharp focus on three major aspects namely, productivity, quality and cost of production.

Similarly manpower availability is coming in way of expansion of area. Mechanisation alone can address this issue to some extent. Hence, need for horticulture engineering is another thrust area.

Post harvest loss is reported to be 20-30 per cent depending on crop and region. So for the attempts made are either sporadic or incomplete. This aspect needs again a serious consideration and evolve new pre harvest treatment, processing, preservation and value added sciences.

Similarly the threat of climate change and ways and means to mitigate the ill effects of this global phenomenon appears to be imperative. Research towards this also needs sharp focus. Based on the crop specific problems and also to address the challenges of future following research priorities have been drawn.

2.5.1 Organisational Setup of Directorate of Research

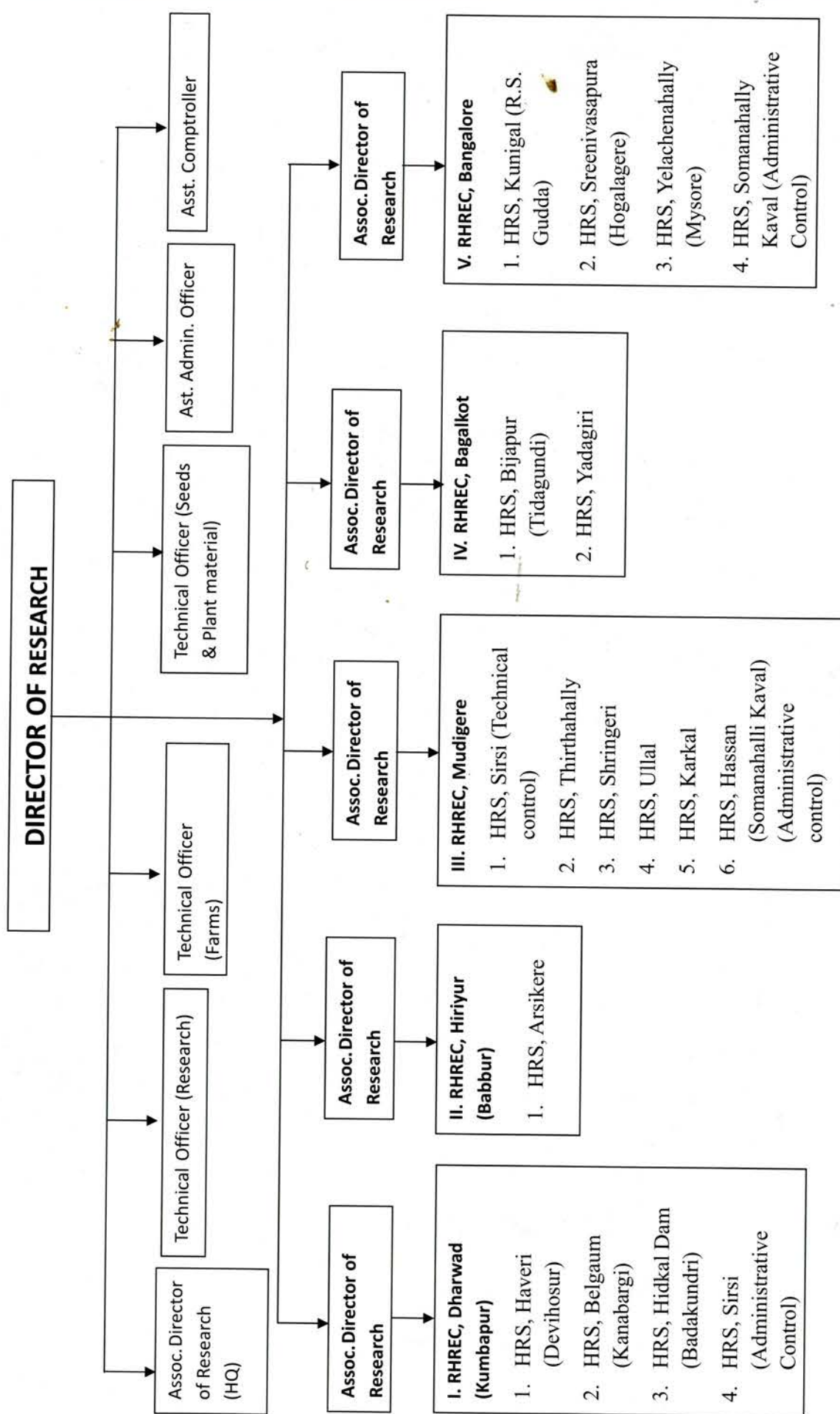
The Directorate of Research is headed by Director of Research at the University and Associate Directors of Research at Zonal Horticulture Research and Extension Centres.

A large number of Horticultural crops are grown in almost all taluks of 30 Districts of the State. Most of these crops are grown over a sizable extent of land. Location specific, need based and farmers centric research



- I. RHREC, Bagalkot
 1. North-Eastern Transitional zone
 2. North-Eastern Dry zone
- II. RHREC, Dharwad
 1. Northern Dry Zone
 2. Northern Transitional Zone
- III. RHREC, Hiriya
 1. Central Dry Zone
- IV. RHREC, Bangalore
 1. Eastern Dry Zone
 2. Southern Dry Zone
 3. Southern Transitional Zone
- V. RHREC, Mudigere
 1. Hilly Zone
 2. Coastal Zone

Agro-Climatic Zones and Regions of Karnataka

**DIRECTORATE OF RESEARCH**

is a continues process to address the problems hindering productivity of crops. Therefore, to conduct research on the commercially important horticultural crops of the State. Thirteen crop based research centres and 10 AICRP's of ICAR have been transferred to the University of Horticultural Sciences, Bagalkot which were earlier functioning under UAS, Bangalore and Dharwad. Two have been freshly started. In addition, it is proposed to establish five more research stations. Two more AICRP centres namely onion and garlic have been sanctioned by the ICAR. All the research stations organise research and extension programmes needed for the regions /zone exclusively on horticultural crops unlike when they were with the Agricultural Universities.

Mandate Crops at Different Horticultural Research Stations

Horticultural Research Stations	Year of establishment	Mandate Crops
Region – I RHREC, Bagalkot	2009	Pomegranate, Sapota, Flowers, Medicinal and Aromatic crops
1. HRS, Bijapur (Tidagundi)	2002	Grapes, Pomegranate, Orange, Fig
2. HRS, Yadagiri *	2010	Tropical arid fruits
Region – II RHREC, Dharwad	1994	Mango, Guava, Sapota, Potato
1. HRS, Haveri (Devihosur)	2000	Chilli, Garlic, Vegetables and Annual Spices
2. HRS, Belgaum (Kanabargi)	1986	Flowers and Vegetables
3. HRS, Hidakal Dam, Belgaum Dist	2009	Minor fruits and Mango
Region – III RHREC, Hiriyur	1916	Coconut, Sapota, Orange, Onion, Fig, Pomegranate
1. HRS, Arsikere	1958	Coconut
Region – IV RHREC, Bangalore	2009	High-tech Horticultural crops, Flowers and Medicinal plants
1. HRS, Srinivasapura (Hogalagere)	2009	Cashew, Mango, Arid zone fruits and Vegetables
2. HRS, Hassan (Somanahally Kaval)*	2010	Potato, Sapota, Mango
3. HRS, Kunigal, Tumkur Dist*	2010	Vegetables, Flowers, Hi-tech Horticulture
4. HRS, Yalachenahally,* Mysore Dist	2010	Vegetables, Flowers
Region – V RHREC, Mudigere	1957	Cardamom, Pepper, Cashew, Rubber, Vanilla
1. HRS, Sirsi	1965	Arecanut, Pepper, Cardamom, Pineapple Medicinal plants, Garcinia
2. HRS, Thirathahally	2008	Areca nut, Banana, Cocoa, and Vanilla
3. HRS, Shringeri (Sub Station)	2009	Arecanut Crop Protection
4. HRS, Ullal	1953	Cashew nut
5. HRS, Karkala, Udupi Dist *	2010	Coconut, Pineapple, Jack, Cashew, Vegetables

* proposed for establishment



SL NO.	AICRP	Year of establishment	LOCATION
1	AICRP on Cashew	1982	Chintamani
2	AICRP on Spices	1971	Mudigere
3	AICRP on Spices	2006	Sirsi
4	AICRP on Palm	1976	Arasikere
5	AICRP on Potato	1983	Dharwad
6	AICRP on Potato	1993	Hassan
7	AICRP on Vegetables	1995	Dharwad
8	AICRP on Tropical Fruits	1994	Arabhavi
9	AICRP on Tuber crops	2001	Dharwad
10	AICRP on Oil Palm	1978	Gangavathi
11	AICRP on onion (Voluntary centre)	2009	Hiriyur
12	AICRP on Cashew nut (Voluntary centre)	2009	Kanabargi

The general approaches followed for research on development of varieties and technologies at all RHRECs, HRS and AICRP centres are:

- Assemblage and maintenance of germplasm of the given crop for conservation of biodiversity and their utilisation in breeding programmes.
- Organising research on development of new crop varieties, production technology, crop protection technology, etc. to suit to various situations and farm holdings.
- Development of integrated management protocols to reduce biotic and abiotic stresses to increase productivity in horticulture crops.
- Establishment of model demonstrations blocks following all the technologies of important crops for the benefit of farmers.
- Development of horticulture crop based farming system studies suitable for zone/ region (Integrated Farming System Research) for economic sustainability and optimum use of farm resources.
- Estimation of yield losses due to natural vagaries and to work out economics crops vis-à-vis other competing crops of the area.
- Generation of information on post harvest handling, storage, processing, marketing of mandate crops.
- Development of newer conventional cost effective methods and protocols for tissue culture mass multiplication of important horticultural plant materials.
- Establishment of nursery for multiplication of quality planting materials and seed production units of important horticultural crops and to supply to the growers.

2.5.2 Horticultural Research Stations

The brief profile of various research stations of the University is given as follows



2.5.2.1 Horticulture Research Station, Sirsi

This Research Station was under University of Agricultural Sciences, Bangalore, till 1986 and subsequently transferred to UAS, Dharwad. This Research Station has now been transferred to UHS, Bagalkot from April, 2009. One AICRP centre on spices is also functioning in this research station.

The station is having 7.10 ha area. It is geographically located at 74° 50' E, Longitude 14° N, Latitude with is 619 m MSL (2043 ft). The topography is valley at the middle and slopy hills asides. The soil type is lateritic clay, depth upto 2.5', pH is 5.5 to 6.2.

Achievements

a) Crop Improvement

- * Released SAS-1 arecanut in 1996 which gives higher yield with good quality nuts.
- * Released SC-1(Sirsi Colocasia -1) variety in tuberous vegetable during the year 2008.

b) Production Technology

- * Standardized fertilizer recommendation of 200-80-280 NPK g/plant with double the recommended dose of FYM for Arecanut and pepper mixed cropping.

c) Crop Protection Technology

- * Two promising lines in black pepper viz., Ademane pepper (long spikes, higher yield and tolerant to *Phytophthora* foot rot) and Kudragutta, (tolerant to drought) were identified under CVT in 2006.

The station has developed the integrated control measures for the control of quick wilt and *phytophthora* foot rot in pepper.



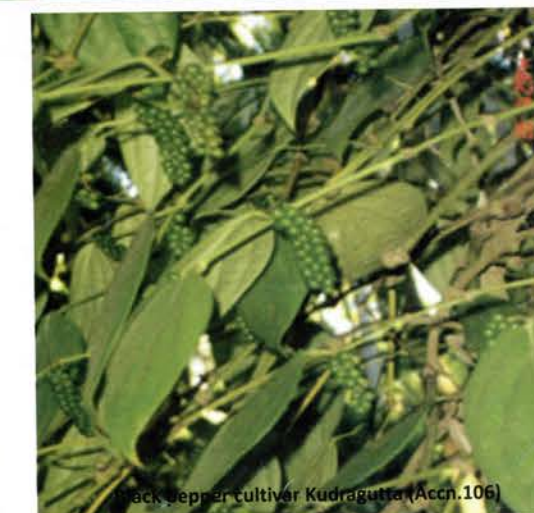
Horticulture Research Station, Sirsi



SAS - 1 Arecanut



SC - 1 Colocasia



Black pepper cultivar Kudragutta (Accn.106)



2.5.2.2 Regional Horticulture Research and Extension Centre, Mudigere

The Regional Horticultural Research and Extension Centre, Mudigere is located at about 2 km South West of Mudigere town at (13° 7'N latitude 75° 37' E longitude with an altitude of 982m MSL) on Chikkamagalur – Mangalore State Highway. It receives annual rainfall of 2380 mm.

The Research Station was started as Cardamom Research Station during 1957 by the State Department of Agriculture of the then Mysore State. Later on, it was transferred to the University of Agricultural Sciences, Bangalore during 1966, for conducting research on cardamom. The station was strengthened under NARP during eighties and elevated as Regional Research Station for hilly Zone. Now, this has been transferred to UHSB. The station has 132 ha area. The soils are sandy loams to red loams with pH of 4.8 to 6.0. Besides, the studies on organic farming, vermicomposting and apiculture are also taken up at this station. One AICRP is working in this station on Spices.

Achievements

- a) The cardamom varieties Mudigere 1, 2 and 3 are released for cultivation.
- b) Application of Azospirillum and P solubilizer Bacteria each @40g/plant +5kg FYM + Recommended NPK has increased the yield of Cardamom by 20-30 per cent.
- c) Spraying 3 per cent fish oil or 0.4 per cent neem oil to black pepper at 20 days interval after the onset of pest infestation for the control mussel scale is recommended.



