Glimpses of Research Activities

Sher-e-Kashmir

University of Agricultural Sciences and Technology of Kashmir,
Shalimar, Srinagar-190 025

Accreditation

Organization	Faculties
• Indian Council of Agricultural Research (ICAR)	➢ **All**
• Veterinary Council of India	➢ **Veterinary Sciences & Animal Husbandry**
• AICTE	➢ **Agri. Engineering**
• Department of Science & Technology (DST-Star College)	➢ **Agriculture** ➢ **Veterinary Sciences & Animal Husbandry**
• Indian Council of Forestry Research and Education (ICFRE)	➢ **Forestry**

National Ranking

12th Among Agricultural Institutions

Sher-e-Kashmir
University of Agricultural Sciences & Technology of Kashmir
www.skuastkashmir.ac.in

Prof. (Dr.) Mushtaq Ahmad
Vice-Chancellor

From Vice Chancellor's Desk

Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir is a leading institution in Hill and Mountain Agriculture committed to furthering research and development for overcoming the challenges as well as harnessing the opportunities in the temperate and cold arid agro-ecosystem. The university has been fostering innovative research in different sectors of agriculture, horticulture, cold water fisheries, livestock etc. In order to overcome the challenges of low production and productivity, SKUAST-K has developed numerous high yielding varieties besides ensuring conservation of the germplasm. Taking a lead in the technological development, the Varsity has earned a number of patents, and developed techniques and processes in the value chain for exploiting the optimum productive potential, plant protection, value addition and diversification. The institution earned an international reputation for producing world's first Pashmina Goat Clone "Noori". Our main focus has been the farmer centric research and fostering the human resource development to produce technocrats par excellence for meeting the emerging challenges of the increasing nutritional demands coupled with shrinkage of resources and climate change. Besides carrying out R&D at different Subject Matter Faculties, the University Research Institutes, Stations and Centres for undertaking the research in Niche areas, adopting multi-disciplinary and location-specific approaches, the University is running numerous projects with short term and long term financial support from reputed funding agencies and has gained high reputation for its performance.The University pledges for dynamic evolution, promoting the frontiers of research to meet the emerging challenges in agriculture and allied sectors.

Prof. Mushtaq Ahmad

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PATENTS GRANTED / APPLIED FOR

Patent No.358378 Date of Grant: 11.02.2021

Title of Invention: Table Top Paddle Operated Naip Charkha For Cashmere (Pashmina) Fibre

Application No.: 3616/DEL/2011
Date of filing: 13/12/2011
Expiration Date: 13/12/2031

Salient Features:


Table Top Paddle Operated Charkha

- ❖ Comprises of table top, small spinning wheel, spindle and foot paddle.
- ❖ The spinner sits comfortably in a working chair and operates the charka using feet.
- ❖ Improvement in spinning efficiency 73.50 (%)
- ❖ Improvement in remuneration 146.64 (%).
- ❖ Reduction of physical drudgery to the artisans.

Patent No.340843 Date of Grant: 08-07-2020

Title of Invention: Mistletoe Eradicator

Application No.: 20161106121
Date of filing: 09/05/2016
Expiration Date: 09/05/2036

Salient Features:

- ❖ Mistletoe Eradicator mechanically removes the weed.
- ❖ While cutting it applies very small amount of chemical to cut end of left over weed on host which destroys embedded root system and prevents regrowth.
- ❖ It can reach all over the canopy with the help of attached wooden bar. Reduction of physical drudgery to the artisans.

Application No.201811008387

Technology: Dal weed based medium for Industrial mass Multiplication of *Trichoderma* Biofungicide

Salient Features:

- A nutritive dal weed specie *Ceratophyllumdemersum*based medium was developed which could support excellent growth of *Trichoderma* bio-pesticide.
- This medium is much cheaper then conventionally used mass culture medium.
- A Dehydrated form of this medium can be stored for any length of time and supplied/transported to any corner of world

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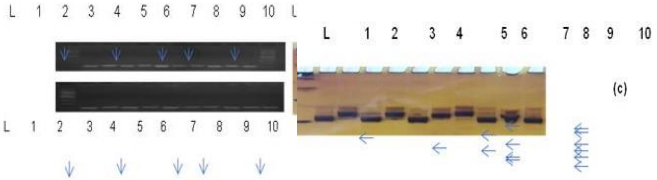
Application No.201911029884

Technology: Quick and easy detection of DNA Polymorphism on PAGE (PAGE-QEDDP)

Salient Features:

- A Non-denaturating polyacrylamide gel coupled with Fast Silver Staining facilitates the efficient detection of novel and multiple polymorphic bands.
- Researcher friendly process for quick and easy detection of DNA polymorphism on PAGE. This technique is quicker, cost effective, easy to implement, does not require any special technical skill with good picture clarity. We can store our stained gels for permanent records as well and can have library of stained gels.



Application No.:201911003321

Technology: Organic Fertilizer preparation from Dal weed through microbial fermentation

Salient Features:

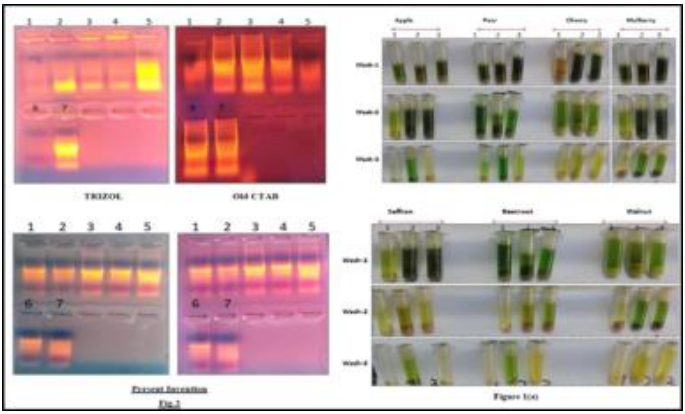
- ❖ The fertilizer preparation takes 12-15 days
- ❖ Product can be bottled and supplied for field application
- ❖ Besides nutrients the product has other substances to enhance plant growth.
- ❖ Can be used as sole Nutrient in Organic Nutrient farming or as supplement in Integrated nutrient Management.
- ❖ Can be used as spray or soil application in diluted form

Application No.201911025187

Technology: AN efficient and quick RNA extraction method

Salient Features:

- Researcher friendly process for faster, simpler and more efficient method of RNA extraction with respect to quality of RNA & time of experiment (2 hours only) and cost involved. Normal RNA isolation takes 16-20 Hrs



Application No.201811027517

Technology: Low cost plastic Bioreactor/ fermenter (SKUAST Fermenter)

Salient Features:

- ❖ Self incubating and temperature control
- ❖ Temperature monitoring
- ❖ Easy monitoring of biomass growth based on principles of optical density.
- ❖ Laminar air flow assisted inoculation method to ensure high quality biomass, etc..

