

## RESUME

### Dr. A. R. Pathak

Director of Research & Dean, P. G. Studies

Directorate of Research

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### Vision

My vision is to see farmers of Gujarat and rural India prospers with the help of cutting-edge technology in agriculture and allied field.

### Mission

- Provide dynamic leadership in the area of agriculture education, research and extension.
- To make university internationally acclaimed institute by creating it a knowledge hub in agriculture and allied fields.
- Development of excellent human resources and innovative technologies.
- Search of new frontiers of Agricultural Sciences.

### Academic Qualifications

Sr. No.	Examination	Subject	Year	University or Institution	Class
1.	Ph. D.	Plant Breeding & Genetics	1987	Gujarat Agricultural University, SKNagar	3.85/4.00
2	M. Sc. (Agri.)	Plant Breeding & Genetics	1978	G. B. Pant University of Agril. & Tech., Pantnagar	Fist. Dist. (4.0/5.00)
3	B. Sc. (Agri.)	All Subjects	1970	Sardar Patel University	First

### My Best Achievements

➤	<b>Rice Variety Gurjari</b>
➤	<b>Rice Variety GR-13</b>
➤	<b>Castor hybrid GCH-5</b>
➤	<b>Modified method for maintenance of pistillate line</b>

**Date of Birth** : 25-10-1949

**Native** : At & Post : Dholi, Ta. Dholka, Dist. Ahmedabad, Gujarat

## Experience

Total : More than 38 years

(As Director of Research - 04 years, As Professor & its equivalent cadre – 15 years)

Sr. No.	Name of Post	Name of Institute	Period for which held From / To	Nature of work
1	Director of Research & Dean, Faculty of P.G. Studies	AAU, Anand	Dec., 2005 to onwards	To act as Head of Research of the University. Planning, execution and implementation of research programmes of various faculties in the university. Co-ordination of research with ICAR, State and other agencies.
2	Research Scientist (Rice)	GAU/AAU Nawagam	Jan., 1996 to Dec., 2005	In-charge of Rice research & development in the state.
3	Research Scientist (Castor & Mustard)	GAU SKNagar	June, 1991 to Dec., 1995	In-charge of Castor & Mustard research and development work in whole state.
4	Assoc. Res. Scientist (Pulse)	GAU SKNagar	Oct., 1983 to June, 1991	As a Pulse Breeder, improvement of pulse crops.
5	Assistant Research Scientist	GAU SKNagar	Oct., 1974 to June, 1981	As a Cotton Breeder improvement of closed ball types for waged tract as well as work especially of hybrid cotton for irrigated areas of middle Gujarat.
			June, 1981 to Oct., 1983	Pulse Breeder
6	Agril. Officer	GAU Navsari	May, 1971 to Oct., 1974	Involved in breeding of rabi cotton types for Kakrapara command area. June, 1971 to Oct., 1974 - In DR Office
7	Jr. Research Assistant	Institute of Agril., Anand	Aug., 1970 to May, 1971	Involved in Animal Nutrition Research

## Foreign Visit

●	Sweden	-	Lund University for collaboration of Food Technology Research and Student/Staff exchange programme.
●	USA	-	Washington D.C.; Raleigh N. C.; Davis, C. A. - for Confined Field Trials Training Workshop.
●	Philippines	-	IRRI for hybrid rice training

## During the entire period of my scientist's career, I was involved in Research, P. G. Teaching and Extension Education activities

### Research

- I started my career as Jr. Research Assistant in Animal Nutrition Department and involved in Feed Analysis.
- I was selected as Agriculture Officer in Department of Agriculture, GoG and involved in Cotton Research Work.
- As a Cotton Breeder at GAU, Viramgam, associated with Improvement work of *Herbaceum* close ball cotton. Also involved in breeding work of *Hirsutum* cotton at Talod.
- I was shifted to Sardarkrushinagar as Pulse Breeder (Assistant Research Scientist & Associate Research Scientist) involved in improvement of clusterbean, mungbean, cowpea, mothbean and early pigeonpea.
- As a Research Scientist (Castor and Mustard) responsibility of implementation and execution of research & seed production work in whole state. Formulation of technical programme of all discipline, coordination and implementation. Breeding work of both the crops. Worked for popularization of modified method of seed production of pistillate line of castor ensuring high genetic purity in hybrid with less roughing.
- As a Research Scientist (Rice) responsible for implementation, coordination and execution of research work of breeding and other disciplines and breeder seed production. Hybrid breeding work in rice in general and development of water saving technologies and resistant varieties against pest and diseases in particular.

