

SKUAST of Jammu

Vision-2030



**SHER-E-KASHMIR
UNIVERSITY OF AGRICULTURAL
SCIENCES AND TECHNOLOGY OF JAMMU (J&K)**

An institution for sustainable agriculture for food and nutritional security

SKUAST of Jammu

Vision 2030



**SHER-E-KASHMIR
UNIVERSITY OF AGRICULTURAL
SCIENCES AND TECHNOLOGY OF JAMMU
CHATHA, JAMMU-180009, J&K (India)**

An institution for sustainable agriculture for food and nutritional security

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Sher-e-Kashmir University of Agricultural
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Preface

Agriculture is the way of life for more than 70 per cent population in Jammu and Kashmir state. It plays a very important role in the economic and ecosystem stability, food and household security as well as contributes in employment generation. Although, it occupies only 52 per cent of state arable land with predominance of 74 per cent rainfed but contributes 70.7 per cent to its total food production. There is a vast scope to enhance productivity and production in the decades ahead to meet the anticipated demands, which requires paradigm shift in generating science based technologies for holistic development in this Himalayan region. The varied agro-climatic conditions support a variety of agricultural and horticulture crops, besides a large livestock wealth. However, there still exists a wide gap in achieving self sufficiency in food grain production in the State.



Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu is mandated to produce quality human resource as well as to address the basic, strategic and applied research needs in agriculture and applied fields. Being, just only a decade old institution, SKUAST-Jammu has performed to the best of its capacity in serving the state with regard to generation of training human resource, research and technological innovations in agricultural and allied sectors and has made sincere efforts to achieve excellence in developing technologies and making scientific interventions for achieving higher levels of production and productivity to realize at least 4 per cent growth in state agriculture. Innovative techniques have been developed for improving production and quality of fruit crops as well as livestock products. Several useful and cost effective technologies have been developed and recommended for their adoption on the farmers' fields in fruit culture, floriculture, olericulture, veterinary and animal husbandry sciences, which are economically viable, socially acceptable, technologically feasible and are area specific and have direct relevance to marginal and small resource poor farmers. In view of the severe shortage of pulses, oilseeds, vegetables and other crops are being promoted in different micro-climatic situation viz. low, middle and high hills which will enhance per unit productivity and income apart from sustaining the natural resources. University is aiming to work on developing elite varieties or hybrids with resistance to multiple stresses through conventional breeding, pre-breeding

and bio-technological tools, conservation agriculture, high- tech horticulture comprised of micro-irrigation, sprinkler and drip system, integrated farming system, Preparedness for climate change, global warming and resilient agriculture, improving feed utilization efficiency, adopting better reproductive strategies and improving health coverage based on newer generation, biotechnological vaccines and drugs, etc.

In view of changing scenario, emerging opportunity of research, new Govt. policies and broad based mandate of the University, the Vision 2030 has been prepared. This document is a humble effort to identify opportunities, set goals and devising strategically framework to attain the goals. With the dedication and motivation of the University staff, SKUAST-Jammu aspires to accomplish the mission positively. The University is also committed to blossom farmer's field with its research results so that the interest in farming is rejuvenated and farmer's confidence in agriculture is restored. I appreciate the efforts of Prof. Deepak Kher, Project Planning & Monitoring Officer for preparing this important document.

Jammu



(Dilip K. Arora)

Vice-Chancellor, SKUAST-J

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Agriculture Scenario

Agriculture will have to be in the centre of the national priority for meeting our ever growing needs of food, nutrition and household security, which in India's context, is an integral part of the national security. Agriculture will have to change to achieve better than the best. If agriculture has not attended immediately, it would aggravate hunger, poverty and disparity, leading to social and unrest conflicts. Therefore, we have to prepare like a war to fight against hunger, poverty, malnutrition and unemployment and this war has to be won for peace, prosperity and tranquillity with the much needed balanced and harmonized inclusive agriculture.

The country has started its journey from nearly 50 million tonnes of food grains during 1950-51 to a production of about 242 million tonnes during 2010-11 which is a record production till date. Out of total food grain production, Rice contributes more than 95 million tonnes, wheat 86 million tonnes and pulses 18 million tonnes. Similarly the production of oilseeds, fresh fruits, milk, eggs and fish witnessed the highest production during the year. Presently, vegetables occupies an area of 7.98 million hectares with the annual production of 133.74 million tonnes. The livestock population in India has increased from 292.8 million in 1951 to 529.7 million in 2007, which includes 199.1 million cattle, 105.3 million buffaloes, 71.5 million sheep, 140.5 million goats, 11.3 million pigs, 0.6 million horses and ponies, 0.6 million mules and donkeys, 0.5 million camels, 0.1 million yaks, 0.26 million mithun besides 489.0 million poultry. Presently the country is producing 112.5 million tonnes of milk, 59.8 billion eggs and 6.3 million tonnes of meat. Globally, the country produces 25 per cent of total pulses, 22 per cent of sugarcane, 21 per cent of rice, 12 per cent of wheat and 16 per cent of milk. Rice and wheat together produces nearly 33 per cent of total global production which has brought in sense of self- respect, confidence, pride and honour to country. Globally, India ranks: No. 1 in production of pulses, tea, jute and milk; No. 2 in production of rice, wheat, maize, sugarcane and cotton; No. 3 in production of cereals. India continues to be the second largest producer of fruits and vegetables contributes about 12.40 per cent and 13.30 per cent to the total world fruit and vegetable production, respectively. Also, the country ranks in population of cattle, buffalo at No. 1, goat at No. 2 and sheep at No. 3. This production is coming with the share of 2.3 per cent of global land, 4.2 per cent of water resources and 11 per cent of arable land which supports 18 per cent of world's population. The increased farm production has enabled the agriculture sector to register the encouraging growth rate of 6.6 per cent during 2010-11.

The state of Jammu & Kashmir comprising of extreme western sector of Himalayas occupies almost a central position in the continent of Asia. It lies in the North of Indian Union and extends from 32°-17' to 37°-50' N Latitude, from 72°-40' to 8°-30' E Longitude. The state forms a transitional region of diverse physical features between the week monsoon zone of Punjab and cold arid dry zone of Tibet. Jammu Division is located between an altitude of **300 meters** and 4200 meters above Mean Sea Level (MSL). Ranbir Singh Pura in Jammu district and Sumcham (Padder) in Doda district are the lowest and highest permanent settlement points for human population. The outer plains and outer hills of Jammu province (Jammu, Kathua, part of Udhampur and Rajouri districts) are grouped in this zone. The altitude ranges from 215-360 meters. The normal precipitation of the zone is 1000 mm. The area under this region represents the fringe of level lands in continuation with Punjab plains and touches the Jammu hills. Jammu region on the basis of altitude and climate has been divided in to three zones. i. e., Sub-tropical, Intermediate and Temperate zones.

Jammu & Kashmir being the 11th largest state accounting for 3.20 per cent of total area of the country with a geographical area of 103187 sq. km situated at an altitude variation of 300-5400 meters above mean sea level constitutes about 67.5 per cent of North-Western Himalayan region. Agriculture occupies an important place in the economy of the state. The share of Agriculture and allied sectors in the Gross State domestic Product (at 1999-2000 prices) for the year 2010-11 as per Advanced estimates stands at 20.59 per cent. On the other hand nearly 70 per cent of the population in the state derives its livelihood directly or indirectly from the agriculture sector. In spite of increase in food grain production from 4.52 lakh tonnes in 1950-51 to 15.21 lakh tonnes, the demand is still deficit by 38 per cent. The deficiency in cereals is nearly by 40 per cent, 70 per cent each in pulses and oil seeds and 30 per cent in vegetables. The State still meets its demand by procuring large quantities from other states even after 6 decades of our independence. The state is also confronted with negative production growth rates of -2.55, -0.48, -3.36 and -0.44 per cent in case maize, wheat, cereals & millets; and food grains, respectively with negative productivity trends of -2.78, -4.86 and -0.35 per cent in case of rice, wheat and total food grains respectively (Economic Survey, 2008-09).

In the state of Jammu and Kashmir, 58 per cent of the area under agriculture is rainfed and remaining 42 per cent is irrigated. Agro-climatically the state is divided into four zones: sub-tropical zone (2.53 lakh ha), intermediate zone (3.56 lakh ha), temperate zone (4.04 lakh ha) and cold arid zone (0.29 lakh ha). About 64, 90 and 44 per cent of the area in sub-tropical, intermediate and temperate zone respectively is rainfed.

The mean annual rainfall in these agro-climatic zones is 1069 mm (Sub-tropical zone), 1478 mm (intermediate zone), 680 mm (temperate zone) and 83 mm (Cold arid zone). Socio-

economically the biggest constraint of the agriculture in the state is small land holding size of 0.66 ha with more than 77.97 per cent farmers having less than one hectare of land against 1.33 hectare holding size on National basis.

In Jammu and Kashmir state, 11.28, 92.72, 56.99 and 96.15 per cent area under rice, maize, wheat and barley, respectively is cultivated as rainfed crop which attributes to low productivity and production in comparison to National yields. 732 thousand hectares is the net area sown. This indicates that proportion of area under agriculture in the state was 30.30 per cent for the year 2010-11. Area sown more than once constitutes 55.73 per cent of the net area sown for the year 2010-11. Jammu region with a 52 per cent net sown area of the state has 74.03 per cent area as rain fed. The productivity of various crops including rice, maize, wheat, pulses and oilseeds in the State is 19.42, 17.12, 15.35, 5.10 and 8.5 q/ha, respectively compared to 22.03, 23.85, 29.50, 6.38 and 10.86 q/ha on National average.

The details of land use pattern, cultivation area, production and productivity for important agriculture and horticulture crops and live stock population in Jammu and Kashmir are given in tables 1 to 8.

Table 1. Land use pattern (2010-11)

Particulars	Jammu	Kashmir	J&K
Total Area(ha)	1794598	621203	2415801
Net area sown (ha)	392910	338722	731632
Area under major horticulture crops(ha)	109830	215241	325071
Production of major horticulture crops (in metric tonnes)	169680	2052302	2221982
Net area irrigated (ha)	107171	213451	320622

Source : DOS, J&K Govt. (2010-11)

Table 2. Area under forest (2010-11)

(in Sq/kms)

Particulars	Jammu	Kashmir	J&K
Forest area	12066	8164	20230
Wild life area	761.50	14649	15410.50

Source : DOS, J&K Govt. (2010-11)

Table 3. Area sown under different crops (2010-11)

(in ha)

Particulars	Jammu	Kashmir	J&K
Rice	122049	139298	261347
Maize	218319	89896	308215
Wheat	286201	4521	290722
Pulses	18637	10272	28909
Barley	9018	4296	13314
Millets	2644	1844	4488
Fruits and Vegetables	3632	83558	87190
Total Food Crops	679092	339268	1018360

Source : DOS, J&K Govt. (2010-11)

Table 4. Area under Major Horticulture Crops (2010-11)

(in ha)

Particulars	Jammu	Kashmir	J&K
Apple	15076	126641	141717
Pear	5560	6975	12535
Apricot	2773	3085	5858
Peach	1812	614	2426
Plum	2411	1987	4398
Cherry	26	3436	3462
Citrus	13388	48	13436
Mango	11787	0	11787
Ber	7854	0	7854
Other Fresh	11369	2210	13579
Total Fresh Fruit	72986	144066	217052
Walnut	35894	53895	89789
Almond	429	17158	17587
Other Dry Fruit	521	122	643
Total Dry Fruit	36844	71175	108019
All Fruits	109830	215241	325071

Source : DOS, J&K Govt. (2010-11)

Table 5. Production of Food-grains (2010-11)

(in 000 Qtls.)

Particulars	Jammu	Kashmir	J&K
Rice	1912	3165	5077
Maize	4098	1179	5277
Wheat	4420	43	4463
Pulses	108	61	169
Other cereals & millets	159	72	231
Total Food Grains	10697	4520	15217

Source : DOS, J&K Govt. (2010-11)

Table 6. Average yield of Principle Crops (2010-11)

(in Qtls/ha.)

Particulars	Jammu	Kashmir	J&K
Rice	15.67	22.72	19.42
Maize	18.77	13.11	17.12
Wheat	15.44	9.49	15.35

Source : DOS, J&K Govt. (2010-11)

Table 7. Livestock Population (2007)

(in lakhs)

Particulars	Jammu	Kashmir	J&K
Cattles	18.80	15.63	34.43
Buffaloes	10.26	0.24	10.50
Sheep	25.89	15.38	41.27
Goat	15.26	5.42	20.68

Source : DOS, J&K Govt. (2010-11)

Table 8. Production of Major Horticulture Crops (2010-11)

(in Metric Tonnes)

Particulars	Jammu	Kashmir	J&K
Apple	23627	1828786	1852413
Pear	27306	25195	52501
Apricot	1875	13696	15571
Peach	1923	2855	4778
Plum	2200	6404	8604
Cherry	16	11429	11445
Citrus	18981	6	18987
Mango	36712	1	36713
Ber	12755	0	12755
Other Fresh	22748	9032	31780
Total Fresh Fruit	139143	1906404	2045547
Walnut	30498	133246	163744
Almond	15	12496	12511
Other Dry Fruit	24	156	180
Total Dry Fruit	29737	146698	176435
All Fruits	169680	2052302	2221982

Source : DOS, J&K Govt. (2010-11)

Horticulture forms an important sector in the economy of J&K State with an annual turnover of fruits worth Rs. 3000 crores and giving employment to over 25 lakhs people. Saffron and kaala zeera are the other very important crops that have a history of many centuries. The state of J&K has the monopoly for producing Saffron and is placed 2nd in the world after Iran. The productivity is half in comparison to that of Iran and Spain. Commercial floriculture and cultivation of medicinal and aromatic plants have great potential which need to be promoted on a large scale due to their tremendous biodiversity and climatic advantages.

The progress in animal and sheep husbandry has also been significant. In Jammu and Kashmir Livestock population-2007 is about 179.03 lakhs against 40 lakhs in 1955-56. With the introduction of high yielding breeds and up gradation of local stock, the introduction population further increases the demand.

Future Food Requirement

Future projections revealed that demand of food grains would increase to 345 million tonnes in 2030 with decreased arable land, costly inputs, less water, poor soil health with multi nutrients, deficiencies of N, P, K, Zn, B and many micro nutrients, costly labour with climate change and global warming. Livestock sector has emerged as one of the key components of agricultural growth in India. Of late, there has been a shift in the consumption pattern of fruits and vegetables and accordingly the supply side has to gear up to meet the demand requirement in terms and quantity, quality and seasonality. With the projected population of 1473 million by 2030 and considering the standard dietary requirement of 400 g per capita, the domestic requirements of fruits and vegetables would be 250 million tonnes. However, taking into post harvest losses of 20 per cent it is estimated that the production should be at least be 300 million tonnes. Role of livestock sector is crucial to fulfil growing food demand which is expected to increase by 40 per cent by 2030. The increased demand of livestock products can be met by enhancing the numbers of animals, improving feed utilization efficiency, adopting better reproductive strategies and improving health coverage based on newer generation biotechnological vaccines and drugs. With increase in economic development of the country and social obligations of nuclear families, the need for companion animals is certainly going to increase in the coming decades. Thus price rise and withdrawal of food from poor masses, policy reforms are needed from now to avoid the negative developments in the years to come. These reforms may include the establishment of secure water rights to users, decentralization and privatization of water, management functions, appropriate levels, rising reforms, markets in tradable property rights, introduction of appropriate water saving technologies. There is a need of paradigms in our approach and future strategy. Our major concern to be addressed for water crises, soil degradation, fatigue, genetic erosion, increasing biotic and abiotic stresses (pressures), inefficient management practices, inadequate markets, unfavourable trade, increasing knowledge lag in management, production of farm produce, harvest and post-harvest losses. New technologies should be science based, technically feasible, economically viable and socially acceptable. Most of the increase in agricultural output over the years has taken place under irrigated conditions. The opportunities for continued expansion of irrigated area are limited, so increased attention towards rainfed, or unirrigated agriculture is needed to meet the rising demand for food projected over the next several decades.