Application No.201911024917

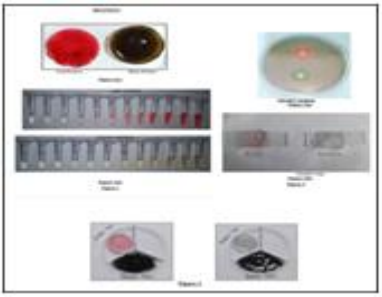
Technology: General Purpose Fungal laboratory Medium Based on Dal Weed

Salient Features:

- ❖ This medium is based on *Ceratophyllum demersum* an aquatic weed specie commonly and freely available in Dal lake and sucrose (Table sugar).
- ❖ Over 45 different fungi showed growth better on this medium than commonly used Potato Dextrose Agar**.**

Application No.201911026650

Technology: SMART Gel, pH Indicator and method thereof'



Salient Features:

- ❖ detection kit for on field testing of fertilizers/ pesticides and Soil samples.
- ❖ Consumer friendly SMART film for detection of real time food spoilage.

❖ Researcher friendly SMART medium for detection of Acidic/basic pathogens**.**

Application No.201911047825

Technology: Conversion of keratinous waste into NPK rich fertilizer

Salient Features:

❖ A novel process converting instantly highly resistant keratinous material like human hair into NPK rich organic liquid fertilizer with the help of fruit waste is developed.

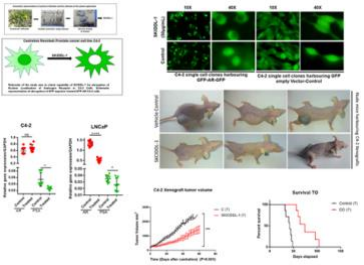
❖ The method provides the best viable means for value addition of solid waste management of this potent environmental contaminant**.**

Application No: Awaited

Date of Submission: 12-09-2019

Technology: SKICDDL -1

Salient Features:



❖ Bioactive molecule extracted from *Taraxicumofficinale*exhibited anticancer activity under mice model system showing abrogation of GFP tagged Androgen receptor completely leading to regression of Prostrate Cancer.

Application No: Awaited

Date of Submission: 11-02-2019

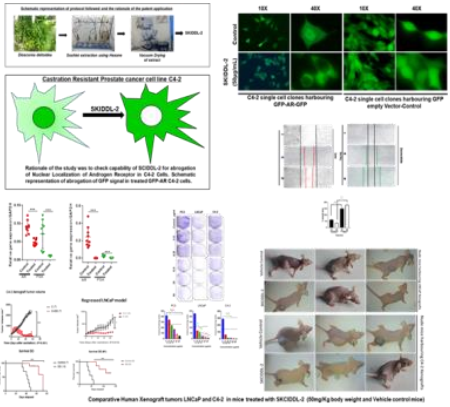
Technology: SKCIDDL-2

Salient Features:

❖ (3β,25R)-Spirost-5-en-3-ol extracted from *Dioscoreadeltoidei*e

exhibited abrogation of GFP tagged Androgen receptor completely and regressed prostate cancer inhibits C4-2 human castration resistant prostate cancer xenografts in nude mice.

- Lack of potency and selectivity, off target effects as well as poor metabolic stability, are hallmarks of early small molecules developed to target prostate cancer



Application No: Under process

Technology: Development of potent nutraceutical powder from Portulacaoleraceae (Nunnar) and AtriplexHortensis (WastaHakh) against oxidative stress

Salient Features:

- The powder from each vegetable was found to be rich in Quercetin, Sigmasterol, Kaemferol , L-DOPA, , GABA and Epinephrine and demonstrated strong antioxidant activity and antidiabetic potential via targeting Insulin signaling pathway in animal models. They also demonstrated strong anticarcinogenic activity against pesticide (Clorpyrifos) induced oxidative stress in animal models.

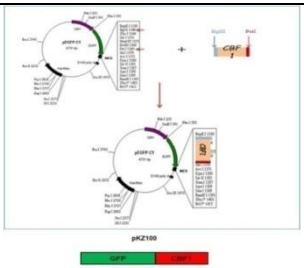
Wasta Hakh

Nunner

Application No: Awaited

Date of Submission: 19-03-2020

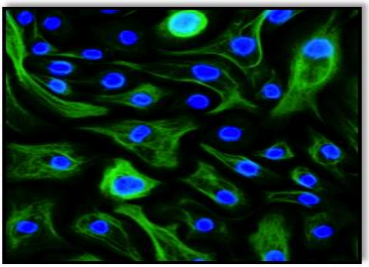
Technology: pKZ100 Plasmid containing GFP-CBF1 Fusion protein



Application No: 201911013320

Technology: Milk derived non-immortalized primary mammary epithelial cells of goat and bovine

Salient Features:



- ❖ Isolation, purification and characterization of animal pMECs from bovine and goat.
- ❖ Non-invasive extraction process of bovine and caprine (goat) pMECs using milk.
- ❖ The pMECs can be cultured till a higher passage number of 15, which is achieved because of the specific culture media composition.
- ❖ Primary Mammary Epithelial Cells of lactating animals can be used in research institutes focused on the areas of:
  a. Model system to study mammary specific diseases of animals and human being such as mastitis, cancer
  b. Veterinary Medicine effect of drugs
  c. Vaccine Production
  d. Drug Screening and Toxicity Analysis

VARIETIES DEVELOPED

SKUA-540: First semi-fine grain and mild aromatic rice variety for low altitudes of Kashmir Valley (1650-1750 m amsl).

- Plant Height: 115-120 cm
- Days to 50% Flowering: 90 days
- Grain yield:65-70 q/ha
- Reaction to blast disease: tolerant

SKUA-522: New rice variety for mid altitudes of the valley (1700-1900 m amsl)

- Plant Height: 115-120 cm
- Days to 50% Flowering:85-90
- Grain yield: 70-80 q/ha
- Reaction to blast disease: tolerant

***Shalimar Moong-3 (SKUA-M-365*)**

- Early Maturing,
- Disease resistant and
- bold seeded Moong variety

SKAU-WW101 and SKAU- WW102 : Early maturity, disease resistance wheat varieties for Kashmir valley

- Early maturity, can be harvestedwithin first week of June.
- Disease resistant
- Show a promise to fit inRice-Wheatcrop rotation.

