

# Annual Progress Report



2012-13



**COLLEGE OF BASIC SCIENCES**  
**CSK Himachal Pradesh Krishi Vishwavidyalaya**  
**Palampur (H.P.)-176 062**

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## Foreword

Basic Science is the mother of all inventions. The Basic Sciences are now being given their due importance at ICAR and National level. The faculty of College of Basic Sciences is striving hard to fulfill the mandate through quality education with research and extension support in the University and to generate good human resource to help the rural masses of the State.

The College of Basic Sciences offered 390 credit hours of teaching to the Undergraduates and 200 credit hours to the Postgraduate students of all the constituent colleges of the university during the period of report. Fifty B. Sc., 29 M. Sc. and 07 Ph.D. students completed their degrees during the academic year 2012-2013. Merit scholarships were awarded to 21 students and Amar Shaheed Captain Saurabh Kalia scholarship to 3 students. One educational tour of 2<sup>nd</sup> year students to South India was successfully conducted. Facilities in the Central Instruments Laboratory were strengthened to impart practical training to the postgraduate students of the constituent colleges and facilitate research. An income of Rs.8,19,169/- was generated by Department of Biology and Environmental Sciences through Vermitechnology revolving fund and Department of Microbiology by imparting paid practical trainings of short durations to the students from other institutions and Department of Physical Sciences and Languages through Statistical Analysis and Audio-Visual Charges.

Teachers of the College were actively involved in various research activities as evident from the projects and number of papers published and presented in National/International Conferences during the year under report. Eleven research projects funded by different agencies were in operation and eight new projects were submitted during the period under report.

Students and staff actively participated in Communal Harmony week celebrations organized in the University Campus from 19 to 25-Nov-2012. A special Camp of NSS was organized at village Rajpur near Palampur from 29-Dec-2012 to 04-Jan-2013. National Science Day was celebrated in the month of February, 2013. The World Environment Day was celebrated on June 7, 2013 in the College. Five days INSPIRE Internship Camps were organised at CSK HPKV, Palampur from 24.7.2012 to 28.7.2012 , 21.8.2012 to 25.8.2012 and 17.10.2012 to 21.10.2012.

Dr. Manoj Bhargava, Professor (Prof. & Head), and Sh. Kapil Sharma, Computer Teacher, Department of Physical Sciences and Languages deserves appreciation for meticulous work of compilation and shaping this report into its final and presentable form.

**Palampur**

**Dean  
College of Basic Sciences**







# ANNUAL REPORT

(For the year 2012-2013)

## COLLEGE OF BASIC SCIENCES

CSK HP KRISHI VISHVAVIDYALAYA

PALAMPUR – 176 062

The College of Basic Sciences is one of the four constituent colleges of the Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur. Initially conceived as the Department of Basic Sciences and Humanities in the then College of Agriculture in 1978, it was elevated to the rank of College of Basic Sciences in May, 1991. It comprises of four departments, namely Biology and Environmental Sciences, Chemistry and Biochemistry, Physical Sciences and Languages and Microbiology, and a Centre for Geoinformatics Research and Training. The College has the following mandate:

### Mandate

1. To impart quality education to Under-graduate and Post-graduate students in Basic Sciences leading to B. Sc., M. Sc. and Ph.D. Degrees.
2. To provide support in teaching and basic research to other constituent colleges of the university.
3. To create trained manpower in different disciplines of Basic Sciences.
4. To carry out research work in relation to the state needs for the upliftment of rural masses of the State.

## Academics, Students, Staff, Administration & Budget

The faculty of the college was engaged in the following teaching programmes of Under-graduate and Post-graduate studies:

Compulsory courses were offered to the students of (i) B.Sc. (Medical and Non-medical) (ii) B.Sc. (Agri.) (iii) B.Sc. Home Sc. (Hons.) and (iv) B.V.Sc. & A.H. of all the constituent colleges. Postgraduate courses: Major, minor and supporting courses were also offered to the students of M.Sc. and Ph.D. of this college and other constituent colleges. The detail of the total teaching credit hours undertaken by the faculty is given in the Table as below:

### Total Credit Hours offered during the Academic Year 2012-13

Name of the Department	Over all		COBS		COA		COHS		COVAS	
	UG	PG	UG	PG	UG	PG	UG	PG	UG	PG
<b>Total</b>	<b>391</b>	<b>200</b>	<b>329</b>	<b>188</b>	<b>21</b>	<b>38</b>	<b>39</b>	<b>23</b>	<b>2</b>	<b>14</b>
<b>Biol. &amp; Env. Sciences</b>	113	78	97	78	5	-	9	-	2	-
<b>Chem. &amp; Biochem</b>	79	43	67	43	3	-	9	-	-	-
<b>Microbiology</b>	14	47	-	47	04	12	10	09	-	-
<b>Phys. Sci. &amp; Lang.</b>	182	32	165	20	06	26	11	14	-	14
<b>C.G.R.T.</b>	3	-	-	-	3	-	-	-	-	-

Some of these courses were offered jointly for different colleges wherever it was required.

## Students Intake

Total number of students admitted to various undergraduate and postgraduate programmes during the Academic Session 2012-2013 are as below:

Students Intake during 2012-13			
Programme	Boys	Girls	Total
B. Sc.	20	60	80
M. Sc. (Biochemistry)	01	05	06
M.Sc. (Biology)	01	04	05
M. Sc. (Environment)	01	01	02
M. Sc. (Microbiology)	-	03	03
Ph.D. (Biochemistry)	-	03	03
Ph.D. (Microbiology)	-	01	01

## Student Total Strength

In total 224 UG students and 67 PG students registered during the academic year and the break-up is:

Programme	Boys	Girls	Total
B. Sc.	60	164	224
M. Sc.	04	51	55
Ph.D.	01	11	12

At present teachers from other colleges are also associated for teaching in some of the disciplines.

## Students Passed Out

The degrees were awarded to 50 UG and 36 PG students as given below

Programme	Boys	Girls	Total
B. Sc.	07	43	50
M. Sc.	03	26	29
Ph.D.	02	05	07

## Scholarships Awarded

*College Merit Scholarship* and *Amar Shaheed Capt. Saurabh Kalia Scholarship* were awarded to the following Undergraduate students:

Merit Scholarship		Amar Shaheed Capt. Saurabh Kalia Scholarship	
B. Sc. (I)	B. Sc. (II)	B. Sc. (III)	
1. Vimal Samkaria	1. Baljeet Singh	1. Anurag Sharma	1. Priyanka Dogra
2. Pintoo Kumar	2. Sheetal	2. Shiwani Rana	2. Pooja Vashisth
3. Anuradha Sharma	3. Damini Nayital	3. Shipra Singh	3. Shingarika Sharma
4. Ishita Mehta	4. Shweta	4. Anil Kumar	
5. Reema Bharti	5. Shefali Sharma	5. Shivani Anand	
6. Nandita Sharma	6. Shilpi	6. Silki Sharma	
7. Ashmita Rana	7. Shalini Atri	7. Sunidhi Rana	



### Budget for Teaching Schemes

The budget expenditure incurred during the year 2012-2013 is given below:

Sr. No.	Scheme No.	Sponsoring Agency	Total Amount (₹)
<b>College of Basic Sciences</b>			
1.	APL-011-25 (Agri.)(i,ii,iii)	State Govt.	3,35,84,925/-
2.	APL-009-25 (Agri.)	-do-	40,14,427/-
3.	APL-076-25	-do-	7,183/-
4.	APL-19-25	-do-	9,67,094/-
<b>Total</b>			<b>3,85,73,629/-</b>
<b>Budget 2011-2012 Detail</b>			
<b>I. Deptt. of Biology and Environmental Sciences</b>			
1.	APL-011-25(iii)	State Govt.	1,24,50,437/-
<b>Total</b>			<b>1,24,50,437/-</b>
<b>II. Deptt. of Chemistry &amp; Biochemistry</b>			
1.	APL-011-25(ii)	State Govt.	47,37,862/-
2.	APL-19-25	-do-	9,67,094/-
<b>Total</b>			<b>57,04,956/-</b>
<b>III. Deptt. of Microbiology</b>			
1.	APL-011-27	State Govt.	23,45,891/-
2.	APL- 009-27	-do-	7,60,020/-
<b>Total</b>			<b>31,05,911/-</b>
<b>IV. Dean, College of Basic Sciences</b>			
1.	APL-011-25(Agri)(i)	State Govt.	1,40,50,735/-
2.	APL-009-25(Agri.)	-do-	32,54,407/-
3.	APL-076-25	-do-	7,183/-
<b>Total</b>			<b>1,73,12,325/-</b>

### REPERSENTATION TO VARIOUS UNIVERSITY BODIES FROM COLLEGE

#### Academic Council

Dr. G.L. Bansal	Dean
Dr. N.K. Gupta	Professor & Head , upto Nov., 2012
Dr. K.P. Singh	Professor
Dr. Manoj Bhargava	Professor & Head, w.e.f. Jan., 2013

#### Research Council

Dr. G.L. Bansal	Dean
Dr.C.K.Oberoi	Professor & Head, Dept. of Chemsitry & Biochemistry

#### Extension Council

Dr. G.L. Bansal	Dean
Dr. S.S.Kanwar	Professor & Head , w.e.f. 26.06.2013

#### Educational and Resident Instructions Advisory Committee

Dr. G.L. Bansal	Dean
Dr. Kamlesh Singh	Professor & Dean, Postgraduate Studies

### Constitution of the Board of Studies of College

Dr. G.L. Bansal	Dean	Chairman
Dr. Manoj Bhargava	HOD, Physical Sciences & Languages	Member
Dr. S.S. Kanwar	HOD, Microbiology	Member
Dr. N.K. Gupta	HOD, Biology and Environmental Sciences	Member
Dr.C.K. Oberoi	HOD, Chemistry & Biochemistry	Member
Dr. S. Bhan	Secretary, Board of Studies, COA	Member
Dr.(Mrs.) Raj Pathania	Secretary, Board of Studies, COHS	Member
Dr. K.B. Nagal	Secretary, Board of Studies, COVAS	Member

### Sports, Games and Literary Activities

The in-charge for various activities were as:

1.	<b>Teacher Incharge (Games &amp; Sports)</b>	<b>Dr. R.C. Chauhan</b>
2.	Athletic	Dr. Nageswer Singh
3.	Football	Dr. S. S. Kanwar
4.	Basketball	Dr. R.C. Chauhan
5.	Cricket	Dr. N. K. Gupta
6.	Volley-ball	Sh. Vaibhav Kalia
7.	Kabaddi	Sh. Kapil Sharma
8.	Table-Tennis	Dr. C.K. Oberoi
9.	Badminton	Sh. Kapil Sharma
10.	Chess	Dr. Manoj Bhargava
11.	Cultural Activities	Dr.(Mrs.) Anita Singh & Dr.(Mrs.) Usha Rana
12.	Literary Activities	Dr.(Mrs.) Sharda Singh & Dr.(Mrs.) Suman Sharma
13.	Mountaineering & Hiking	Dr. M.K. Gupta

### Educational Tour

An Educational Tour to South India for B.Sc. 2<sup>nd</sup> Year students of the college was conducted by Dr. R.C. Chauhan (Tour In-charge) and Dr. (Mrs.) Suman Sharma from 29-12-2012 to 9-01-2013. A total of 59 students (14 boys and 45 girls) alongwith two attendant visited places of educational interest in South India.

### Department-wise Faculty position

Sr. No.	Name of the Faculty	Designation
<b>I. DEPARTMENT OF BIOLOGY AND ENVIRONMENTAL SCIENCES</b>		
1.	<b>Dr. Navneet K Gupta</b>	<b>Professor and Head</b>
2.	Dr. G.L.Bansal	Professor and Dean
3.	Dr.K.P.Singh	Professor
4.	Dr.(Mrs.) Anita Singh	Professor
5.	Dr. Ramesh C. Chauhan	Professor
6.	Dr.Virendra Singh	Principal Scientist
7.	Dr.(Mrs.) Usha Rana	Assistant Professor
<b>II. DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY</b>		
1.	<b>Dr. C.K.Oberoi</b>	<b>Professor and Head</b>
2.	Dr. Nageswer Singh	Assistant Professor (Ad-hoc)
3.	Dr. Suman Sharma	Assistant Professor (Contract)

<b>III. DEPARTMENT OF MICROBIOLOGY</b>		
1.	<b>Dr. S.S. Kanwar</b>	<b>Professor &amp; Head</b>
2.	Dr. M.K. Gupta	Associate Professor (retired on 28/02/2013)
<b>IV. DEPARTMENT OF PHYSICAL SCIENCES AND LANGUAGES</b>		
1.	<b>Dr. Manoj Bhargava</b>	<b>Professor and Head</b>
2.	Dr. Kamlesh Singh	Professor and Dean, Postgraduate Studies
3.	Dr.(Mrs.) Sheela Thakur	Assistant Professor (Ad-hoc)
4.	Sh. Kapil Sharma	Computer Teacher (Contract)
<b>V. CENTRE FOR GEOINFORMATICS RESEARCH AND TRAINING</b>		
1.	<b>Dr. (Mrs.) Sharda Singh</b>	<b>Professor and Programme Director</b>
2.	Dr. R.S. Rana	Sr. Scientist (Agronomy)
3.	Sh. Vaibhav Kalia	Assistant Professor