The key challenge confronting agriculture is to produce more for a growing population and yet do so in a sustainable manner. There is a growing realization that intensification of cropping systems is placing a great strain on the natural resources. Exploiting these resources beyond limits in the long term only results in deterioration and decline in productivity. Further there are

critical levels of population that can be supported in perpetuity from any given land area. The problems of food security and management of our natural resources are, therefore, of concern to the state. Further in the changed scenario agricultural development in future would also be guided by profitability competitiveness and efficiency in our agricultural production as well as exports. Thus agriculture in Jammu and Kashmir is at crossroads. It has to resolve issues relating to priorities. Realization of growth oriented sustainable agricultural system would require a vision, policy, reorientation, re canalization as well as conservation of available resources. This can be achieved only with well thought of and well planned and executed developmental strategy, rallying round the conservation of natural resources, their rational use on sustainable basis.

Table 9 present the requirements for the year 2030 and the productivities required to fulfil the requirement vis-a-vis the current productivity. The populations for the year 2030 has been calculated using linear regression (since, the value of squared correlation coefficient for linear relationship was greater than 0.99 for all the cases) between years and the projected populations for the period 2001-26**. Table 9 show that there is huge gap between the current productivity and required productivity in future for pulses and oilseeds. Enhanced production and productivity of pulses in recent times has been arrived at by enhancing the availability of quality seed through National Food Security Mission. In order to narrow this gap, the availability of inputs particularly seed of HYVs has to be enhanced together with the vigorous extension efforts. Thus, the enhanced availability of inputs, particularly quality seed of HYVs; vigorous extension efforts, coupled with shifting of land from cereals and millets to pulses, will provide a key to narrow the gap between requirement and availability of pulses and oilseeds in the region. Table 9 highlights the need to bring more area under vegetables in J&K to meet the future requirement.

Table 9. Cereal & Millet, Pulse, Oil Seed and Vegetable requirement for the year 2030

	Population (000)	Requirement (000t)				Required Productivity * (Kg / ha)				Current Productivity (Kg/ ha)			
		Cereal & Millets	Pulse	Oil Seed	Vegetable	Cereal & Millets	Pulse	Oil Seed	Vegetable	Cereal & Millets	Pulse	Oil Seed	Vegetable
J&K	14187	2241.5	258.90	517.80	1546.40	2492	8461	7930	25476	1898	464	760	16865
India	1473456	232806	26890	53781.10	160606.7	2311	1217	1940	20312	2183	659	1006	15662

(2008-09) *on the basis of current area

Source : Fertilizer statistics, FAI (2010)

**Hand book of Statistics on Indian Economy 2009-10

Climate Change and Agriculture

Climate change impacts on agriculture are being witnessed all over the world, but countries like India are more vulnerable in view of the huge population dependent on agriculture, excessive pressure on natural resources and poor coping mechanisms. The warming trend in India over the past 100 years has indicated an increase of 0.60°C. The projected impacts are likely to further aggravate yield fluctuations of many crops thus impacting food security. There are evidences already of negative impacts on yield of wheat and paddy in parts of India due to increased temperature, increased water stress and reduction in number of rainy days.

Significant negative impacts have been projected with medium-term (2010-2039) climate change, eg. yield reduction by 4.5 to 9 percent, depending on the magnitude and distribution of warming. Since agriculture makes up roughly 15 percent of India's GDP, a 4.5 to 9.0 per cent negative impact on production implies a cost of climate change to be roughly at 1.5 per cent of GDP per year. Enhancing agricultural productivity, therefore, is critical for ensuring food and nutritional security for all, particularly the resource poor small and marginal farmers who would be affected most. In the absence of mitigation and adaptation strategies, the consequences of long-term climate change could be even more severe on the livelihood security of the poor. The model prepared by the University predicted that the crop water demand under subtropical condition of Jammu increases by 7 percent if temperature alone rises by 3°C. Rise in temperature during rabi season affect the wheat crop adversely because it shortens the duration of all development stages. It was estimated that the wheat yield reduces to the extent of 0.5 q/ha per rise of temperature by 1°C. The testing and validation of CERES-maize model under subtropical condition predicted the significant reduction in maize yield by 34 percent under increase in temperature by 3°C. Studies have shown that production and quality of fruit and vegetable crops are affected by high temperature and exposure to elevated levels of carbon dioxide and even ozone concentration.

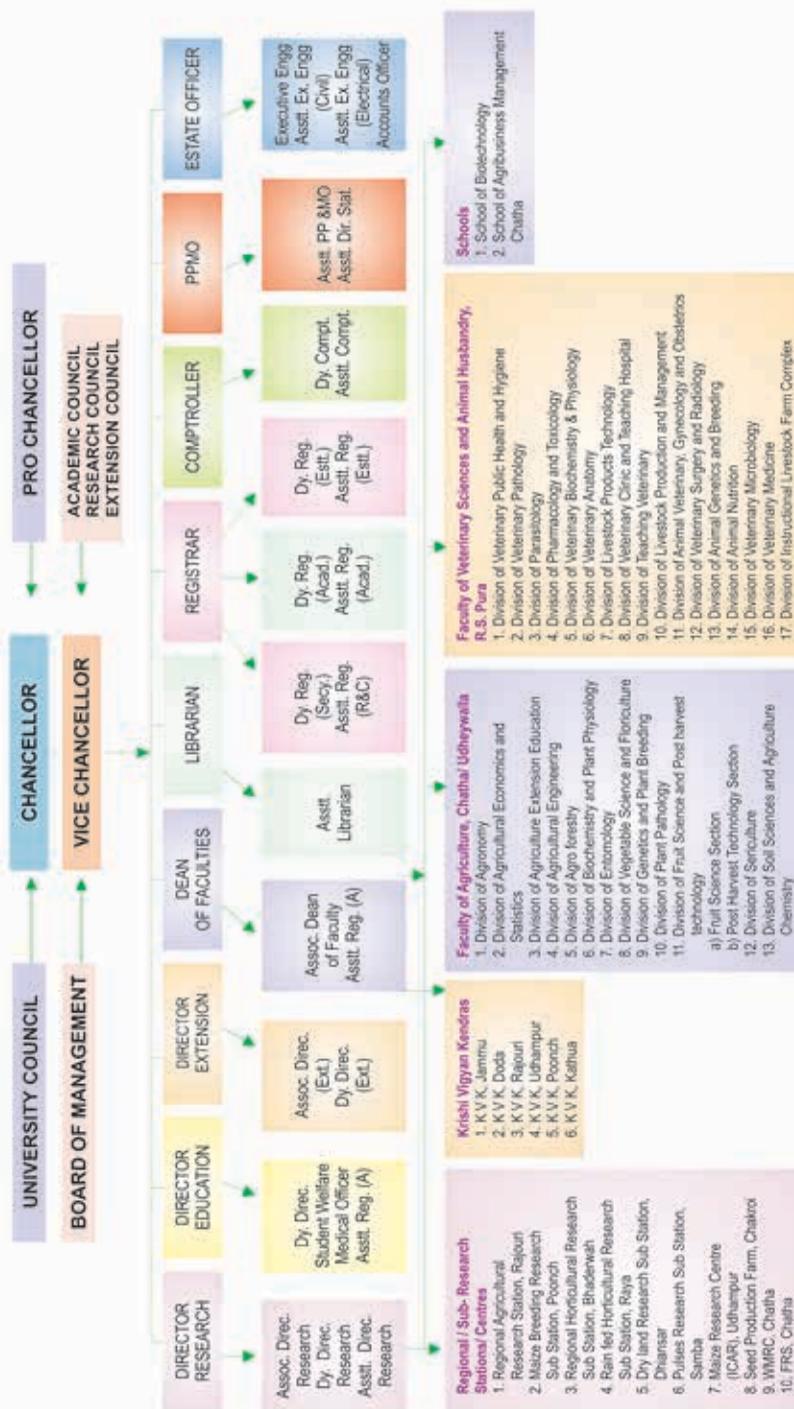
SKUAST of Jammu

Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu came into existence on 20th September, 1999 following the amendment in Sher-e-Kashmir university of Agricultural Sciences and Technology Act, 1982 through the State Legislature. The establishment of SKUAST of Jammu has in its background aspirations, commitment and missionary zeal to cater the needs of Jammu Division for the region specific advances through education, research and extension. With the generous and constant patronage of Chancellor and Pro-Chancellor; Central & State Government and Indian Council of Agricultural Research, the University is marching ahead for increasing agricultural production and productivity with overall economic enhancement of farmers of Jammu division. SKUAST-J is a multi-campus university with its headquarter located at Chatha, Jammu. Since its inception, the University has grown with rapid pace in terms of infrastructure and human resource. The Campus at Chatha comprises of modern main faculty building housing 13 divisions, administrative block, Conference Hall, Central Library. The faculty of Agriculture at Chatha has 231.2 ha. Faculty of Veterinary Sciences & Animal Husbandry at R. S. Pura has 33.6 ha land holding with 17 divisions has full fledged academic block, modern veterinary clinical complex, a class room cum examination complex, library and hostel for boys and girls to cater the need of faculty and students undergoing various degree programmes in animal science disciplines. There are six research stations/sub-stations and six KVKs in the university which are located in different agro-climatic zones of Jammu region of the state for catering to the location-specific needs of the farming community. The total land holding (including research stations/sub-stations and KVKs) of the university is 455.65 ha. University pursues high standard research through research projects funded by various central and state agencies.

Organization and Governance

The different authorities of the SKUAST-J are University Council, Board of Management, Research Council, Extension Education Council, Academic Council, Faculties and Board of Studies of different groups of subjects of different faculties. The University Council reviews the policies and programmes of the University and advises in regard to future plans, development and expansion and examines the annual accounts and annual audit report. The Board of Management suggests the programmes and policies which it considers necessary for the betterment and promotion of agriculture in broader sense in the State and in connection with the affairs of the University.

SHER-E-KASHMIR UNIVERSITY OF AGRICULTURAL SCIENCES AND TECHNOLOGY OF JAMMU



The Research Council considers and makes recommendations in respect of research programmes and projects undertaken or to be undertaken by the various University units in the state in the field of agriculture, veterinary science and animal husbandry, and other allied sciences with a view to promoting effective co-ordination. The Vice-Chancellor and authorities of the University are assisted by full time Project Planning and Monitoring Officer.

The Extension Education Council considers and makes recommendations in respect of co-ordination of extension education activities for improvement of agriculture, animal husbandry and allied branches, and for the development of rural communities. The Academic Council is responsible for maintenance of standards on all academic matters. The SKUAST-J has 3 faculties for effective control and supervision of teaching, examination and academic matters pertaining to the respective faculties.

The faculty constitutes the Board of Studies of each discipline. The board of Studies proposes to the faculty concerned the courses of study and curricula for various programmes of instruction offered by that faculty.

MISSION

The Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu aspires to become a leading agriculture University in India with the mandate of serving the people of Jammu division, the State and the Nation.

MANDATE

- Advancement of education in Agriculture, Animal Husbandry, Veterinary Sciences and other allied sectors.
- Conduct basic, strategic and applied research in agriculture and allied sectors.
- Dissemination of knowledge and technology to the farming community.
- Collaborate with National and International organisations for enhancing the knowledge expertise and excellence for the well being of the people of Jammu and Kashmir in particular and the country in general.

JURISDICTION

SKUAST-Jammu has mandate to cater to the needs of the farming community falling under the territorial jurisdiction of Jammu province.

The area comprises of following agro-climatic zones:

Sub- Tropical Zone: Kathua, Samba, Jammu, part of Udhampur and Rajouri.

Intermediate Zone: Parts of Rajouri, Udampur, Poonch, Ramban and Kathua.

Temperate Zone: Parts of Poonch, Rajouri, Doda, Kathua, Ramban and Kishtwar.

ACADEMICS

At present the University is imparting education through three faculties, School of Biotechnology and School of Agri-Business Management located at Chatha, Udheywala and R.S. Pura:

- Faculty of Agriculture
- Faculty of Veterinary Sciences and Animal Husbandry
- Faculty of Post Graduate Studies
- School of Biotechnology
- School of Agri-Business Management

Apart from degree programme, in Agriculture and Veterinary, University offers Master programme in 15 disciplines of Agriculture and 17 disciplines of Veterinary Sciences. Whereas, Doctoral programme is offered in Agriculture and Veterinary faculties for 27 disciplines. The University with its meagre financial resources and existing faculty strength has established the School of Biotechnology with the programmes of B.Sc., M.Sc. and Ph.D. The University has revised its Post Graduate curricula, both in Agriculture and Veterinary Sciences as per the guidelines issued by the education division ICAR. At under graduate level of Agriculture, revised curricula as per 4th Deans committee recommendation has been adopted. Similarly, for Veterinary Science curricula was revised as per Veterinary Council of India (VCI) recommendations. In additions to this, short-term job oriented certificate courses have also been started. While the degree programmes are aimed at imparting higher education to society and people of the state, the certificate courses are aimed at increasing skill level and entrepreneurship of the common youth and farmers of the state.

Upon the recommendation of the ICAR Peer Review Team and Education Division, and on meeting the minimum accreditation criteria, the Accreditation Board has granted accreditation to the Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu, Jammu and its following constituents faculties for five year i.e. up to November 16,2016.