SKAU-WB-1634 (Semi-pole type) & SKAU-WB-341 (Pole type): Disease resistant, high yielding common bean varieties

- Two common bean varieteis with high yield and disease resistance have been developed and have been identified for release

SKAU-WB-1634

SKAU-WB-341

SKAU-WCP-101 : Cold tolerant summer chickpea lines with resistance to wilt

- In collaboration with ICRISAT-Hyderabad, IARI-New Delhi, IIPR-Kanpur, ICARDA-SYRIA, programme on chickpea breeding has been strengthened. One of the most promising lines, SKAU-WCP-101 has been evaluated at different locations within Kashmir valley under minikit trials

SKUA-494: First Basmati variety evolved for Kashmir valley

- More remunerative than medium slender rice variety, Shalimar Rice- 4 and fine grained aromatic variety, Pusa Sugandh 3. The variety marks a net return of Rs. 1.83 lakh/ ha with benefit cost ratio of 3:1 in comparison to Rs. 1.33 lakh and B:C ratio of 2.2:1 estimated for Pusa Sugandh 3

Shalimar Pop Corn-1 (KDPC-2):

- It was released for cultivation in Zone 1, 2 3 and 5 across India.
- It possesses butterfly shaped popcorn with excellent taste and soothing feel.
- Its average yield is 4t/ha.
- It has a popping percentage of 80%
- It is resistant to TLB and Common Rust Disease.
- It is moderately resistant to Maize Stem Borer
- It's a part of the National Seed Chain in Maize

Shalimar Fodder Oats-6(SKO-225)

- The variety has been released for cultivation in Northern Hill Zone at National Level including the States of J&K, H.P and Uttaranchal.
- It has very good quality attributes like C.P, IVDMD, ADF, NDF etc. with high green fodder yield (450qha^{-1}) and seed yield (24q ha^{-1}).

FARM MACHINERY AND TOOLS DEVELOPED

Pea Planter

Vermi-composting unit

Integrated Tractor drawn mulch laying machine

Remotely controlled self propelled boom sprayer

Universal walnut cracker

Walnut dehuller-cum-washer

Hand operated apple peeler

Low cost lotus rhizome washer

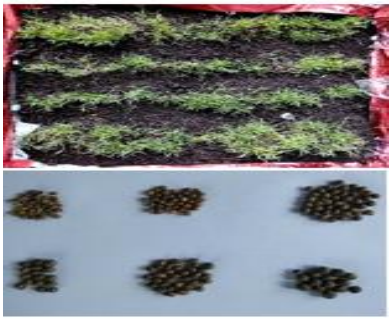
Value chain for inshelled walnuts

CROP IMPROVEMENT TECHNIQUES & PROCESSES

Saffron-Kalazeera intercropping Technology

- Unique production system module for increasing potentiality of soil and production per unit area as well as income
- Saffron corms planted at 10 lakh corms per ha intercropped with 2.5 lakh tubers of Kalazeera/ha gave total returns of Rs. 1855000.0 which is double than sole cropping system of saffron.

Application of Shalimar Biocontrol-1 (Kargar) for cultivation of Kalazeera



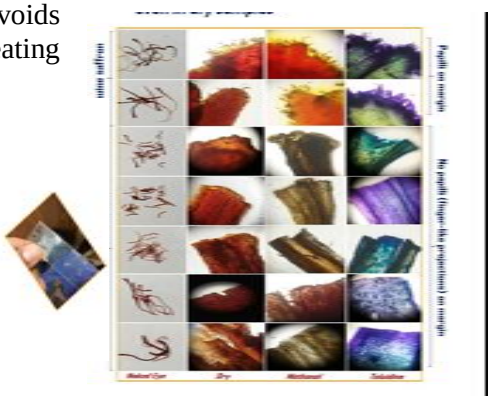
- Successful cent percent germination and micro tuber formation in Kalazeera though Application of Shalimar Biocontrol-1 (Kargar),
- Reduction of time span of flower tuber formation from 5 to 3 years.

Indoor Saffron Technology

- Developed for the industrialists as well as the interested farmers who have small land holding
- A 20 x 20 ft multi-tiyer structure can yield at least 1.0 - 1.5 kg of saffron

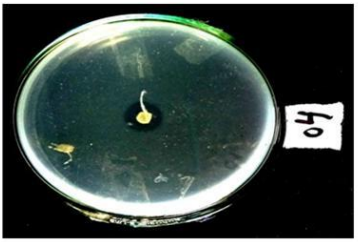
Identification of pure saffron based on visual markers using Foldscope.

- Cheap, user-friendly, avoids fraud and cheating effectively.



Triple action bio agent (Tab)

- A single microbe acts as a bio fertilizer (PSM) as well as bio fungicide.Such Microbe can be commercialized as bio Fertilizer (PSM) thus no CIB registration may be needed. These fungal bio agents are additionally resistant/compatible to Cu-oxychloride hence can be applied in combination to enhance disease management.



Phosphorus solubilizing activity (after 15 hours only)

- Two such fungal strains are submitted to MTCC (IDA) patent deposit (No. MTCC-25285 and MTCC-25286

FOOD TECHNOLOGY& VALUE ADDITION

Rice-chickpea based ready-to-eat nutritious extruded snacks

- **Moisture:** 2.64% ; **Protein:** 8.82% ; **Fat:** 0.70% ; **Carbohydrates:** 84.14% ; **Ash:** 1.23% ; **Crude fiber:** 2.47% ; **Energy:** 378.14 Kcal/100g
- **Shelf life:** 6 months

Apple chips developed from *Maharaji* , Red delicious and White dotted red apple variety

- ***Moisture content:***2.96% ; ***Acidity:*** 1.40% ; ***Ascorbic acid:****19.91% ; **Ash:** 0.94% ; **Totalsugars:** 53.71% ;**Reducing sugars:*** 43.20% ;***Antioxidant activity****:* 28.85%
- **Shelf life:** 6 months

Egg incorporated lentil based extruded ready-to-eat snacks

- **Moisture:** *4.20%;* **Protein:** *31.62% ;***Carbohydrates:** *54.18% ;* **Crude fat:** *3.72% ;* **Ash:** *2.54% ;* **Crude fibre:***3.74%.*
- **Shelf life:** 6 months

Water chestnut based extruded ready-to-eat snacks

- **Moisture:** 4.62% ;**Protein:** 3.12% ; **Fat:** 0.20% ; **Carbohydrates:** 86.15% ; **Ash:** 2.45% ; **Crude fibre:** 3.43% ; **Energy:** 403.65 Kcal/100g.
- **Shelf life:** 6 months