#### Department-wise Staff position in the college

Sr.No	Name	Designation
<b>I. DEAN OFFICE</b>		
<b>A. Ministerial Staff</b>		
1.	Sh. Om Parkash	Supdt. (Retired on 28-02-2013)
2.	Sh.R.P.Bist	Supdt. (w.e.f. 23-03-2013)
3.	Sh. P.C. Changra	Sr. Scale Stenographer
4.	Sh. Kalyan Chand	Sr. Assistant
5.	Sh. Uttam Chand	Jr. Assistant
6.	Sh. Satish Kumar	Jr. Assistant
7.	Sh. Surjeet Kumar	Jr. Assistant
8.	Sh. Randir Singh	Jr. Assistant
<b>B. Technical Staff</b>		
1.	Sh. Jyoti Swaroop	STA-II
2.	Sh Hukum Singh	STA-II
<b>C. Class – IV</b>		
1.	Sh. Hari Singh	Peon
2.	Sh. Ramesh Chand	Peon
3.	Sh. Anup Singh	Beldar
4.	Sh. Sansar Chand	Beldar
5.	Sh. Kehar Singh	Beldar
6.	Smt. Kamlesh Kumari	Sweepress
7.	Sh. Mahinder Singh	Sweeper
<b>II. LAND SCAPPING SECTION (COBS)</b>		
<b>A. Class-IV</b>		
1.	Sh. Sanjayjeet Kumar	Beldar (Transferred on 22-12-2012)
2.	Sh. Keshav Ram	Beldar
3.	Sh. Kuldeep Kumar	Beldar (w.e.f. 21-12-2013)
<b>III. BAMBOO SECTION (COBS)</b>		
<b>A. Technical staff</b>		
1.	Sh. Angat Ram	Field Assistant (Transferred to RSS, Malan)
<b>B. Class-IV</b>		
1.	Sh. Bishamber Dass	Beldar
<b>IV. DEPARTMENT OF BIOLOGY AND ENVIRONMENTAL SCIENCES</b>		
<b>A. Ministerial Staff</b>		
1.	Sh. Yudhvir Singh Rana	Sr. Assistant

<b>B. Technical Staff</b>		
1.	Sh. Arjun Singh	Jr. Technician
2.	Sh. Jagan Nath	Laboratory Assistant
3.	Sh. Baldev Kumar	Laboratory Assistant
<b>C. Class-IV Staff</b>		
1.	Sh. Subhash Chand	Peon
<b>V. DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY</b>		
<b>A. Ministerial Staff</b>		
1.	Mrs.Nisha Bhardwaj	Sr. Assistant (on half day basis)
<b>B. Technical Staff</b>		
1.	Sh. Dharm Chand	Lab. Assistant
2.	Sh. Shakti Chand	Lab. Assistant
<b>C. Class-IV Staff</b>		
1.	Sh. Santosh Kumar	Lab Helper
2.	Sh. Om Parkash	Peon
<b>VI. DEPARTMENT OF MICROBIOLOGY</b>		
<b>A. Ministerial Staff</b>		
1.	Smt.Usha Rani	Sr. Assistant
2.	Sh. Sushil Kumar	Sr. Scale Stenographer
<b>B. Technical Staff</b>		
1.	Sh.Roshan Lal	Lab. Assistant
2.	Sh. Jai Raj	Lab. Assistant
<b>C. Class-IV Staff</b>		
1.	Sh.Manohar Lal	Peon
<b>VII. DEPARTMENT OF PHYSICAL SCIENCES AND LANGUAGES</b>		
<b>A. Ministerial staff</b>		
1.	Mrs. Nisha Bhardwaj	Sr. Assistant (on half day basis)
<b>B. Technical Staff</b>		
1.	Sh. Surjeet Kumar	Lab. Assistant
<b>C. Class-IV staff</b>		
1.	Sh. Satish Kumar	Beldar (w.e.f. 21-03-2012)
<b>VIII. CENTRE FOR GEO-INFORMATICS RESEARCH AND TRAINING</b>		
<b>A. Ministerial staff</b>		
1.	Sh Randhir Singh	Jr. Assistant (on half day basis)

## TEACHING

### 1. COURSES OFFERED

Following UG and PG courses were offered by the various departments:

#### I. Department of Biology and Environmental Sciences

Sr. No.	Course No.	Course title	Credit Hours	Name of Instructor
<b>SEMESTER-I</b>				
<b>A. Undergraduate Courses</b>				
1.	Bot.111	Phycology and Mycology	2+1	Dr.(Mrs.) Anita Singh
2.	Bot.112	Bryophyta and Pteridophyta	2+1	Dr.(Mrs.) Usha Rana
3.	Bot.211	Diversity of Seed Plants-Gymnosperms	2+1	Dr.(Mrs.) Anita Singh
4.	Bot.212	Diversity of Seed Plants-Angiosperms	2+1	Dr.(Mrs.) Usha Rana
5.	Bot.311	Plant Ecology	2+1	Dr.K.P.Singh
6.	Bot.312	Biochemistry and Biotechnology	2+2	Dr.K.P.Singh / Dr. Navneet K. Gupta
7.	Bot.221(R)	Structure and Development of Flowering Plants	2+1	Dr.(Mrs.) Anita Singh
8.	Zoo.111	Invertebrates-I	3+1	Dr(Mrs.) Meena Kumari
9.	Zoo.112	Cell Biology	1+1	Dr(Mrs.) Meena Kumari
10.	Zoo.211	Genetics-I	1+1	Dr(Mrs.) Meena Kumari
11.	Zoo.212	Animal Physiology-I	3+1	Dr. Navneet K. Gupta
12.	Zoo.311	Applied Zoology-I	2+2	Dr(Mrs.) Meena Kumari
13.	Zoo.312	Ecology	2+1	Dr. Navneet K. Gupta
14.	Zoo.121 ( R )	Life and Diversity of Animals-II	3+1	Dr. Navneet K. Gupta
15.	Zoo.122( R )	Genetics-II	2+1	Dr. Navneet K. Gupta
16.	Zoo.221( R )	Animal Physiology-I	3+1	Dr. Navneet K. Gupta
17.	ENV 311	Introduction to Environmental Science	2+0	Dr. Virendra Singh
<b>B. Postgraduate Courses</b>				
1.	Bio 501	Cell Biology	2+0	Dr. Navneet K. Gupta
2.	Bio 502	Developmental Biology	2+1	Dr.(Mrs.) Usha Rana
3.	Bio 504	Biochemistry	2+1	Dr. Navneet K. Gupta
4.	Bio.511	Radiation Biology	2+0	Dr. Navneet K. Gupta
5.	Bio 514	Research Techniques in Biology	2+1	Drs.K.P.Singh/Anita Singh/Usha Rana
6.	Bio 531	Cellular Physiology and Plant water relations	2+1	Dr.G.L.Bansal
7.	Bio 532	Inorganic Nutrition-Physiological and Molecular aspects	2+1	Dr.K.P.Singh
8.	Bio 536	Physiological aspects of Field Crops	2+0	Dr.K.P.Singh
9.	Pl Physiol 503	Physiological and Molecular Responses to Abiotic Stresses	2+1	Dr.K.P.Singh
10.	Pl.Physiol. 507	Physiological and Molecular aspects of Photosynthesis-Carbon and Nitrogen Assimilation	2+1	Dr.K.P.Singh