Faculty of Post Graduate Studies, Jammu

Faculty of Agriculture, Chatha, Jammu

Faculty of Veterinary Science & Animal Husbandery, R.S. Pura, Jammu

Academic programmes run by the university:

UG Programme : B.Sc. (Ag), B.V.Sc & AH and B.Sc (Biotechnology)

PG Programme : M.Sc. (Ag), M.Sc (Biotechnology), M.V.Sc. and MBA (ABM)

Ph.D. (Ag), Ph.D. (Vet) and Ph.D. (Biotechnology)

Details of P.G. Programme:

S.No.	M.Sc.(Ag)	Ph.D.(Ag)	M.V.Sc.	Ph.D.(Vet)
1	Soil Science & Agriculture Chemistry	Soil Science & Agriculture Chemistry	Veterinary Animal Breeding & Genetics	Veterinary Animal Breeding & Genetics
2	Genetics & Plant Breeding	Genetics & Plant Breeding	Veterinary Animal Nutrition	Veterinary Animal Nutrition
3	Entomology	Entomology	Veterinary Animal Reproduction, Gynecology & Obstetrics	Animal Reproduction, Gynecology & Obstetrics
4	Agriculture Extension Education	Agriculture Extension Education	Clinical Veterinary Medicine including Ethics & Jurisprudence	Clinical Veterinary Medicine Ethics & Jurisprudence
5	Vegetable Science	Vegetable Science	Veterinary Microbiology & Immunology	Veterinary Microbiology & Immunology
6	Agriculture Economics	Agriculture Economics	Veterinary Parasitology	Veterinary Parasitology
7	Agronomy	Agronomy	Veterinary Pharmacology & Toxicology	Veterinary Pharmacology & Toxicology
8	Fruit Science	Fruit Science	Veterinary Public Health & Hygiene	Veterinary Public Health & Hygiene
9	Post Harvest Technology	Post Harvest Technology	Veterinary Surgery & Radiology	Veterinary Surgery & Radiology
10	Plant Pathology	Plant Pathology	Veterinary Livestock Product Technology	-
11	Statistics	Biotechnology	Veterinary Biochemistry	-
12	Bio Chemistry	-	Veterinary Livestock Production & Management	-

13	Forestry	-	Veterinary Epidemiology & Preventive Medicine	-
14	Sericulture	-	Veterinary Anatomy & Histology	-
15	Biotechnology	-	Veterinary Pathology	-
16	Floriculture	-	Veterinary Animal Husbandry Extension	-
17.	-	-	Veterinary Physiology	-

Scholarship

The under graduate and postgraduate students are being awarded various scholarships.

Educational Tour

Educational tour are mandatory for under graduate students to gain the benefit of exposure to Agricultural Education and Research Centres at National levels. The Under Graduate students undertake education tour in 3rd year for B.Sc. (Hons.) Agriculture and 4th year for B.V.Sc. & A.H.

RAWE PROGRAMME

The Rural Agriculture Work Experience (RAWE) programme provide the students practical experience so that the graduates can respond to the real life situation in their profession. The activities undertaken under RAWE programme are: Techno-economic survey (2weeks), Soil and water sample collection and analysis (2 weeks), Plant clinic (3 weeks), Attachment to agro-industry (2 weeks) and rural experience in terms of Attachment (9 weeks) with farmers in village. The students are paid a stipend during this period.

INTERNSHIP PROGRAMME

Students of B.V.Sc. & A.H. are exposed to internship programme for a period of 6 months in the 10th semester. The student are paid internship allowances during this period.

LIBRARY

The University has a central library at main campus Chatha and faculty library at R. S. Pura campus. The university library is wi-fi enabled, having access to 2900 online journals through CeRA consortium, other open access databases and Internet services. The Central library also has e-Kiosk facility for accessing the database of literature. The university has around 26468 books, 85 periodicals and 550 dissertations.



Central library at Chatha

The Central library at Chatha and faculty library at R. S. Pura are equipped with 30 KWA Solar Power back-up.

STUDENTS RADIANCE

Talent display activities.

Counselling and career advice.

Facilities for Student activities

- Indoor games like TT, Carom, Ludo, Chess etc., Reading room and a cafeteria.
- Outdoor sports Cricket, Football, Volley Ball, Badminton, Athletics etc. Gymnasium for hostel boarders.
- Conference hall for literary/cultural events.

Students Strength (as on 01.11.2012)		
UG Programme	Intake Capacity/ Year	On Roll
B. Sc. (Hons.) Agriculture	58	153
B. Sc. (Hons.) Biotechnology	20	48
B.V.Sc. & AH	58	249
PG Programme		
M.Sc. (Agri. & Allied Sciences)	84	84
M.Sc. Sericulture	07	07
M.Sc. Forestry	04	08
M.Sc. (Biotechnology)	06	11
M.V.Sc.	105	140
Ph.D. (Agri.)	29	42
Ph.D. (Vety. Sc.)	19	18
Total	390	760
Diploma Courses		
Basic Agriculture Training (BAT)	09	09
Basic Horticulture Training (BHT)	33	33
Total	42	42



Sports Activities at R. S. Pura

Hostel Facilities

- Separate hostels for boys and girls.
- Spacious and well furnished dining hall, common room, lawn, courtyard, CTV with cable/dish connection etc., have also been provided in the hostels.
- Facilities for indoor games like table tennis, chess, ludo, and carom boards, also have been made available.



Students' Placement and Counselling Cell

- Provide information for various scholarships and employment avenues.
- Updating of students' knowledge through information bulletins from prestigious national and international institutes of repute.
- Awareness about anti-ragging legislature.

Extra Curricular Activities

The students of the university have participated in a number of cultural activities and youth programmes. Some of the important ones are mentioned below.



Participation of Students in Cultural Activities

- Awareness rallies in commemoration of World AIDS day organized.
- Red Ribbon Club participated in awareness rally.
- Awareness on HIV/AIDS was organized during Kissan Mela.
- Cultural Activities & Youth Programmes Organized under “Display Your Talent”.

- Student participation in various inter-university and national programmes like Youth Leadership Camp, National Debate Competition, Observance of Communal Harmony campaign and Sadhbhavna Divas.

Medical facilities

- Medical facilities are available to the students, faculty members and university staff at both the campuses of the university.
- Medicines and clinical laboratory tests are Free for students and boarders.
- Two fully equipped ambulances for shifting of patients.

RESEARCH ACTIVITIES

Research in the SKUAST-Jammu is being carried out by the faculty placed under Faculty of Agriculture at Chatha/ Faculty of Veterinary Sciences and Animal Husbandry, R. S. Pura and by the scientists working at different research stations/sub-stations/centers, spread over various agro-climatic zones i.e., low altitude sub-tropical and mid to high altitude intermediate zone of the Jammu division.

Research Stations/ Sub-Stations/ Centre

- Regional Agricultural Research Station, Rajouri
- Maize Breeding Research Sub Station, Poonch
- Regional Horticultural Research Sub Station, Bhaderwah
- Rain fed Horticultural Research Sub Station, Raya
- Dry Land Research Sub Station, Dhiansar
- Pulses Research Sub-Station, Samba
- Maize Research Centre, Udampur
- Seed Production Farm, Chakroi
- Water Management Research Centre, Chatha
- Farming System Research Centre, Chatha

Research Achievements

Crop Improvement

Four varieties of rice (Saanwal Basmati, Ranbir Basmati, Basmati 564 & SJR5); three varieties of wheat (RSP-303, RSP-81 & RSP- 561); five varieties of oilseeds (Gobhi sarson: DGS-1, Raya: RSPR-01, RSPR-03, Toria: RSPT-1 & RSPT-2) and one gram variety in pulses (SCS-3) have been released.

- High yielding varieties of various field and vegetable crops viz., rice, wheat, gobhi sarson, knol-khol, radish, spinach beet, fenugreek, coriander, broccoli and cauliflower are in the pipeline and are at advanced stage of testing.
- Silkworm hybrids (Udhey-3x1, Udhey-4x6, PO₃ x ND₅) developed by the university have been identified by Central Silk Board for release.
- Chandler, Gorella and Belrubi cultivars of strawberry have been recommended for commercial cultivation in sub-tropical areas of Jammu.



Basmati 564



RSP- 561



DGS-1

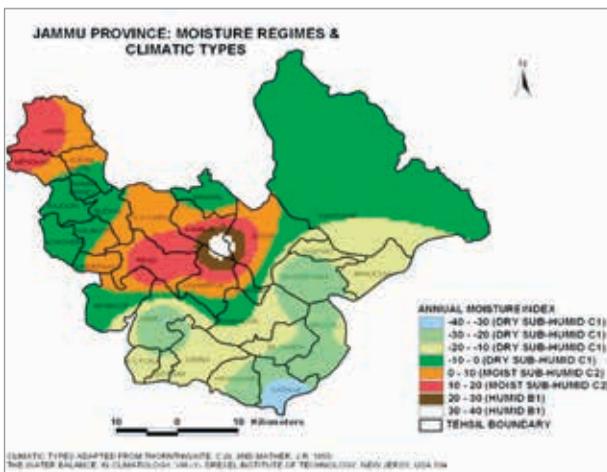


Bivoltine silkworm hybrid PO₃ x ND₅

Crop Production

- Determination of Annual Moisture Index and climate.
- Characterization of Jammu region using Geographical Information System (GIS).
- Participatory technology developed for the cultivation, inducing flowering and fruiting in olive.

- Popularization of round the year cultivation of button mushroom, oyster mushroom (dhingri) and milky mushroom species in Jammu.
- For crop intensification and diversification various sequences instead of rice wheat crop rotation have been tested and recommended which include Rice-Marigold-French Bean, Rice – Potato-Onion, Rice-Cabbage onion and maize+ Black gram –Potato – onion.



Dhingri Mushroom



Nectarine

- Successful fruiting of nectarine an exotic fruit has been achieved and technology for its cultivation is now available.

Crop Protection

- Eco-friendly management of insect-pests and diseases of economically important crops has successfully been attempted
- Pomegranate butterfly has been successfully managed by three weekly releases of *Trichogramma embryophagum* (1.5 lakh/ha) in wild pomegranate (Anardana) cultivation in the intermediate zones of Jammu.
- The spread of *Varroa destructor* mite resulted in decline of 80-90 per cent of colonies i.e., from more than 30,000 to 7,000 only. Oxalic acid (3.5 per cent) has been found to control mites successfully up to 90 per cent.

- Application of biocontrol agents (*Ampelomyces quisqualis* and *Trichoderma* spp.) @ 5 per cent before fruit-set and at 10-15 day intervals has been found effective against powdery mildew of ber.
- Gladiolus corm treatment with resident isolate of *Trichoderma* sp. followed by soil drenching with carbendazim (0.1 per cent) at 15 days interval reduced wilt up to 56 per cent.



Damaged fruit by Annar Fruit borer



Caterpillar of Annar fruit borer

Animal production and management

- Backyard poultry has been encouraged to meet the egg shortage because of high cost of egg production in temperate zones.
- Urea-molasses multi-nutrient blocks enriched with area specific mineral mixture has been developed for amelioration of macro and micronutrient imbalances in cross-bred cattle, buffaloes, sheep and goats in various districts of Jammu.
- Recipes developed for utilization of spent hen meat in preparation of chicken kabab.
- The pharmacokinetics of various antimicrobial drugs in animals has been worked out for their safe and judicious use.



Animals being treated at Vety. Refral Hospital at R.S. Pura

ON GOING EXTERNALLY FUNDED RESEARCH PROJECTS

All India Coordinated Projects

- All India Coordinated rice improvement project, Chatha.
- All India Coordinated Research Project on Integrated Farming System, Chatha.
- All India Coordinated project on wheat and barley, Chatha.
- All India Coordinated project on Water Management Research Centre, Chatha.
- All India Co-ordinated Research Project on Chickpea, Samba.
- All India Co-ordinated Research Project on Agrometeorology, Chatha.
- All India Co-ordinated Research Project on Dryland Research, Dhiansar.
- All India Co-ordinated Research Project on Maize, Udhampur.
- All India Co-ordinated Research Project on Rapeseed and Mustard, Chatha.
- All India Co-ordinated Research Project on Honey bee and pollinators, Chatha (Voluntary Centre).
- All India Co-ordinated Research Project on Onion and Garlic, Chatha (Voluntary Centre).
- All India Co-ordinated Research Project on Weed control, Chatha (Voluntary Centre).
- All India Co-ordinated Research Project on Vegetables, Chatha (Voluntary Centre).

Department of Bio-Technology (DBT)

- Isolation, characterization and multiplication of bioagents for management of wilt disease in solanaceous crop in Jammu.
- Morphometry and Phylogeography honeybees and stingless bees in India.
- Breeding and Management strategies in Dairy Animals for Socio Economic upliftment of rural women.
- Androgenesis Mediated Interogression of Fruit and Shoot Borer (*Leucinodes orbonalis*) Resistant Genes into Cultivated Eggplant (*Solanum melogena*).
- Popularization of lac cultivation through large scale demonstrations and trainings in Jammu and Kashmir.
- Assessment of genetic diversity using molecular markers of basmati rice and in situ conservation through participatory approach.
- Bovine Cryptosporidiosis and its Zoonotic Potential in Jammu District.

-
- Impact of chawki reared silkworm on double cropping system and its role in livelihood generation in rural areas.

Department of Science & Technology

- Popularization of bio-fertilizers in rainfed areas of Jammu division for sustainable agriculture development.
- Improving the productivity of traditional agricultural system in Rajouri with Scientific Intervention.
- Mechanism Controlling the Metalaxyl Induced Developmental toxicity with Special Reference to Reproduction Indices in Wistar Rats.
- Effect of non-insecticidal agrochemicals on growth and development of insect pests.
- Diversity analysis of Pseudomonas Fluorescence and its utilization in disease suppression and nutrient management.
- Socioeconomic upliftment of women farmers through backyard poultry farming.
- Determining genetic diversity among common bean (*Phaseolus vulgaris* L.) genotypes and assessment for water stress tolerance.

Indian Council of Agricultural Research

- Seed Production in Agricultural crops and Fisheries.
- Enhancement of livelihood security through farming systems and related farm enterprises in north-west Himalayas.
- Molecular basis of capacitation like cryodamage during Cryopreservation of bovine spermatozoa (Buffalo and crossbreeds).
- National Initiative on Climate Resilient Agriculture (AICRPDANICRA).
- Vulnerable assessment of major food crop production zones to climate variability in major rainfed crops zones (AICRPAM-NICRA).
- National Initiative on Climate Resilient Agriculture (AICRPDANICRA-Component-II).
- Climate change on Lac crop performance (NICRA).
- National Information System on Agricultural Network (NISAGENET).
- Serological diversity of *D. nodosus*/validation work of vaccine against virulent footrot (NAIP).
- Network Project insect bio-systematics.

Ministry of Earth Science (MES)

- Agro Advisory Services (Jammu).

Ministry of Food Processing, Govt. of India

- Seed capital assistance for running food processing training centre.

Ministry of Agriculture Sciences, Govt. of India

- Scaling up of Water Productivity in Agriculture for Livelihoods through Teaching-cum-Demonstration, Training of Trainers and Farmers (SWPA).

Indian Immunological limited (Hyderabad)

- Evaluation of Tick-Mid-Gut Vaccine.

Indian Institute of Remote Sensing

- Soil carbon pools assessment under national carbon project.

National Innovation Foundation, Ahmedabad

- Documentation, Validation and Extension of suitable package of practices of Indigenous Technical Knowledge and Practices (ITKs) in treatment of various ailments of Livestock in Jammu Division of J&K State.

National Medicinal Plant Board

- Conservation, production and sustainable management of Shatavar (*Asparagus recemosus* Willd.).

Indian Council Medical Research

- Important Emerging Zoonotic Disease of Equines Used for Tourism and Pilgrimage in Jammu and Kashmir.

Indian Meteorology Department

- Yield forecasting for maize, wheat and mustard in low altitude subtropical region of Jammu under FASAL.

Ministry of Human Resource Development (MHRD), Department of Higher Education

- All India Survey on Higher Education (AISHE).