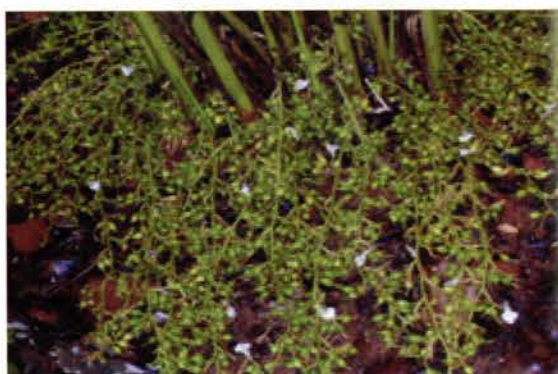
Regional Horticulture Research and Extension Centre, Mudigere



Mudigere – 1 Cardamom variety



Mudigere – 3 Cardamom variety



Mudigere – 2 Cardamom variety



- d) In newly planted cardamom plantations, spraying thiamethoxam 25 WG @ 1 g or imidacloprid 200SL at 0.5 ml per litre of water during the onset of cardamom shoot fly helps in its management.
- e) Two sprays of 0.1 per cent propiconazole to vine during the last week of May and August is recommended for the management of anthracnose disease in black pepper. This is an alternate to 1 per cent Bordeaux mixture.

2.5.2.3 Horticulture Research Station, Haveri (Devihosur)

The Horticultural Research Station, Devihosur was established by UAS, Dharwad in the year 2000 near Haveri. It is situated in Northern transitional agro-climatic zone at 14° 47' N latitude and 75° 21' E longitude at 563m above MSL.

The station is situated in the heart of popular Byadgi Chilli growing tract of Karnataka and is just 25 km away from Byadagi town where the biggest chilli market in the entire Asia is situated.

The station has 38.25 ha area. The soil type is black with medium depth. The annual average rainfall is 700mm.

Achievements

- a) Genetic purification of Byadgi Kaddi, Byadagi Dabbi and Sankeswar chilli varieties is underway.
- b) Application of NAA @ 150 ppm at flower bud formation and fruit set will reduce the dropping of flowers and fruits.
- c) Standardised the package of practices for chillies.



Horticulture Research Station, Haveri (Devihosur)



Purified Byadagi Dabbi variety





2.5.2.4 Horticulture Research Station, Bijapur (Tidagundi)

Horticulture Research Station, Tidagundi was established during 2002 by the University of Agricultural Sciences, Dharwad. The research station is located on National highway No. 13 which is 20 km away from Bijapur on the way to Solapur. It comes under Northern dry zone of Karnataka. The station is geographically situated at a latitude of $16^{\circ}49'$ North and a longitude of $75^{\circ}43'$ East.



Horticulture Research Station, Bijapur (Tidagundi)

The total area of the farm is 20.25 ha. The soils are shallow with medium black colour, with pH ranging from 7.5 to 8.5 and falls under Northern Dry Zone of Karnataka.

The station has been sanctioned a project "Establishment of advanced centre on the management of diseases of horticultural crops with a special reference to grapes, pomegranate and acid lime" under Rashtriya Krishi Vikas Yojana (RKVY) with an out lay of Rs. 2.54 crores.

Achievements

- a. Complete filling of live hole on the grape stem with dichlorovos 76 EC @ 80 ml/l of water with the help of squeeze bottle and closing the hole with wet mud effectively controls the stem borer in grape.

2.5.2.5 Horticulture Research Station, Ullal

The Horticultural Research Station, Ullal was established in 1953. During the year 1965, the Research station was brought under the control of University of Agricultural Sciences, Bangalore. The station was strengthened under World Bank Aided Multistate Cashew Project between 1980 and 1985.

The Research Station is located at a distance of 10km south of Mangalore on the way to Kasargod (NH-17). The



Horticulture Research Station, Ullal (Mangalore)



altitude of the Research station is 15m above Mean sea level and located at a latitude of 13° N and longitude of 75° E, geographically.

The research station is having 14.1 ha area. The soil type is typical laterite of the west coast with patches of red sandy loam. The terrain is mostly undulating with a gradient of 4 to 15 per cent. The soils are very shallow, low to medium in fertility, acidic in nature with a pH range of 5.4 to 5.8.

The prime objective of this research station is to conduct research on various aspects of cashew viz., crop improvement, crop production and protection, transfer of technology, and large scale multiplication of cashew grafts of released varieties for supply to the farmers.

Achievements

- a) Five cashew varieties namely Ullal-1, Ullal-2, Ullal-3, Ullal-4 and UN-50 were released for general cultivation in the State.
- b) Standardised the technique for rejuvenating uneconomical cashew plantations through top-working for higher yields.
- c) Foliar application of growth regulators (2,4-D, NAA and Ethrel) at lower concentrations (5 ppm, 25 ppm and 50 ppm, respectively) was found to be very effective in increasing hermaphrodite flowers, fruit set and nut yield per tree in cashew.
- d) Growing Black Pepper as a mixed crop in old cashew plantations was found to be feasible for additional returns, in coastal region.
- e) Identified promising Sweet Potato (C-43, S-1010 and X-108-1) and Cassava (H-2304 and S-856) cultivars suitable for coastal conditions.
- f) Standardised the complete package of practices for cashew nut, Sweet Potato and Cassava crop under coastal conditions.



Ullal – 1 Cashew variety



Ullal – 4 Cashew variety



UN-50 Cashew variety



2.5.2.6 Horticulture Research Station, Arsikere

The Research Station, Arsikere was established in the year 1958 by the Department of Agriculture as Regional Coconut Research Station. Later, it was handed over to the Department of Horticulture in 1963 and further transferred to the University of Agricultural Sciences, Bangalore during 1965. It has been renamed as Horticulture Research Station. Under UHSB regime.

The Research Station is located at 7 km away from Arsikere town of Hassan District on Arsikere – Hassan Road and situated at 76° 15'E longitude and 13° 15'N latitude at an altitude of 808 m MSL.

The soils are red sandy loams to medium black clay with pH of 7.39, low in available nitrogen (254.1 kg N/ha) and Phosphorous (19.0 kg P₂O₅/ha) and medium in available potassium (246.0 kg K₂O/ha). The research station receives an annual rainfall of 815.7 mm. The mean minimum temperature ranges from 11.0°C (January) to 19.3°C (June) and the maximum temperature ranges from 27.9°C (December) to 35.4°C (March). The Research Station is having 48.61 ha area, out of which 24.30 ha under protective irrigation and 18.10 ha under rainfed area. It represents Central Dry Zone.

The AICRP on Palms at Horticulture Research Station, Arsikere started functioning from May 1976.

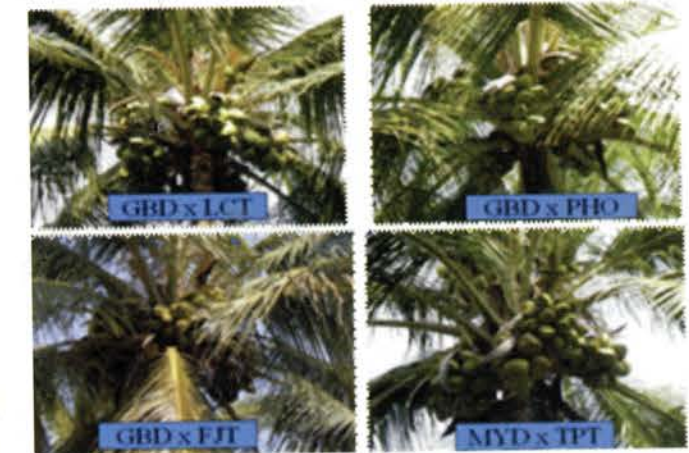
Achievements

- Released Kalpatharu variety of coconut for Karnataka, Tamil Nadu and Kerala districts.
- Planting of seed nuts in horizontal position at 30cm apart is ideal to get good stand of robust seedling compared to vertical planting
- When there is good source of irrigation water, banana can be grown as inter crop in coconut, with



medium available water drumstick, french bean, ladies finger and medicinal plants can be grown as inter crops. With limited source of irrigation water, red gram can be grown as rain fed crop with need based protective irrigation.

- Combined application of Hexaconazole (1%) 100ml root feeding at quarterly interval along with soil application of neem cake @ 5kg/palm/ year plus Trichoderma @ 50g /palm/ twice a year has been effective in the management of basal stem rot disease of coconut.
- The nut and copra yield of coconut was higher in the crosses of GBD X LCT, GBD X FJT, GBD X PHO and MYD X TPT and these hybrids are found suitable for maidan tract of Karnataka.
- Standardised agro techniques for coconut cultivation



Coconut Hybrids for maiden tract of Karnataka



2.5.2.7 Regional Horticulture Research and Extension Centre, Dharwad (Kumbapur)

In commemoration of 50th year of meaningful existence of College of Agriculture Dharwad, this station was established as Golden Jubilee Horticulture Garden in the year 1994. The station is transferred to University of Horticultural Sciences, Bagalkot on 22.11.2008 from University of Agricultural Sciences, Dharwad.

The research station is having 49.2 ha of land. It is situated at 15° 16'N latitude, 75° 07'E longitude with the altitude of 678 m above MSL. The research station receives mean rain fall of about 844 mm. The soils are shallow red and embedded with small sand gravels.



Regional Horticulture Research Station, Kumbapur (Dharwad)



The station was established with objectives of strengthening the plant multiplication efforts in fruit crops like mango, guava, sapota and other horticulture crops viz., tamarind, cashew *etc.* It has well established scion bank / progeny orchards in mango (cv Alphonso, Khadar, Kesar, Mallika), guava (cv. Lucknow-49) and sapota (cv. Kalipatti, Cricket Ball, DHS-1 and DHS-2) to meet the scion requirement for planting material production.

This centre also has housed three AICRP centres viz., Potato, Vegetables and Tuber crops.

Achievements

- Kufri Surya late blight tolerant potato cultivar has been identified and recommended for cultivation.
- Good number of germplasm collection of chilli, tomato, okra, cucurbits, beans, etc, has been made.

- A dual purpose (leaf and seed) early, moderately resistant MRL 1 of Fenugreek variety has been identified.

- Following varieties / technologies are under farm trial

- Drumstick: Bhagya KDM-01
- Green chilli: GCS/94-68
- Capsicum : CP-40
- Paprika: HPL-8 and DWD-7
- Coriander: DWD-purple
- Treatment with VAM 15kg/ha + 75% P + 100% NK for higher yield in tomato.
- Treatment with 50% NPK + Vermicompost 2t/ha + *Azospirillum* 5 kg/ha for higher yield in cucumber.



2.5.2.8 Horticulture Research Station, Thirthahally

The Horticulture Research Station has been established at Seebinakere, Thirthahally in the existing State Department of Horticulture farm on 01.01.2008 mainly to tackle the problems of arecanut. The total area of the farm is about 17.54 ha and is situated at 75° 23' E longitude, 13° 7' N latitude and an altitude of 591 m above MSL.

The soil types are sandy loam to sandy clay loams with a depth of 2-3m. Soil pH ranges between 5.5 and 6.3 with low to medium fertility.



The station is equipped with good laboratories for soil analysis and physiological studies.

2.5.2.9 Regional Horticulture Research and Extension Centre, Hiriur (Babbur Farm)

The Horticultural Research Station, Hiriur was established in 1916 under the Department of Agriculture. Later (1965), it came to the Administrative control of University of Agricultural Sciences, Bangalore and now has been transferred to University of Horticultural Sciences, Bagalkot on 1st April, 2009. The station is having 51.2 ha of land, in which Coconut, Mango and other crops are being cultivated. It is located at 3 km from Hiriur on Bangalore –Pune Highway. It is geographically situated at 70° 37' East longitude and 13° 57' N latitude and an altitude of 506.1m MSL. The soils are red sandy loam to deep black with pH ranging from 8.2 to 8.9. The station has recently been awarded a AICRP voluntary centre on onion.



Horticulture Research Station, Thirthahally

2.5.2.10 Horticulture Research Station, Sringeri

Horticulture Research Station, Sringeri is located in Hilly zone covering Chikkamagalur and Shimoga districts. The station has been established during 2009 under the administrative control of University of Horticultural Sciences, Bagalkot.

The station is having 3.24 ha land received from State Department of Horticulture farm located at Sringeri.

2.5.2.11 Horticulture Research Station, Belgaum (Kanabargi)

The Horticulture Research Station, Kanabargi was established during 1986 under the administrative control of University of Agricultural Sciences, Dharwad and has been transferred to University of Horticultural Sciences, Bagalkot since, April 1st 2009.

The total area of the farm is 08.45 ha where in Cashew, Mango, Bird of Paradise, Heliconia and vegetable crops are being cultivated. Recently one AICRP centre on cashew has been sanctioned to this centre.

2.5.2.12 Regional Horticulture Research and Extension Centre, Bangalore

The Research Station was established during October, 2009 after the formation of University of Horticultural Sciences, Bagalkot. It represents Southern Dry Region of Karnataka.

The Station is having 40 ha area. The mandate of this Research Station is to conduct research on Hi-Tech Horticulture, dry land horticulture, crop improvement, flowers and medicinal plants. The centre has been



established recently. Land development, formation of roads and layout blocks and planting is being taken up.

2.5.2.13 Horticulture Research Station, Hidkal Dam (Badakundri)

Horticulture Research Station located at Hidkal is a new research station added to UHS, Bagalkot. It is about 150 Km from Bagalkot. The station has been handed over from Department of Horticulture to UHS, Bagalkot as per the Govt. Order No. ಕೃತೋಜ 326 ತೋಜವಿ 2009 Bangalore. The Station has come in to existence from April, 2009.

The area of the research station is 27.20ha. The mandate crops are minor fruits, mango and medicinal plants.

2.5.2.14 Regional Horticulture Research and Extension Centre, Bagalkot

The Orchard Office, UHS, Bagalkot is located about 10 kms west of Bagalkot Railway Station (16°12'N, 75°45'E) on Raichur – Belgaum State highway. The annual average rainfall is 550.00 mm. The soils are gravelly soils with low fertility.