## Research Achievements


I was one of the contributors for development/release of following crop varieties.

Sr. No.	Crop	No. of Varieties	Variety & year of release
1	Cotton	1	<b>G.Cot.-13 (1981) :</b> Tested as 53-3-1; 15% & 10% higher yield over kaliyan & V-797. Semi open ball type reducing cost of shelling.
2	Mungbean	2	<b>K-851(1984) :</b> Early maturing, synchronous maturity YMV & LB tolerant, Bold seed. <b>GM-3 (1993):</b> Early maturing, YMV tolerant, suitable for summer.
3	Clusterbean	2	<b>HG-75 (1984) :</b> High yielding over Malosan, Profusely Branched, Mid-early, Gum content 32%. <b>GG-1 (1990) :</b> Developed through mutation of Kutch-8, Resistant to BLB; 20% higher yield over Maloson and 12% over HG 75 pods long.
4	Pigeonpea	3	<b>BDN-2 (1983) :</b> Wilt resistant, 15% higher yield over T-15-15, pods medium black streaks, mid-early maturing, NDT types. <b>GT-1(1990) :</b> Developed through hybridization of T-15-15 x Pusa Ageti, DT type, early maturing, White bold seed, synchronous maturity. <b>GT-3 (1998):</b> White seeded wilt resistant, Developed through hybridization of T-15-15 x BSMR-3, Bold seeds.
5	Cowpea	1	<b>GC-3 (1990) :</b> Developed through hybridization of Pusa Falguni x Blacy eye-7, Long pod, black eye spot on hilum, Early maturing.
6	Chickpea	1	<b>GG-2 (1999) :</b> Selection from ICRISAT segregating material. Tolerant to salinity, Bold seed, early maturity, Resistant to stunt virus and wilt.

7	Rapeseed	1	<b>GS-1 (1992) :</b> 20 % higher yield over Patan local, Long siliqua, early maturity.
8	Mustard	1	<b>GM-2 (1995) :</b> Selection from local material, Bold seeded, 12 % higher yield over GM-1, Siliqua long with 7 - 8 seeds.
9	Castor	3	<b>GC-2 (1993) :</b> Triple bloom, 15% higher yield over GC-1, wilt tolerant, intersperse type, capsule medium with spine. <b>GCH-5 (1995) :</b> Hybrid developed by Geeta x SH-72, Long primary spike, Capsule with Semi spines, Mid late, Wilt resistant, Seed bold. <b>GCH-6 (2000) :</b> Hybrid developed by JP-65 x JC-291, Resistant to root-rot, Spike condensed capsule with spiny.
10	Rice	10	Gurjari (2000); GR-8 (2001); Dandi (2001); GR-9 (2002), GR-104 (2002); GR-12 (2004); Ashoka 200F (2005); AAUDR-1 (2007); GR-13 (2009)
<b>Total</b>		<b>25</b>	

Fourteen Technologies on Castor and Rice on agronomical and plant protection were developed under my guidance which includes management of wilt; Castor based cropping sequences; Pest management in Castor, pest management in Rice; Rice based cropping sequence; Disease management in Rice; WBPH and leaf folder management in Rice; Water saving techniques like SRI; Organic farming in Rice etc.

#### **Rice varieties developed and released for farming community during last decade**

	<ul style="list-style-type: none"> <li>• Moderately resistant against WBPH, SB &amp; LF</li> <li>• Moderate resistant against major diseases viz; BLB, SR &amp; GDC</li> <li>• Yield potential 8000 kg/ha</li> <li>• Widely grown in the State</li> </ul>
<p><b>Gurjari</b></p>	



**Gujarat Rice 7**

- Resistant against major diseases viz; BLB & Blast
- Moderately resistant against LF, WBPH & SB
- Yield potential 6000 kg per hectare



**Gujarat Rice 8**

- Extra early maturing in 75 days
- Suitable for rainfed condition
- Yield potential 2000 kg/ha







**Dandi**

- Suitable for saline-alkaline condition of Bhal and Coastal belt
- Yield potential 5000 kg/ha
- Resistant/moderately resistant against major pests & diseases