Horticulture Technology Mini Mission (ICAR)

- Production of quality planting material for subtropical fruits.
- Production of quality planting material for ornamental crops in Jammu.
- Establishment of Root stock and Budwood banks at SKUAST-J.
- Development and promotion of integrated pest management module in important vegetable crops of Jammu.
- Construction of a rain water harvesting tank for evaluation and demonstration of supplemental benefits for horticultural crops in Rajouri.
- Site specific analysis and management of nutrient in fruit growing areas of Jammu for precision horticulture.
- High density orcharding of mango and guava in Jammu subtropics.
- Promotion of year round mushroom cultivation for self employment in Jammu Division
- Trench cultivation of vegetables as livelihood security in perennial river beds of Jammu.
- Training & demonstration on rejuvenation of old/unproductive orchards in Jammu subtropics.
- Seed production of hybrid and open pollinated varieties of vegetables under the mid hill conditions of Jammu
- Promotion of biological control a key component of management soil-borne pathogens for sustainable horticulture in Jammu province of J&K state.
- Determination of quality and harvest maturity for commercially grown fruit crops in Jammu subtropics.
- Technology refinement and dissemination of ginger and turmeric in Jammu region.
- Standardization/refinement of production technologies for cultivation of hybrid vegetables in Jammu region.
- Establishment of additional rootstock and budwood bank and virus indexing facilities at Baderwah and their large scale multiplication.
- Post harvest value addition of subtropical fruits and vegetables for women empowerment in Jammu region.
- Technology refinement in micro irrigation and fertigation for improving quality and productivity of important horticultural crops in rainfed areas of Jammu.

National Horticulture Board

- Establishment of Mother plant nursery for high pedigree planting material for fruit crops.

EXTENSION

Directorate of Extension undertakes the effective dissemination of latest technical information and technologies developed by the scientists to farmers and entrepreneurs. This Directorate disseminates the information developed through the rigorous and scientific research available with Directorate of Research and various divisions of Faculty of Agriculture & Faculty of Veterinary Sciences & A.H.

The main responsibilities/functions of the Directorate of Extension are:

- To Plan and execute extension education activities of the University.
- To coordinate extension education activities among Divisions of two Faculties, Research Stations, Sub-Stations, KVKs etc. of the University.
- To act as a strong liaison between university scientists and allied developmental departments, national & international institutes and farming community for developing demand driven technologies.
- To timely transfer the innovative/ proven technologies through KVKs.
- To supplement and complement the efforts of state development departments through elite/ frontline/ limited extension work.
- Organizing training programmes for officers, farmers and unemployed/ rural youth.
- Organizing skilled demonstrations, on farm trials, exhibitions, fairs, kisan melas etc.
- Communicating/ updated farm information through package of practices, books, booklets, leaflets, folders, posters, bulletins, pamphlets and through print and electronic media
- Farm Advisory services.

Krishi Vigyan Kendra

The Krishi Vigyan Kendra (KVK) are innovative science based institutions which have been established to impart vocational and skill training to farmers and field level extension workers not only in agriculture and allied sectors but also in other income generating activities like value addition, fruit preservation, canning, milk preservation, dairy farming, bee keeping, mushroom cultivation etc. that may supplement the income of farm families. Six KVKs of the university are functioning for the upliftment of farming community,

women empowerment and generation of employment for rural youth through different trainings aimed at development of entrepreneurship.



KVK, Kathua



KVK, Jammu



KVK, Rajouri



KVK, Poonch



KVK, Reasi



KVK, Doda

The activities of extension education (exclusively primarily being carried out by faculty members of Krishi Vigyan Kendras (KVKs). The university at present has got following KVKs.

Major workshops and meetings organized by Directorate of Extension.

- Zonal Research & Extension Advisory Committee Meetings.
- Monthly Officers' Workshops.
- Scientific Advisory Committee (SAC) Meetings of KVKs.
- Capacity Building Programme on Future Commodity Markets.
- Agri-Enclave on Livestock Management.
- Dealers and Retailers Orientation Programme.
- Short-term trainings on Sericulture for field functionaries.
 - Incubation and chawki rearing of silkworm.
 - Diseases of Silkworm and their management.
 - Late age rearing, ripening of silkworm, seri-position, harvesting and storage of cocoons.
 - Role of silkworm seed production technology in sericulture.
 - Management of diseases and insect pests of mulberry.
 - Mulberry maintenance and cultural operations.

Transfer of Technology and Trainings/Demonstration

- The university has started village visit programme on weekly basis to address the on-spot problems of farmers. This has generated significant impact among farmers.
- The university is actively involved in dissemination of latest scientific technologies by holding training programmes on crop production, crop protection, entrepreneurship development and livelihood security, value addition of agricultural produce and animal health to make farmers aware about the latest know-how and do-how of agro-techniques.



Farmers attending training programme on Apiculture



Farmers attending Animal Health Camp

SAMETI: Directorate of Extension is also functioning as State Agricultural Management and Extension Training Institute, Jammu (SAMETI-J). SAMETI has been organising annual trainings as per the needs of the field functionaries.

International and National linkages of University

The university has developed strong linkages with national and international organizations with a view to harness the information, materials, expertise and exchange of scientists and student visits. MoUs have been signed by the university with the national and international organizations. Very recently, the University has signed MoU with Cornell University, USA to facilitate the exchange of new technologies of mutual interest, students and the faculty.

For excellence in research, teaching and HRD, university has signed MOU with following institutes:

- Cornell University, USA.
- Indian Agricultural Research Institute, New Delhi.
- National Dairy Research Institute, Karnal, (Haryana).
- CSK HP Agricultural University, Palampur, (HP).
- Integrated Farming System Research, Modipuram (UP).

- Institute of Himalayan Bio-resource Technology (CSIR), Palampur (H.P).
- State Forest Research Institute, Jammu & Kashmir.
- Directorate of Sheep Husbandry, Jammu.

Convocations of SKUAST-Jammu

Sher-e-Kashmir university of Agricultural Sciences & Technology of Jammu has organized three convocations so far held on 17 May 2004, 26 May 2008 and 4 March 2011 with Dr. Mangla Rai then DG. ICAR, Smt. Prathiba Devi Singh Patil then President of India and Dr. Manmohan Singh Prime Minister of India as the chief guests respectively.

Publications

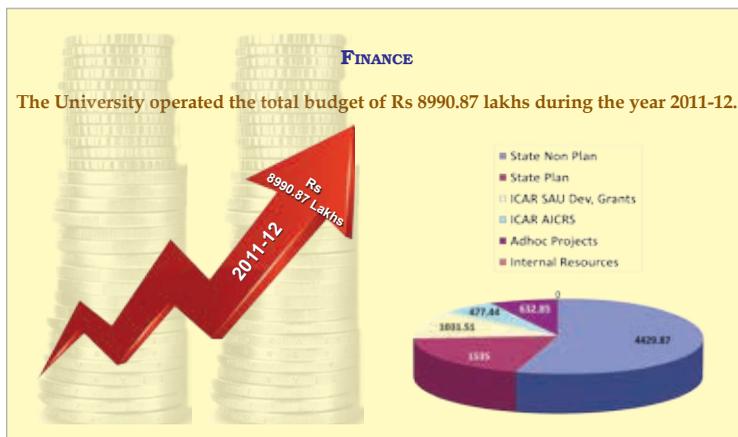
The university brings out periodical formal publications like Annual Report covering new technologies, innovations and progress on various researchable issues. News letter of the university gives an update of new achievements and ongoing activities. Other publications include Accreditation Report, Regulations of Education, Package of Practices, various technical bulletins, brochures, folders and CDs portraying the significant academic activities, research findings and extension materials for dissemination to farmers, stakeholders and resource personnel.

Staff Strength (as on 01.11.2012)

Category	Sanctioned	Filled	Vacant
Administrative Officers			
Vice-Chancellor	01	01	
Officers	08	05	03
Teaching			
Dean	02	01	01
Associate Dean	02	02	
Professor / Equivalent	34	19	15
Associate Professor/ Equivalent	85	73	12
Assistant Prof. /Equivalent	220	194	26
Non-Teaching			
Administrative	237	189	48
Technical	40	35	05
Auxiliary / supporting	504	453	51
Total	1133	972	161

Budget

The University operated a budget of Rs 8990.87 lacs during the year 2011-12.



New Initiatives

Education

- Prospectus of University for the admission to various courses has been prepared for the knowledge of admission seekers.
- Examination guidelines on external pattern has been prepared and separate examination cell has also been established under the I/c Controller of Examination.
- University Council in its 8th Meeting held on 28.09.2012 has approved the establishment of School of Agri Business Management.

Administration

- Transfer policy of the teaching / non-teaching staff has been drafted.
- The RTI cell has been constituted to bring the transparency in the working and conduct of the University.
- University has constituted a Grievance Cell which is taking care of the grievances projected by the employees / students / public.
- A Procter Cell has been constituted by the University.
- The University also intends to adopt the concept of e-governance in the near future to make its working more effective, transparent and accountable.

SKUAST of Jammu 2030

The establishment of SKUAST of Jammu has in its background aspirations, commitment and missionary zeal to cater the needs of Jammu division for the regions specific advances through education, research and extension and has been serving the state since last thirteen years. During this period it has strengthen its infrastructure and human resources and is well prepared to face the domestic and global challenges with the active involvement of the stake holders. The University will continue to play leading role in meeting the future challenges and safeguard the food, nutrition and livelihood security of the people of Jammu region in particular, the state and the country in general.

Vision

An institution for sustainable agriculture for food and nutritional security.

Mission

The Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu aspires to become a leading agriculture University in India with the mandate of serving the people of Jammu division, the State and the Nation.

Focus

To realize the vision and mission, SKUAST of Jammu will concentrate on the following key issues in the coming years:

- Breaking yield barriers by exploitation of heterosis for developing hybrids, introducing hybrid culture in agriculture.
- Broadening of genetic base of varieties by use of alien species for yield traits, biotic and abiotic stresses.
- Biotechnological interventions viz Gene pyramiding, marker aided selection for biotic, abiotic and quality traits, Transgenic, Structural and Functional genomics and Nano-technology.
- Seed research and self-sufficiency in quality seed.
- Bio-chemical prospecting of medicinal and aromatic plants for bioactive molecules, having pesticidal, anti oxidant and anticancer activities.
- Improvement of Jammu basmati rices.
- Sustainability of cropping system and farming system for livelihood and food security.

- Resource conservation technologies involving refinement of machines, developing tillage specific varieties, diversification/ intensification, optimization of water and nutrient use, tackling weeds and pests under tillage and residue management.
- Improving soil health through characterization of arable land and optimization of inputs and maximization of input use efficiency, soil fertility mapping, increasing carbon content, correction of micro nutrient deficiencies / toxicity.
- Organic farming in selected areas for selected crops using agriculturally important micro-organisms, bio-agents and biological control of pests and diseases.
- Preparedness for climate change, global warming and resilient agriculture
- Sustainable rainfed agriculture management and agro-forestry models.
- Advances in horticulture, floriculture, olericulture, mushroom cultivation, agro forestry and other allied sectors for increasing productivity, profitability and quality products.
- Post harvest technology, value addition, storage and marketing.
- Urgent need to cross-breed 75 per cent of local low producing animal with the objective of achieving a level of exotic inheritance upto 62.5 per cent.
- Improve the local breed of buffaloes through selective breeding with superior germplasm by embryo transfer technology, and making the elite germplasm available for cattle required for cross multiplication at farmers' doorsteps.
- Strengthening of dairy industry through "Clean Milk Production" and establishing milk plants in hilly districts.
- Epidemiological mapping of disease in livestock.
- Promotion of fodder crop production through improved agronomic practices and silvipasture. Wastelands should be exploited to meet the shortage of feed and fodder.
- Feeding of dairy animals with roughage blocks enriched with concentrates during the lean period is to be encouraged.
- To reduce the cost of treatment in animals, the dosage schedule of antibiotic is required to be recalculated under Jammu climatic conditions.
- Encourage farmers to rear poultry birds and meat producing sheep and goat breeds.
- Development of Globally competitive human resources through UG / PG Education in basic and advanced areas of agriculture and animal sciences.
- Accelerated Technology Transfer and communication through ICT and public private partnership.
- Identification of Technologies suitable for different ecologies / environments and their dissemination.

Harnessing Science

SKUAST-Jammu is committed to address the issues of natural resource conservation and to increase the agricultural production. Changing life style and dietary consumption patterns, however, call for added emphasis on diversified production system. Hence, emphasis will be given for cultivation of fruits, vegetables and value added agricultural products. The region also holds promise for livestock and fishery development by utilizing the potential of untapped natural resources.

Potential of Genetic Resource Management

The region is endowed with rich resources of plant and animal biodiversity. Harnessing this valuable natural resource for improving the genetic makeup of different crops will play a major role in increasing agricultural production. Integration of traditional breeding programmes with frontier technologies on genetic resource management like gene pyramiding, marker assisted selection; allele mining will go a long way in addressing the issues of food production. Likewise, in case of livestock, genetic improvement is need of the hour. Quality seed production in case of crop and livestock shall be carried out in a participatory mode.

Management of Natural Resources

Soil and water are the basic resources of agriculture. Scientific and efficient management of these resources is the core of sustainability of agriculture production system. The region is largely dependent on rainfed agriculture. Despite the annual rainfall being adequate across all agro-eco systems, agriculture production suffers from water stress on the one hand and excess runoff and water congestion causing floods on the other. For the sustainable management of natural resources, the techniques like integrated watershed management, conjunctive use of surface & ground water, improving water productivity, managing flooded, flood prone and waterlogged areas and acid soils management needs to be perfected. Restoration of degraded lands through agro forestry interventions is another major issue in non-classified wastelands.

Declining quality of natural resources like water and soil is a major cause of concern. The conventional method of amelioration are proving expensive and unstable. Hence production systems are to be efficiently managed for sustainability. Potential of conservation agriculture, zero tillage, precision agriculture and micro-irrigation need to be explored and suitable fine tuning to

be made. With the advancement of weather forecasting and remote sensing technologies short term and medium term prediction can be made and effective amendments can be implemented to meet natural disasters like drought and floods. Complex simulation models enable us in predicting pest outbreaks and immigration whereby precautionary and prophylactic measures can be undertaken to avoid huge losses.

Agriculture Diversification

The present economic regime offers opportunity for diversified dietary behaviour of both urban and rural population. Traditionally, rice and wheat dominates the food habits in the region. To combat nutritional deficiency, horticultural crops by virtue of their palatability and rich nutritional value can be a better option for fulfilling the diversified dietary needs of the people of this region. Crop diversification through horticulture crops can also play a vital role in increasing the income of rural household.

Post Harvest and Value Addition

Post harvest losses of fruits and vegetables account for about 20 per cent of total loss. Mango, guava, jamun, anola, bael, are promising fruit crops of this region. Among vegetables crops, tomato, brinjal, cauliflower, cabbage, peas are predominantly grown. The poor shelf life of these crops, however, is a major constraint in the production system. Value addition of fruits like jackfruit, bael, jamun and tamarind and vegetables like tomato, peas, cauliflower will enhance its marketability. Similarly, flowers like rose, chrysanthemum and gladiolus perform well under our conditions. However, sustained efforts need to be made to standardize the packages to improve the shelf life. Research on developing suitable and economical post-harvest technologies for processing, preservation and value addition of important horticultural products is the priority of this University.