11.	Env 501	Definitions and Concepts in Environmental Sciences	2+0	Dr. R. C. Chauhan
12.	Env 503	Environmental Pollution	2+1	Dr.(Mrs.) Kanika Baghla
13.	Env 504	Environmental Impact Assessment	2+1	Dr. R. C. Chauhan
14.	Env 506	Global Climate Change	2+0	Dr.R.S.Rana,Sh.Vaibhav Kalia
	ENV 591	Credit Seminar	1+0	Dr.Virendra Singh
<b>Semester-II</b>				
<b>A. Undergraduate Courses</b>				
1.	Bot.121	Mycology, Plant Pathology and Lichens	2+1	Dr. Anita Singh
2.	Bot.122	Cell Biology	2+1	Dr. Usha Rana
3.	Bot.221	Structure and Development of Flowering Plants	2+1	Dr. Anita Singh
4.	Bot.222	Reproduction in Flowering Plants	2+1	Dr. Usha Rana
5.	Bot.321	Plant Physiology	3+1	Dr. Usha Rana
6.	Bot.322	Economic Botany and utilization of Plants	2+1	Dr. Anita Singh
7.	Zoo.121	Invertebrates-II	3+1	Dr. Meena Kumari
8.	Zoo.122	Developmental Biology	1+1	Dr. Meena Kumari
9.	Zoo.221	Genetics-II	2+1	Dr. Meena Kumari
10.	Zoo.222	Animal Physiology-II	3+1	Dr. Navneet K. Gupta
11.	Zoo.321	Applied Zoology-II	2+2	Dr. Meena Kumari
12..	Zoo.322	Evolution	2+1	Dr. Navneet K. Gupta
13.	Zoo.121HSc	Human Physiology and Hygiene	2+1	Dr. Navneet K. Gupta
14.	ENV.311	Introduction to Environmental Sciences	2+0	Dr. R.C. Chauhan
15.	ENV 311	Introduction to Environmental Sciences	1+1	Dr. Virendra Singh
16.	Cr.Physiol.241	Crop Physiology	2+1	Dr.K.P.Singh
<b>B. Postgraduate Courses</b>				
1.	Bio 505	Animal Physiology	2+1	Dr. Navneet K. Gupta
2.	Bio.506	Plant Physiology	2+1	Dr.K.P.Singh
3.	Bio 507	Taxonomy and Economic Botany	2+1	Dr. Anita Singh
4.	Bio 508	Functional organization of Animals	3+1	Dr. Navneet K. Gupta
5.	Bio 515	Ecology and Biodiversity	2+0	Dr. Ramesh C Chauhan
6.	Bio 516	Morphology and Plant Anatomy	2+1	Dr. Anita Singh
7.	Bio 518	Genetics and Genetic Engineering	2+0	Dr. Navneet K. Gupta
8.	Bio 521	Applied Zoology	2+1	Dr.(Mrs.) Rani Dhanze
9.	Bio 536	Physiological Aspects of Field Crops	2+0	Dr.K.P.Singh
10.	Bio 537	Abiotic Stress responses in Plants	2+0	Dr.G.L.Bansal
11.	Bio 591	Credit Seminar	1+0	Dr.G.L.Bansal
12.	ENV.505	Environmental Chemistry	2+1	Dr. Ramesh C Chauhan
13.	ENV.509	Pesticides and Environment	2+1	Dr. Kanika Baghla
14.	ENV.510	Environment Conservation	2+1	Dr. Ramesh C Chauhan
15.	ENV.512	Biodiversity/Wildlife Conservation and Himalayan Ecosystem	2+0	Dr. Ramesh C Chauhan
16.	ENV. 591	Credit Seminar	1+0	Dr. Ramesh C Chauhan

## Department of Chemistry and Biochemistry

Sr. No.	Course No.	Course title	Credit Hours	Name of Instructor
<b>Semester-I</b>				
<b>A. Undergraduate Courses</b>				
1.	Chem-111	States of Matter, Colloids and Chemical Kinetics(New)	3+0	Dr.(Mrs.)Suman Sharma
2.	Chem-112	Basic Principles of Inorganic Chemistry, Representative Elements and Noble Gases (New)	3+1	Mrs. Abha Chaudhary
3.	Chem-111	States of Matter (Old)	2+0	Dr(Mrs.) Suman Sharma
4.	Chem-112	Basic Principles of Inorganic Chemistry(Old)	2+0	Dr. (Mrs.) Neelam Sharma
5.	Chem-113	Physical Organic Chemistry (Old)	1+1	Dr.C.K.Oberoi
6.	Chem-211	Thermodynamics	2+0	Dr(Mrs.) Suman Sharma
7.	Chem-212	Transition and Inner Transition Elements	2+1	Dr. (Mrs.) Neelam Sharma
8.	Chem-213	Chemistry of Functional Groups-I	2+0	Dr.C.K.Oberoi
9.	Chem-311	Quantum Mechanics & Photochemistry	2+0	Dr.(Mrs.) Suman Sharma
10.	Chem-312	Advanced Inorganic Chemistry -I	2+1	Dr(Mrs.) Suman Sharma
11.	Chem-313	Heterocyclics, Pericyclics and Spectroscopy	2+0	Dr.C.K.Oberoi
12.	Chem.-121	Colloids and Chemical Kinetics	1+1	Dr.(Mrs.) Suman Sharma
13.	Chem.-122	Representative Elements and Noble Gases	2+0	Dr.(Mrs.)Suman Sharma
14.	Chem.-123	Hydrocarbons & Organic Halides	2+0	Dr.C.K.Oberoi
14.	Chem.-221	Electrochemistry and Phase Equilibrium	2+0	Dr.(Mrs.)Suman Sharma
15.	Chem.-222	Coordination Chemistry and Non-Aqueous solvent	2+0	Dr.(Mrs.)Suman Sharma
16.	Chem.-323	Natural Products, Synthetic Polymers and Dyes	2+0	Dr.C.K.Oberoi
17.	Biochem-111	Biochemistry (Home Sc)	2+1	Dr.Nageswer Singh
18.	Biochem-351	Biochemistry (Agriculture)	2+1	Dr.Kamal Mohini/ Dr.Nageswer Singh
<b>B. Postgraduate Courses</b>				
1.	Biochem-501	Basic Biochemistry	3+1	Dr.Kamal Mohini/Dr.Nageswer Singh
2.	Chem-512	Analytical Chemistry	2+1	Dr. (Mrs.) Neelam Sharma
3.	Biochem-541	Immunochemistry	2+0	Dr..Nageswer Singh
4.	Biochem-551	Techniques in Biochemistry	1+3	Dr. Nageswer Singh
5.	Biochem-591	Seminar	1+0	Dr. Nageswer Singh
<b>Semester-II</b>				
<b>A. Undergraduate Courses</b>				
1.	Chem-121	Thermodynamics, Electrochemistry & Equilibrium (New)	3+1	Dr.(Mrs.) Suman Sharma