**Gujarat Rice 9**

- Suitable for drilled rainfed condition
- Higher yielder than Sathi, 34-36 and GR-5 to the tune of 25-35 %

 <p><b>Gujarat Rice 104</b></p>	<ul style="list-style-type: none"> <li>• A scented variety possess It possess strong aroma than GR-101 &amp; Narmada</li> <li>• Resistant against leaf &amp; neck blast</li> <li>• Moderately resistant against BLB and WBPH</li> <li>• 25 – 30 % yield superiority over checks</li> </ul>
 <p><b>Gujarat Rice 12</b></p>	<ul style="list-style-type: none"> <li>• Moderate resistant against major pests &amp; diseases (Multi resistant)</li> <li>• Yield potential 6000 kg/ha</li> <li>• Possess Kolam type grain</li> <li>• Early high yielding, long slender grain</li> </ul>
 <p><b>Ashoka 200F</b></p>	<ul style="list-style-type: none"> <li>• Suited for rainfed drilled (upland) rice growing area</li> <li>• Exhibited 16, 13 and 40 per cent yield advantage over GR-8, IRTP-10800 and Hira</li> <li>• Matures in 85-90 days</li> <li>• Grain yield of 1500-2000 kg/ha</li> <li>• Long slender grains</li> </ul>
 <p><b>Anand Drilled Rice 1</b></p>	<ul style="list-style-type: none"> <li>• Gave 21.7 % and 26.5 % higher yield over GR-5 and GR-9</li> <li>• Early maturing, drought tolerance, with good grain quality</li> <li>• Recommended for rainfed / drilled rice growing conditions</li> </ul>



**Gujarat Anand Rice 13**

- **A fine grained variety with an overall yield increment of 18.4 % over check variety GR 11.**
- **Multi resistant to pests and diseases**
- **Midlate maturing in 130-135 days**

### **As a Director of Research**

- ✓ Formulate research policies and programme of the University.
- ✓ Prepare an Annual Development Plan of University for education, research and extension education keeping in the view the Govt. Policy, market requirement and feed back from farmers.
- ✓ Established Regional Research Station, Centre of Excellence on Biotechnology, Centre for Organic Farming.
- ✓ Provides leadership in the field of agriculture research and allied sciences, on the mandated crops, new areas leading to cutting-edge research.
- ✓ Responsible for initiation, organization, coordination and conduct of research programme inclusive of P.G. research in the University.
- ✓ Exercise broad administrative control over funds allotted for research programme and budget estimation, to act as a liaison officer for Govt. of India, Govt. of Gujarat, ICAR and Central Institute as well as NGO and Private Agencies.
- ✓ New Research mandate for Sanand, Thasra and Devgadhbaria.
- ✓ Soil Health Card.
- ✓ Setup Automated Weather Stations at Research Station one each in district.
- ✓ Equipped eleven sub-stations with Soil Testing facility.
- ✓ Strengthened Tissue Culture Lab for mass multiplication of date palm, jatropha and sandal.
- ✓ Pesticide Residue Lab strengthened for NABL accreditation
- ✓ Preparation of Annual Report of University.
- ✓ Statutes for University
- ✓ PG Board of Studies and Research Council, its formation and meeting conduction.

## Memorandum of Understanding (MoU)

As Director of Research, following MoU were signed for exchange of research and technologies for Public Private Partnership (PPP)

- National Dairy Development Board, Anand.
- Jain Irrigation, Jalgaon.
- Erasmus Mundus External Cooperation Window India (EM-ECW Lot 15), Lund University, Sweden.
- The Department of Science & Technology of Guangxi Zhuang Autonomous Region, China.
- Zydus Pharmaceuticals for Veterinary.
- D.D. Institute of Technology, Nadiad for Nanotechnology research.
- ✓ **Implemented new projects during last 4 years - 214 (worth Rs.68 crores)**

State Plan	ICAR & GOI	NAIP	RKVY	NHM	GOG and Private Organization	Total
39	49	04	14	11	125	242

- ✓ **Seed production** : Increased seed production capacity of the University by about 3 times from **225 t** to **640 t** (2008-09).
- ✓ **University Technologies Recommended : Total – 282** : I was instrumental in guiding, providing necessary facilities and inspiration to scientists for developing technologies for farmers of Middle Gujarat.