The Orchard Office initially started with six different gardens which were transferred from Bagalkot Town Development Authority Bagalkot for conducting Research on different crops and also for practical teaching.

The mandate crops are Pomegranate, Sapota, Gauva, Custard apple, lime, major flowers, ornamental Plants and other medicinal and aromatic Plants.

2.5.2.15 HRS, Srinivasapura (Hogalagere)

The University has established this HRS, to conduct intensive research on cashew, mango, other minor fruits and vegetables in an area of 150 acres. It is proposed to shift the AICRP on Cashew to this centre from Chintamani.



Main Horticulture Research and Extension Centre, Bagalkot

Sl. No	Sector	Division	Area (ha)
01	01	Vegetable Science	9.224 ha
02	09	Silvi Horticulture	8.208 ha
03	13	Post Harvest Technology	9.050 ha
04	37	Floriculture and Landscaping	6.125 ha
05	41	Medicinal and Aromatic plants	8.147 ha
06	70	Fruit Science	9.193 ha
07		Main Campus	120.00 ha



2.5.2.16 HRS, Karkala

Research stations are located at Udupi with an area of 50 acres of land. The research focus will be on coconut and minor fruit plants.

2.5.2.17 HRS, Hassan (Somanahalli Kaval)

This Research Station is located at the centre of potato growing area of Hassan district. The area of research station is 100 acres and it is proposed to take up research on bacterial blight disease of potato, in addition to mango and Sapota.

2.5.2.18 HRS, R.S. Gudda (Tumkur)

The university is establishing a research station at R. S. Gudda, (Thumkur) in 50 acres of land. It is proposed to conduct research on vegetables, flowers and High Tech Horticulture.

2.5.2.19 HRS, Yelachenahally (Mysore)

In order to conduct intensive research on Fruits, Vegetables, and Flower crops it is proposed to establish HRS, Yelachenahally (Mysore) in 50 acres of land.

2.5.2.20 HRS, Yadagiri

The Research Station is located at the dry zone of Northern Karnataka. The university has established this Research Station to conduct research on dry land horticulture and water management in 20 acres of land.

The other AIRCPs functioning under University of Horticultural Sciences, Bagalkot are

1. AICRP (Tropical Fruits) - Arabhavi

Earlier AICRP on Tropical Fruits scheme was started at UAS, Dharwad during 1994, later shifted to KRCCCH, Arabhavi and transferred to UHS, Bagalkot during 2009. The objectives of the AICRP are,

The following 15 technologies have been developed and incorporated in to package of practices.

1. Fertigation in banana cv. Robusta
2. Onion as best inter crop in banana
3. High density planting in banana
4. Use of organic and inorganic fertilizers on growth and yield of Sapota
5. Management of Nematodes in banana
 - a. Growing of Crotalaria juncea (sunhemp) 45 days before planting effectively reduced the nematodes population
 - b. Suckers dipped in 0.1125 per cent. Acephate for 60 min + sunhemp incorporated 90 days after planting effectively reduced the nematodes population
 - c. Parring + Prolinage with carbofuran 3 G (40 g Furadan/ sucker) effectively reduced the nematodes population.



6. Three sprays of propiconazole 0.1 per cent at 30 days interval effectively controlled the Sigatoka leaf spot disease
7. Mancozeb 0.25 per cent + copper oxychloride 0.3 per cent effectively controlled the leaf spot disease of banana
8. Tolerant cultivar Ney Poovan (Yalakkibale) for burrowing nematode was identified
9. Two sprays of carbendazim 0.1 per cent effectively controlled the leaf spot disease.

Presently 25 projects on banana and 2 projects on sapota are completed and 25 projects on banana and 12 projects on sapota are ongoing.

2. AICRP (Oil palm) - Gangavathi

The AICRP on palm (oil palm) was initiated during 1978-79 and transferred to University of Horticultural Sciences, Bagalkot during 2009. The experiments are laid out in 5.6 ha of deep clay soils, with the following objectives.

- a. To assess the water and nutrient requirement of oil palm under T.B.P area
- b. To find out the suitable cross combination of oil palm under T.B.P area
- c. Transfer of technology for the promotion of cultivation of oil palm through seminars, farmers interactions, field days, extension folders and through T.V. and Radio

Projects completed

- a. Studies on the adaptability of oil palm and to work out the irrigation and nutrient requirements of oil palm.
- b. Studies on the comparative performance of different hybrid combination of oil palm.

Ongoing projects

- a. Evaluation of oil palm genotypes for drought tolerance.
- b. Evaluation of new cross combinations in oil palm.
- c. Studies on fertigation in oil palm through micro irrigation.
- d. Evaluation of Hybrid cross combinations in oil palm.

2.6 EXTENSION

The Directorate of Extension is responsible for transfer of the technologies generated by the research wing of the University to the different stake holders particularly to the technical staff of State Horticultural Department and farmers through organising training, publication, organising demonstrations, etc.

The specific objectives of the Directorate of Extension are as follows,

- Technology validation by assessment and refinement.



- Conducting farm trials, front line demonstrations, whole farm demonstrations and other demonstrations at University Research Stations, progressive farmers fields and State Horticultural Farms on important commercial horticulture crops.
- Training farmers, farm youths, farm women and officers of the Horticulture and other development departments of state.
- Establishment of Horticulture Extension Education units at Research Stations and TVKs (Totagarika Vigyan Kendra) at district level.
- Formation of crop based progressive farmers groups and facilitate marketing, processing, value addition, etc.
- Export oriented horticulture programmes to farmers and extension workers.
- Offering Diploma and certificate courses for school/college drop outs and unemployed youths.
- Refresher courses for Department officers and for newly recruited technical staff of University.
- Mobile advisory services to the farmers.
- Publication of Extension literature, package of practices, journals and news letters.
- Starting community FM radio service.

In compliance with decisions of Extension Education Council, extension activities are reframed from time to time to meet the changing needs.

2.6.1 Achievements

After the formation of the Horticultural University, the Extension system had to be developed and organised afresh. At the outset, seven Horticultural Extension Units were formed at Bidar, Bagalkot, Arabhavi, Hiriya, Mudigere, Ullal and Kolar to organise and co-ordinate extension activities.

2.6.1.1 Trainings

The human resource development and upgrading the knowledge of stake holders are the two major activities of the Directorate of Extension in the initial years of University formation with the available limited staff. The Directorate of Extension has organised 20 training programmes during 2009-10, on various aspects like, kitchen gardening, processing technology, production technology on areca nut, coconut, cardamom, cabbage, nursery management, etc., A total number of 437 farmers and farm women, 260 Extension workers were benefited by these trainings.

2.6.1.2 Exhibitions

Participated in four exhibitions during 2009-10 at Belgaum, Dharwad, Bidar and Bijapur by having university stalls.

**2.6.1.3 Krishimela**

Organised two Krishimelas and participated in 3 Krishimelas during the year 2009-10. A cashew mela was organised on 26.02.2010 at Ullal, Mangalore.

2.6.1.4 Field visits and consultancy

Scientists from Colleges and Research stations visited farmers fields and gave suitable solutions to the problems, as and when farmers consulted them.

Similarly, the farmers visiting different campuses were given suitable advise by the scientists of Colleges and Research Stations.

2.6.1.5 Celebrations

World Environmental Day, world food day and farmers day were celebrated by involving line departments and farmers.

2.6.1.6 Publications

Directorate of Extension has been publishing UHS, news letter regularly and brought out five issues during the year.

2.6.1.7 Farmers Participations in International Conference

The University sponsored 10 selected progressive farmers for participation in International Conference on Horticulture held at Bangalore on 9-12 November, 2009.

2.6.1.8 Ad-hoc Projects

- Establishment of bio control agents laboratory under NHM (40 lakhs).
- Creation of training facilities for SHGS under NREG (3 lakhs).
- Conducting SAMETI level trainings under ATMA (2.56 lakhs)

2.6.1.9 Linkage with other Institutions

The University has established linkage with other Universities, Research Organisations and Voluntary Institutions in order to strengthen the education and research activities of mutual interest by utilizing the resources available in the collaborating institutions.

In the recent past, some of the private companies have shown remarkable achievements in the field of varietal improvement, multiplication of seeds/plants and distribution, crop protection, *etc.* These new varieties and products are being tested and popularised through progressive and enterprising farmers who are resource rich, risk taking and innovative. This partnership has brought many new varieties and technologies to the lime light and helped to improve productivity. Now it is high time for the Universities and public funded institutions to join hands with such private firms/entrepreneurs to synergise the ideas and mobilize



resources. Keeping this in mind, UHS, Bagalkot is planning to draw exclusive public-private partnership research programmes involving the major stake holder's viz., Farmers, Company and Scientists.

2.7 Establishment

University has Administrative Officer to provide administrative facilities for managing academic programmes. The administrative offices include Office of the Registrar, Office of the Administrative officer and Comptroller.

The office of the Registrar is completely responsible for implementing all the academic programmes, award of degrees and appointments in the University. Each college has a unit of these officers who assist the respective Deans of Colleges in carrying out the academic programmes.

2.8 University Finance

With a view to achieve progress, University has taken measures to implement various programmes. Since the university is very young, developmental needs are to be considered on priority with the help from State Government, ICAR and other authorities. The funds received from the State Government during the period from 2007-08 to 2009-10 are given below.

The Comptroller is the custodian of finance and he will advise the Vice-Chancellor in all aspects of resource generation and utilization of grants.

Year	Non Plan (Rs. in lakhs)	Plan (Rs. in lakhs)	Total (Rs. in lakhs)
2007-08	--	800	800
2008-09	--	700	700
2009-10	800	2025	2825

2.9 Estate

The University has limited infrastructures to organise education, research and extension education programmes in various places. There is an urgent need to build infrastructure in newly established colleges, research stations and extension centres along with the strengthening of infrastructure in existing campuses and research stations.





III. PERSPECTIVES

Horticulture Industry ensures three major securities namely Income Security, Employment Security and Health Security. Karnataka being the major Horticulture State has to gear up its activities fully to address some of the issues for making the industry more vibrant for realization of income and effective transfer of technology to the stake holders. The SWOT analysis has been made involving of the concerned organizations working towards the development of the industry and the same is presented below.

SWOT analysis

a) Strengths

- 1) Availability of congenial agro-climatic conditions for cultivation of horticulture crops (especially for tropical crops)
- 2) Enterprising farmers capable of venturing into modern horticultural activities and investments
- 3) New varieties introduced into Karnataka by Multinational companies, ICAR Institutions and SAUs
- 4) Huge domestic and export markets for vegetables, flowers, fruits and herbal medicines
- 5) Strong linkage between Agriculture Universities, ICAR Institutions and developmental departments besides, establishment of an exclusive Horticultural University
- 6) Central and State governments Support to Horticulture through AC, KSDH, ICAR, DBT, DST, CSIR, NHM, NHB, NMPB *etc.*
- 7) Large population in need of livelihood.

b) Weaknesses

- 1) Inadequate production and supply of quality and certified true-to-type planting material
 - a) Only 40% in fruit crops
 - b) Production and Supply gap of plantation, spices and flower crops are low as compared to the demand
 - c) Vegetable seed from only private and locally by farmers
- 2) Inadequate technology transfer to primary stake holders
- 3) Unscientific basis of area expansion leading to declined productivity and fluctuation in market prices resulting in market instability in certain seasons



- 4) Inadequate infrastructure for storage, marketing, handling and processing of horticultural produce especially during glut season
- 5) Inadequate air cargo and rail cargo facilities in the State
- 6) Inadequate power supply in the State and exorbitant power tariff for the floriculture and processing sectors as these enterprises are considered as an industry
- 7) The irrigation resources in the State are smaller when compared with the neighboring States
- 8) Mono cropping system of cultivation leading to increase in incidence of diseases and pests affecting production
- 9) Increase in prices of plant protection chemicals and fertilizers on one side and spurious / adulterated agro-chemicals on the other
- 10) Occurrence of new pest and diseases and their complexity

c) Opportunities

- 1) Congenial agro climatic conditions - with potential to double the horticulture area / production
- 2) Increase in demand for horticultural products especially fruits, vegetables and flowers, both in domestic and international markets
- 3) Introduction and development of new potential crops namely orchids, anthuriums, medicinal and aromatic plants, cocoa, sweet tamarind, oil palm and season insensitive mangoes, rambutan, longan, heliconium, bird of paradise, etc.
- 4) Potential for production of hybrid vegetables and fruits to gear up production to meet the national per capita availability
- 5) Horticulture based exports have potential to become one of our major foreign exchange Earners
- 6) Organic production of horticulture crops
- 7) Development of special processed products like ready to serve horticulture food products, spice encapsulation, oleoresins, pigments, dry flowers, potpourris and other value added products
- 8) Protected cultivation of flowers and vegetables
- 9) Scope for introduction of different cropping systems to overcome endemic problems and regional cropping imbalances
- 10) Scope for extension of area under drip irrigation and fertigation for horticultural crops
- 11) Opportunities for conversion of waste lands into productive lands through dry land horticulture

**d) Threats**

- 1) Reduced fertility especially organic carbon status of the soil
- 2) Management of pest and disease problems (Old and New)
- 3) Vagaries of monsoon during the cropping seasons
- 4) Fragmentation of land holdings
- 5) Entry of middlemen and pre-harvest contractors at the time of marketing
- 6) Acute shortage of water and power for horticulture sector
- 7) Utilization of excesses produce during season for value added products
- 8) Effects of climate change
- 9) Non availability of agricultural work force in rural areas

As could be seen from SWOT analysis, though Karnataka has congenial climate, varied soil types and adventurous farmers, ready to venture into modern fields of Horticulture with higher investment, they need socio technological empowerment to realize the full benefit of the potential which Horticulture Industry holds. The University being the major organization serving as source of trained man power with required cutting edge technologies to address the problems being faced by the industry and help the line department for effective transfer of technology.