2.	Chem-123	(New) Physical Organic Chemistry, Hydrocarbons and Organic Halides	3+0	Dr.C.K.Oberoi
3.	Chem-121	Colloids and Chemical Kinetics(Old)	1+1	Dr.(Mrs.) Suman Sharma
4.	Chem-122	Representative Elements and Noble Gases(Old)	2+0	Dr.(Mrs.) Neelam Sharma
5.	Chem-123	Hydrocarbons & Organic Halides(Old)	2+0	Dr.C.K.Oberoi
6.	Chem-213	Chemistry of Functional Groups-I	2+0	Dr.C.K.Oberoi
7.	Chem-221	Electrochemistry and Phase Equilibrium	2+0	Dr.(Mrs.) Suman Sharma
8.	Chem-222	Coordination Chemistry and Non Aqueous Solvents	2+0	Dr.(Mrs.) Neelam Sharma
9.	Chem-223	Chemistry of Functional Groups-II	1+1	Dr .C.K Oberoi
10.	Chem-321	Solutions and Spectroscopy	1+1	Dr. (Mrs.) Suman Sharma
11.	Chem-322	Advanced Inorganic Chemistry -II	2+0	Dr.(Mrs.) Suman Sharma
12.	Chem-323	Natural Products, Synthetic Polymers& Dyes	2+0	Dr .C.K Oberoi
13.	Chem-324	Analytical Techniques in Chemistry	0+1	Dr.(Mrs.) Neelam Sharma
14.	Biochem-111	Biochemistry (Odd semester)(H.Sc.)	2+1	Dr.Nageswer Singh
15.	FST-125	Basic Biochemistry (H.Sc.)	2+1	Dr..M.K. Acharya & Dr.Nageswer Singh
<b>B. Postgraduate Courses</b>				
1.	Biochem-501	Basic Biochemistry	3+1	Dr.Nageswer Singh
2.	Biochem-502	Plant Biochemistry	3+0	Dr.Nageswer Singh
3.	Chem-503	Chemistry of Pesticides	2+1	Dr.(Mrs.) Neelam Sharma
4.	Biochem-504	Enzymology	2+1	Dr.Nageswer Singh
5.	Biochem-505	Intermediary Metabolism	3+0	Dr..M.K. Acharya
6.	Biochem-521	Food & Nutritional Biochemistry	2+1	Dr Nageswer Singh
7.	Biochem-591	M.Sc. Seminar	1+0	Dr.Nageswer Singh
8.	Biochem-601	Biochemistry of Biotic & Abiotic stresses3+0	3+0	Dr.Rajan Katoch
9.	Biochem.602	Advanced Molecular Biology	3+0	Dr. Rajan Katoch
10.	Biochem-611	Advanced Techniques in Biochemistry	0+2	Dr. Nageswer Singh
11.	Biochem.691	Ph.D. Seminar	1+0	Dr. Nageswer Singh

## II. Department of Microbiology

Sr. No.	Course No.	Course title	Credit Hours	Name of Instructor
<b>Semester-I</b>				
<b>A. Undergraduate Courses</b>				
1	Ort-111	Orientation	1+0	Dr. S.S. Kanwar
2.	FST-124	Food Microbiology	2+1	Dr. S.S. Kanwar
3.	FST-236	Industrial Microbiology	2+1	Dr. C.R. Sharma
4.	FST-352	Food Biotechnology	2+1	Dr. Pratibha Mishra
5.	FST-355	Food Safety and Microbial standards	2+1	Dr. Pratibha Mishra
<b>B. Postgraduate Courses</b>				
1.	Micro-501	Principles of Microbiology	2+1	Dr.S.S.Kanwar/ Sh. Rajinder Kumar
2.	Micro-505	Techniques in Microbiology	0+2	Dr. M.K. Gupta



3.	Micro-531	Food Microbiology	2+1	Dr. C.R. Sharma
4.	Micro-551	Introduction to Human Microbial Pathogens	2+1	Dr.M.K.Gupta/ Sh. Rajinder Kumar
5.	Micro-591	M.Sc. Seminar	1+0	Dr. M.K. Gupta
6.	Micro-599/600	M.Sc. Research		Respective Advisor
7.	Micro-699/700	Doctoral Research		Respective Advisor
<b>Semester-II</b>				
<b>A. Undergraduate Courses</b>				
1.	Micro.121	Basic Microbiology	1+1	Dr.S.S.Kanwar
2.	FST.124	Food Microbiology	2+1	Dr(Mrs.)Pratibha Mishra
3.	Ag.Micro.121	Agricultural Microbiology	2+1	Dr.C.R.Sharma / Sh.Rajinder Kumar
<b>B. Postgraduate Courses</b>				
1.	Micro-502	Microbial Taxonomy	2+1	Dr. C.R. Sharma
2.	Micro-503	Microbial Physiology and Metabolisms	2+1	Sh. Rajinder Kumar
3.	Micro-504	Microbial Genetics	2+1	Dr. (Mrs) Pratibha Mishra
4.	Micro-541	Industrial Microbiology	2+1	Dr. C.R.Sharma
5.	Micro-601	Advances in Microbiology	2+1	Dr. S.S.Kanwar
6.	Micro-603	Advances in Molecular Microbiology	2+0	Dr. (Mrs) Pratibha Mishra
7.	Micro-599/600	M.Sc. Research		Respective Advisor
8.	Micro-691	Seminar	1+0	Dr. S.S. Kanwar
9.	Micro-699/700	Doctoral Research		Respective Advisor
10.	Micro-502	Microbial Taxonomy	2+1	Dr. C.R. Sharma

### III. Department of Physical Sciences and Languages

Sr. No.	Course No.	Course title	Credit Hours	Name of Instructor
<b>Semester-I</b>				
<b>A. Undergraduate Courses</b>				
1.	Comp 111	Principles of Computers-I	1+1	Sh Vaibhav Kalia
2.	Comp 111	Computer Science (HSc)	1+2	Sh Kapil Sharma
3.	Comp 115	Application of Computers (H.Sc.)	2+2	Sh Kapil Sharma
4.	Comp 121	Principles of Computers-II (R)	1+1	Sh Vaibhav Kalia
5.	Comp 221	Computer Programming-C (Non-Medical)	2+1	Sh Kapil Sharma
6.	Eng 111	Prose, Poetry and Functional English	2+0	Sh Rajesh Kumar
7.	Eng 111	Comprehension and Communication Skills in English [BSc (Hons)Ag]	1+1	Sh Rajesh Kumar
8.	Math 111	Algebra and Trigonometry	3+0	Mrs Anupam
9.	Math 112	Calculus	3+0	Dr (Mrs) Sharda Singh
10.	Math 121	Algebra and Ordinary Differential Equation	3+0	Dr (Mrs) Sharda Singh