Bio-Risk Management

Some crops are highly sensitive to climatological changes. Their production and productivity are severely influenced by the anomalies of climatic parameters. Incidence of pests and diseases are highly influenced by changes in weather parameters. Development of weather based forecasting tools for the prediction of pest incidence especially in horticultural crops will be a major component in integrated pest management strategies. Use of conceptual as well as black box models like artificial neural networks in pest and disease forecasting can be used to develop forewarning systems. Advance tools like GIS and remote sensing for mapping of pest and disease incidence will be helpful in assessing the risks involved and their management.

Improve Access to Information and Knowledge

Access to information and knowledge is vital for increasing food production. To equip personnel with state-of-the-art technology skill, expertise and knowledge, capacity building programmes in cutting-edge technologies and frontier areas viz. climate change impact modelling, risk analysis and management, integrated farming system research, water productivity assessment, multiple use, bio-informatics, information and communication technology, behavioural science and research management skills, IPR issues, integrated water management, integrated aquaculture management and socio-economic and policy research are envisaged. Brainstorming meetings, effective co-ordination of multi-commodity, multi-disciplinary research and co-ordination with line departments of state/central government will be done to advocate policy issues for the benefit of stakeholders.

Institutions and Policies

Policy research will be an integral part of the mission of this University. In order to disseminate agriculture technologies, socio-economic constraints in adoption of biophysical solution will be identified. Principles and policy guidelines will be developed for integration of production technologies with socio-economic environment. Major emphasis will be given for socio-economic characterization of the region for identification of removable production constraints. Through its research and outreach activities and development of suitable service delivery system/mechanism, the policies shall be promoted to reduce poverty, improve food and nutritional security, and alleviate pressure on fragile natural resources. Taken together these activities will create a formidable matrix for advancing sustainable agricultural development in the region.

Transfer of Technology

Technologies developed at research stations have to be assessed at micro level with greater involvement of farmers and accordingly modified to suit the needs of the clientele. To bridge the gap between the technologies developed at research stations and its adoption by major stakeholders especially by farmers, technology assessment, refinement and dissemination will be taken up.

Latest ICT tools have revolutionized the pace and quantum of information flow. Proven technologies can now be taken to be end users and stakeholders rapidly and convincingly. Higher investments in these areas pay richer dividends. Novel approaches can be designed to reach out remotest part of the country. It is important to continuously strive to develop new and

better technologies. Their effective delivery mechanism would greatly help in bridging wide gap between the potential and the realized productivity.

Changing socio-economic scenario

Under changing socio-economic world order due changes are also needed in restructuring institutionalized research activities. IPR related issues have already throttled free flow of germplasm and breeding material even within the country. Several of the biotechnology products developed by public organizations are likely to be entangled in proprietary related legal issues before seeing the light of the day. Hence it is imperative to evolve effective public and private sector partnerships and undertake confidence building measures for development of technologies which are good both for public and the private sectors.

Strategy and Frame Work

Making agriculture a sustainable enterprise is the basic concern in the present era of global climate change. The global climate change has already had observable effects on environment. Temperature is rising, glaciers have shrunk, ice on rivers and lakes is breaking up earlier, plant and animal ranges have shifted, trees are flowering sooner, landscapes are changing also due to massive land erosion, there is an increased risk of drought, fire and floods, stronger storms cause increased storm damage and more heat related spreads of diseases and pests put biodiversity at risk and cause economic losses. Simultaneously, the population is increasing at an alarming rate and in order to feed millions of mouths there is a dire need to grow enough food, feed, fuel and fibres. The necessity to meet requirements of the ever-increasing population has put the tremendous pressure on natural resources. Moreover, the resource base is degrading due to large scale soil and water erosion in the hilly and sloppy areas, appearance of wide-scale secondary salinization and waterlogging in the irrigated and flood-affected area, deterioration in water quality, chemical degradation, diminishing forest cover and inaccessibility to the costly inputs in agriculture. Soil a vital natural resource is under competitive demand for industrial growth and urban expansion. Since pressure on available soil resources will increase with time, its effective and rational use will be the core strategy to increase the productivity on sustainable basis. Soil health and fertility must also draw immediate attention of all concerned, especially when organic matter content has gone down (0.3-0.5 per cent), and several micronutrient deficiencies are now surfacing prominently. Thus, there is a strong need for conserving soil and land resources and preserving natural ecosystem in proper equilibrium so that short-term exploitative measures on soil resources do not jeopardize long-term sustenance of soil productivity and health. Water is also a scarce resource. It is estimated that even after achieving the full irrigation potential, nearly 50 per cent of the total cultivated area will remain rainfed. Such low level of water availability is considered a severe constraint to socio-economic development and maintenance of environmental quality.

Agriculture will continue to be a major contributor to the economies of most developing countries. However, as countries become more industrialized, the agricultural share of the gross domestic product will progressively decline. In many developing countries, the agricultural sector is undergoing rapid changes as a consequence of both technological progress and an industrialization process that calls for an increased market focus, competitive practices and higher productivity. Employment opportunities in off-farm agriculturally related activities

are expected to increase at a faster rate than in production agriculture. The reorientation of curricula will need to incorporate both the new role of market-oriented agriculture as well as issues of direct relevance to food security and rural poverty. Courses of study will need to better reflect the importance of social and environmental issues for sustainable agricultural and rural development. Meaningful curricula revision will require a better understanding and incorporation of the underlying psychological processes that influence learning, with special attention to experiential learning and participatory learning strategies that focus on inductive reasoning skills. Moreover, agricultural institutions need to do a better job of carrying through with their unique ability to solve the agricultural problems of the communities they serve. A holistic approach to teaching agricultural production through a multi-disciplinary systems perspective will increase the utility of both scientific and local knowledge.

In order to accomplish the aforesaid vision and goals of SKUAST-J, a comprehensive approach with a shift in focus from supply-driven to demand-driven technological advancement is required. This would necessitate institutional changes in research focus to production - supply chain improvements right from planting material production to organized marketing. Commodity and discipline based research programmes need to be reoriented to system based research for which strong linkages with other research organizations and private sector is necessary. Overall development of horticulture in the country would require considerable improvement in the productivity and quality of the produce and reduction of post-harvest losses. Strong support of basic and strategic research in conjunction with utilizing the new and frontier areas of science to complement conventional approaches can only ensure further growth of agriculture industry. The research outputs are to be transmitted effectively to the end users. Furthermore, the efficient utilization of available human resources and infrastructure along with strengthening of research resources and capacity of the existing manpower is needed. Keeping all these facts in mind, the following strategy is framed to accomplish vision and goal of the University and to enhance efficiency of research and teaching resources (for details see annexure) that is expected to culminate with enhanced productivity, profitability and quality products.

Research

Agriculture Sciences

Harnessing the Potential of Genetic Resources

- Collection, conservation and utilization of available genetic resources of agricultural, horticultural and other crops.
- Using diversity to understand genome organisation, gene function and plant evolution in order to clarify fundamental aspects of plant biology

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- Development of improved cultivars of agricultural, horticultural and aquatic crops suitable for cultivation in Jammu region.
 - Development of crop varieties having tolerance to biotic and abiotic stress under climate change regime.
 - Ensuring intellectual protection of genetic resource through IPR strategies.
 - Understanding the mechanism of evolution of agriculturally important crop species.
 - Broadening of global gene pools by characterization of genetic resources.

Natural Resource Management through Development and Applications of State of Art Technologies

- Development of agricultural, horticultural and aquatic crops based on location specific farming system models.
- Improvement in biological properties of soil in agricultural and horticultural based cropping system.
- Amelioration of acidic and alkaline soils.
- Evaluation of alternate strategies for climate adaptive water resource management, and feasibility studies on multipurpose water harvesting projects.
- Optimum use of water resources through improved water application and water conservation technologies.
- Raising productivity of rainfed agriculture through 'green water' management and watershed management research in uplands and hills.
- Development and popularizing resource conservation technologies for enhancing total factor productivity and input use efficiency.
- Restoration of degraded lands through agroforestry interventions.
- Harnessing of solar power to enhance agricultural production.

Replacement of low potential/pest and disease susceptible existing varieties with new high yielding potential varieties (food grain, vegetable and fruit crops)

- Breeding strategies both innovative and conventional will be adopted to evolve high yield varieties having resistance biotic and abiotic stresses.
- Multi location testing of improved varieties and technologies.
- Increased seed multiplication of newer varieties for problematic and strategic areas under various ecosystems.
- Validation and popularization of the varieties and production technologies.

Genetic tailoring through biotechnological means for multiple trait incorporation in cereal crops.

- Using biotechnological tools for developing varieties suitable for various stress situations.
- Gene pyramiding of important biotic and abiotic stresses.
- Transgenic approaches for developing varieties for biotic and abiotic stresses and with better nutritional quality.
- Development of varieties having nutrient use efficiency.
- Multi-locational testing of developed varieties, production technologies, validation and popularization.

Hybrid seed production of cereals (Rice and maize) and vegetables

- Simplification of seed production technology for hybrid seed production of important cereal and vegetable crops.
- Spread of hybrid seed technology, seed village, training and ensuring availability of quality parental lines of seeds to growers.
- Adoption/encouragement of cultivation of hybrid varieties of fruit crops through demonstration.
- Validation and popularization of hybrid varieties of field crops and production technologies.

Enhancing grain and nutritional quality (rice, maize, wheat, rajmash)

- Evaluation of germplasm to grain and nutritional quality.
- Standardization and search for novel quality parameters.
- Transferring of aroma and associated quality parameters in non-aromatic high yielding rice.
- Identification and popularization of newly developed quality varieties.

Development of water saving technologies and its management.

- Adoption of run-off rain water management practices.
- Development of better water technologies.
- Strategies for enhanced water and nutrient use efficiency under across the ecologies.
- Identification and popularization of water saving technologies.
- Site specific testing on multiplication basis.

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- Breeding for drought resistance and developing varieties suitable for rainfed areas.

Diversification and identification of promising and profitable cropping and Farming systems.

- Evaluation and development of cropping system approach.
- Development of model system for integrated farming system feasible for adoption among the low-income group.
 - Livelihood development systems including fish, prawn and livestock like poultry, duckery, piggery, etc.
 - Identification and inclusion of component system such as horticulture, vegetable crops etc.
 - Impact studies on the developed technologies and their popularization through spread of technology capsules and modules.

Sustaining soil health through

- Improved integrated management
- Monitoring soil quality
- Adopting resource conservation technologies
- Building up soil resilience through innovative carbon sequestration strategies
- Utilization of microbial diversity

Enhancing water productivity through

- Soil water conservation.
- Implementing synergistic effects of water and nutrient interaction.
- Utilization of biomolecules to reduce water loss.

Improving input use efficiency through

- Precision nutrient management.
- Diagnostics of soil and plant nutritional problems.

Sustaining crop productivity under changing climate through

- Assessing climate change and its impact.
- Selecting crop genotypes resilient to climate change.

Integrated pest management through

- Understanding molecular basis of tritrophic interactions.
- Precise delivery system for pesticides.
- Designing diagnostic tools.
- Developing decision supporting system.
- Exploiting ecosystems services.
- Pest risk analysis.

Conservation Agriculture

- Collection of information on the status at the block level and preparation of plans for implementation at grass root.
- Development of infrastructure, machines and modern tools.
- Need based research on the aspect
- Study about the indicators of sustainability and development of feedback system.

Crop-weather relationships and crop growth modeling

- Establishing a better understanding of relationship of weather parameters and crop growth to develop proper crop management practices both under rainfed and irrigated conditions.
- Validation and utilization of crop growth models for estimating regional agricultural production.

Application of Remote Sensing and GIS for crop management

- Estimation of land use pattern.
- To prepare land capability classification.
- Estimation of problem soils and demarcation of areas for planning of crop management.

Climate resilient Agriculture

- Study about the impact of climate change / variability and future scenarios of the climate and their impact on crops.
- Modification of crop management strategies with the pace of climate change.
- Real time monitoring for preparation of contingency crop plans.

Water and land resources management

- Determination of crop water demand for different cropping systems.
- Development of techniques to bridge the gap between available water supply and crop water demand. Development of efficient water control and conveyance structures.
- Assessment and performance evaluation of available instruments for on-farm water management. Development of low-cost instruments for on-farm water management.
- Assessment of utilizable ground water resources for agriculture. Development of technologies for groundwater recharge.

Recycling of waste and runoff waters in agriculture

- Development of technologies for use of poor quality and waste waters for agriculture.
- Monitoring the accumulation of nitrates and heavy metals in soils and ground waters.
- Development of bioremediation technology for waste and polluted waters using blue green algae and Azolla.

Water and nutrient synergy for enhancing crop productivity

- Crop planning for efficient water and nutrient management under deficit water availability.
- Quantification of water-nutrient interactions in various cropping systems.

Enhancing productivity of rainfed areas

- Assessment of harvestable rain water.
- Development of technologies for rain water recharge and direct use.
- Assessment and planning for efficient utilization of natural resources on watershed basis.

Weed management strategies

- Initiation of research on aquatic and parasitic weeds.
- Mitigating the emerging threats of biosimilars through molecular and other approaches.
- Identification of herbicide metabolites.
- Emphasis on crop-weed interaction and productivity in the changing climate.
- Developing IWM practices.

Farm mechanization

- Development of low cost, high efficient farm implements for poor and marginal farmers.
- Popularization of farm machinery and implements.

- Energy saving technologies for crop production and post harvest management.
- Design and development of farm machinery for multiple uses.
- Processing and value addition of post harvest products from food crops.
- Multi-locational trials and training.

Protection technologies for improved demand driven field crops.

- Development of improved plant protection measures.
- Development of strategies for specific disease management through botanicals and chemicals.
- Development of pest management strategies in endemic and other areas.
- Impact of increased temperature and carbon dioxide in the atmosphere on rice varieties, disease pest and crop response.
- Integration of crop production system with improved disease pest

Resources use efficiency under rainfed & irrigated eco-system.

- Benchmark survey for identification of current use of resources.
- Enhancement of resource use efficiency through sustainable modules.
- Multilocational trials for testing at farmers field
- Impact/validation.

Seed production technologies, Increase in the seed replacement rate.

- Availability of quality seed at right time, place and in right quality.
- Simplification of seed production technology for hybrids.
- Broadening the genetic base of the parental lines by utilizing wide compatibility genes.
- Spread of hybrid rice technology: Seed village, training of the potential farmers for hybrid seed production and making of quality parental line seeds available to the hybrid seed producers.

Veterinary Sciences and Animal Husbandry

- Surveillance and prompt field diagnosis of emerging, reemerging and trans-border animal diseases.
- To develop appropriate technology for forecasting of incidences, mortality, production and post harvest losses.
- Development of super specialty clinics with the input of latest equipment and technology.