Keeping the three mandates in mind, namely Teaching, Research and Extension the University has drawn the perspective action plan following vision and mission mode approach. This perspective vision of the University is presented in three separate sections namely Education, Research and Extension. In addition, it is also indicated some of the services the University can offer to the Department, NGOs and all the stake holders who are working for the development of the Horticulture in the State so that they will be able to reap the good harvest with higher income for better living.

The Horticultural University came into existence on 22 November, 2008, at Bagalkot carving out of UAS (B) and UAS (D) with jurisdiction of entire State of Karnataka for benefit of different stake holders dealing with horticulture and allied sectors.

The University of Horticultural Sciences, Bagalkot has nine horticultural colleges, one PG centre, 13 Research Stations and 10 AICRP centers located in different ecological zones of the State. The University offers B.Sc. (Horticulture), M.Sc.(Horticulture) and Ph.D. (Horticulture) degree programmes. The course curriculum prescribed by the IV Dean's Committee of ICAR is by and large followed. This University is organizing basic, applied, location specific and farmers / Industry participatory research for the over all development of horticultural research in the State. The research programme organised under categories, viz.,



postgraduate research, university scientist's research, outside funded projects and All India Co-ordinated Research Projects.

Extension service is other important activity for undertaking out reach programmes for the benefit of technical pursuance of the State Department of Horticulture and various horticultural based industries in general and the farmers in particular. All the three mandated activities have to be geared up to meet the challenges of future besides addressing the current problems being faced and described in the separate activities.

3.1 EDUCATION

Quality human resource in respective field is a pre requisite for growth of any industry. Graduates and post graduates in the field of Horticulture who are efficient and competent to face the challenges encountered in growth of horticulture is the immediate requirement.

The University has major responsibility of developing trained man power with required skills at all levels of activities namely Direction level, Implementation Monitoring Level, Operation Level, Field Performance Level to meet the man power for various above levels. The University has planned to organize the following courses.

i. Ph.D. Course	-	3 Years
ii. M.Sc. Course	-	2 Years
iii. Graduate Course	-	4 Years
iv. PG Diploma Course	-	1 Year
v. Diploma Courses	-	2 Years

At present, the University is having 9 constituent colleges offering UG programmes of which 3 colleges and a PG centre namely KRCCCH, Arabhavi. COH, Mudigere, COH, Bagalkot and PG Centre, Bangalore are organizing Ph.D. and M.Sc. degree programmes.

3.1.1 Strengthening of Colleges

As the jurisdiction of Horticulture University is entire State of Karnataka and looking to the opportunities in the field of Horticulture, the State Government has kind enough to sanction colleges spread over the State so as to help easy access to local area people to send their children for higher studies. This also helps to attend the problems of local area by the teachers and scientists. Located in these colleges. However, there is need to provide state-of-the-art infrastructure facilities in terms of college building, laboratories, hands on training facilities, instructional farms including experiential learning facilities, sports and cultural facilities in each of the college campus. Besides, residential facilities, like hostels, staff quarters are also to be built.

**3.1.2 Increase in the intake of under graduate students in the existing colleges**

There is a need for more number of technical personnel as more positions are to be filled in State Horticulture Department, private firms and seed firms, and Further there is a wide scope to become good entrepreneurs adoption of new techniques by graduates themselves. To achieve this, more number of

Name of the college	Existing intake	Proposed intake
KRC, College of Horticulture, Arabhavi (Belagaum)	55	70
College of Horticulture, Mudigere (Chikkamagalur)	53	70
College of Horticulture, Bagalkot	50	70
College of Horticulture, Bidar	50	70
College of Horticulture, Kolar	45	55
College of Horticulture, Mysore	30	50
College of Horticulture, Sirsi	35	50
College of Horticulture, Hiriyur	35	50
College of Horticulture, Koppal	30	50

Note: Including 15% ICAR Quota

graduates are needed. Hence, it is proposed to increase the intake of students in the existing Colleges only after strengthening of infrastructure.

3.1.3 Increase in the intake of Post Graduate (M.Sc.) students

Post graduate programmes are aimed at quality manpower development for shouldering the responsibility of teaching, research and meeting the needs of managerial professionals in horticulture and allied sectors like food chain management, agro input industries and services. The courses are to be designed to keep pace with developments in Science and Technology on regular basis to meet the demands for experts in critical areas of horticulture and allied sciences.

Exposure to emerging areas, hands-on-experience in modern techniques and apprenticeship in horticulture R and D should be given priority in curriculum for quality education such approaches naturally attracts students from within the country and also from many Asian and African countries.

Name of the Discipline	Existing intake	Proposed intake
Vegetable science	04	10
Fruit Science	04	10
Post Harvest Technology	04	10
Floriculture and Landscape Architecture	04	10
Plantation, Spices, Medicinal and Aromatic Plants	04	10
Crop Improvement and Biotechnology	04	10
Plant Pathology	04	10
Entomology	04	10

Note: 25% of students intake will be admitted through ICAR Quota.



In general Horticulture is growing globally and more particularly in India. Hence, there is a need to increase the intake of PG students in various disciplines at University of Horticultural Sciences, Bagalkot. the proposed increase in number of intake of students in various disciplines, over years is as follows.

3.1.4 Opening of new Post-Graduate degree programs

With increased area under plantation crops, fruit crops, flowers and vegetables also increased, the incidence of insects and diseases. In some cases like mites in coconut, bacterial blight in Pomegranate, Yellow Leaf Disease in Arecanut, wilt in pepper *etc.*, have caused greater damage even to an extent of removal of the plantation itself by loss to the farmers.

there fore human resource in these areas are required. Hence it has be planned to start of the PG

Disciplines M.Sc. Horticulture	Name of the Campus and Annual intake (Nos)				Total
	KRCCH, Arabhavi	PG Centre, Bangalore	COH, Mudigere	COH, Bagalkot	
Floriculture and Land Scape Architecture	--	--	--	4	04
Plantation, Spices, Medicinal and Aromatic Crops	--	--	--	4	04
Vegetable Science	--	--	4	--	04
Fruit Science	--	--	--	4	04
Post Harvest Technology	--	--	4	4	08
Crop Improvement and Biotechnology	--	4	4	4	12
Pathology	--	--	4	4	08
Entomology	4	4	--	4	12
					56*
Ph.D. (Horticulture)					
Horticulture	--	--	5	5	10
					10

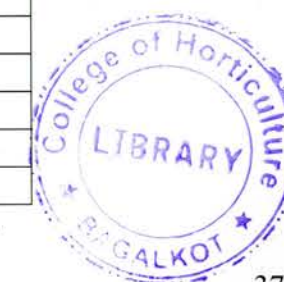
programmes on Horticultural Entomology, Pathology, Biotechnology, Economics, in the existing PG colleges/centres and also at the main campus to be taken up on priority. Accordingly, new Post-Graduate programs at various Colleges, have been planned as detailed below.

3.1.5 Start of Ph.D. Programme

Applied, basic and strategic research in fields like Floriculture, Fruit Science, Vegetables, Plantation, Spices, Medicinal and Aromatic Plants *etc.*, are very much needed. They are the foreign exchange earning fields. Any new findings either in varieties or in technology which led to increase in productivity, definitely,

Name of the Discipline	Intake Number
Floriculture and Landscape Architecture	05
Fruit Science	05
Vegetable Science	05
Plantation, Spices, Medicinal and Aromatic plants	05
Post harvest Technology	05
Horticultural Pathology	03
Horticultural Entomology	03
Crop improvement and Biotechnology	03

Note: 25% students of intake will be admitted through ICAR Quota.





fetch a lot of money to farmers which in turn benefit the State and Country. This is possible only when expert personnel are in place. Therefore, the Post Graduate programmes, leading to Ph.D., in frontier areas will be started in following specialised disciplines as being done at M.Sc.(Hort) level.

3.1.6 Start of Diploma Courses

Diploma courses help students to undertake small scale enterprises on their own after acquiring skills by undergoing such courses. Those who cannot pursue degree programmes for economic reasons can join short term diploma courses to enable them to stand on their legs or by seeking employment in public, private, multinational companies, etc.

The identified areas of Diploma courses for one or two years are

1. Horticulture Nursery Management, KRCCH, Arabhavi
2. Viticulture practices at Bijapur
3. Hi-Tech Horticulture at Bagalkot and Arabhavi.
4. Landscaping at Arabhavi and Bagalkot.
5. Plant Protection
6. Integrated course in Horticulture
7. Precision Farming and Hi-Tech Horticulture at Bangalore and Bagalkot
8. Microirrigation
9. Micropropagation

3.1.7 Starting of PG Diploma Courses for Graduates

After completing Horticulture degree, such of the candidates could not secure PG degree leading to M.Sc. can join PG diploma courses. Therefore to give an opportunity to acquire advance skills with perfection

Course	Eligibility	Duration
PG Diploma in wine Technology	Science degree holder	1 year
PG Diploma in Precision farming	Science degree holder	1 year
PG Diploma in post harvest processing and value addition	Science degree holder	1 year
PG Diploma in production of bio agents	Science degree holder	1 year



it has been conceived to start one year diploma in some important areas. After acquiring one can become entrepreneur by himself or can seek employment in organisations where such skilled man power is required.

Proposed Diploma courses

3.1.8 Start of new undergraduate degree programmes

There is a need to have specialised degree programmes to know or learn the specialised technologies in depth. With this special learning program students can go for higher studies or start their own enterprises as soon as they complete their studies in the following areas.

- a. B. Tech Horticulture Biotechnology
- b. B. Tech Horticulture Engineering and Post Harvest Technology
- c. B. Tech Horticulture Business management and Economics

3.1.9 Starting of Post Graduate Degree Programmes

After completing Horticulture degree programmes, students need to go for specialised studies which make them to learn techniques in depth and give confidence to start their own enterprises or join organisations in need of these trained technical personal. The post graduate degree programmes proposed to start is MBA Horticulture Marketing and Economics at Bagalkot and Bangalore.

3.1.10 Collaboration with other international Universities and Institutions

Attempts will be made to develop the collaborative relations with the international universities and organisations by collaborative research and sandwich PG programs and exchange the knowledge and technologies with horticulturally advanced countries. This also helps our local students to get exposed to new line of thinking.

3.1.11 Experiential learning and Earn while you learn programmes

The students will be given thorough and practical working knowledge to conceive programme and implement programmes independently. In order to create interest and help monetarily the students are encouraged to participate in Earn while you learn scheme.

3.1.12 Proposed regrouping of Departments

1. Horticultural Sciences
 - Fruit Science
 - Vegetable Science
 - Floriculture and Landscape Architecture
 - Spices and Plantation crops
 - Medicinal and Aromatic crops
 - Post Harvest Technology

**2. Crop Improvement and Biotechnology**

Horticultural Biotechnology and Bio informatics

Genetics and Plant Breeding

Seed Science and Technology

3. Horticulture Crop Protection

Horticultural Entomology

Horticultural Pathology

Horticultural Microbiology

4. Natural Resource Management

Horticultural Chemistry and Soil Science

Agronomy and water shed management

Horticultural Engineering

Forestry

Environmental Sciences

Horticultural crop physiology

Veterinary Science

Sericulture and Bee keeping

5. Allied Sciences

Horticulture Extension Education

Horticulture Economics

Horticulture Statistics

6. Basic Sciences

Biochemistry

Computer Science

Languages

Additional staff and other facilities like buildings, class rooms, laboratories, hostels, libraries, cafeteria, playgrounds, etc., are needed in all the Colleges, to undertake proposed education programmes.

3.2 RESEARCH

Conducting research on all fields of horticulture industry is the second important activity of the university. The research programmes are planned to find solutions to the problems being faced by the farmers and also address the issues hindering production, productivity and quality.

**3.2.1 Research Approaches**

Following are the six approaches framed to conduct Horticultural Research in the University.

- Conducting research at University/ Colleges by scientists/ Teachers and also M.Sc. (Hort) and Ph.D students.
- Conducting research at Horticultural Research Stations on mandate crops.
- Conducting traditional knowledge and farmers practice based research.
- Conducting Hi-tech research in specialized centres on specific frontier areas of science.
- Conducting research through All India Co-ordinated Research Projects (AICRP's) on specific crops.
- Conducting onfarm research for validation, adaptation and popularisation of new technologies on farmers fields with participatory mode.

At the end, fully tested, refined and well proven successful technologies alone will be given to primary stake holders. These six types of research forms will supplement and compliment to each other.

2.3.2 Research and Development Priorities

- Identification, prioritization, and finding solutions to the problems affecting the production and productivity of important horticultural crops.
- Arranging multiplication, certification and distribution of seed and planting material of crops in demand.
- Strengthening research on propagation and development of tissue culture and diagnostic laboratories.
- Integrated pest, disease and weed management through installing Plant health Clinics
- Sophisticated disease diagnosis and mobile service (108) facilities, besides Weather and Disease forecasting units.
- Technology Development to face challenges of climate change, and to mitigate drought and floods.
- High density planting with canopy, nutrition and moisture management
- Dry land Horticulture farming and development of drought resistant varieties.
- Organic Horticulture
- Conservation and cultivation of local germplasm especially of Medicinal and Aromatic Plants and less exploited Fruits
- Integrated horticulture based Farming Systems
- Production technology of off season fruits and vegetables
- Crops and varieties suitable for problematic soils and water



- 14) Biotechnology- Micro propagation, Genome mapping and Gene transformation
- 15) Development of Specific technology / varieties for
 - a) Bacterial blight and wilt resistant pomegranate
 - b) YLD resistant areca nut
 - c) Late blight resistant potato
 - d) Ring spot virus resistant papaya
 - e) Murda resistant chilli
 - f) White fly resistant bhendi (okra)
 - g) Yellow vein mosaic resistant bhendi
 - h) DBM resistant cabbage.
 - i) Katte resistant cardamom
 - j) Wilt resistant pepper variety
 - k) Soft rot resistant ginger variety
 - l) Spongy tissue free Alphonso
- 16) Introduction and cultivation of new crop varieties namely, all season mangoes, rambutan, longan, vegetables *etc.*,
- 17) Development of technology for wine industry
- 18) Mechanization in Horticulture Activities
- 19) Promotion of contract/corporate farming
- 20) Development of variety suitable for biotic and abiotic Stresses

2.3.3 Traditional Knowledge and farmers practice based research

To harness the time tested traditional knowledge being practiced through ages by farmers attempts will be made to collect, compile and validate the same. Besides, there are a few farmers who follow their own systems and ideas for crop husbandry, resource management and crop protection. All of such practices will be systematically documented, revalidated and put to use.