Carrot candy

- ***Moisture:*** *25% ;* ***Protein:*** *1.20% ;* ***Fat:*** *0.80% ;* ***Crude fibre:*** *1.35% ;* ***Carbohydrates:*** *70.16% ;* ***Energy:*** *292.63 Kcal/100g*

Rice bran incorporated corn-based ready-to-eat extruded snacks

- **Crude protein:** 7.56% ;**Crude fat:**2.95% ; **Crude fiber:** 2.5% ; **Dietary fiber:** 13.05% ; **Energy:** 382.95 Kcal/100g

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Osmo-dehydration of Strawberry

- **Osmotic Solution:** 60% sucrose solution incorporated with 1% each of calcium chloride, ascorbic acid (0.024%), erythrosine
- **Treatment Period:** 6 hours at 28^{o}C±2^{o}C
- **Post drying:** cabinet drying at 55^{o}C to final moisture content of 12%
- **Shelf life:** up to 6 months using PET jars as packaging material

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Functional processed paneer spread

- **Fortification**: 1% trisodium citrate, 15% water and 0.5% quince seed mucilage was comparable with its western counterpart processed spread in terms of almost all quality characteristics.
- Antioxidant potential improved
- **Storage**: 21 days at refrigeration temperature.

Functional *dahi* fortified with pomegranate peel and seed powder

- **Fortification**: 0.5% pomegranate peel powder or 0.5% pomegranate seed powder
- **Functionality**: Added antioxidants from natural sources
- **Storage**: 28 days at 4 ± 1°C

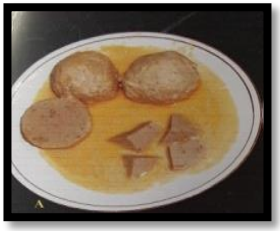


Antioxidant enriched (rosemary extract and α-tocopherol) *Rista and Goshtaba*

- **Fortification**: Rosemary extract and α-tocopherol incorporated at 0.005 and 0.02 percent levels, respectively.
- **Functionality:**Antioxidants helpful in maintaining improved physico-chemical characteristics, oxidative stability, microbial status and sensory quality
- **Storage:**Up to 21 days at 4 ± 1°C.

Low-fat *Goshtaba* formulated with fat replacers

- **Fortification**:and hydrated oatmeal @ 10%
- **Quality**:Low fat
- **Storage***:* Up to 20 days at 4 ± 1°C



Improvised Warping System

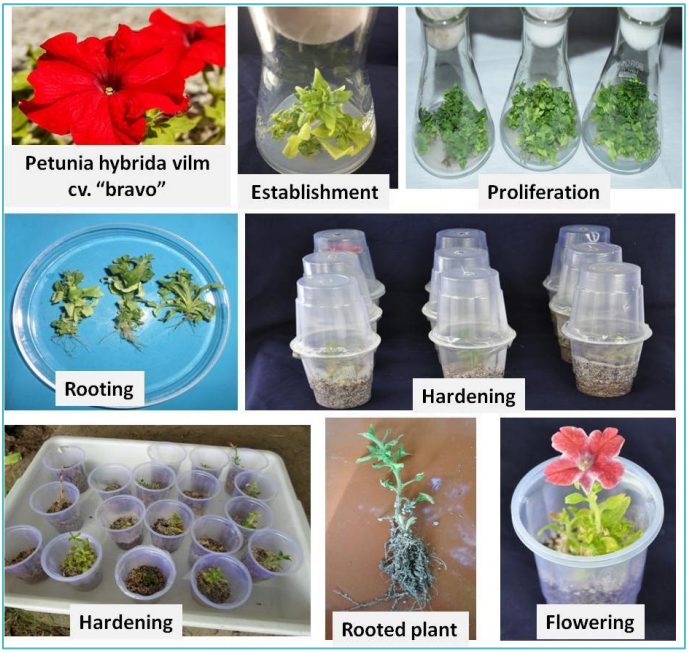
- It comprises of big circular wooden structure where a warp can be made by a single person stationed at a place by fixing the yarn and rotating the structure.
- Reduction in physical drudgery.
- Saving of warping time (150%).
- Reduction in warping cost (100 %).

Pashmina Blended Knitwears

- 50:50 pashmina:wool
- Diversification of pashmina product range
- Better functional, wearing and aesthetic properties.
- Within the reach of common masses

Organic Pashmina Dyeing

- Waste materials from organic substances viz: walnut husk, onion peal, saffron flower petals, pomegranate rind, silver oak, myrobalan, meddar, henna, tulip, sesame, Crofton weed, Common Lantana, Lumb, Litchi were used for natural dyeing of pashmina fabric
- Eco-friendly value addition of the heritage product.
- Utilization of organic waste material
- Economical.
- Good fastness properties



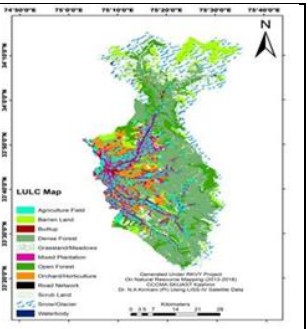
In vitro* propagation of *Petunia

Corm production in Gladiolus by using half corms

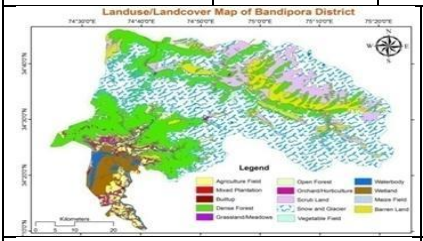
RESOURCE MANAGEMENT

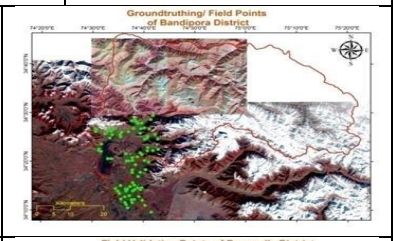
Resource mapping of Kashmir Valley using RS & GIS technology

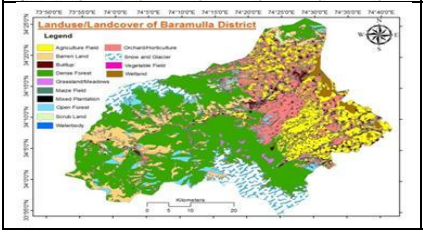
LULC	Area (ha)	(%)
Dense Forest	79464.74	28.74
Snow/Glaciers	49974.60	18.07
Open Forest	30085.97	10.88
Builtup	4142.75	1.49
Mixed Plantation	18879.02	6.82
Agricultural Field	26629.69	9.63
Orchard	16267.98	5.88
Barren	24305.55	8.79
Grassland	12896.11	4.66
Scrub land	9753.88	3.52
Water	3720.54	1.34
Road	367.06	0.13
Total	**276487.94**	**100.00**