- Ultra modern facilities for identification of pathogenesis, management of toxic and deficiency diseases.
- To explore the opportunities for better and judicious utilization of naturally available resources.
- To formulate the strategy for better livestock health through intervention of nutrition and management.
- Implementation of food quality assurance programme with particular emphasis on GMP (Good manufacturing practices), GHP (Good hygienic practices), HACCP, ISO Certification System.
- Development of advanced technologies for milk and meat processing, value addition, packaging and shelf life extension of perishable food commodities.
- Invitro and Invivo studies on the effect of environmental contaminants/toxicants effecting ecosystem.
- Focus must be given on the identification, improvement and conservation of native germplasm.
- Need for the identification of species suitable for rearing at high altitude.
- Need for the identification of medicinal plant available in the hilly track of J&K with their active principal and their therapeutic potential.
- Clinics with well equipped computed tomography, magnetic resonance imaging, 3D Doppler colour ultrasound and flexible endoscopes, particle cell counter, auto analyzer, endoscopy, Real time ECG, EEG etc.
- To develop specific and sensitive serological, molecular based diagnostics for important bacterial, viral, fungal and parasitic diseases.
- Development and production of new generation vaccines.
- Identification and dissemination of superior germplasm under farm and field conditions in cooperation with Animal and Sheep Husbandry Department.
- The nutritional management and requirement are highly variable in different agro climatic regions of the state. Therefore, modelling approach will be adopted for optimizing nutrient utilization and animal productivity.
- The mechanism of nutrient utilization under changing climatic conditions to enhance animal productivity will be elucidated using biotechnological approaches.

- Identification of technologies for nutritional enhancement of unconventional regional feed resources.
- Application of biotechnological means in processing, product development, preservation and packaging technology of fresh and processed meat and meat products.
- Fabrication and designing of novel livestock products by employing different emerging technologies.
- Development of designer livestock products.

Education

Strengthening UG Programmes

Increased emphasis on Career- oriented courses: The objective is to introduce Career and market-oriented, skill enhancing add-on courses that have utility for job, self-employment, competence and empowerment of the students.

Application of information technology: By using information technology skills in education, teachers need to prepare slides, presentation and online lecture materials. The class rooms need to be re-designated as “virtual class room or model class rooms” in order to make the lessons/ topics more understandable and interesting. The learner / student with the advent of internet and other technologies trained in using the internet in early stages and these virtual classes are the stepping stones for building future virtual colleges and Universities. To prepare the agricultural graduate to meet out the challenges in new millennium, the role of ICT in modern scenario will not be underlined.

Increase in the intake capacity by 50 per cent: Increased scholarship funds and focus on minority and backward students. Counseling and proper guidance camp shall be organized for the popularization of the agricultural education among the student.

Practical orientation to teaching through field classes: Field classes shall be mandatory during the teaching programmes. It will enable the students to understand the subject well and explain the logics in scientific manner.

Revision and implementation of intellectually challenging and professionally satisfying and useful curricula to train graduates for present scenario across the globe. The emphasis will be on skill-oriented instruction and developing critical thinking and analysis.

Teaching on indigenous technologies by modifying the curriculum upto 20 per cent as permissible by ICAR norms.

Train Human Resources in Core and Emerging Areas by Introducing New UG Programmes

Introduction of inter-disciplinary teaching:

Agricultural research will leverage promises of frontier sciences, nano-technology, information and communication technology and remote sensing; techniques like Geographic Information System and Global Positioning System. These frontier sciences and techniques would be well integrated in the on-going and future agricultural education for improving research efficiency, better targeting of technologies and also identifying production and marketing environments.

Programmes such as organic agriculture, WTO, intellectual property rights, and sustainable agriculture, Biodiversity, Nanotechnology, Start of school of agri-business management.

Training youth including women to acquire practical skills and enable them to serve as grass root level functionaries or entrepreneurs with regard to biofertilizers, biopesticides, organic basmati, mushroom cultivation, vermi-composting, apiculture, value-addition, floriculture, market linkage, protected cultivation, medicinal & aromatic plants, fisheries, dairy, poultry, seed, production, soil testing, artificial insemination, etc.,

Improving the quality and relevance of post graduate education by strengthening P.G. and research programmes

Revision of course curricula of all the PG degree programmes .

Introduction of new PG degree programmes

Modifying the curricula by 20 per cent to accommodate the commercial indigenous technologies, such as value addition in agriculture.

Water Conservation, Commercial Horticulture, sericulture, apiculture, seed production, dry land & rainfed agriculture

Establishment Centres of Excellence:

Schools of Advanced Studies in which the university has core competence in areas such as:

1. School of Biotechnology
2. School of Agri-Business Management
3. School of Seed Technology

4. School of Innovative Crop Improvement Technologies
5. School of Resource Management
6. School of Human Resources Development
7. Advance Centre of Studies on Basmati And Rajmash
8. Advance Centre for Watershed Management
9. Advance Centre on Value Addition
10. Advance Centre For organic Agriculture
11. Advance Centre For Hill Agriculture
12. Advance Centre For Farm Modelling
13. Advance Centre For Disease Diagnosis
14. Advance Centre For Vaccines

Increase of inter-disciplinary and collaborative teaching and students research programmes. Synergistic teaching programme in biotechnology and plant breeding , seed science technology and crop improvement, Floriculture and Agroforestry (Medicinal & aromatic plants)

Creation of new Faculties

S.No.	Faculty	Additional Menpower Requirement		
		Teaching	Non-Teaching	Total
1	Faculty of Dairy technology	41	9	50
2	Faculty of Agriculture Engineering	17	21	38
3	Faculty of Forestry & Horticulture	12	10	22
4	Faculty of Basic Sciences	30	12	42
5	Faculty of Home Sciences	25	20	45
6	Faculty of Fisheries	22	18	40

Professional development opportunities for teachers to get exposure to recent advances and teaching capabilities

- 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 country and abroad.

- iii) Promotion of collaborative research programmes, training and academic exchange programmes between the faculty and foreign collaborators
- iv) Promote organization of summer and winter schools, and special academic programmes by highly experienced teachers.

Encouraging 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) Encouraging Ph.D students to carryout research work in identified Research and Development organizations in the PPP mode.

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 placement cells to enable them to identify employment opportunities.

Provide international 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) Establishment of academic exchange and collaborative research and teaching programmes with foreign universities and research institutions.
- iii) Encourage faculty to teach and conduct research abroad by extending sabbatical leave facilities and organize and attend international seminars , workshops and meets.

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.

Strengthen facilities and services for the visiting faculty such as temporary housing, laboratory and transportation facilities. Simplifying administrative procedures to promote such exchange.

Provide basic medical care facilities in all constituent units of the University.

- i) Further promotion of the participation of students in National Service Scheme and National Cadet Corp activities by extending these to all teaching campuses.
- ii) Promote students to participate in University sports, youth festivals, debates, games, literacy and cultural meets conducted at regular events.
- iii) Promote the increased use of computer and information technology for fostering IT knowledge and international communication.
- iv) Support efforts such as global class rooms by providing video conferencing facilities.
- v) Establishment of state of art laboratory and teaching halls.

Starting diploma and PG diploma courses

Introduction of PG and post matriculation level in diploma courses in several areas in each of the faculties to train rural youth, women and economically weaker sections of society. Establishment of Agriculture, Horticultural and veterinary & Animal Husbandry polytechnic in all the districts of the state with at least one such institution in each district. Commencement of certificate, courses in organic farming , soil testing, plant clinic.

Library

- Computerization of Faculty, Libraries and major research stations.
- Establishment of Wan and Internet connectivity in the faculties and research stations.
- Strengthening book collection at all faculties and research stations.
- Digitizing all dissertations and other University documents.
- Establishing student's computer labs.
- Computerization and servicing.
- Servicing through UNLINK to all other Universities of the State.
- Provision of statistical Analysis package to all the faculties and research stations.
- Improvement of Library and Information access facilities by computerizing Library operations.
- Inter-Library linkages through wide area networking.

Extension

- 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 skill and methods to reduce drudgery of farm women (performing 80 percent 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.
- Establishment of zonal level training institutes/ technology parks at Research stations / KVK.
- 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 led extension.
 - Organisation of farmers field schools.
 - Mobile Advisory system.
 - Identify technological gaps.
 - Efficient transfer of technology for ensuring adoption.
 - Impact assessment of technologies in socio- economic modes for further refinement with PRA.
- Development of technology for socially handicapped groups and disseminating low-cost technology through Non-governmental Organizations, Agri clinics and seed Villages.
- Development of linkage with industry for:
 - Testing of plant protection chemicals.
 - Patenting the implements/technology.
 - Development of information / technology for agro-industries.
 - Repair and maintenance facilities of agricultural implements and machines at village level.
- Validation and transfer of technologies through.
 - On-Farm Trials.
 - Front Line demonstration.

- Breeder seed production.
- Sponsored and need based training programmes.
- Specific crop knowledge management portal system.
- Constraint analysis studies.

Livestock Extension Services

- To popularize organic livestock production system.
- Development of mass media programmes for better animal production and health.
- Establishment of multimedia with audio visual facilities for disease prevention.
- Documentation and dissemination of indigenous technical knowledge in livestock production, health and processing sector.
- Development and establishment of KIOSKs in the adopted villages and university's interconnected network.
- To generate the baseline anatomical, physiological & biochemical data of local available livestock to make them recognised as notified breeds.
- Development of software in different languages for livestock farmers and owners.
- Development of videos/clips in local languages for transfer of technology and information regarding animal health and management.

Research coordination for

- Close linkages with SAUs for multiplication exchange of information, germplasm, testing of varieties in pest/disease endemic areas and management of technology generation, identification and refinement.
- Adoptive trials at farm level for on-farm technology assessment.
- Transfer of technology generated in other parts of India.
- State Agricultural Universities/Trainers etc.
- KVK's for trials in farmer's fields.
- State line Depts. for various components of extension, viz., seed supply, field visits, etc. Diagnostic visits to farmer's field, front-line demonstrations, procurement and selling.
- Voluntary agencies for supply of seeds etc.

Creation of New Krishi Vigyan Kendras

S.No.	Krishi Vigyan Kendra	Manpower Requirement		
		Scientific Staff	Non-Scientific	Total
1	KVK, Samba	7	9	16
2	KVK, Ramban	7	9	16
3	KVK, Udhampur	7	9	16

Infrastructure Development:

- Construction of Buildings for Faculty of Dairy Technology, Faculty of Basic Sciences, Faculty of Agro-forestry and horticulture, Agriculture Engineering and School of Agri-business Management.
- Construction of shopping complex.
- Construction of Visiting Scientists Hostel.
- Construction of NRI Students Hostel.
- Establishment of gymnasium in the boys and girls hostel.
- Establishment of more residential quarters for both teaching and non-teaching.
- Construction of hostels and residential accommodation for girl students and foreign students in all the major teaching campuses.
- Provide additional recreational facilities such as indoor games, pavilion, play field and synthetic courts for outdoor games.
- Establishment of Technology Parks.
- Establishment of state of art laboratory and teaching halls.
- Establishment of faculty club in both the campuses.
- Establishment of multipurpose stadium.
- Development of super speciality poly clinics with 24 hrs emergency services .
- Development of centralized instrumentation laboratory with ultramodern facilities.
- Establishment of Bio-technology park.
- Setting up of Bioinformatic Centre.
- Establishment of Diagnostic centre.
- Setting of Gene Bank.

- Adoption of bio safety and bio security measures.
- Establishment of centrally air-conditioned lecture rooms with audiovisual multimedia projectors, capable of implementing e-learning programmes.
- Establishment of air conditioned milk and meat processing units.
- Construction of post-mortem rooms with modern incineration plant for carcass disposal.
- Construction of modern & centrally air conditioner (AC) Dissection Hall and embalming room in Anatomy.
- State of art common instrumentation facility.
- Development of E-library.
- Development of customised experimental sheds and Animal House, Lab. Animal.
- Establishment of fish production unit/farm.

Annexure

Agriculture Sciences			
	Goal	Approach	Performance Measure
Crop Improvement			
a. Cereals	Germplasm improvement	<ul style="list-style-type: none"> ◆ Development of pre-breeding lines resistant to biotic and abiotic stresses having high yield potential ◆ Exploration and procurement of diverse germplasm lines for important economic traits. ◆ Creating and exploiting global gene pools. ◆ Screening for novel genes following hybridization and selecting new cultivars for local adaptation. ◆ Gene discovery for biotic & abiotic stresses through biotechnological interventions. ◆ Development of plant ideotype for conservation agriculture 	To identify the suitable genetic resources for the improvement of traits related to yield and resistant to stresses.
	Development of high yielding varieties and hybrids having better quality and resistance.	<ul style="list-style-type: none"> ◆ Exploitation of exotic gene-pool to introgress component traits. ◆ Introgressing the yield enhancing QTLs from exotic and traditional germplasm. ◆ Development of productive inbred lines ◆ Identification of functional polymorphisms affecting important agronomic traits. ◆ Development of early and medium maturing single cross hybrids and populations ◆ Gene pyramiding for various disease & quality traits. ◆ Adopting innovative high-throughput genotyping technologies for screening of large number of molecular markers and samples in lesser time. ◆ Use of marker assisted selection 	Plant type/variety for conservation agriculture Varieties with more than 5 per cent and hybrids with 10-15 per cent higher yield than the present best variety and hybrids

	Improving nutritional quality	<ul style="list-style-type: none"> ◆ Evaluation of germplasm for Zn, Fe & protein content. ◆ Improving quality for consumer's preference and for domestic and export purpose by applying conventional and molecular breeding approaches ◆ Biochemical / molecular profiling of germplasm, inbred lines and hybrids for various quality parameters ◆ Use of nutritionally superior inbred lines in development of hybrids ◆ Gene discovery for Zn, Fe & protein content. ◆ Marker-assisted selection (MAS) for the improvement of above traits. 	Varieties with superior quality for export & domestic need with high iron, zinc, and protein. Nutritionally improved inbred lines and hybrids
	Stabilizing productivity by improving biotic and abiotic stress tolerance	<ul style="list-style-type: none"> ◆ Identification, mapping and introgression of novel genes using conventional and molecular breeding approaches ◆ Developing varieties having tolerance to cold and drought. ◆ Customized adaptive breeding and selection programs for biotic and abiotic stresses. 	Crop Varieties with multiple resistance to biotic and abiotic stress tolerance
	Mitigating the effects of climate change	<ul style="list-style-type: none"> ◆ Precise phenotyping of germplasm for various abiotic and biotic stresses. ◆ Breeding for various abiotic and biotic stresses through conventional and MAS approaches. 	Hybrids tolerant to various biotic and abiotic stresses
	b. Oilseeds and Pulses		
	Germplasm improvement	<ul style="list-style-type: none"> ◆ Development of pre-breeding lines resistant to various stresses. ◆ Collection, purification and characterization of local landraces for various diseases and insect pests. ◆ Gene discovery for biotic & abiotic stresses through biotechnological interventions. ◆ Identification of new sources of disease and insect pest resistance. ◆ Development of large scale molecular markers for germplasm characterization. ◆ Mapping of genes of economical importance. ◆ Marker-assisted selection & pyramiding of genes for important traits. ◆ Evaluation of landraces for various micronutrients including Zn, Fe & protein content. ◆ Development of oilseed varieties with increased oil content and aphid resistance having high seed yield potential. 	Pre-breeding genetic resources for yield improvement. Oilseed varieties with 5-10 per cent higher seed yield and oil content.