11.	Math 122	Geometry	3+0	Dr (Mrs) Sharda Singh
12.	Math 211	Advanced Calculus	4+0	Mrs Anupam
13.	Math 212	Dynamics	3+0	Sh V P Sood
14.	Math 221	Differential Equation	4+0	Dr (Mrs) Sharda Singh
15.	Math 222	Statics	2+0	Dr (Mrs) Sharda Singh
16.	Math 311	Analysis	3+0	Dr (Mrs) Sharda Singh
17.	Math 312	Abstract Algebra	4+0	Sh V P Sood
18.	Phys 111	Mechanics & Theory of Relativity	4+0	Mrs Meenakshi Sharma
19.	Phys 112	Current Electricity and Magnetism-I	2+1	Dr (Mrs) Sheela Thakur
20.	Phys 121	Statistical Physics and Thermodynamics	3+0	Dr (Mrs) Sheela Thakur
21.	Phys 122	Current Electricity and Magnetism	2+0	Dr (Mrs) Sheela Thakur
22.	Phys 211	Oscillation and Waves	3+0	Dr (Mrs) Sheela Thakur
23.	Phys 212	Quantum Mechanics	3+0	Dr (Mrs) Sheela Thakur
24.	Phys 213	Physics Laboratory-III	0+1	Dr (Mrs) Sheela Thakur
25.	Phys 222	Atomic, Molecular and X-rays Spectra	2+0	Dr (Mrs) Sheela Thakur
26.	Phys 311	Solid State Physics	3+0	Mrs Meenakshi Sharma
27.	Phys 312	Nuclear Physics-I	3+0	Dr (Mrs) Sheela Thakur
28.	Phys 313	Physics Laboratory-V	0+1	Dr (Mrs) Sheela Thakur
29.	Stat 231	Elementary Statistics [for B.Sc. (H.Sc.)]	1+1	Dr Manoj Bhargava
30.	Stat 351	Statistics [for B.Sc. (Hons.) Ag.]	1+1	Dr Manoj Bhargava
<b>Old Syllabus</b>				
31.	Comp 111	Principles of Computer-I	1+1	Sh Vaibhav Kalia
32.	Eng 111	Prose, Poetry and Functional English	2+0	Sh Rajesh Kumar
33.	Math 111	Matrices, Trigonometry and Vector Analysis	3+0	Dr (Mrs) Sharda Singh
34.	Math 112	Calculus	3+0	Dr (Mrs) Sharda Singh
35.	Phys 111	Mechanics and Theory of Relativity	3+0	Dr (Mrs) Sheela Thakur
36.	Phys 112	Vector Calculus and Electrostatics	2+0	Dr (Mrs) Sheela Thakur
37.	Phys 113	Physics Laboratory-I	0+1	Dr (Mrs) Sheela Thakur
38.	Stat 231	Elementary Statistics	1+1	Dr Manoj Bhargava
<b>B. Postgraduate Courses</b>				
1.	Comp 501	Computer Fundamental and Programming	2+1	Sh Kapil Sharma
2.	Stat 500	Introduction to Statistics	1+1	Dr Manoj Bhargava
3.	Stat 511	Statistical Methods for Applied Sciences	3+1	Dr Kamlesh Singh
4.	Stat 512	Elements of Sampling Theory	2+1	Dr Kamlesh Singh
5.	Stat 513	Sampling Techniques	2+1	Dr Kamlesh Singh
6.	Stat 531	Data Analysis using Statistical Packages	2+1	Dr Manoj Bhargava/ Sh Kapil Sharma
<b>Semester-II</b>				
<b>A. Undergraduate Courses</b>				
1.	Comp 121	Principles of Computers-II	1+1	Sh Vaibhav Kalia
2.	Comp 221	Computer Programming-C (Non-Medical)	2+1	Sh Vaibhav Kalia
3.	Comp 222	Application in FoxPro and Programming in BASIC (Medical)	2+1	Sh Kapil Sharma
4.	Comp 241	Introduction to Computer Application [for B.Sc. (Hons.) Ag.]	1+1	Sh Kapil Sharma

5.	Eng 121	Comprehension, Composition and Translation	2+0	Sh Rajesh Kumar
6.	Eng 121	English and Technical writing [for B.Sc. (H.Sc.)]	1+1	Sh Rajesh Kumar
7.	Math 121	Ordinary Differential Equations and Vector Analysis	3+0	Dr (Mrs) Sharda Singh
8.	Math 122	Geometry	3+0	Mrs Anupam
9.	Math 211	Advanced Calculus	4+0	Dr (Mrs) Sharda Singh
10.	Math 221	Differential Equation	4+0	Sh V P Sood
11.	Math 222	Statics	2+0	Mrs Anupam
12.	Math 311	Analysis	3+0	Dr (Mrs) Sharda Singh
13.	Math 321	Metric and Inner Product Spaces	3+0	Sh V P Sood
14.	Math 322	Numerical Analysis	3+1	Dr (Mrs) Sharda Singh/ Sh Vaibhav Kalia
15.	Phys 121	Statistical Physics and Thermodynamics	3+0	Mrs Sushila Devi
16.	Phys 122	Current Electricity and Magnetism-II	2+1	Dr (Mrs) Sheela Thakur
17.	Phys 211	Oscillation and Waves	3+0	Dr (Mrs) Sheela Thakur
18.	Phys 212	Quantum Mechanics	3+0	Dr (Mrs) Sheela Thakur
19.	Phys 221	Optics and Lasers	3+0	Mrs Sushila Devi
21.	Phys 222	Atomic, Molecular and X-rays Spectra	2+0	Dr (Mrs) Sheela Thakur
22.	Phys 223	Physics Laboratory-IV	0+1	Dr (Mrs) Sheela Thakur
23.	Phys 321	Nuclear Physics-II	3+0	Mrs Sushila Devi
24.	Phys 322	Electronics	3+0	Dr (Mrs) Sheela Thakur
25.	Phys 323	Physics Laboratory-VI	0+1	Dr (Mrs) Sheela Thakur
<b>Old Syllabus</b>				
26.	Comp 121	Principles of Computers-II	1+1	Sh Vaibhav Kalia
27.	Eng 121	Comprehension, Translation and composition	2+0	Sh Rajesh Kumar
28.	Math 121	Algebra and Ordinary Differential Equation	3+0	Dr (Mrs) Sharda Singh
29.	Math 122	Geometry	3+0	Mrs Anupam
30.	Phys 121	Statistical Physics and Thermodynamics	3+0	Mrs Sushila Devi
31.	Phys 122	Current Electricity and Magnetism	2+0	Dr (Mrs) Sheela Thakur
32.	Stat 231	Elementary Statistics	1+1	Dr Manoj Bhargava
<b>B. Postgraduate Courses</b>				
1.	Comp 501	Computer Fundamental and Programming	2+1	Sh Kapil Sharma
2.	Comp 502	Introduction to Networking and Internet Applications	1+1	Sh Kapil Sharma
3.	Stat 500	Introduction to Statistics	1+1	Dr Manoj Bhargava
4.	Stat 511	Statistical Methods for Applied Sciences	3+1	Dr Kamlesh Singh
5.	Stat 513	Sampling Techniques	2+1	Dr Manoj Bhargava

## IV. Centre for Geoinformatics Research and Training

Sr. No.	Course No.	Course title	Credit Hours	Name of Instructor
<b>Semester-I</b>				
<b>A. Undergraduate Courses</b>				
1.	GIS-481	Remote Sensing GIS and Land Use planning	1+2	Dr. R.S. Rana / Mr. Vaibhav Kalia
<b>B. Postgraduate Courses</b>				
1.	GIS-501	Geographic Information System and its Applications	2+1	Dr. R. S. Rana/ Dr. Sharda Singh
2.	GIS-502	Remote Sensing and its applications	2+1	Dr. R.S. Rana / Sh. Vaibhav Kalia