Crop Improvement	27	Crop Production	95
Plant Protection	45	Dairy & Engineering	42
Animal Production	39	Animal Health	24
Social Science	10		

- ✓ **Enhanced University Income** : In 2004-05 from **Rs.2.82 crore** to **Rs.5.66 crore** during 2008-09.
- ✓ **New Land Development** : About **11-12 ha** at Arnej, Navli Farm, HF Farm and RRS.
- ✓ **New Farm Acquired and Developed** : Kakanpur (**20.47 ha**), Seed Farm, Derol, Godhra (**26 ha**).
- ✓ **New Farm under Development** : **Total 206 ha** at Sansoli, Nenpur, Vaso, Khambholaj, Meenawada, Ram-Na-Muvada and Jabugam.
- ✓ More than 135 ha land area covered under micro irrigation.
- ✓ **PG Teaching** :
  - **Started new courses: Biotechnology (Plant, Animal and Food), Poultry Breeding, Veterinary Extension, PG in FPT, PG Diploma in AIT, PG in IABM.**
  - **Course curricula as per IV Deans Committee.**

## Teaching

As a P. G. teacher I have guided students for their M.Sc. (Agri.) & Ph. D. degree as given below :

Completed		At present	
M. Sc.	: 06	M. Sc.	: 05
Ph. D.	: 03	Ph. D.	: 02

The Thesis Research for both the degree students were planned and executed on various aspects such as:

- ✓ Genetic analysis of quantitative and qualitative traits for clusterbean, cowpea, pigeonpea, mungbean, rice and castor.
- ✓ Creation of variability through mutagenesis in clusterbean, cowpea and mothbean.
- ✓ Inheritance of wilt in castor.
- ✓ Molecular characterization for WBPH in rice.
- ✓ Male sterility use in rice.
- ✓ Drought resistance in rice.

## Extension Activities

- ✓ Delivered lectures in training programmes organized by Govt. and Semi-Govt. Agencies.
- ✓ Guided farmers for their problems on rice, castor, pulses, mustard and other crops.
- ✓ Imparted training during pre-seasonal training, monthly and bi-monthly workshop-cum-training programmes for extension officers.
- ✓ Participated in Farmer's Fair, Krishi Mela, Farmer's Meet and delivered lectures.
- ✓ Prepared literatures in the form of folders, booklets, leaflets, notes, etc for the benefit of farmers.
- ✓ Transfer of technology through TV and Radio talk.

## HRD Activities

As a Director of Research, I have made all efforts to develop the human resource in the University in following areas.

1. XIII Annual Review Meeting of Agro Advisory Services of NCMRWF and IARM of Economic Impact Assessment of Agro Advisory Services on 25-27 October, 2004.
2. Seminar on Food Safety, Food Loss and Standards relevant to Dairy Industry on 23-24 April, 2005.
3. National Seminar on "Monsoon-2005- Ancient and Modern Techniques" on 20<sup>th</sup> June, 2005.
4. Seminar on Fermented Food in 22-23 July, 2005.
5. Second International Conference on Fermented Foods on 17<sup>th</sup> December, 2005.
6. XII Annual Animal Nutrition Conference on Technological Intervention in Animal Nutrition for Rural Prosperity during 7-9 January, 2006.