c. Forest trees	Screening and evaluation of multipurpose tree species (MPTS)	<ul style="list-style-type: none"> ◆ Biomass production potential of identified tree species ◆ Performance of species at the tree-crop interface with least competition with agricultural crops ◆ Management practices of the selected MPTS 	Tree species with improved biomass, growth rate with least negative effects on associated field crops.
d. Fruit crops	Increasing fruit production and productivity	<ul style="list-style-type: none"> ◆ Development of high yielding varieties. 	High yielding varieties with improved production and productivity.
e. Vegetables	Maintenance breeding	<ul style="list-style-type: none"> ◆ Collection, evaluation and maintenance of germplasm for utilization in breeding programmes 	Identification of elite genotypes
	Identification and development of new genotypes	<ul style="list-style-type: none"> ◆ Development of elite inbreds / pure lines ◆ Development/identification of hybrids. 	Replacement of farmers seed on large scale Increase in production and productivity / unit area
f. Ornamental crops/ medicinal plants	Germplasm conservation of ornamental crops	<ul style="list-style-type: none"> ◆ Collection, conservation and documentation of germplasm (marigold, gladiolus, chrysanthemum, rose, tuberose, annuals) for utilization in breeding programmes ◆ Collection of germplasm of various ornamentals viz., trees, shrubs, climbers, annual flowers, bulbous plants etc. for utilization in various landscaping. 	Development of new genotypes suitable for different agro-climatic zones of Jammu region
	Biochemical prospecting of medicinal and aromatic plants for antioxidant, antifungal and anticancer metabolites	<ul style="list-style-type: none"> ◆ Biochemical prospecting of medicinal and aromatic plants for antifungal/antioxidant and anticancer metabolites. ◆ Activity guided fractionation of promising essential oils/extracts for bioactive constituents having antifungal/antioxidant and anticancer activities. ◆ Identification and characterization of bioactive constituents. ◆ Protection of the generated information through patents. 	The identified novel molecules may be utilized for drug/biopesticides development. The identified molecules may serve as leads for further improvement of structure and activity.
Natural Resource Management			
	Conservation Agriculture	<ul style="list-style-type: none"> ◆ Development of conservation agriculture techniques on nutrient, water and weed management for suitable cropping systems 	Sustainability of the system and input use efficiencies
	Precision Agriculture	<ul style="list-style-type: none"> ◆ Use of leaf colour charts, optimization of the techniques with the précised equipments and tools, site specific nutrient management 	Assessment of input responses in term of time, space and quantity

Water saving agriculture through enhancing the productivity of irrigation water	<ul style="list-style-type: none"> ◆ Adoption of FIRB for suitable crops, aerobic rice, SRI and irrigation scheduling for different crops in different ecological zones. 	Refinement of irrigation system, Water use efficiency, water saving, net return of the farmer
Application of RS and GIS for watershed management	<ul style="list-style-type: none"> ◆ Procurement of Topo sheet and recent imagery of the area and use of GIS package for land use, runoff and estimation of soil loss. 	Runoff, erosion rate, land use
Designing of water Conservation Structures	<ul style="list-style-type: none"> ◆ Estimation of catchment area, peak flow, geology and land use 	Optimum size of WHS, Roof water harvesting structures and location and designing of the capacity of recharging structures
Design of engineering measures for controlling soil erosion	<ul style="list-style-type: none"> ◆ Development of land capability classification using RS and GIS, Identification of suitable sites for different engineering measures 	Engineering measures/ structures to control the soil erosion
Design and adoption of pressurized irrigation system	<ul style="list-style-type: none"> ◆ Designing location specific pressurized irrigation system and training and demonstration to the personnel of line department and farmers 	Enhancement of water use efficiency, economics of the system
On farm water management	<ul style="list-style-type: none"> ◆ Proper design of irrigation system, crop water requirement and irrigation scheduling for different crops in different ecological zones 	Water use efficiency, water saving, net return of the farmer
Water quality analysis	<ul style="list-style-type: none"> ◆ Samples of surface, sub surface and rural drinking water will be analyzed 	Recommendation for use will be furnished
Enhancing Soil Health	<ul style="list-style-type: none"> ◆ Development of soil quality indicators ◆ Judicious use of organic materials ◆ Correcting nutrient imbalances ◆ Restoration & reclamation of degraded soils/land. 	Status in realtion quality indicators Dilneation of problematic soils/lands Yield enhancement in degraded areas
Carbon sequestration	<ul style="list-style-type: none"> ◆ Developing soil carbon inventory in different land uses. ◆ Prioritization agricultural systems for carbon sequestration ◆ Development of carbon credit index ◆ Development of agriculture management practices for enhancing carbon sequestration in different production systems 	Soil carbon stocks Identify carbon production systems. Increased Carbon levels

Managing soil pollution	<ul style="list-style-type: none"> ◆ Judicious use of Industrial effluents. ◆ Techniques for remediation of contaminated soils ◆ Gainful utilization urban /rural solid wastes ◆ Developing guidelines for heavy metal loading. 	Heavy metal loading
Enhancing nutrient use efficiency	<ul style="list-style-type: none"> ◆ Precision farming ◆ Fertility evaluation techniques. ◆ Soil Test Crop Response ◆ Recycling of crop residues and organic and organic waste ◆ Integrated Nutrient management ◆ Fortification of fertilizer 	Increased productivity Returns against fertilizer investments
Soil inventory for cataloguing potentials and problems.	<ul style="list-style-type: none"> ◆ Soil properties data bases ◆ Soil fertility mapping using GIS at block levels ◆ Evaluation of land resources through remote sensing 	Soil maps Database of soil properties
Conservation techniques for hilly and rainfed ecosystem	<ul style="list-style-type: none"> ◆ Runoff management ◆ Rain water harvesting and recycling ◆ In situ moisture conservation ◆ Soil erosion check 	Increased water productivity Reduced erosion

Production Technology

Standardization of production technology	<ul style="list-style-type: none"> ◆ Popularization and adoption of good agricultural practices in agricultural crops ◆ Evolving technologies for increasing productivity in fruit crops. ◆ Development of Climate Resilient technologies to meet the global warming ◆ Refinement and development of innovative techniques to ensure round the year availability of vegetables ◆ Implementation and popularization of water conservation and Vegetable forcing techniques to produce off-season peri-urban vegetables ◆ Standardization of production technology of hybrids 	Increase in area and cropping intensity Reduction in pre-harvest losses Water saving Rise in socio-economic status of the farmers
Organic farming technology	<ul style="list-style-type: none"> ◆ Standardization and popularization of bio agents and cultural practices for development of viable organic modules 	Reduction in environmental and health hazardous pollutions Improvement in soil structure and texture Quality produce with sustainable yields

Protected cultivation	<ul style="list-style-type: none"> ◆ Development of climate control system for quality flower production (rose, gerbera, chrysanthemum), planting material production fruits and vegetable crops, popularization of drip-irrigation system, production of off-season flower crops 	Increase in quality and market value Availability of flower throughout the year as well as production of quality planting material of horticultural crops
Quality seed/ planting material	<ul style="list-style-type: none"> ◆ Production of quality seeds/planting material of elite germplasm of various medicinal and aromatic crops / ornamental annuals / forest trees /fruit plants/ vegetables/ shrubs/pot plants, establishment of model horticultural nurseries and plant tissue culture facilities 	Dissemination of quality planting material
Standardization of agro-techniques	<ul style="list-style-type: none"> ◆ Screening of potential medicinal and aromatic crops for different agro-climatic zones ◆ Improved package of practices for cultivation ◆ Promotion of cultivation of two cash crops like kala zeera and saffron 	Improved growth, yield and economics of different medicinal and aromatic crops
Establishment of herbal gardens	<ul style="list-style-type: none"> ◆ Herbal Gardens in different agro-climatic zones 	Increase in area under cultivation of M& AP
To increase honey and crop productivity through enhanced pollination	<ul style="list-style-type: none"> ◆ Pollination requirement of fruit/field crops. ◆ Evaluation of bee floral plants for improved honey production. ◆ Selection of colonies with superior strains for improved honey production and pollination. ◆ Investigations into honey bee diseases/ enemies and their management. ◆ Pesticide residues in bee products. 	Enhance D crop productivity by > 20 per cent. Exploration of bee floral plants during dearth periods will double enhance honey productivity, Pest problem /identified/ managed
Promotion of mushroom cultivation with long-term sustainability	<ul style="list-style-type: none"> ◆ Promoting mushroom cultivation in the region by integrating mushroom cultivation with traditional farming systems. ◆ To collect and conserve mushroom biodiversity ◆ Recycling agro-residues through mushroom production. ◆ Genetic improvement and management of biotic and abiotic stresses. ◆ Exploration of vast mushroom gene pool. ◆ Hi-tech mushroom cultivation and processing for round the year availability. 	Ameliorating poverty through self-employment. Resource for food, medicines and novel compounds. Use of spent mushroom substrate (compost) as organic manure and fuel. A sustained growth in mushroom productivity. Genetic enhancement of cultivated mushrooms.

Post Harvest Technology/ Value Addition & Food Technology

Post harvest technology for loss reduction	<ul style="list-style-type: none"> ◆ Development of need based and cost effective technology for grading, packaging, safe storage, handling and marketing ◆ Development of agro-processing technologies for different commodities for adoption at rural level ◆ On –farm storage and minimal processing ◆ Standardization of packaging technologies, creation of cool chain facility and marketing channels. 	<p>Income generation and better quality of life</p> <p>Enhance opportunities for small growers and effective Post-harvest management and marketing especially cut and loose flowers</p>
Value addition & nutrition improvement	<ul style="list-style-type: none"> ◆ Value addition of horticultural, agricultural and dairy produce ◆ Primary and secondary processing of cereals, pulses, oilseeds, fruits and vegetables ◆ Standardization of technologies for extraction of colour/flavours from anthocyanin rich fruits and vegetables ◆ Establishment of facilities for essential oil extraction ,processing and export of dry flowers, extraction of natural dyes 	<p>Farming will become an industry supported and industry driven activity</p> <p>Replacing the use of synthetic colours and flavours</p> <p>New product development.</p> <p>Time saving , nutritious , therapeutic and palatable foods,</p> <p>To make floriculture a profitable venture</p>
By product and waste utilization	<ul style="list-style-type: none"> ◆ Development of technology for converting by-products produced in food industries into value added products 	<p>Reduction of environmental population</p> <p>Extraction of nutrients and other bio active components</p>

Farming System Research

Designing and Development of Location Specific Models for Small holding farmers of various districts of J&K	<ul style="list-style-type: none"> ◆ Resource characterization and constraint analysis. ◆ Design, validation and refinement of location specific IFS model. ◆ Developing system based farm production technologies 	<p>Improved resource use efficiency and system productivity.</p>
Improve income, nutrition and livelihood of small and marginal farmers	<ul style="list-style-type: none"> ◆ Integration of various farm enterprises. ◆ Farm level employment generation. ◆ Integration of low cost on farm-agro processing and value addition methods. 	<p>Improve vertical profitability</p>
IFS research approach and climate resilient agriculture	<ul style="list-style-type: none"> ◆ Input low cost input for production system ◆ Measure the green house gas emission under IFS model 	<p>Sustainable agriculture</p>

Popularization of 0.5 ha IFS model at farm family level in each district	<ul style="list-style-type: none"> ◆ Establishment and demonstration of developed IFS model 	Improve productivity and profitability
Sustenance of resource base	<ul style="list-style-type: none"> ◆ Developing location specific conservation agriculture technologies. ◆ Precision management of external and farm level production inputs. ◆ Practicing organic agriculture for bio-diversity management and nature's harmony. 	Energy auditing at farm level; improved produce, soil, water, environmental quality and bio-diversity.
Crop diversification	<ul style="list-style-type: none"> ◆ Commercialization of non-traditional fruit crops. ◆ Promotion of genetically precocious fruit crops. ◆ Inter-space utilization. ◆ Integration of farming system research. 	Proper use of farm resources. Improved economic condition of the farmer
Climate Change and Agriculture		
Crop-weather relationships and crop growth modeling	<ul style="list-style-type: none"> ◆ Development of water production functions for important crops under rain-fed and irrigated conditions ◆ Spectral responses of crops under varied climate situations ◆ Studies on horticulture and vegetable agricultural systems. ◆ Validation and utilization of crop growth models for estimating regional agricultural production using current weather. 	Forecasting of Agricultural output under climate change scenario.
Influence of weather on pest and diseases	<ul style="list-style-type: none"> ◆ Development of databases on incidence and spread of pests and diseases. ◆ To develop relationships between weather and pests using crop micro climate data ◆ Development of simple DSS and thumb rules and their application in IPM/Agro-advisories. 	Minimum use of fungicides and pesticides.
Climatic resilient agriculture	<ul style="list-style-type: none"> ◆ Study about the impact of climate change / variability on crops, modification of crop management strategies with the changing climate. ◆ Adaptation and mitigation measures 	Measurement of climatic parameters, assessment of global warming potential

Crop Protection

Plant-microbe interactions

- ◆ Multi disciplinary approach for discovering the plant-microbe interactions.
- ◆ Development of new experimental tools and powerful computation capabilities.
- ◆ Combination of genomic, molecular, and ecological approaches.
- ◆ Understanding the molecular basis of pathogen virulence and quantitative and non-host disease resistance.
- ◆ Assessment of patterns of genetic variation in pathogen and plant populations in correlation with the climatic conditions.

Accurately predict the complex interactions among the pathogen, vector, host, and environment.

Comprehensive view of interaction of microorganisms in natural habitats will be developed.

This will form the conceptual basis for natural processes of plant disease suppression.

To provide insights into the epidemiology of plant disease.

Knowledge-based disease management strategies

- ◆ Accurate assessments of plant disease losses.
- ◆ Comprehensive understanding of the interactions between plants, pathogens, vectors, and the environment.
- ◆ Improved detection and diagnostic capacity for plant pathogens.
- ◆ Novel cultural practices, developed from enhanced knowledge of pathogen biology and disease epidemiology, will become increasingly important components of integrated plant health management programmes.
- ◆ Development of disease resistant plants.
- ◆ Testing of new chemicals that are effective in managing disease at low application rates.
- ◆ Natural processes of disease suppression will be better understood.

Models for prediction of epidemics.

Development of more sustainable and profitable disease management practices.

Increased accuracy with quick remedial measures.

Fundamental to cost-effective and environmentally-sound plant disease management in the future.

Reduction on the dependence on the chemical measures of plant disease management and having greater relevance on Integrated Plant Disease Management.