## 2. THESES COMPLETED

## I. Department of Biology and Environmental Sciences

## M. Sc. (Biology)

Sr. No.	Name of student & Admission No.	Title of Thesis	Name of Major Advisor
1.	Mr. Arun Koundal S-2009-30-09	To study the feeding and breeding behaviour of Green Head Spotted Murrel( <i>Channa punctatus</i> , Bloch and Schn).	Dr.(Mrs.) Rani Dhanze
2.	Ms.Anika Kumari S-2010-30-13	Association of Copper, Magnesium and Zinc concentration with Cardiovascular Diseases and Hypertension	Dr. Navneet K. Gupta
3.	Ms. Dipika Pathania S-2010-30-14	Studies on Biology of <i>Spilosoma dalbergiae</i> (Moore) Lepidoptera: Arciidae	Dr. Navneet K. Gupta
4.	Ms. Jyoti S-2010-30-15	Morphophysiological and Biochemical responses to water stress in Chickpea ( <i>Cicer arietinum</i> L.)	Dr.(Mrs.) Usha Rana
5.	Ms.Nitika Sharma S-2010-30-16	Morphometric changes during Ontogenic development of wax moth.	Dr. Navneet K. Gupta
6.	Ms.Priyanka Sharma S-2010-30-17	Association of Sodium and Potassium concentrations with Cardiovascular Diseases and Hypertension.	Dr. Navneet K. Gupta
7.	Ms.Priyanka Rana S-2010-30-18	Studies on the planktonic diversity of village ponds in Palampur.	Dr.(Mrs.) Rani Dhanze
8.	Ms. Ragini Sharma S-2010-30-19	Morphological and Antioxidant Properties of <i>Bacopa monnieri</i> and <i>Matricaria recutita</i> of Palampur and its surrounding areas	Dr.(Mrs.) Anita Singh
9.	Ms. Simmi Rana S-2010-30-20	Physiological studies of growth, development and yield in Garden Pea ( <i>Pisum sativum</i> )	Dr.K.P.Singh
10.	Ms.Somu Kaundal S-2010-30-21	Studies on the food and feeding habits of some hill stream fishes of district Kangra.	Dr.(Mrs.) Rani Dhanze

11.	Ms. Shalini Rana S-2010-30-22	Morphological and Antioxidant activities of Aloe species of Palampur and its surrounding area.	Dr.(Mrs.) Anita Singh
12.	Ms.Sujata Devi S-2010-30-23	Studies on phenotypes associated with human hereditary traits and their allelic and genotypic frequencies within the population.	Dr. Navneet K. Gupta
13.	Ms. Sumita S-2010-30-24	Morphophysiological and Biochemical characterization for drought tolerance in Brown sarson ( <i>Brassica campestris</i> L.)	Dr.(Mrs.) Usha Rana

**M. Sc. (Environmental Sciences)**

Sr. No.	Name of student & Admission No.	Title of Thesis	Name of Major Advisor
1.	Ms. Akanksha Bhardwaj S-2010-30-25	Diatoms as indicators of Water Quality in Khajiyar Lake, Himachal Pradesh.	Dr.Ramesh C Chauhan
2.	Ms. Priyanka Sharma S-2010-30-26	Response of Rotifers to Water Quality in Khajiyar lake, Himachal Pradesh.	Dr.Ramesh C Chauhan

**II. Department of Chemistry and Biochemistry**

**M.Sc. (Biochemistry)**

Sr. No.	Name of student & Admission No.	Title of Thesis	Name of Major Advisor
1.	MsAnshu Kanwar (S-2010-30-01)	Studies on phytochemical constituents of mentha species	Dr.Nageswer Singh
2.	Ms. Khushboo (S-2010-30-02)	Biochemical evaluation of bread wheat doubled haploids	Dr. Kamal Mohini
3.	Ms. Mitali Mahajan (S-2010-30-3)	Studies on biochemical constituents of horsegram ( <i>Macrotyloma uniflorum</i> ) genotypes of Himachal Pradesh	Dr. Kamal Mohini
4.	Ms.Poonam Kumari (S-2010-30-04)	Studies on biochemical constituents of Linseed ( <i>Linum usitatissimum</i> L.) genotypes	Dr. Kamal Mohini
5.	Ms. Pratiba Rana (S-2010-30-05)	Seasonal variations of polyphenols and polyphenols oxidase activity in tea [ <i>Camellia sinensis</i> (L) O Kuntze]	Dr.Nageswer Singh
6.	Ms. Ragini Sen (S-2010-30-06)	Assesment of antimicrobial activity of essential oils and plant extracts from Eupatorium and Lantana	Dr.Rajan Katoch
7.	Ms. Reetu (S-2010-30-08)	Persistence studies of pretilachlor and its biochemical effects in transplanted rice	Dr. Neelam Sharma
8.	Ms. Shivani Sharma (S-2010-30-09)	Biochemical evaluation of adjuki bean [ <i>Vigna angularis</i> (Willd.) Ohwi and Ohasi] genotypes	Dr.C.P. Awasthi
9.	Ms. Shivani Sharma (S-2010-30-10)	Molecular characterization of a kanor Begomovirus infecting pulse crops in Himachal Pradesh	Dr.Nageswer Singh
10.	Ms. Suman (S-2010-30-11)	Biochemical evaluation of potato as influenced by metribuzin	Dr.Neelam Sharma

**Ph. D. (Biochemistry)**

Sr. No.	Name of student & Admission No.	Title of Thesis	Name of Major Advisor
1.	Ms. Kanika Sharma (S-2008-40-01)	Evaluation of protease inhibitor on insect proteases and isolation of gene encoding protease inhibitor from rice bean ( <i>Vigna umbellata</i> )	Dr.Rajan Katoch
2	Ms. Shweta (S-2009-40-01)	Studies on the biochemical profile of different <i>Vigna</i> spp. prevalent under mid hill conditions of Himachal Pradesh	Dr.Rajan Katoch

**III. Department of Microbiology****M. Sc. (Microbiology)**

Sr. No.	Name of the Student and Admission No.	Title of Theses	Name of Major Advisor
1.	Ms. Kalpna Rana (S-2010-30-28)	Purification and characterization of bacteriocin(s) of Enterococcus spp. obtained from fermented foods of Himachal Pradesh	Dr. S.S. Kanwar
2.	Ms. Meghna Sharma (S-2010-30-29)	To study the biodiversity of Listeria in the dairy products of Himachal Pradesh	Dr. S.S. Kanwar
3.	Ms. Nandita Sharma (S-2010-30-30)	Evaluation of antimicrobial activity of <i>Ajuga bracteosa</i> (Neelkanthi) against human & phytopathogens	Dr.M.K. Gupta
4.	Ms. Nisha Chauhan (S-2010-30-31)	Purification and characterization of bacteriocin(s) of Lactobacillus spp. Obtained from fermente foos of Himachal pradesh	Dr. S.S. Kanwar
5.	Ms. Poonam Sharma (S-2010-30-32)	Behaviour of indigenous plant growth promoting rhizo bacteria under different stress conditions	Dr. S.S.Kanwar

**3. SHORT TRAININGS**

The Department of Microbiology imparted training to the students of the Lovely Professional University, Phagwara (Pb)

**4. MANUAL**

1. Manual: Laboratory manual on Techniques in Biochemistry by Dr. Nageswer Singh, Dr.C.K.Oberoi and Ms. Kanika
2. Practical Lab Manual on “ Remote sensing , GIS and Land Use Planning” with Hands on exercises ( 2013) (Vaibhav Kalia, Ranbir Singh Rana, Sharda Singh, Kunal Sood and Arun Kaushal and Nutan Sharma 2013, CGRT COBS , CSKHPKV , Palampur.