2.3.4 Hi-Tech research in specialised centres on specific frontier areas of science

To cope up with the changing situations, conduct of research on precision farming, protected cultivation in horticulture, dry land horticulture, integrated pest and disease management, integrated farming system approach for optimisation of resource management *etc.*, Specialised Centre of Excellence with the state-of-the-art facilities and highly specialised manpower is conceived.



2.3.5 On farm Research for Validation, Adaptation and Popularisation of New Technology on Farmers Fields with Participatory mode

New varieties and technologies are being tested and popularised through progressive and enterprising farmers who are resource rich, risk taking and innovative. It is time for the University and public funded institutions to join hands with such private firms/ entrepreneurs to synergise the ideas and mobilize resources. University of Horticultural Sciences, Bagalkot is planning to draw exclusive public-private partnership research programmes involving the major stake holders *viz.*, farmers, company and scientists.

2.3.6 Post – Harvest Processing and Marketing

1. Post harvest handling, preservation and establishment of processing units, cold chains and exporting units
2. Development of ripening chambers /store houses
3. Marketing –e marketing, futures trading, auction centers and co-operatives, direct marketing of commodity based produces and marketing societies
4. Market Information Centers for export and domestic trading
5. Small Farmers Agri-Business Consortium (SFAC)
6. Promotion of linkages between producers and growers / marketing agency for Buy back arrangement for Horticulture produce
7. Grading, Quality testing, residual analysis and, sanitary and phyto sanitary certification for export market
8. Development of Technology for Bio - Preservation
9. Development of technology for Packaging and transport
10. Establishment of crop based farmers associations
11. Promote contract/corporate farming with end-to-end approach on partnership mode
12. Promote value addition for the surplus products

2.3.7 Strengthening /Widening International Horticultural Bondages

Because of the Horticulture strengths of the Country, India can become World leader but needs some of the following changes in its International out looks/approaches to utilize the resources and to strengthen the relationships in useful advanced technology.

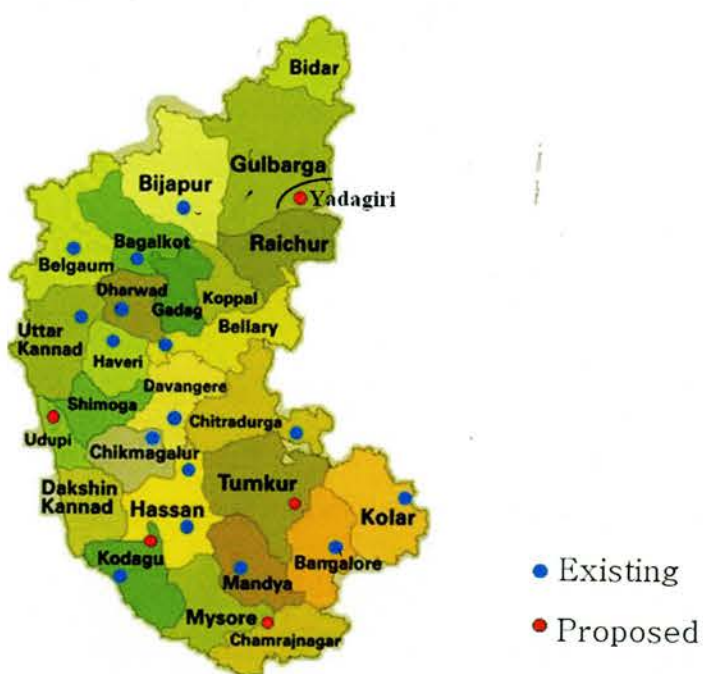
1. Promoting cultivation of identified export potential horticulture crops to cater to specific demands of niche market.



2. Developing required infrastructure especially for growing of quality products.
3. Start International collaboration for R and D Programmes to enhance quality and productivity, introduction of new crops, incorporation of foreign genes, mechanization, *etc.*
4. Enhance production activities through selected crop based interest groups for export of products.
5. Attracting foreign investment on partnership basis linked to high value crops.
6. Have long term strategy for export niche markets.

2.3.8 Start of new Horticultural Research Stations

Following five new crop based Horticulture Research Stations are proposed to be started shortly.



Horticulture Research Stations

2.3.9 Horticulture Research Station, Yadagiri

In this research station, more emphasis will be given for dry land Horticulture and Watershed management technology. The importance will be given for the selection of the crops and varieties that require low water requirement and more work will be initiated on drought and its resistance.

2.3.10 Horticulture Research Station, Rangaswamy Gudda (Tumkur Dist)

Research on flowers and Hi-Tech Horticulture will be given more emphasis in this research station. Technologies for maximising production through Hi-Tech research as through introduction of the varieties well be attending under protected cultivation.



2.3.11 Horticulture Research Station, Ramasamudra, Karkala (DK)

Research on tropical fruits, minor fruits and tuber crops will be taken up at this research station. Special attention will be given to the crops which require humid and high rainfall.

2.3.12 Horticulture Research Station, Mysore (Yelachenahally)

Research on fruits, flowers and vegetables will be taken up in this research station to solve the problems of these crops of this locality.

2.3.13 Horticulture Research Station, Hassan (Somanahally Kaval)

The station is proposed to work on the management and control of late blight in potato, potato seed production in addition to research work on vegetables and fruits.

2.3.14 Improvement of Vegetable Crops

Large area is under cultivation of vegetables in Karnataka State. Many vegetables are season bound, susceptible to pests and diseases and have low shelf life. Hence, there is a need to.

- Develop insect pest and disease resistant, high quality varieties suitable for different situations.
- Collection and evaluation of local varieties for yield, quality and, pests and disease resistance.
- Seed multiplication and supply chain.
- Develop protected cultivation practices for increasing the quality and yield of high value vegetable crops.
- Evolve technologies to enhance shelf life of vegetables.
- Develop post harvest handling technologies (treatment, preservation and processing).
- Improvement and multiplication of local good quality Brinjal varieties in Hiriyur.

2.3.15 Improvement of Fruit Crops

Varied agro climatic conditions in the State are congenial for cultivation of various fruits like mango, banana, citrus, sapota, guava, grape, papaya, *etc.* There is a necessity to develop appropriate technology for improving productivity and production of these crops. Important general issues that deserve the research attention are listed below.

- Identification of varieties /hybrids suitable for export.
- Standardization of various aspects related to high density planting (spacing, pruning, INM, *etc.*)
- Production of organic fruits in various fruit crops.
- Standardizing propagation techniques /root stock studies.





- Commercial exploitation of minor fruits.
- Research on causes of physiological disorders / diseases and insect pests.
- Effective water management practices.
- Developing integrated farming systems.
- Developing suitable INM practices.
- Research on development of transgenic fruit crops for biotic and abiotic stresses.
- Establishment of banana tissue culture laboratory in Chitradurga district.
- Intensive studies on pomegranate blight and Ring Spot Virus of papaya.
- Post harvest processing, treatment, preservation and development of value added products.

2.3.16 Improvement in Floriculture Research

Commercial flowers are remunerative for both domestic and export market. There is a need to develop technologies with the following objectives

- Protected cultivation of flowers like rose, chrysanthemum, tuberose, gladiolus, jasmine, *etc.*, for improvement in keeping quality and quality of the flowers.
- Standardization of agro-techniques for protected cultivation of carnation, gerbera, orchids, anthuriums, *etc.*
- Collection, evaluation and development of varieties of various non-traditional commercial flowers.
- Dry flower Technologies.
- Development of technology that enable export of flowers.

2.3.17 Intensification of Research on Spice/ Condiments

Research is required to develop technologies to improve quality and productivity of spices like garlic, onion, ginger, turmeric, cumin, coriander, *etc.*

- Develop high yielding varieties which are resistant/ tolerant to pests and diseases as in the case of pepper, cardamom, turmeric, *etc.*
- Develop production technologies for higher yields and more monetary benefits.
- Develop post-harvest technologies for preservation and value added products.
- Organic spices



- INM
- IPM and IDM in Spices
- Production technology for the exportable spices.
- Address the issue of quick wilt of pepper, katte disease of cardamom, *etc.*

2.3.18 Research on Medicinal and Aromatic Plants

Presently the information on production technology of medicinal and aromatic plants is very limited. Hence, there is an urgent need to develop improved technologies for higher production with high quality medicinal and aromatic plants. Also there is a need to develop post harvest processing technologies for storing and preparation of value added products and utilization of medicinal plants to develop new formulations for the combat of ailments.

2.3.19 Intensifying research in integrated pest management

The era of “all pesticides” is coming to “limited and need based use” The team work is required in developing perfect sustainable IPM systems for more popular horticulture crops. Entomologists, pathologists, soil scientists and crop physiologists comprising of Horticulturists.

It is necessary to develop the practices that are environmentally safe and easy to adopt

2.3.20 Directorate of Seeds and plant propagation

Seed and plant material are the critical inputs for the farmers. These inputs are of much more important to the horticulture farmers as most of the plants are perennial in nature. Hence, the truthful and genuine material of elite varieties has to be distributed to the farmers in large quantities. The plant material should be free from pests and diseases. Hence, there is a need to establish a special Directorate for the seeds and plant multiplication exclusively for horticulture crops.

2.3.21 Specialised Research Centres of Excellence

To cope up with the changing situations, specialised centres of excellence with the state-of-the-art facilities and highly specialised manpower is conceived. Accordingly, following 9 Special institutions are contemplated during the next 2-3 years to addresses local/contemporary issues.

1. Centre of excellence in organic based farming systems and bio-resource management at Arabhavi and Hiriyur.
2. Centre of excellence for biotechnology and genetic engineering in horticulture at Bagalkot and Kolar / Bangalore.
3. Hi-tech research centre for precision farming and protected cultivation at Bagalkot and Bangalore.



4. Centre for utilization of traditional knowledge and indigenous biodiversity at Arabhavi, Dharwad and Karkal.
5. Advance centre for dry land horticulture at Kolar, Bijapur and Yadagiri.
6. Centre of excellence for bio-control of pests and diseases, and production of bio-formulations at Hiriya and Arabhavi.
7. Advance centre for farm mechanization and post harvest technology at Bangalore and Bagalkot
8. Advance centre for cashew research at Ullal and Kolar.
9. Centre of excellence on spices and plantation crops at Sirsi and Mudigere.
10. Centre of excellence for flowers and protected cultivation at Arabhavi and Mudigere.
11. Initiation of National Research Centres or AICRP units for Mango (Dharwad), Banana (Arabhavi), Grape (Bijapur), Pomegranate (Kustagi, Hiriya), Sapota (Kaladagi) and Papaya (Hiriya), lime in Bijapur, *etc.*, in collaboration with ICAR.

2.3.22 Farmers Practices and Traditional Knowledge Based Research

The time tested traditional practices and techniques being practiced through ages by farmers. There is a need for systematic collection, documentations and revalidation of them for large scale practice. A centre will be initiated to oversee such activities in horticulture crops.

2.3.23 Scientists- Farmers- Company Participatory Research

In the recent past, some of the private companies have shown remarkable achievements in the field of varietal improvement, multiplication of seeds/plants and distribution, crop protection *etc.*, These new varieties and products are being tested and popularised through progressive and enterprising farmers who are resource rich, risk taking and innovative. This partnership has brought many new varieties and technologies to the lime light and helped to improve productivity. Now it is high time for the Universities and public funded institutions to join hands with such private firms/entrepreneurs to synergise the ideas and mobilize resources. Keeping this in mind, UHS, Bagalkot is planning to draw exclusive public-private partnership research programmes involving the major stake holder's *viz.*, Farmers, Company and Scientists in the so called Institution – company – Farmers (ICF) linkage programmes.



3.3 EXTENSION

The successful achievement in agricultural sector of India was possible because of green revolution. While recognizing the impact of the green revolution in infusing dynamism to Agricultural Sector, it must be also confessed that the green revolution remained confined to the irrigated belts of the country and to selected crops only. The intensive research in Horticulture and the mechanism to transfer these research results, is almost negligible and lacking until 2005. Of late, the potentiality of the country in boosting the productivity of Horticulture crops and their export potential has been well recognized by the government of India and being materialized through exclusive programmes like NHM, NHB, RKVY and National Mission on Medicinal Plants, *etc.* Government of Karnataka also recognizing the scope and potentiality of State in Horticulture sector (which has already a separate State Department of Horticulture), took a forward step by establishing an exclusive University of Horticultural Sciences, at Bagalkot.

Now, the University of Horticultural Sciences, Bagalkot has started its activities particularly with respect to research and teaching in full swing. But this generated technology, only if, delivered to the target group or end users very effectively and at faster rate, a revolution in Horticulture Sector could be expected. Therefore, it is necessary to develop a sound mechanism of transfer of technology at the point of technology generation itself and further dissemination can be taken care by the Developmental Departments.

So far, the transfer of technology lacked focus on location specific needs of the regions, disadvantaged areas, target groups and entrepreneurs. Further, individual and institutional issues under human resource development, the training of trainers, researches, subject matter specialists, extension functionaries and the farmers had not been addressed properly and adequately. The linkages between research-extension and farmers remained either weak or non-existent. The farmer driven and farmer accountable feedback systems in Horticultural Extension need to be developed.