7. Seminar on “Opportunities for graduates in Globalization for Agriculture, Dairy Science and Veterinary Students” on 11<sup>th</sup> January, 2006.
8. Seminar on Opportunities and Challenges for Agriculture Sector in Globalization on 19<sup>th</sup> June, 2006.
9. Training on “Analytical methods of soil, water, manures and pollutants in agriculture” during 1-2 and 7-8 August, 2006.
10. National Dairy Judging Contest in October, 2006.
11. Dairy Quiz Contest-2006 in October, 2006.
12. Workshop on “Plant Variety Protection” organized on 15<sup>th</sup> November, 2006.
13. Laboratory training on “Aonla Processing” on 16<sup>th</sup> December, 2006.
14. Interface meeting on “Popularizing Biocontrol Problems and Perspective” on 17<sup>th</sup> February, 2007.
15. Workshop cum Training programme on “Soil Testing” during 8-9 February, 2007.
16. Training programme for Industry on “Synbiotic Functional Dairy Products – Novel business Prospects for Dairy Industry” during 29<sup>th</sup> January to 3<sup>rd</sup> February, 2007.
17. Training programme for Academia on “New Horizons in Promoting Human Health and Well-being using Synbiotics” during 12-17 February, 2007.
18. Winter School on “Molecular Detection of Seed Borne Diseases and Seed Health Status as Global Prospective” during 12<sup>th</sup> December, 2006 to 1<sup>st</sup> January, 2007.
19. Winter School on “Challenges in Poultry Farming” during 24<sup>th</sup> January to 13<sup>th</sup> February, 2007.
20. Seminar on “Bio-diesel for sustainable growth” on 18<sup>th</sup> August, 2007.
21. Seminar on “Sustainable Agriculture for Poverty Eradication” during 14-28 September, 2007.
22. Seminar on “Stakeholders interface on Medicinal and Aromatic Plants” during 29-30 October, 2007.
23. National Symposium on “Horizons of Veterinary Public Health in Augmenting Veterinary, Medical and Environmental Health” during 29-30 November, 2007.
24. Third International Conference on “Fermented Foods, Health Status and Social Well-being” during 14-15 December, 2007.
24. National Seminar on Micro and Secondary Nutrients for Balanced Fertilization and Food Securing during 11-12 March, 2008.
26. International Symposium on “Agrometeorology and Food Security” during 18-21 February, 2008.
27. Training Course on “Advanced Laboratory Chemical Quality Assurance in Dairy Industry” during 29<sup>th</sup> February to 9<sup>th</sup> March, 2008.
28. Seminar on “Good Agricultural Practices” during 17<sup>th</sup> March, 2008.
29. National Seminar on “Innovation in Food Processing and Entrepreneurship Development” during 9-10 February, 2009.

## Awards and distinction

- ✓ Sardar Patel Agricultural Research Award 1995-96 for Guar variety Guj. Guar-1.
- ✓ Sardar Patel Agricultural Research Award 1996-97 second award for Mustard variety GM-2 as a Main worker.
- ✓ Sadvichar Pariwar Research Award for cereal by GAAS for 1998 for development & release of high yielding, WBPH resistant rice variety “**GURJARI**”.
- ✓ GSFC Science Foundation award for Hybrid Rice Project as outstanding project.
- ✓ Recipient of “e-governance” award of Department of IT, Govt. of India.
- ✓ Sadvichar Pariwar Research Award for cereals by GAAS for 2002 for release of multiple resistant, high yielding rice variety GR-7.

## Participation in International & National training/workshop/symposium/seminars conference in India and abroad.

### (A) Abroad

- ✓ IRRI Philippines training on Hybrid Rice from March, 2000 to April, 2000.
- ✓ Lund University, Sweden for collaboration of PG research and teaching from September, 2007.
- ✓ Confined Field Trial of Transgenic, USA from 7<sup>th</sup> to 14<sup>th</sup> June, 2009.

### (B) National

- ✓ Workshops attended (ICAR- Cotton, Pulses, Castor, Mustard & Rice) : **30**
- ✓ International symposiums / seminars : **05**
- ✓ National seminar / symposium / conference : **10**
- ✓ Review & Planning meeting : **04**

## Books / Paper published

- Chapter in Books : **04**
- Research Papers : **45 (33 National + 12 International)**  
**(As per Annexure-I).**
- Paper presented in Conferences : **29**

## Transfer of Technology

• Popular Articles	>30
• T. V. Programmes	12
• Radio Talks	>10
• Folder / Leaflets	12
• Lecture delivered	>50
• Subject Matter Specialists	>50
• FLD's	>100

## **Members/Experts:**

- (i) Member, Board of Management, Anand Agricultural University, Anand.
- (ii) Member, Management Committee, Directorate of Medicinal & Aromatic Plants, ICAR, Boriavi.
- (iii) Member, Board of Management, Gujarat State Seed Certification Agency, Ahmedabad during 1998 to 2003.
- (iv) Member, Governing Board of Gujarat Organic Product Certification Agency, Govt. of Gujarat, Gandhinagar.
- (v) Member, Executive Committee, National Horticultural Mission, Gujarat State.
- (vi) Member, State Varietal Release Committee, Gandhinagar.
- (vii) President, Gujarat Association for Agricultural Scientists of Anand chapter.
- (viii) Member Secretary, Research Council, Anand Agricultural University, Anand since inception of AAU.
- (ix) Member, Academic Council, AAU, Anand.
- (x) Member, Extension Council of AAU since 2005.
- (xi) Member, Academic Council, of Anand Agricultural University.
- (xii) Member of various Committees AGRESKO (Eight).
- (xiii) Member, Academic Council, GAU for three times i.e. total of 6 years.
- (xiv) Member, Research Council, GAU, S.K. Nagar for six years.
- (xv) Member, Centralized Admission Committee of SAUs of Gujarat.
- (xvi) External Examiner at P.G. level in various SAUs of the country.
- (xvii) Organized a national level seminar on Agricultural Finance in October, 1997.
- (xviii) Member, Advisory Board, GAU Research Journal, an official publication of Gujarat Agricultural University, Gujarat State.
- (xix) Chairman, Quarter Allotment Committee of AAU, Anand.
- (xx) Member, Building Construction Committee of AAU, Anand.
- (xxi) Member, P. G. Board of Studies of GAU during 2001 to 2003.
- (xxii) Chairman, P. G. Board of Studies of AAU since 2006.
- (xxiii) Coordinator, 33<sup>rd</sup> Annual Vice Chancellor's Conference, IAUA, organized conference during December, 2008.