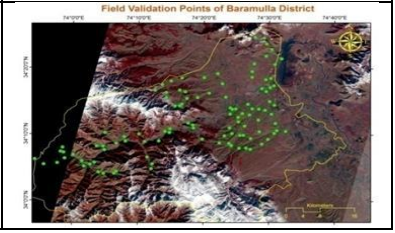


LULC Map with area statistics of district Anantnag

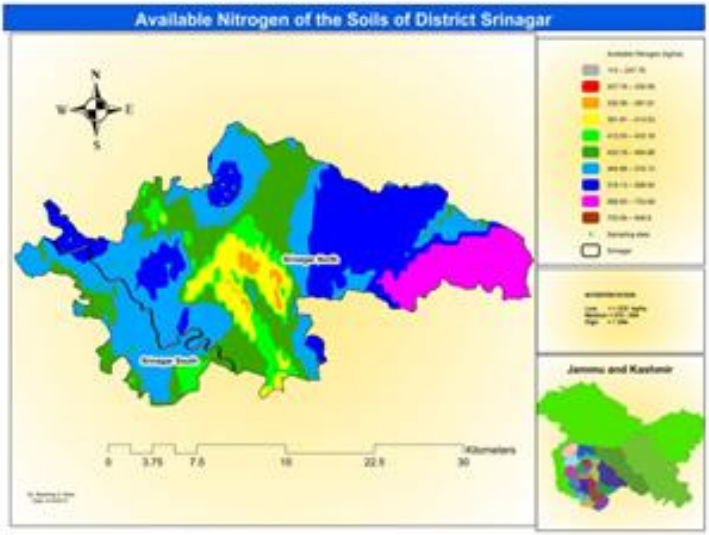


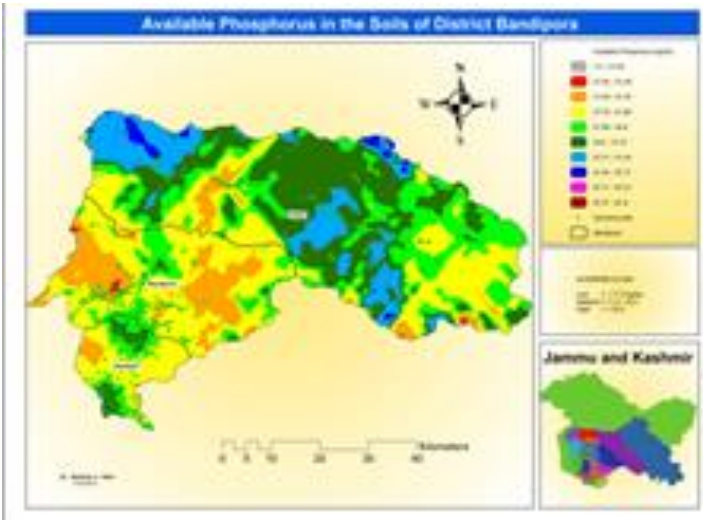




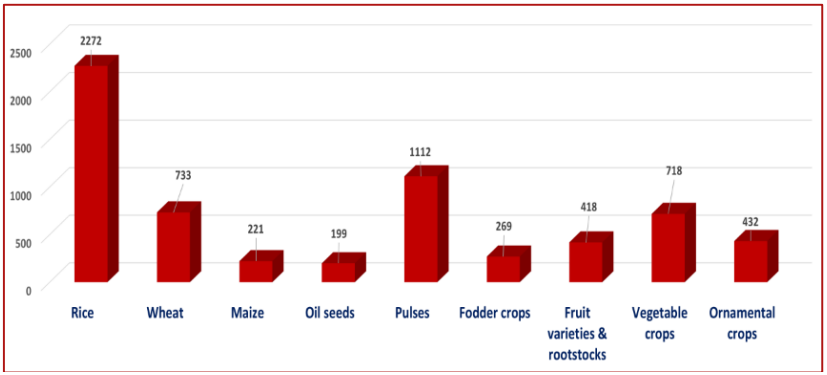


FERTILITY MAPPING
(Using Geo Spatial Technology)





BIODIVERSITY CONSERVATION



Number of landraces/breeding lines/varieties/rootstocks maintained at SKUAST-Kashmir

Germplasm ConservationEvaluation and identification of Elite Genotypes in cut flowers

EXTERNALLY FUNDED PROJECTS OPERATIONAL (2020-21)

S. No	Name of the Project	Total Budget/ (in lakhs)
	1. Projects sponsored by Government of J&K	
	A. RashtriyaKrishiVikasYojna (RKVY)	
1.	National Mission on saffron–economic revival of J&K saffron sector	540.00 (62.40)
	B. National Bank for Agriculture and Rural Development (NABARD)	
2.	Performance of earth tube heat exchanger and ground air collector for space heating under cold arid conditions of Ladakh	11.06
3.	Dissemination of Vermi Compost technology in Ladakh region	9.00
4.	Creation of Seed Hub in Maize by Strengthening of local seed systems for enhancing farmers income	7.00
5.	Propagation of elite backyard birds for enhancing egg production in rural areas	8.04
6.	Popularization of Improved Saffron Technologies developed by SKUAST-Kashmir for doubling the farmers income	7.56
7.	Production of quality planting material of high expert grafted walnut plants under low cost controlled conditions for sustainable horticulture sector in DisttKupwara	10.08
8.	Mass multiplication of clonal rootstocks for large scale distribution among orchardists for the development of high density apple orchardists	9.07
	C. Jhelum Tawi Flood Recovery J&K	
9.	Survey, collection and multiplication of superior cricket bat willow (Salix alba var. caerulea) Germplasm for livelihood security of farmers and economic sustainability of cricket bat industry of Kashmir	--
	2. Projects sponsored by Government of India	
	A. Indian Council for Agricultural Research (ICAR)	
	a) Niche Area of Excellence (NAE)	
10.	Study of Clostridium perfringens and Dichelobacternodosus (Anaerobic Bacteriology)	399.008
	b) Tribal Sub-Plan (TSP)	
11.	Technological interventions for reducing food, fodder and income security among highland tribal agro-pastoralists of Nyoma block and improve their livelihood	75.00