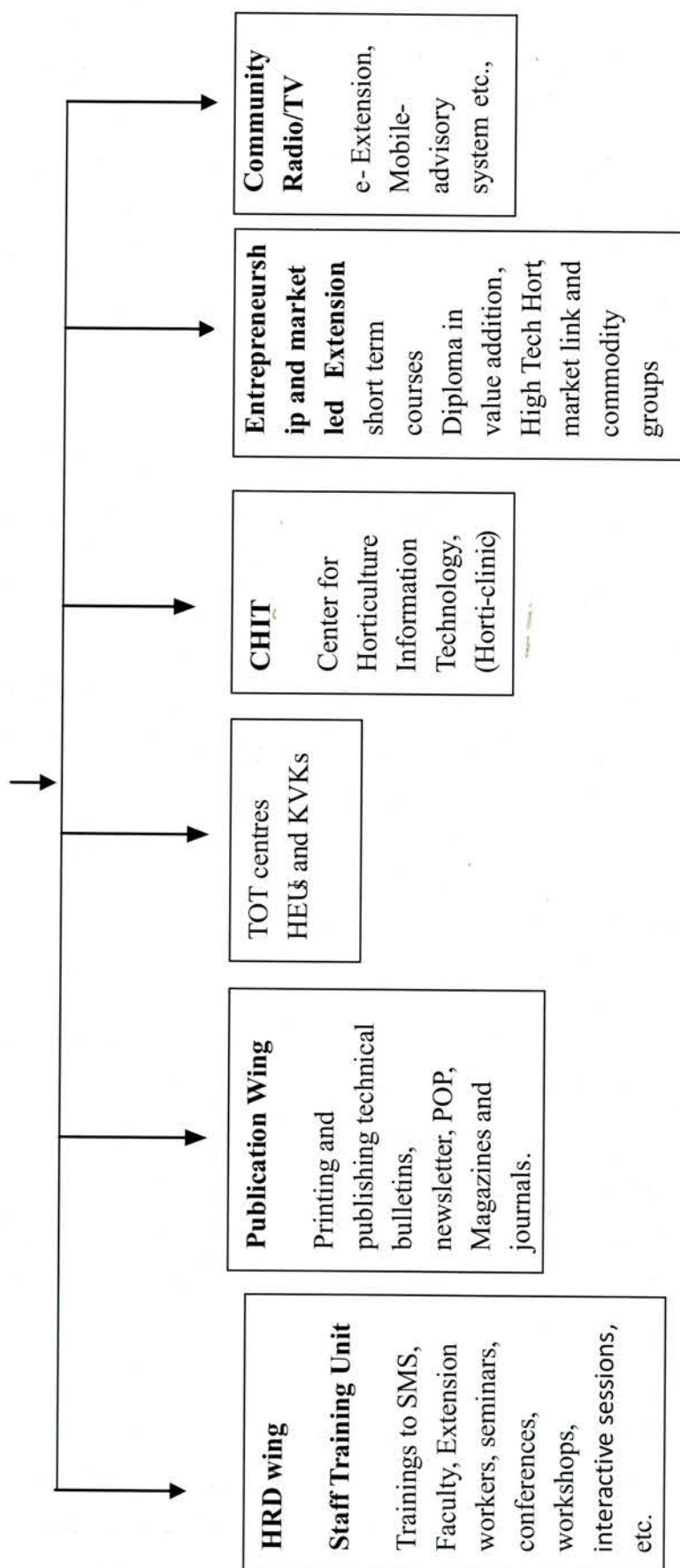
Precisely to meet those various needs of sector and fulfil the objectives of transfer of technology, UHS, Bagalkot proposes to have the broad vision of Extension system as follows.

The entire Horticulture Extension System will be planned and executed by the Directorate of Extension, using the inputs from the research and teaching faculty and feedback from the stake holders, extension workers, *etc.* It will be the sole responsibility of Directorate, in bringing social and economic changes in the rural agriculture community in general and, faster and phenomenal change in horticulture sector, in particular. To achieve this herculian task, the following organizational set up is proposed by indicating their operational details.

The Directorate of Extension will be responsible for systematic planning (to put a firm foundation) and executing the Horticulture Extension based on the adoptable technology generated by the research wing of the University. The above mentioned different wings/ units function under the Directorate of Extension to achieve the goal of transfer of technology by several mechanisms like training, print media, front line and

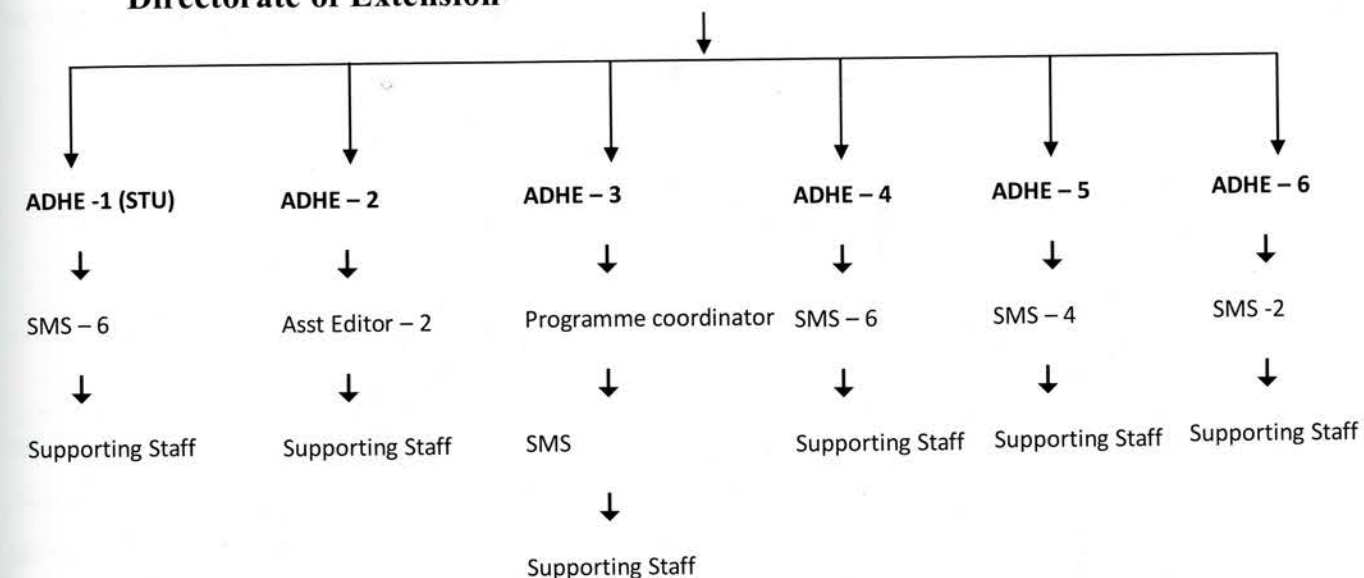


Directorate of Extension



first line demonstrations, technology validation assessment, farmers field schools, consultancy services to the farmers, NGO's, stake holders, Extension Officers, providing online technology information through e-extension, mobile Horticulture Advisory system, developing Horticulture Portals using Information Communication Technology for online audio-video viewing by farmers, starting of skill oriented (Entrepreneurship) Diploma and Certificate courses, etc., Each wing, under the Director of Extension, will be headed by the Associate Directors of Hort. Extension (ADHE) (Professor Cadre totally six posts) and assisted

Technical Staffing Pattern Directorate of Extension



by the required technical and non-technical staff.

3.3.1 HRD Wing (Staff Training Unit)

The staff training unit will be located at the main campus of UHS, Bagalkot. The main objective of this unit will be empowering the newly recruited staff of the University and the Extension Officers of the various Developmental Departments, with the latest developments in the field of horticulture. The state level training programmes and refresher courses sponsored or collaborated by ATMA, MANAGE, GOI and GOK, will also be conducted. Few special trainings, directly to the farmers, will be also conducted at times for the transfer of technology for the seasonal burning problems. This wing will also have the responsibility of conducting seminars, conferences, workshops symposia etc.

3.3.1 Publication and Communication Centre

All the publications of the University will be handled by this centre, like publication of package of practices, monthly magazines, scientific periodicals, newsletters, books, etc., The Associate Director of this wing will be called as Editor and he will have the team of scientists and technical and non-technical staff to assist. The bimonthly UHS News letter, monthly "Udyan Loka", crop specific and problem oriented



bulletins, books, Karnataka Journal of Horticulture Sciences, monographs, *etc.*, are some of the planned publications to be taken up by this wing.

It is planned to start FM community Radio Service for the farmers. The Horti-portals will be developed using ICT and continuous video/audio relay will be planned for the online transmission of technology. The activities and programmes related to e-extension, mobile Horti Advisory systems, *etc.*, are envisaged under this section. A toll free telephone facility will also be the part of the programme.

3.3.2 Transfer of Technology

To meet the demand driven Extension requirements of the various regions and Zones, the University has planned to establish Horticulture Extension Units and **Totagarika Vigyan Kendras** under the Directorate of Extension.

Objectives

1. These institutes will take up the Front line demonstrations,
2. Technology assessment,
3. Technology validation,
4. Imparting training to the farmers and extension workers, offer consultancy to the farmers.

These TOT centres will have the Programme Co-ordinators (Associate Professor) as heads of these institutions of transfer of technology with a team of subject matter specialists (Horticulture, Soil Science, Entomology and Plant Pathology). ICAR sponsored KVK's, if any, will be also under this unit of Directorate of Extension. The need based and demand driven extension programmes like farmer field schools, formation of commodity produces groups, self help groups, *etc.*, will be also taken up.

3.3.3 Centre for Horticulture Information and Technology (CHIT)

This centre will be similar to the model of ATIC in other farm universities. It will have the mandates as follows

1. To function as single window delivery system for agricultural/ horticultural information
2. To make available all the technologies and products to the climate
3. To offer advise by adopting multidisciplinary diagnostic approaches
4. To function as repository of horticulture information pertaining to skills, practices, inputs and education.
5. To offer consultancy service to different stake holders.

This will serve as single window delivery system for solving the problems of farmers by providing diagnostic services and input supply. It will function as Horti business clinic. ATIC model of UAS, Dharwad will be adopted and certain improvements like on spot analysis facilities for soil, plant and water will be provided. The subject matter specialist will provide the solutions to the problems after analysing the data.



3.3.4 Entrepreneurship development and market led extension

Short term courses on value chain management and value addition to Horticulture, Hi-Tech Horticulture, Organic Horticulture, Seed and Seedling production, Crop protection, Horti-business clinics are planned, to produce the much needed skilled human resource for the expanding Horticulture sector.

Diploma and Certificate Course

Course	Eligibility	Duration
Training and pruning in fruit crops/Canopy architecture	SSLC	6 months
Vegetative propagation	SSLC	6 months
Wine technology	SSLC	6 months
Flower arrangement	SSLC	6 months
Dry flower technology	SSLC	6 months
Tissue culture	SSLC	1 year
Certificate course in plant protection	PUC	1 year
Certificate course in Organic horticulture	PUC	6 months
Short term courses in skill development	Farmers/ farm workers	3 months

Market information service will also be provided to the farmers regarding various horticulture commodities, export potential, market requirements, linking farmers with exporters *etc.*, besides broadcasting commodity prices at various main markets.

3.3.5 District Advisory Service

Each district head quarters will have a team of scientists to provide consultancy service to the needy farmers and others this team of scientist will work in close co-ordination with line departments and give feed back to the research system.

To monitor all these extension activities all over the state, the Directorate of Extension needs to be strengthened with human resource, infrastructure, audio visual aids, mobile units, transport facilities *etc.*

3.4 STUDENTS WELFARE

The following activities have been planned from the Directorate of Students Welfare for the future

1. Strengthening sports and cultural activities and infrastructures for the existing Colleges and creation of state of art infrastructures for all kind of sports and cultural activities at the newly established/ establishing Colleges and at the University Head Quarters to promote overall personality development of the students of the University.



2. Regular conducting of sports and cultural meets at various Colleges and University levels to encourage sportsmanship to bring out best talent among the students and also facilitate the talented students to take part at national and international events.
3. Creation of high quality infrastructural facilities like cafeteria, synthetic tracks for sports, Dispensaries, Hostel amenities, swimming pools, *etc.*, at all the Colleges / Campuses for the comfort of the students.
4. All the efforts will be made to keep the discipline among the students of the University.

The University is planning to reintroduce State Study tour which will expose the students to new technologies developed by many institutions involved in developing technology pertaining to horticulture and other subsidiary occupations.



IV. GENERAL SERVICES

4.1 LIBRARY AND INFORMATION SERVICES

The University Library will be developed so as to be the “Learning Hub” of the University, achieving excellence and contributing strongly to intellectual inquiry and knowledge creation in the University. Our mission is to actively enhance learning and research by providing a flexible and stimulating study environment, seamless and timely access to high quality information resources, with efficient and innovative services delivered by knowledgeable and creative staff. We are committed to empower the student and under community with skills essential to academic excellence and lifelong learning.

The Library's Strategic Objectives are designed to be in alignment with the Strategic Plan of University of Horticultural Sciences, Bagalkot 2020.

1. Collection Development

- Ensure better coordination in the integrated print and digital collection linking and supporting the University curriculum, research, extension and the wider use of blended-learning.
- Strengthen the Library's collections supporting University strategic development of areas of excellence.
- Target special purchases to support the new 4-year undergraduate degree programmes, foundation year and co-curricular programmes.
- Seek to provide adequate library resources for programme accreditation by each University discipline.
- Measure collection adequacy, levels and usage of collection to identify and fill-up collection gaps in a digital and collaborative environment.
- Engage stakeholders in collection development by hosting publishing industry development tasks to University Communities on a regular basis, and further improving online book recommendation and notification system.
- Pursue the feasibility of establishing JURA (Joint University Research Archive) for enhanced access to lower use research materials.
- Pursue additional consortial opportunities to achieve cost efficiency and further benefits for our user population.