- (xxiv) Member in Committee for scrutinization of R & D of seed companies for registration of crop hybrids (2004-2005), Govt. of Gujarat.
- (xxv) Convener, Plant Breeding & Genetics Sub-committee of Agresco from 2004, Gujarat Agricultural University.
- (xxvi) Acted as Refree for Indian Journal of Agriculture Science during 1991onwards...

**Expert in selection/recruitment committees of Scientists etc.:**

1. Expert, Agricultural Scientists Recruitment Board, New Delhi.
2. Selection Committee Member for Professor (Direct recruitment) and for assessment of Assistant Professor for promotion under Career Advancement Scheme, Junagadh Agricultural University, Junagadh.
3. Selection Committee Member for Assistant Professor (Plant Breeding), Junagadh Agricultural University, Junagadh.
4. Selection committee Member for all teaching cadre (career advancement scheme as well as direct selection) for Anand Agricultural University, Anand.
5. Chairman, Selection Committee for Research Associate/ Senior Research Fellow/ Junior Research Fellow for various projects running at Anand Agricultural University, Anand.
6. Chairman, Selection Committee for Laboratory Technician, Supporting Technical Staff of Anand Agricultural University, Anand.

**Life Membership in scientific organization/Association:**

1. Life member of Indian Society of Genetics & Plant Breeding.
2. Life member of Association of Rice Research Workers, CRRI, Cuttack.
3. Life member of Gujarat Association for Agricultural Scientists.
4. GAU Research Journal.

## **Future planning**

### **Education**

- Strengthening of education programmes of the University by establishing new College of Biotechnology (BT), Nano Technology (NT) and courses converging IT/ BT / NT / College of Agri. Business Management.
- ISO certification of all present and new colleges.
- Development programme keeping focus on capacity building through market driven courses like IPR, Agril. Informatics and prepare agriculture entrepreneurship and allied fields.
- ICT based curriculum techniques.
- Online teaching for clients flexibility of time.
- More Hands-on/practical training experience at model plant, factory, field crops, fruits and vegetables.
- Open and distant learning (ODL).
- Case study method.
- Project preparation and implementation method.
- Establishment of short term programmes on tissue culture, food technology, natural resource management, bio-informatics, energy technology and marketing etc.
- Seminars.
- RAWE / Internship / Implant Training.
- Collaboration with International Institute for student as well as faculty exchange for dual degree.

### **Research**

- To develop environment friendly / eco-friendly technologies and bridge the yield gap of different crops with that of USA / China and other countries.
- Commodity competitiveness.
- Quality matching international requirement.
- Contractual Research with Agro-based industries.
- Cutting age technology for major crops of south Gujarat.
- Post-graduate research on solving industrial problems.
- Establishment of Centre of Excellence on Value Addition, Agro-Waste Management etc.
- Strengthening existing research programmes of the university. The area is bestowed with Sugarcane, Paddy, Cotton, Fruits, Vegetables, hence technologies and value addition to be given top priority.
- Natural resource management for managing secondary salinization and better utilization of precipitate. Cropping sequences including floriculture and horti-silvi-fisheries, integrated farming system.

### **Extension**

- Focus on satellite teleconferencing and IT based system.
- 24 x 7 Community Radio broadcasting Farmer's Programme.
- Demonstration of ITK based technology for the benefit of farmers.
- Production and distribution of quality seeds to the farmers.
- Strengthen linkages between University and line departments.