12.	Technological interventions for reducing food, fodder and income insecurity among tribal farmers of Zanskar and improve their livelihoods	107.00
13.	Technological interventions for improving food, income and livelihood security of tribal farmers of Nubra	95.00
14.	Technological interventions for improving tribal farmers food, fodder, income and livelihood security among Tribal farmers of Leh Block and improve their livelihood.	71.00
15.	Technological interventions for improving food, income security and livelihoods of kargil farmers.	94.00
	c) National Bureau of Fish Genetic Resources (NBFGR, ICAR)	
16.	National surveillance programme for aquatic animal disease	78.80
	d) National Fisheries Development Board (NFDB) GoI	
17.	Setting up of referral Laboratory for Screening of Aquatic Animal Pathogens and Quality Assurance	**884.55**
	e) National Initiative on Climate Resilient Agriculture (NICRA), ICAR	
18.	Climate Change Impact on erosion Processes, Carbon Sequestration and Crop Productivity under Cold Arid Agro-Ecosystems	45.65
19.	Climate change impact on water resources availability in cold arid regions of North-western Himalayas	62.00
20.	Impact of season long temperature increase on quality and yield of aromatic Rice landrace(Muskibudji) under temperate climatic conditions of Kashmir J&K india	20.75
21.	Carbon foot printing based on lifecycle assessment in apple crop production under mountain agro- ecological system of kashmir	18.75
22.	Design and development of protective structure for high vaued crops to reduce damaged from hail and frost	9.0
	f) National Institute of Agricultural Economics and Policy Research	
23.	Policy Imperatives for Promoting Value Chains	33.62
	g) Indian Agriculture Research Institute (ICAR)	
24.	Mainstreaming rice landraces diversity in varietal development through genomic predictions: A model for large-scale utilization of gene bank collections of rice	12.53 1st inst.
	h) Indian Council of Social Science Research (ICSSR)	
25.	Rural economy and livelihood under climate change in Himalayan region of India: economics of adaptation measures	2.50 1stinstt

26.	Development of remunjerative organic waste management systems for colder regions of India with the intervention of psychrophilic aerobic and anaerobic microbial consortia	33.00
	B. Department of Science & Technology, GoI (DST)	
27.	Use of Dal Lake weed as a source of media for Tulip, Lilium, Hyacinthus and Gladiolus	53.01
28.	Experimental Agromet Advisory Services (GrameenKrishiMausamSeva, GKMS)	Funding on yearly basis
29.	Mining dual acting plant based small molecule inhibitors affecting AR Nucleo-cytoplasmic translocation and P13K signaling pathways in castration-resistant prostate cancer	48.98
30.	Promoting cultivation of endangered Kala Zeera for enhancing livelihood of tribal farmers in temperate highlands of North India	16.89
31.	Improvement of grazing land/pastures through participatory management approach in temperate conditions of Kashmir valley	38.2392
32.	Revival of Traditional beekeeping by Improving the health of honey bees for restoration of degraded agro- ecosystems in Kashmir	54.48
33.	Development of Innovative Strategies for Management of whitefly in Vegetable Ecosystem of Kashmir	22.13
34.	Assessment of Anti-cold stress effects of Nano-zinc, Vitamin C and Vitamin E in Poultry birds and its implementation in field conditions in various districts of Kashmir valley	29.70
35.	Ecofriendly utilization of aquatic weeds and agricultural waste for paper production in Kashmir valley	18.80
36.	Scientific interventions in management of brown tail moth (*Euproctischrysorrhoea*) with reference to its biology under cold arid region of Ladakh	20.00
37.	Impact Assessment of climate change on agriculture in Kashmir Himalaya	69.41
38.	Bacterial endophyte community dynamics in apple cultivars: Its impact on scab prevalence in Kashmir valley	27.91
39.	Design and development of efficient electronic saffron dryer using infrared heating	10.00
40.	Household waste management for organic kitchen gardening and clean environment	10.00
41.	Technological interventions for socio-economic upliftment of rural dairy farming women-An initiative for development model villages with least mastitis	29.16
42.	Cultured allogeneic mesenchymal stem cell application in	24.82

	selected veterinary clinical disorders vis-à-vis preclinical studies in artificially induced lab animal models	
43.	Smart sensor network platform for irrigation scheduling in saffron and rice in Kashmir, India	43.49
44.	Techno interventions for tribal improvement through myucoplasmosis vaccination in sheep and goat	40.78
45.	Innovative technological interventions to address basic needs of the tribal farming people of Lasakh region	48.52
46.	Achieving sustainable livelihood in cold arid regions of Ladakh through skill development in tuber production of kalazeera (Beniumpersicumboiss.)	102.37
47.	Technological innovation and transfer of technology for poverty alleviation via mechanized formulation of poultry feed for tribal backyard poultry farmers by sustainable use of agricultural cum food residues	32.24
48.	Promotion of enhanced sustainable livelihood opportunities through Ecotourism, Wildlife and cultural tourism for tribal youth of Kargil and Ladakh region of Jammu & Kashmir	67.07 1st instt. 9.41
	C. Department of Biotechnology, GoI (DBT)	
49.	Bioinformatics infrastructure facility	Yearly funding
50.	Star College at FOA Wadura	47.00
51.	Genetic Dissection of Heat Tolerance in Wheat using Multiple Bi-parental RIL Mapping Populations	45.00
52.	Molecular screening, cell culture based isolation & characterization of fin fish and shell fish viruses and establishment of national repository	106.00
53.	Genome Wide Association Studies in *Phaseolus vulgaris* - *Colletotrichumlindemuthianum*pathosystem	55.33
54.	Dissemination and demonstration of pheromone/dispenser technology for the area wide management of codling moth in Ladakh	24.99
55.	Microscopy (Foldscope) as a basic tool in field Research (Aquatic)	8.00
56.	Utilization of Chia Seeds (*Salvia Haspancia*L.) for the Development of Functional Foods	33.00
57.	Standardization of pulsing and holding solution to improve the keeping quality of cut gladiolus spikes, tulip cut scapes, Asiatic hybrid lily	8.00
58.	Identification on pure saffron using foldscope based visual markers to avoid fraud and cheating, and to create a poster of these markers for customers/vendors	8.00
59.	Use of foldscope in determining the annual growth cycle, PHF:SHF ratio of cashmere fibre in pashmina goat of J & K	8.00
60.	Establishment of small scale production units of Trichoderma in	26.31