- Understand the relationship between our print and digital collections and seek ways to better plan and manage these resources in a coordinated fashion to reduce duplication and to extend the range of book and serials titles.
- Develop partnership with local and regional information providers in resource sharing.

2. e-enabled Learning and Teaching Engagement

- Plan for the staged introduction of credit-based Information Literacy programmes, in collaborating with academic departments on course design and delivery.
- Ensure the greater integration of information resources into course design/delivery.
- Develop a platform with adapted use of Web 2.0 features to enhance online interaction with users and delivery of information services.
- Enhance library workshops, services and resources for local, and international students.
- Intensify training of front-line and roving staff on the use of electronic tools and reference resources to provide timely assistance to users.
- Create flexible and innovative learning environments to support individual and group learning.
- Complete a Design Brief or Master Plan to optimize the use of Library space for learning and research purposes.

3. Research Enhancement

- Raise the University's scholarly profile, both locally and internationally, by establishing and growing a Institutional Repository (IR) to capture, archive and publicise University's academic accomplishments for open access on the internet.
- Pilot with selected academic departments to promote open source publishing and the availability of research publications on the web.
- Create social and informational spaces which are informative, research friendly and responsive to discipline interests.
- Apply the latest and effective technologies providing integrated one point of access to information resources; and empower researchers with a multi-platform search engine and knowledge discovery tools.
- Identify and support the research and extension needs of academic staff by strengthening the role of the Faculty Librarian Team to collect researchers' feedbacks, and to harvest research information from the Faculties to support collection development, policy direction and IR growth.



- Conduct advanced workshops and seminars on using all information resources to conduct research effectively and efficiently.
- Provide seamless remote access to electronic resources with a user-friendly client-free authentication mechanism.
- Present a unified approach to the Library's created digital resources and to economize on technological and staffing resources, through UNILINK (University Library and Information Network of Karnataka).

4. Communication and Promotion

- Develop a marketing program to raise the profile of the Library, its services and information resources among students, staff, alumni and the wider community.
- Conduct regular user group meetings, web surveys and interviews to solicit feedbacks on current Library services and opinions on future initiatives for the Library.
- Achieve coordinated publicity or marketing of major library initiatives *via* webpage, Library Newsletter, exhibitions and other innovative means to promote active participation and awareness from stakeholders.

5. Partnership Development

- Enhance strategic alliance and deep collaboration with Agricultural and other university libraries of state through Karnataka Knowledge Commission.
- Further strengthen collaborative efforts with partner academic libraries *via* staff exchanges, interlibrary loans, and professional consultation services and strengthen the book approval programme with University Library.
- Establish partnerships with relevant teaching support centres to ensure that students have the best learning experience possible.

6. The Skilling of Our People

- Establish a means to understand and prepare Library staff for the present and future skills required across the whole organization.
- Create a Staff Development Programme across all levels of library staff aimed at achieving the Preferred Library Scenario.





4.2 ESTABLISHMENT OF PROJECT PLANNING, MONITORING AND CO-ORDINATION CELL

This cell play an important role in finalising plan documents, perspective plan, annual plan, self study report for accreditation etc. It will assist the Vice-Chancellor in all aspects of technical support required. Further, this unit will initiate concurrent evaluation of various programmes implemented in the University. Source of the areas on which PPMC will focus include designing, monitoring mechanisms for various levels of teaching, research and extension activities, evaluation of technologies, research prioritization, impact assessment studies, training of staff on development of sound and winning R&D project proposals, facilitating patenting of technologies, commercialization of technologies etc. The unit will be headed by a faculty who is not below the rank of Professor with appropriate technical and secretarial support whom works directly under the administrative control of the Vice-Chancellor.

4.3 ESTABLISHMENT OF PLACEMENT CELL

Placement of students during their completion of year of under graduate programme or post graduate programme has been turning out be a boon to both to the budding graduates as well as to the organisation which require the technical service of the graduate in organising /conducting activities. In recent years, many organisations like food industries, high tech horticulture, flower industries, micro irrigation companies, Banks, Fertilizer, pesticide and seed companies fresh retail outs, parasite laboratories etc., are looking forward to select their manpower requirement at the campus level itself. The demand for such arrangement is well sought after particularly for horticultural graduates. Therefore, it has been planted to establish a full fledged placement cell at the University head office and at other colleges of the university with necessary human resource and infrastructure to facilitate the process of placement effectively.

4.4 CAMPUS DEVELOPMENT

The proposed additional activities are called for expanding the real estate facilities in the University. The new proposals require new buildings, laboratories, hotels, guest house, vehicles and communication facilities. These facilities will have to be equally distributed in the different campuses of the university. These facilities will have to be gradually developed as and when new programmes are introduced in the University.

4.5 FINANCES

The University, is in infancy just started during 2008, has to create a lot of infrastructure facilities for teaching, research and extension programmes as per the perspective plan in all the campuses, research stations and extension centres. There is also a need to increase human resources both scientific and supporting cadres as per the norms stipulated by Indian Council of Agricultural Research, New Delhi. This has to be done on priority in order to get all University contitient colleges accredited by ICAR. Therefore the university depended heavily on the funding by State Government. However, the faculty will also be encouraged to get the funding through writing the research and extension projects from private and public institutions. Some of measures proposed for raising fund are :



- The fee structure in the University will be revised upwards to bring them *on par* with other professional courses and also to make them realistic in comparison with the cost of education.
- The funds allotment to the University is only from the State Department of Horticulture. In order to attend the requirements, possibilities of getting funds from other state Departments and other agencies like Department of Agriculture Marketing and Cooperation, NHM, NHB, NABARD, DBT, ICAR will be explored.
- Admitting foreign nationals to various educational programmes in the University is an additional strength
- The Research and Extension activities of the University generally provide benefit to the entire region and all the institutions in the region. Thus, the institutions in the region like DCC banks, APMCs, Sugar factories and other public institutions will be persuaded to earmark funds for the University.
- Collaborating with other teaching and research organisations for furthering interest of both the institutions. University is thinking of collaborating with Central research institutions and Non Government Organisations located in Karnataka in particular, and India and abroad in general.
- Raising funds through development of technologies for patenting and commercialisation.
- University planned to charge the modules of training programmes so that they are competitive to get funding from external agencies.
- The production of planting material and Seeds production will be stepped up to increase the self financing of University activities.

**V. TIME FRAME MATRIX OF VISION –2020 AND BEYOND.....****5.1 EDUCATION**

Strategies	Time frame			
	2010 - 15	2015 - 20	2020 - 25	2025 - 30
Strengthening UG Programmes				
Increased emphasis on student-centred learning Provision of access to internet, teleconferencing, e-mail and communication facilities	*	*		
Revision and implementation of intellectually challenging and professionally satisfying and useful curricula to train graduates for scenario across the globe. The emphasis is on skill-oriented instruction and developing critical thinking and analysis	*	*		
Train human resources in core and emerging areas by introducing new UG Programme				
Introduction of inter-disciplinary teaching programmes such as Food Science and Technology, Sustainable Horticulture, Biotechnology, Foods, Nutrition and Dietetics, Post-Harvest Technology at UG level	*	*	*	
Training youth and women to acquire practical skills and enable them to serve as grass root level functionaries or entrepreneurs	*	*	*	
Improving the quality and relevance of post-graduate education by strengthening PG, professional and research programmes				
Revision of courses curricula of all the PG degree programmes. Introduction of new PG degree programmes:	*	*	*	
Master of Horticulture Management		*	*	
Food Science and Technology, Soil Sciences and Water Conservation Engineering, Post-Harvest Technology, Commercial Horticulture, and Plant Biotechnology		*	*	
Establishment Centres of Excellence, Schools of Advanced Studies in which the University has core competence in areas such as 1. School of Crop Improvement 2. School of Resource Management 3. School of Plant Protection 4. School of Basic Sciences 5. School of Social Sciences 6. School of Human Resources Development		*	*	
iv) Increase of inter-disciplinary and collaborative teaching and students research programmes	*	*	*	*



Professional development opportunities for teachers to get exposure to recent advances and teaching capabilities				
Strategies	Time frame			
	2010 - 15	2015 - 20	2020 - 25	2025 - 30
Strengthening UG Programmes				
i) Deputation of teachers both within and outside the country, for training in teaching methodology and Pedagogy	*	*	*	*
ii) Support deputation of teachers to attend advanced training programmes within the country and abroad	*	*	*	*
iii) Promotion of joint research programmes, training and academic exchange programmes between the faculty and foreign collaborators	*	*	*	*
iv) Promote organisation of Summer and Winter Schools, and special academic programmes by highly experienced Teachers	*	*	*	*
Encourage interaction with business leaders and agribusiness trade				
i) Introduction of novel programme of deputing students of UG and PG programme to work in agribusiness establishments for a period of 2-3 months to gain hands-on experience	*	*	*	*
ii) Inviting alumni and leaders in agribusiness to interact with students and faculty	*	*	*	*
iii) Seek and obtain funding for specific research projects and training programmes from agro industries, agribusiness, banks and trade	*	*	*	*
iv) Encourage of Ph.D. students to carryout research work in identified Research and Development organisations in the corporate sector	*	*	*	*
Improvement of student amenities and services				
i) Strengthening academic advisory and support services to enable students to perform better in academic, extra-curricular and co-curricular activities	*	*		
ii) Strengthening student career guidance and placement services by providing additional facilities to existing placements cells to enable them to identify employment opportunities, provide information to students on career guidance and employment	*	*		
Provide international/ global exposure to students and faculty				
i) Provide support for participation in international student exchange and study abroad programme. Encourage foreign students to study in the University		*	*	*
ii) Establish academic exchange and collaborative research and teaching programmes with foreign universities and research institutions	*	*	*	*
vi) Encourage faculty to teach and conduct research abroad by extending sabbatical leave facilities and organise and attend international seminars, workshops and meets	*	*	*	*



Strategies	Time frame			
	2010 - 15	2015 - 20	2020 - 25	2025 - 30
Encourage specialists and academicians to participate in academic, research and extension programmes of the University				
Proposal for placement of teachers, researchers and experts to visit the University on exchange fellowships, sabbaticals	*	*	*	*
Strengthen facilities and services for the visiting faculty such as temporary housing, laboratory and transportation facilities. Simplify administrative procedures to promote such exchange	*	*	*	
ii) Provide basic medical care facilities in all teaching institutions.	*	*		
Promote participation of students in extra and co-curricular activities				
i) Promote further the participation of students in National Service Scheme and National Cadet Corp activities by extending these to all teaching campuses	*	*	*	
ii) Depute students to participate in inter-University youth festivals and meets and national and International events	*	*	*	*
iii) Promote students to participate in University sports, games, literacy and cultural meets conducted at regularly events	*	*	*	
Strengthen basic student services including student housing and recreation				
Invest more on the construction of halls of residence for girl students and foreign students in all the major teaching campuses.	*	*		
Provide additional recreational facilities such as indoor games, pavilion, play fields and synthetic courts for outdoor games in the new college campuses.	*	*		
Promote the increased use of computer and information technology of fostering IT knowledge and international communication	*	*		
Support efforts such as global class rooms by providing video conferencing facilities	*	*		
Technology Parks				
Establish Horticultural Technology Parks	*	*	*	
Establishment of state of art laboratory and teaching halls	*	*	*	
Starting diploma and PG diploma courses	*	*	*	
Introduction of PG and post-matriculation level diploma courses in several areas in each of the faculties to train rural youth, women and economically weaker sections of society. Establishment of Horticultural polytechnic in all the districts of the state with at least one such institution in each district	*	*	*	



5.2 RESEARCH

Objective	Time frame			
	2010 - 15	2015 - 20	2020 - 25	2025 - 30
■ Clonal /seedling selection in perennial fruit trees	*	*		
■ Breeding for dwarfing, regular bearing and spongy tissue free with quality comparable to Alphonso	*	*	*	
■ Breeding sapota of dwarf tree size and fruit quality	*	*	*	*
■ Evolving dwarf banana with slow ripening, greater shelf life and withstanding low temperature, rich in carotene.		*		
■ Breeding banana for fusarium wilt resistance with quality comparable to Ney poovan.	*	*		
■ Breeding dwarf guava with red pulp, soft seeds and red skin colour		*		
■ Breeding spineless pineapple for fruit size and uniformity matching	*	*		
■ Developing blight resistant pomegranate seedless variety with big juicy aril, having pleasant flavour, moisture stress tolerance without fruit cracking and aril browning	*	*		
■ Breeding dwarf gynodioecious types of papaya with good shelf life and high carotene and deep pink colour	*	*	*	*
■ Evolving self thinning Thompson Seedless type grapes for export.	*	*	*	
■ Development of bacterial blight and wilt resistant pomegranate	*	*	*	
■ Development of YLD resistant Arecanut	*	*	*	
■ Development of Ring spot virus resistant Papaya	*	*	*	
■ Development of Murda resistant Chilli	*	*	*	
■ Development of Whitefly resistant Bhendi	*	*	*	*
■ Development of DBM resistant Cabbage	*	*	*	*
■ Development of Katte resistant Cardamom	*	*		
■ Development of Wilt resistant Pepper	*	*	*	
■ Development of root stocks tolerant to water stress, salinity and alkalinity	*	*	*	
■ Exploiting the yield potential of under utilized horticultural crops	*	*	*	*
■ Improvement of presently available varieties/ cultivars and land races suitable to various agro-climatic and crop growing situations for higher yields. The yield levels to be increased at a minimum of 30 per cent over the existing, with sustainability in vegetables, ornamentals and medicinal crops	*	*	*	*
■ Exploitation of hybrid vigor and development of F ₁ hybrids with higher yields with an yield advantage of about 50 per cent in vegetables.	*	*	*	*
■ Evolving high yielding varieties/ hybrids using biotechnological tools resulting in genetically modified vegetables.	*	*	*	*
■ Development of Soft rot resistant ginger	*	*		
■ Breeding indigenous varieties in roses, carnation, gerbera, anthurium etc., with quality on par with exotic varieties	*			