<p>To reduce pesticide pressure and increase crop productivity through development of biological control</p>	<ul style="list-style-type: none"> ◆ To undertake comprehensive research efforts for exploring the biodiversity of various natural enemies viz., parasitoids, predators and pathogens and their documentation through conventional and molecular techniques. ◆ To develop biopesticides based on indigenous strains and enhancement of their activity through various approaches ◆ To develop the entomophage parks for conservation of natural enemies in various ecologically undistributed habitats wherein the traditional agriculture is still being practiced (Remote higher hills of Jammu). ◆ To integrate the use of existing ITK along with available natural bio-resources in hill agro-ecosystems for developing sustainable pest management strategies. ◆ To evolve effective habitat management strategies for promising natural enemies. ◆ To conduct need based advanced research for devising area specific bio-intensive strategies for management of crop pests with special reference to the crops having export potential viz., high quality Basmati Rice, Walnut, Apple and olive. ◆ To impart advanced technical knowhow for entrepreneurship and effective human resource development. 	<p>Usage of bio agents/ biopesticides for reduction of pesticide usage (25-30 per cent)</p>
<p>To identify pest problems and their management</p>	<ul style="list-style-type: none"> ◆ Survey, monitoring and forecasting of major insect-pests of Jammu ◆ Bio-ecology and population dynamics studies on key pests and their natural enemies. ◆ Assessment of crop losses under field condition and its relationship with pest density/ disease intensity. ◆ To explore the role of cultural manipulations and non-crop vegetation on pest abundance and their management. ◆ Development and validation of location specific and economically feasible eco-friendly IPM module against key pest, diseases and nematodes through integration of available natural resources. 	<p>Identify pest problems Reduction in crop Losses IPM modules generated/ tested</p>
<p>Evaluate new molecules of insecticides</p>	<ul style="list-style-type: none"> ◆ Screening of new molecules of insecticides. ◆ Evaluation of field efficacy of various newer insecticides with novel modes of action. ◆ Waiting period in various crops after insecticide application. 	<p>Potent insecticides tested/ recommended Pesticides resistance noticed</p>

Identify nematode problems and their control to enhance crop productivity by reducing crop losses	<ul style="list-style-type: none"> ◆ Identification and management of different plant parasitic nematodes in different crops ◆ Screening of antagonistic agents against various plant pathogenic nematodes ◆ Identification and use of entomopathogenic nematodes against various crop pests ◆ Standardization of mass production techniques for indigenous isolates of entomopathogenic nematodes and their utilization in the field. 	<p>Nematode problems diagnosed/identified.</p> <p>Entomopathogenic nematode tested/ recommended for management</p>
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Landscaping

Awareness generation	<ul style="list-style-type: none"> ◆ Generation of awareness regarding the benefits of urban landscaping (terrace gardens, vertical gardens, roof gardens etc.) on human health by organizing various trainings and crash courses 	Development of gardens in the residential areas
Beautification of university campus	<ul style="list-style-type: none"> ◆ Planting of avenue trees, mass planting of flowers, interior scaping etc. 	Aesthetic look of the campus
Creation of model landscapes	<ul style="list-style-type: none"> ◆ Creation of model landscapes, botanical gardens, crop cafeterias, cactus gardens, rosaries etc. 	Awareness among the students
Establishment of separate division of floriculture and landscape architecture	<ul style="list-style-type: none"> ◆ To boost the floriculture related activities in the region 	Increase in number of staff working in diversified areas

Human Resource Development

Human resource / Skill development	<ul style="list-style-type: none"> ◆ Up gradation of skill by organizing various trainings, diploma courses 	Promotion of agriculture sector & opportunities for the un-employed youths
Education, human resource development and deployment	<ul style="list-style-type: none"> ◆ Post graduate education ◆ Strengthening national and international collaboration ◆ Need based training under mission mode ◆ Promotion of team spirit ◆ Efficient deployment of scientific personnels 	<p>Ph.D's & M.Sc's completed.</p> <p>Number of MoU signed, personnel trained.</p> <p>Improvement in research efficiency. Qualified manpower in agriculture, agriculture research and agriculture business</p>

Strategic manpower development	<ul style="list-style-type: none"> Capacity building for researchers, extension workers and other stakeholders. Strengthening of institutional infrastructure and inter-institutional linkages. Manpower planning and improving HRD competence Establishment of centres of excellence, Advance studies in all teaching discipline Organisation of industry- Academics intercase workshop to reorient education and research contributing to the economic growth. 	<p>Trained personnel in the field of farming system research and development.</p> <p>Improved quality of Research and Extension.</p>
Employment generation and increasing profitability to the farmers	<ul style="list-style-type: none"> To increase profitability by enhancing the input use efficiency of water, nutrients, pesticides and labour. 	<p>Improved per capita income</p> <p>Rural livelihood security</p>

Transfer of Technology and Impact Assessment

Entrepreneurship Development	<ul style="list-style-type: none"> Identification and documentation of entrepreneurs 	<p>Successful enterprises and entrepreneurs</p>
Evaluation research to Improve the impact of development and research programmes	<ul style="list-style-type: none"> To conduct evaluation impacts studies for providing feedback 	<p>To increase the outcome in terms of achieving the goals of research and developmental programme</p>
Adoption of agro-technologies to popularize the scientific recommendation	<ul style="list-style-type: none"> Survey of the farmers to find out the extent of technology adoption 	<p>Adoption gap, and factors effecting adoption and non adoption</p>
Blending ITK with scientific Knowledge	<ul style="list-style-type: none"> Identification, documentation and scientific validation of ITK (ethno science practices) 	<p>To develop scientific validated ITK package</p>
Technology transfer and validation	<ul style="list-style-type: none"> Demonstration of hybrid technology to farmers involving KVKs through trainings, FLDs, Kisan melas, etc 	<p>Impact and constraint analysis studies</p>
Sustainable productivity	<ul style="list-style-type: none"> Popularization of integrated approaches like INM,IPM,IDM and IWM modules 	<p>Reduction in air, water and soil pollutants</p>
Dissemination of Production technology	<ul style="list-style-type: none"> Replacement of seed on large scale with hybrids / HYV On Farm demonstrations On farm trainings Organization of awareness camps and brainstorming sessions 	<p>Strengthening of readily available quality seed chains.</p> <p>Increase in area and production</p> <p>Increase in cropping intensity</p> <p>Rise in socio-economic status</p>

Adoption of modern thermal and non thermal processing technologies.	<ul style="list-style-type: none"> ◆ Initiatives will be taken for adoption of new technologies like high pressure, membrane technology, ohmic processing etc. 	Quality improvement and competitiveness in global market
Improve technology delivery system for small and marginal farmers	<ul style="list-style-type: none"> ◆ Use of dedicated mass media channels. ◆ Electronic communication platform between farmers and scientists. 	Improved rate of adoption of advanced farming system technologies and reduced yield gaps.
Agromet -Advisory services	<ul style="list-style-type: none"> ◆ Development of interactive regional weather-based agro-advisory. ◆ Network system linking to national agro-advisory network. ◆ Economic impact analysis of agro-advisories for further refinement. ◆ Expansion of agromet observatory network and linking up with national advisory network / agromet data bank. 	Minimum farm losses due to aberrant weather and pest diseases infestation.
Impact assessment of agriculture technologies and policy reforms	<ul style="list-style-type: none"> ◆ Technology assessment and refinement in a participatory mode. ◆ Enabling policy and institutional options to enhance uptake of improved technologies 	<p>Number of technologies assessed and refined.</p> <p>Number of policy briefs and social engineering modules developed</p>
Nutrition Security and Export promotion		
Nutritional security	<ul style="list-style-type: none"> ◆ Exploitation of indigenous unutilized fruit crops ◆ To improve the quality fruit access to consumer through cool chain system. ◆ Strict adherence to the food safety standards. 	<p>Overcoming the problem of malnutrition</p> <p>Developed technologies with food safety standards</p>
Export promotion	<ul style="list-style-type: none"> ◆ Product competitiveness ◆ Market intelligence for export promotion and import restriction. ◆ Creation of market infrastructure. ◆ Reduction in the cost of production. ◆ Pest risk and residue analysis for non tariff barriers for imports. 	<p>Earning foreign exchange.</p> <p>Increased share in GDP and national growth</p>

Veterinary Sciences & Animal Husbandry		
Prompt diagnosis of diseases	<ul style="list-style-type: none"> Development of highly sensitive serological, molecular and nanotechnology based diagnostics for important emerging, re-emerging and transborder diseases. Efficient diagnosis and quick reporting of notifiable diseases. 	<p>Better return to the livestock rearing community.</p> <p>Reduced incidences of disease.</p>
Prevention and control of diseases	<ul style="list-style-type: none"> Surveillance and diagnosis Prompt forecasting of incidence, mortality and morbidity pattern Control through proper prophylactic measures. 	<p>Reduction in the number of disease outbreaks.</p> <p>Less morbidity and mortality.</p> <p>Better livestock health and production.</p>
Excellence in clinical services	<ul style="list-style-type: none"> Strengthening the veterinary ambulatory clinical activities. Development of new generation drugs for drug resistant organisms and parasites. 	<p>Reduction in the cost of treatment per animal.</p> <p>Reduction in the number of cases per village.</p> <p>Better animal production and productivity.</p>
Development of alternate and unconventional medicines	<ul style="list-style-type: none"> Documentation of locally available herbs/ toxic plants with known medicinal value and toxic activity Extraction and analysis of active principles present in the herbal plants/ toxic plants. Pharmacodynamic and pharmacokinetic studies of various unconventional locally available drugs in exptal animals. Pesticide toxicity with reference to Mutagenecity, Teracogenecity using HPLC technique. 	<p>Reduction in the cost of the treatment.</p> <p>More use of locally available herbs in the villages.</p>
Improvement in the fertility of domestic animals	<ul style="list-style-type: none"> Evolution of ultramodern technology for the long term preservation. Establishment of semen bank. Establishment of liquid nitrogen manufacturing unit. Organization of awareness camps and village visit programmes. Development of highly sensitive and better heat detection methods. Introduction of well proven superior germplasm. Grading-up of locally available less productive breeds. 	<p>Optimum reproductive performance.</p> <p>Reduction in the number of repeat breeders, anoestrous, etc.</p> <p>High fertility and conception rates.</p> <p>Infiltration of technology with better germplasm to the remote areas.</p>

<p>Improvement in livestock management</p>	<ul style="list-style-type: none"> ◆ Strategic utilization of unconventional feed and fodders. ◆ Development of area specific mineral mixtures and micronutrient incorporated rations to improve the rate of fertility and health of animals. ◆ Emphasis on utilization of bypass proteins and fats for better feed efficiency ratio. ◆ Emphasis on utilization of unconventional locally available feed resources. ◆ Development of new feed formulations with better feed supplements, neutraceuticals, prebiotics and probiotics for optimizing the milk, meat and wool production. 	<p>Reduction in the cost of ration.</p> <p>Better feed efficiency.</p> <p>Low biological waste.</p> <p>Good environment.</p> <p>Better bioavailability of the nutrients to the animals as per the specific area requirement.</p> <p>Increase in production.</p>
<p>Quality assurance of livestock products</p>	<ul style="list-style-type: none"> ◆ Upgradation of laboratory and meat and milk pilot plants as per ISO 9000 certification systems. ◆ Implementation of total quality management system for production of value added meat and milk products. ◆ Continuous implementation of the training programme about the implementation of HACCP/GHP/GMP/TQM. ◆ Utilization of modern pattern of packaging like vacuum packaging, active packaging, MAP, biodegradable, microovenable and retortable techniques. 	<p>Better utilization of culled/ aged animals after their productive life.</p> <p>Less environmental pollution and improved quality and shelf life of the livestock products.</p> <p>Availability of good quality products at reasonable price.</p> <p>More consumer satisfaction.</p>
<p>Upliftment of Extension programmes</p>	<ul style="list-style-type: none"> ◆ Dissemination of technologies to the farmers through mass media. ◆ Campaigning about the modern practices of animal husbandry. ◆ Felicitation of progressive farmers. ◆ Organization of the continuous training programme about vermi-composting and organic livestock production. ◆ 24 hrs support system through cyber linkages. 	<p>For better and prompt response to the queries of livestock owner.</p> <p>Transmission of information regarding the routine practices like vaccination and deworming schedules of animals and poultry from time to time.</p> <p>Exchange of ideas among the livestock owners and scientists about ITK.</p>

Human resource development and entre-preneurship development	<ul style="list-style-type: none"> ◆ Upgradation of course curricula, designing of new programmes. ◆ Improvements in the methodologies of teaching using E-module system. ◆ Implementation of online examination system. ◆ Emphasis must be provided on the distant learning education systems. ◆ Collaboration with the national and international agencies. ◆ Enrolment of more NRI /NRI sponsored/ foreign students. ◆ Exchange programmes with reputed foreign universities. ◆ International exposures to the faculty members. ◆ Financial assistance for the socially deprived students. ◆ Establishment of centre of excellence in the niche area of meat, wool and fur. ◆ Implementation of training/diploma programmes for paravets. 	<p>More availability of trained persons for the livestock based industry.</p> <p>High standards of UG and PG students with better knowledge.</p> <p>Conducive environment for teaching, research and extension.</p> <p>Self employment generation and empowerment of rural youth.</p> <p>Talented academicians and students at par with organizations of international repute.</p>
Resource generation	<ul style="list-style-type: none"> ◆ Implementation of intellectual property rights. ◆ Public private partnership. ◆ Implementation of training programmes to the industrialists. ◆ Certification systems on animal health and quality of feed, livestock products and vetolegal cases. ◆ Paid laboratory testing facilities. ◆ Consultancies services to the industry. 	<p>Increase in the annual income of the faculty.</p> <p>Percolation of knowledge from scientific community to the livestock owners and industry persons for better national growth.</p>
Diagnostic and clinical services for farmers	<ul style="list-style-type: none"> ◆ Establishment of super specialized units viz. Dermatology, Nephrology, Cardiology, Gastroenterology, Dentistry etc. ◆ Strengthening diagnostic setup with advance diagnostic tools viz. particle cell counter, auto-analyzer, endoscopy, ECG, EEG etc. ◆ Introduction of advanced imaginary techniques such as CTSCAN, MRI etc. ◆ Establishment of an intensive/ critical care unit. ◆ Improvement in clinical diagnosis of diseases with latest techniques with endoscopy, echocardiography etc. 	<p>Early recovery from diseases leading to reduced convalescent, less cost of treatment and less economic loss to the farmers.</p>



SHER-E-KASHMIR UNIVERSITY OF AGRICULTURAL SCIENCES AND TECHNOLOGY OF JAMMU (J&K)

TERRITORIAL JURISDICTION OF SKUAST-JAMMU(JAMMU DIVISION)



Head Quarter:

Administrative Building,
Main Campus, Chatha

Faculties/Schools:

Agriculture: Chatha/ Udheywalla
Veterinary Sciences & AH: RS Pura
Post Graduate Studies
School of Biotechnology, Chatha
School of Agribusiness Management,
Chatha

Krishi Vigyan Kendras:

R.S.Pura (Jammu)
Bhaderwah (Doda)
Tandwal (Rajouri)
Reasi (Udhampur)
Poonch (Poonch)
Kathua (Kathua)

Research Stations/Sub Stations/Centre:

- Regional Agricultural Research Station, Rajouri
- Dry land Research Sub-station, Dhiansar
- Rain fed Research Sub-station for Sub-tropical Fruits, Raya
- Regional Horticulture Research Sub-station, Bhaderwah
- Pulses Research Sub-station, Samba
- Maize Breeding Research Sub-station, Poonch
- Water Management Research Centre, Chatha
- Seed Production Farm, Chakroi, RS Pura
- Farmers Research Centre, Chatha
- Maize Reseaech Centre, Udhampur