	different districts of Kashmir valley for the management of root rot of apple	
61.	Pathogenicity gene(s) discovery in collectotrichumlindemuthianum, the causal agent of bean anthracnose	10.84
62.	Augmentation of Household Income through Improvement of Production Efficiency of Dairy Cattle and Fodder Production in the Rural Areas of Kashmir Valley	33.30
63.	Demonstration and popularization of Bio-farming inputs to improve economic conditions of tribal families under Himalayan ecosystem of Jammu & Kashmir	18.98
64.	Establishment of Biotech- "KISAN HUB" at SKUAST-Kashmir	190
65.	Socio Economic Upliftment of Sheep Breeders through technology transfer in Temperate Himalayan Region of J & K	71.96
66.	Innovative poultry horticulture integrated farming systems for optimum resource utlilization and strengthening rural livelihoods	30.00
67.	Mapping of nut traits to accelerate breeding in walnut (Juglansregia L.)"	43.15
68.	Expansion of activities of Biotech-KISAN Hub in two aspirational districts (Baramulla and Kupwara) of Kashmir	96.00
69.	Conversion of the silkworm bombyxmori droppings into value added products in Jammu & Kashmir	47.35
	D. Mission for Integrated Development of Horticulture (MIDH, GoI)	
70.	Production and popularization of temperate spice crops for livelihood security	72.80
71.	Precision Farming Development Centre, HMAARI, Leh	18.25 1st inst. 2018-19
72.	Pheromone baited technology for the management of codling moth in Ladakh	19.80
	E. OTHER FUNDING AGENCIES	
	1. Ministry of Earth Sciences, India Meteorological Department	
73.	Forecasting agricultural output using space agro-meteorology and land based observations.	12.64
74.	Solar development of Solar power integrated micro – power project	36.5
	2. Ministry of Food Processing Industries (GOI)	
75.	Setting up quality control/ food testing laboratory	736.84
76.	Optimization of processing variables for quality improvement of ethnic meat products of Jammu & Kashmir	--
	3. Indian Council of Medical Research	
77.	Population screening and identification of biomarkers for early	33.30

	detection and surveillance of gastric cancer in Kashmiri population	
78.	A study from Kashmir valley on status & prevalence of biochemical deficiency of thiamine in breast fed infants with encephalopathy and in their lactating mothers	39.14
79.	Identification of Early Bio Markrs of functional polycystic ovarian syndrome in rat model and their valiation in human counter parts	144.00
	4. Protection of Plant Varieties and Farmers Rights Authority, Ministry of Agriculture, Deptt. of Agriculture and Cooperation, New Delhi	
80.	Collection, Characterization, Utilization and Registration of Farmers Varieties of Maize Land Races of Kashmir Valley.**(For all varieties)**	18.00
81.	Development of descriptors for saffron (*Crocus sativus*L.) indigenous to temperate region of J&K	18.00
	5. National Bee Board, Ministry of Agriculture, Deptt. of Agriculture and Cooperation, New Delhi	
82.	Setting up of Integrated Beekeeping Development Centre (IBDC)/Center of Excellence (COE)	166.70
	6. National Medicinal Plants Board, Ministry of AYUSH, New Delhi	
83.	Regional cum Facilitation Fund	149.00
84.	Drug discovery against prostate cancer from medicinal plants endogenous to Kashmir valley through green fluorescence protein (GFP) labeling of androgen receptor	3.00
85.	Chemical profiling of essential oils obtained from aromatic crops growing in Kashmir	3.00
86.	Conservation of Medicinal Plants and Promotion of Indigenous Knowledge through Local Health Traditions among Rural Communities in Ladakh.	21.60
	7. Science & Engineering Research Board (SERB)	
87.	Technological interventions for prophylactic and therapeutic management of contagious caprinepleuropneumonia (CCPP) in pashmina goats"	35.00
88.	Proteome identification of binding partners interacting with alpha-I-syntropein (SNTAI) protein in human breast cell lines.	48.05
89.	Study on waterfowl ecology, migratory patterns and disease monitoring in the wetlands of Kashmir valley	70.50
90.	Mining of scab resistance R-Genes from different cultivars of apple and introducing of scab resistance in commercially important varieties of apple grown in Kashmir valley through cis-genesis	58.00
91.	Generation of a genetically stable live vaccine candidate against Infectious Bursal Disease Virus (IBDV) through mutagen driven lethal mutagenesis	45.24
92.	Transcriptome profiling of local Kashmiri vs commercial	60.19

	poultry for disease resistance against Salmonellosis	
93.	Cultured Allogenic Mesenchymal Stem Cell Application in Selected Veterinary Clinical Disorders vis-à-vis Preclinical Studies in Artificially Induced Lab Animal Models	48.10
94.	Genetic mapping of anthracnose resistance gene(s) in a common bean bi-parental RIL. Population (KRC 22 x Jawala) and development of anthracnose resistant breeding lines	53.79
95.	Generation and Invivo development of FGF5 disrupted pashmina goat embryo through CRISPR –Cas based gene editing technique	58.00
96.	Oocyte vitrification for long preservation of important animal genetic resources of temperate Himalayas	46.85
97.	Breaking seed dormancy vis-à-vis rapid micro-tuberization and plantlet regeneration in kalazeera (Buniumpersicum (Bioss.) Fedts.	35.15
98.	Morphological and Molecular Evaluation of Apple (*Malus x domestica*Borkh) for Scab Resistance: Towards Breeding Scab Free Apple Cultivars	19.20
99.	Ecology of Leopard (*Pantherapardus*) in Kashmir Himalaya, India: Implications for mitigating human leopard conflict	19.20
Defense Research & Development Organization HQ (DRDO)		
100.	Evaluation of locally available phytogenics as feed additives	23.09
8. G. B. Pant Institute of Himalayan Environment and Development (GBPIHED) under National Mission on Himalayan Studies		
101.	Vulnerability to disturbances, resource mapping and ex-situ conservation of endemic and relict species BetulaUtilis D. Don (Himalayan birch) in Sindh Forest division of Kashmir	12.81
102.	Development of Psychrophilic earthworms for biowaste conversion in Gurez&Tulial Valley of Jammu & Kashmir	14.40
103.	Livelihood improvement and empowerment of rural poor through quality bulb production of cut flowers under temperate conditions of Kashmir	44.25
104.	Long term conservation of Hangul – Hangul movement pattern study using GPS – Satellite collaring	37.23
105.	Impact of climate change on apple production and screening of climate resilient varieties in Kashmir valley	43.46
106.	Livelihood improvement through quality corn production viz-a-viz promotion of saffron (*Crocus sativus*L.) cultivation in cold arid regions of Ladakh	37.58
107.	A value chain of saffron in new areas of NW Himalayas by engaging youth and women for strengthening a bio-based green economy	97.52
108.	Database on livelihood generation and carbon sequestration through wicker willow in Kashmir	16.06
109.	Collection characterization conservation & utilization of	47.71