Objective	Time frame			
	2010 - 15	2015 - 20	2020 - 25	2025 - 30
■ Evolving techniques for large scale production and assessing the purity of seeds of improved varieties	*	*		
■ Identification of varieties for problematic soils	*	*		
■ Develop varieties / hybrids for lean and off-season and for polyhouse cultivation (ex: bhendi, peas, capsicum, chrysanthemum, etc.)	*	*	*	*
■ Develop technologies to produce fruits, vegetables, flowers having uniform, size, shape and appearance (colour) to fetch premium price and to become more quality competitive in the international market for increasing exports.	*	*	*	*
■ Develop varieties/ hybrids resistant to various insect-pests, nematodes and diseases	*	*	*	*
■ Developing varieties for exports thus ensuring export promotion and import restrictions	*	*	*	*
■ Production technologies for yield enhancement	*	*	*	*
■ Off season production of commercial mango varieties	*	*		
■ Mechanism of vigour regulation in fruit crops (Ex. Mango)	*	*		
■ Establishment National Research Centres on very important crops	*	*	*	*
■ Identification of pollinations and pollinizers suitable for improving the fruit set and enhance the income to orchardists.	*	*		
■ Developing the appropriate models of substrate dynamics for different crops/ horticultural eco systems	*	*	*	
■ Developing fertigation schedules	*	*	*	*
■ Evolving techniques for high density orcharding	*	*		
■ Standardization of organic farming and bio dynamic farming	*	*	*	
■ Integrated Farming System in Horticulture				
■ Enhancing fruit set control of fruit drop for higher productivity in mango	*	*		
■ Technology for rejuvenation of old orchards for enhancing productivity in fruits	*	*		
■ Fruit crop based cropping systems for efficient land use	*	*		
■ Developing fruit crop based cropping systems for watershed areas	*	*		
■ Development of integrated production strategies in papaya for periurban areas	*	*		
■ Development of integrated nutrient and water management practices for table and wine grapes	*	*		
■ Generating leaf nutrient guides and package of practices in fruits	*	*	*	
■ Developing DRIS in fruits	*	*		
■ To develop integrated nutrient and water management systems involving micro irrigation and fertigation in vegetable, ornamentals and medicinal crops	*	*		
■ Improve labour use efficiency in hybrid seed production in vegetables	*	*		



Objective	Time frame			
	2010 - 15	2015 - 20	2020 - 25	2025 - 30
■ Sustainable production under various cropping systems	*	*		
■ Nutrient use efficiency in cropping system	*	*		
■ Organic production technologies of selected vegetables, ornamentals and medicinal crops	*	*		
■ Integrated nutrient management	*	*		
■ Evolving technologies for sustainable production of horticultural crops under rainfed condition, high temperature and problematic soils	*	*	*	*
■ Mechanism of water, stress, heat and salinity tolerance in vegetable crops	*	*		
■ Developing production technologies under adverse situations like; drought high temperature, saline and problematic soils	*	*		
■ Methodologies for cultivation in non-traditional and degraded lands	*	*		
■ Evolve precision farming schedules for input usage	*	*		
■ Evolve packages, good horticultural practices for commercially important crops	*	*		
■ Develop technologies for optimum use of inputs like water, nutrition, pesticides and other inputs with an integrated approach	*	*		
■ Identification of rootstocks for tree size control sustained productivity under soil biotic and abiotic stresses (ex. grapes)	*	*	*	*
■ Identification of economic injury levels due to pests and diseases to plan optimum dosages of plant protection measures under natural calamities like outbreak of pests, disease epidemics, viral spreads, etc.	*	*		
■ Insect pest forecasting and also pest resistance mechanism to plan spray schedules.	*			
■ Development of online databases and information system for insect pest management	*	*	*	
■ Integrated management of nematodes with biopesticides	*	*		
■ Developing Integrated Pest and Disease Management practices using botanicals, bio-control agents and micro-organisms in vegetables	*	*	*	*
■ Integrated pest, disease and weed management through installing health clinics	*	*	*	
■ Development of maps of diseases and yield loss estimation	*	*		
■ Epidemiology and disease forecasting models for major diseases	*	*		
■ Development and mass production of bio control agents	*			
■ Development and mass production of PGPR for management of soil borne diseases	*	*		
■ Develop Integrated Pest Management and Integrated Disease Management protocols using trap crops, botanicals pheromones, bio-control agents, micro organisms to reduce the pesticide load on the products	*	*	*	*



Objective	Time frame			
	2010 - 15	2015 - 20	2020 - 25	2025 - 30
■ Substrate dynamics in sustaining the productivity levels to ensure efficiency of inputs	*	*	*	*
■ Develop models for pest forecasting	*	*		
■ Pest risk analysis for placement of pesticides to reduce cost of production	*	*		
■ Development of resistance to pesticides to reduce cost of production	*	*		
■ Development of resistance to pesticides by the pests and further resistance mechanisms	*	*		
■ Development of software for disease and pest forecasting	*			
■ Arranging multiplication, certification and distribution of seed and planting material of crops in demand.	*	*	*	*
■ Standardization of propagation techniques for large scale multiplication of identified less known fruit trees	*	*		
■ Micro propagation techniques in rose and other difficult to propagate ornamentals	*	*		
■ Evolving techniques for mass multiplication of genuine and disease free planting material	*	*	*	*
■ Minimize the post harvest losses through – Evolving varieties/ hybrids having higher shelf life and long transportation qualities	*	*	*	*
■ Increasing shelf life by standardizing post harvest treatment and practices	*			
■ Storage studies on organically grown products	*	*	*	*
■ Identification of organism causing post harvest spoilages/ decay and standardizing protocols to prevent the spoilages	*			
■ Evolve varieties suitable for processing	*	*	*	*
■ Evolve technologies for value addition in various forms like RTS, Carbonized drinks, juices, condiments, dehydrated products, canned products, frozen products, etc.	*	*	*	*
■ Horticultural waste product utilization	*	*	*	*
■ Exploitation of mushrooms for bioremediation	*			
■ Assessment of active principles from fruits, vegetables and medicinal crops for providing nutrients/ antioxidants and further synthesis of the same	*	*		
■ Extraction of antioxidant from horticultural wastes	*	*		
■ Reduction of toxic and heavy metal contamination in soil and water	*	*		
■ Identification of scavenger plants for reduction of urban effluents	*			
■ Establishment of Small farmers Agri-Business consortium	*	*		
■ Market intelligence and price forecasting	*	*	*	*
■ Promotion of contract / corporate farming	*	*		
■ Establishment of crop based associations	*	*	*	*
■ Promotion of buyback arrangements	*	*	*	



Strategies	Time frame			
	2010 - 15	2015 - 20	2020 - 25	2025 - 30
■ Export performance of fresh and processed produce for direction and quantum	*			
■ Economics of horticulture based farming systems	*			
■ Economics of peri urban horticulture	*			
■ Total factor productivity analysis	*			
■ Information system for germplasm	*	*	*	*
■ Stability model for vegetable research	*			
■ Bioinformatics resources for horticultural crop research	*	*		
■ Developing and testing of e-learning modules for horticultural crops	*	*		
■ Bringing mechanisation in Horticulture	*	*	*	



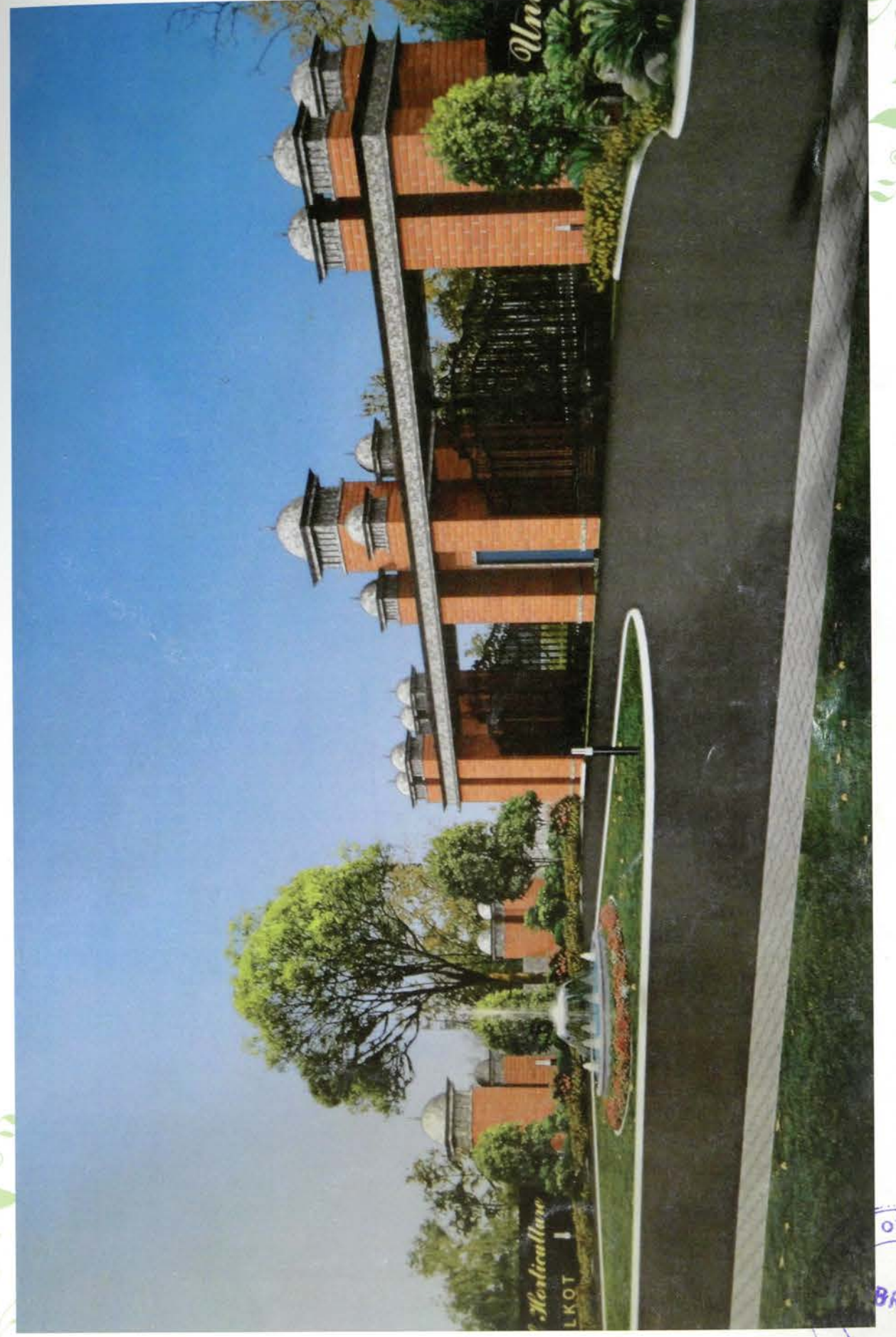
5.3 EXTENSION

Strategies	Time frame			
	2010 - 15	2015 - 20	2020 - 25	2025 - 30
Achieve high rate of adoption of new and relevant technologies by the farmers				
Integrated Farming Systems approach using participatory method with full involvement of research scientists and extension workers	*	*	*	
Special drive in organizing training programmes to improve skills and methods to reduce drudgery of farm women (performing 80 per cent farm operations though account for only 50 per cent of rural population)	*	*	*	*
Technology assessment and refinement to make it feasible for easy adoption by small and marginal farmers	*	*	*	
Agenda for District Horticultural Advisory Centres (DHACs)	*	*		
• To develop horticultural communication management system to respond to new	*	*		
• Information needs of farmers	*	*		
• Modernization of press	*	*		
• Publication of monthly journals in local language	*	*	*	*
• Publication of diagnostic manual for field level workers	*	*		
• To establish and strengthen the centres with full fledged audio-visual aids van and transport facilities	*	*		
• Establishment of Technology Information Museum Centre for Horticulture Information and Technology (CHIT)	*	*		
Single window approach through establishment of Centre for Horticulture Information and Technology (CHIT)	*	*		
Establishment of zonal level training institutes/ technology parks at ZHREC.	*	*		
Distance Education to extend the technology through more number of TV channels	*	*		
Establishment of an exclusive production unit at University Headquarters to cater to the needs of farming community in different agro climatic zones by developing suitable programmes for Television, Radio and Video.	*	*		
Working out appropriate methodologies for technology transfer based on specific and emerging needs and implementing the same	*	*	*	*
■ Establishment of centre for value addition and market hed extension	*	*		
■ To start farmers field schools	*			
■ Mobile Advisory System	*			
■ Identify technological gaps	*	*		
■ Efficient transfer of technology for ensuring adoption	*	*	*	*
■ Impact assessment of technologies in socio metric and economic modes for further refinement with PRA	*	*	*	*



5.4 LIBRARY AND INFORMATION SERVICES

Strategies	Time frame			
	2010 - 15	2015 - 20	2020 - 25	2025 - 30
Computerization of the main library, internet connectivity, Establishment of LAN	*	*		
Computerization of college libraries and major research stations,	*	*		
Establishment of Wan and Internet connectivity at all colleges and research stations	*	*		
Strengthening book collection at all colleges and research stations	*	*	*	
Digitizing all dissertations and other university documents	*	*	*	
Establishing students computer labs	*	*	*	
Computerization and servicing	*	*	*	
Service through UNILINK to all other universities of the state	*	*		
Provision of statistical Analysis package to all the Colleges and Research Stations	*	*		
Improvement of library and information access facilities by computerizing library operations	*	*		
Inter-library linkages through wide area networking	*	*		



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