	important genetic resources of hilly regions of J&K and ladakh	
110.	Entrepreneurship Development and Livelihood of Shina Tribe through Value Chain Improvement of Non-Timber Forest Resources in Gurez Valley of Kashmir"	16.06
111.	Revival of kala zeera cultivation through germplasm conservation and community based approaches under tribal area conditions of Gurez valley	39.48
112.	Water fowl Ecological Monitoring and Conservation through Community Participation and Rural livelihood in Shallabug Wetland Reserve, Kashmir (J&K)	30.00
113.	Development of site-specific and appropriate crop/ enterprise based models suitable for different agro-eco situations of Kashmir	80.86
8.Ministry of Agriculture and Farmers Welfare (GoI)		
114.	Establishment of Farm Machinery Testing Centre	150.0
F. Students Research Projects		
1). Department of Science &Technology		
(i) Young Scientist Fellowship Projects		
115.	Analysis of the mechanistic regulations of SNTAI/p66Shc interaction on cytoskeleton organization and migration in breast carcinoma cells (DST INSPIRE)	35.00
116.	Phenotypic and genetic variation of free floating invasive populations of Duckweed (Lemna minor) in Kashmir Himalaya: a phylogeographic comparison	19.20
117.	Development of field validation of low cost rainbow trout hatchery technology for livelihood enhancement of Ladakh population	41.27
(ii). Women Scientist Scheme - B		
118.	Farmers participatory collection, characterization and conservation of Buniumpersicum Kala Zeera in North – Western Himalaya	**35.38**
2). Department of Biotechnology Government of India		
117	Monoculturing of exotic sheep in J&K its impact assessment using molecular markers for conservation genetics	40.00
3). Centre for Scientific & Industrial Research		
118	Exploring the genetic poly morphism of genes controlling growth and adaptability of bakerwal goats of nomadic tribe of J&K under trans migratory system	18.00
G. National Collaborative Projects		
119	National Agricultural Higher Education Project	3000.00
120	Establishment of Modern Fruit and Vegetable Agro processing	----

	Centre on Processing and Blue addition of fruits and Vegetables	
121	Unnat Bharat Abhiyan (demonstration of technology in 5 villages)	0.50
	H. M/S TrichoAgronica Pvt. Ltd. MRIIRS, Sector-43, Aravali Hills, Faridabad, Haryana, 121005	
122	Evaluation of oil based bio-formulation against foliar diseases of tomato	6.72
	i. Centre for Improvement for Maize, Wheat &Tursicum (CIMMYT)	
123	Development of hybrids having inbuilt tolerance to cold and *turcicum* leaf blight (material exchange programme) (Funding fromAICRP Maize)	-
124	Use if 1-MCP (pre and post) for shelf life extension of apple cv. Red Delicious (Partnership between Essentive-LLC, USA & SKUAST-K)	Material supports
	ii. **International Rice Research Institute (IRRI)**	
125	International network on genetic evaluation of rice **(Material exchange programme) (**Funding from AICRP/ Station funds)	-
126	Stress tolerant rice for Africa and South Asia (STRASA) Phase 3	2.10
127	KASP genomics in Rice **(Bangor University UK)**	35.00
128	Mapping the Adoption of improved varieties of Major Crops and management practices in Kashmir	19.99
129	Identification and introgression of QTLs for seedling stage tolerance to cold	100.00
130	Conservation and restoration of threatened deer species through conservation breeding, conservation genetics and community development	36.34
	iii. **Indo-Dutch Collaborative project (SKUAST-K and Verbeek)**	
131	Evaluation of two year apple varieties on M-9-T-337 rootstock under Kashmir conditions	150.00
132	Simulation and scab modelling software) A Weather data based Scab Disease Advisory System (RIMPro)	
	iv. European Union	
133	Erasmus + programme for student and staff mobility to university of padova Italy	30.00
International Potash Institute, Switzerland		
134	Response of polyhalite as a multi-nutrient fertilizer on growth, yield and quality of apple in Kashmir	6.30 1st insttl.

All India Coordinated Research Projects (AICRP)

(a) Coordinated projects			
1.	AICRP on Biological Control of Pests and Weeds	1985-86	--
2.	AICRP on Potato	1985-86	--
3.	AICRP on Vegetables	1985-86	--
4.	National Seed ProjectBSP/STR	1985-86	--
5.	AICRP on Post-Harvest Technology	2000-01	--
6.	AICRP on Agro-forestry	1985-86	--
7.	AICRP on Maize	1985-86	--
8.	AICRP on Pulses	1985-86	--
9.	AICRP on Rice	1985-86	--
10.	AICRP on Forage Crops	2010-11	--
11.	AICRP on Floriculture	1987-88	
12.	AICRP on Application of Plastic Engineering & Technology	2010-11	--
13.	AICRP on Honey Bees & Pollinators	2012-17	--
14.	AICRP on Wheat & Barley	2012-13	19.39
15.	Seed Production in agricultural crops and fisheries	2009-10	23.00
16.	AICRP on Agro Meteorology (AICRPAM)	2014-15	--
(b) Network Centres			
17.	Soil Test Crop Response (STCR) based Fertilizer Recommendations for Rice sunder Temperate Conditions of Kashmir	2010-11	--
18.	AICRP on Changthangi Goat, Leh	2014	--
19.	Network Project on Poultry Seed Production	2014	--
20.	Network project on value chains **(NCAP)**	2017-18/ Yearly	25.00
21.	AINP on Pesticide Residues	2014-15	40.00
(c) Voluntary Centres			
22.	AICRP on Weed Control	2013-14	-
23.	Network project on Vertebrate Pest Management	2015-16	-
24.	AICRP on Mushroom	2015-16	-
25.	AICRP on Soyabean	2018-19	-

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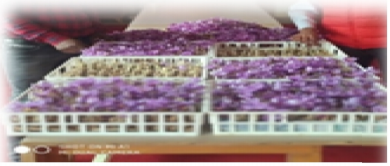

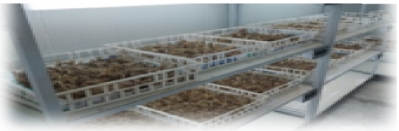

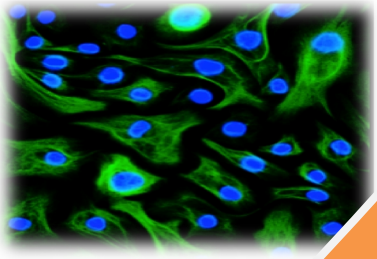

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