**5. NATIONAL ELIGIBILITY TEST (NET)**

The following students have cleared National Eligibility Test (NET) in the year 2011-12:

1. Ms. Gitanjali (S-2008-30-20)
2. Mr. Gaurav Sood (S-2009-30-29)
3. Mr. Shobit Thapa (S-2009-30-32)

**6. INSPIRE FELLOWSHIP**

1. Ms. Natasha (S-2009-40-02)
2. Ms. Sohini Walia (S-2009-40-04)
3. Ms. Keshani (S-2010-40-02)
4. Kalpana Rana(S-2010-30-28)
5. Ms. Kanika Sharma (S-2008-40-01)
6. Ms. Shweta (S-2009-40-01)

## RESEARCH

### I. ON-GOING RESEARCH PROJECTS

Sr. No.	P.I./Co-P.I.	Title of the Project	Budget outlay (in lakhs)	Funding Agency	Duration of the Project
1.	Dr. Virendra Singh	Morphological and ecological characterization of germplasm collection and propagation of Seabuckthorn in cold deserts of Himachal Pradesh	40.00	DBT, GOI	1.08.10-31.07.13
2.	Dr.G.L.Bansal	Vermitechnology based empowerment of women of economically backward district Chamba of H.P.	20.60	DBT	
3.	Dr.R.C.Chauhan	Harmonizing Biodiversity conservation and agricultural intensification through integration of plant, animal and fish genetic resources for livelihood security in fragile ecosystem.	24.00	World Environmental Agency	2009 3 years
4.	Dr S.S.Kanwar	Development of liquid biofertilizer and bio-fertilizer based integrated nutrient management in District Kangra	57.48	RKVY	2009 to March, 2013
5.	Dr S.S.Kanwar	Probiotic potential of indigenous isolates obtained from traditional fermented foods of Himachal Pradesh”	27.95	DST	July 2012 2 years
6.	Dr S.S.Kanwar	Mass cultivation & distribution of liquid biofertilizer made from indigenous Plant Growth Promoting Rhizobacteria of Himachal Pradesh	76.00	RKVY	August 2012 to Sept., 2013
7.	Dr S.S.Kanwar	Development of Potential direct fed microbial from rumen of migratory goats & sheep for enhancing livestock production ( <i>Project in collaboration with IVRI, Palampur</i> )	43.5	DST	January, 2013 for 3 years
8.	Dr. Sharda Singh Dr. Ranbir Rana, Mr. Vaibhav Kalia	Spatial disaggregation of agricultural statistical data & food security analysis through SPOT VEGETATION datasets for a mountainous state of Himachal Pradesh	8.75	UGC, New Delhi	-



9.	Sanjay Kumar Sharma  Dr. Ranbir S. Rana Dr. N.K.Shakhayan and Dr. Luxmi Kant Sharma	Status of primary, secondary and micronutrients of soils under vegetables – horticultural land use system in high hills dry temperate	12.0	RKVY, DOA, HP.	-
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## II. RESEARCH PROJECTS COMPLETED

Sr. No.	P.I./Co-P.I.	Title of the Project	Budget outlay (in lakhs)	Funding Agency
1.	Ranbir Rana Sharda Singh, V. Kalia	Impact, Vulnerability and Adaptation of Mountain Agriculture to Climate Change in Indian Agriculture 2007-13	65.00	ICAR
2.	Ranbir Rana	Application of Extended Range Forecast in crop Planning and Operations under Sub-humid and Temperate Wet Conditions of Himachal Pradesh 2007-13	19.98	Union Ministry of Agriculture with Nodal Agency IIT Delhi
3.	Ranbir Rana, V. Kalia	Impact of climate change on Mountain Agriculture 2010-13	44.29	RKVY
4.	Sharda Singh, Ranbir Rana, V. Kalia	GIS based Agriculture Resource Information System for Himachal Pradesh 2010-13	11.45	RKVY

## III. RESEARCH PROJECTS SUBMITTED

Sr.No.	Title of the project	Budget outlay	Funding Agency
1.	Bio-prospecting of Lactic Cultures from 'Cold Desert Regions' to develop Functional Fermented Milk Products with Potential Health Benefits <i>(Project in collaboration with NDRI, Karnal)</i>	71.49 Lakhs	DST
2.	A consortium approach to strengthening the profile of natural fibres through innovative technology interventions to enhance their industrial use <i>(Multi-institutional project)</i>	142.77 Crores	ICAR
3.	Evaluation of indigenous <i>Bacillus coagulans</i> and <i>Lactobacillus</i> Species of Himachal Pradesh for functional and protective attributes during DMH induced colon carcinogenesis <i>(Project in collaboration with P.U. Chandigarh)</i>	25.39 Lakhs	CSIR

4.	Climate Change Project in National Mission for Sustaining Himalayas Ecosystem (NMSHE)	1.8 Crores	National Action Plan on Climate Change
5.	Spatial Data Infrastructure for Rural Development for the State of Himachal Pradesh	22.0 Lakh	Department of Rural Development, Govt of Himachal Pradesh, Shimla

#### IV. Research Highlights

##### **Research highlight-I:**

##### **Variation in biochemical constituents of buck wheat, chenopod and adzuki bean genotypes**

Biochemical evaluation of 27 genotypes of adzuki bean, 40 genotypes of buckwheat and 27 genotypes of chenopod obtained from NBPGR, Phagli, Shimla was carried out for following quality parameters by following standard procedures and the pertinent data is presented as under:-

##### **i) Variation in crude protein, *in vitro* protein digestibility, cooking quality of Adzuki bean genotypes**

The crude protein content in adzuki bean genotypes ranged from 16.62 (EC-340253 & EC-340259) to 25.37% (EC-340261). The range of variation *in vitro* protein digestibility content was observed from 70.50 (EC-340265) to 85.20% (HPU-51). The range of variation in cooking time was observed from 47 (EC-340251) to 60 (EC-340277) min. The average cooking time in adzuki bean genotypes was found to be 53.5 min. i.e. moderate quality.

##### **ii) Variation in crude protein, total polyphenols, antioxidant activity, ash, calcium, magnesium and potassium of Buckwheat genotypes**

The crude protein, total polyphenols, antioxidant activity in buckwheat genotypes ranged from 10.50 to 14.43%, 0.12 to 1.38 mg/100ml, 1.26 to 94.21% inhibitions, respectively. The genotype(s) IC-109728 (14.43%) & EC-058322 (14.43%) in crude protein, Himpriya (1.38mg /100ml) in total polyphenols, Sangla B-129 (94.21% inhibition) in antioxidant activity were found promising genotypes for individual quality parameters. Values in respect of total ash content varied from 2.5-4.7%. The highest ash content was observed in genotype EC-386667. The calcium, magnesium and potassium content in buckwheat genotypes ranged from 48.5 (IC-042426) to 99.7 (EC-218742) mg/100g, 137 (IC-204088) to 258.5 (EC-058322) mg/100g and 255 (IC-109729) to 591 (PRB-1) mg/100g, respectively.

##### **iii) Variation in crude protein, ash, calcium and iron content of Chenopod genotypes**

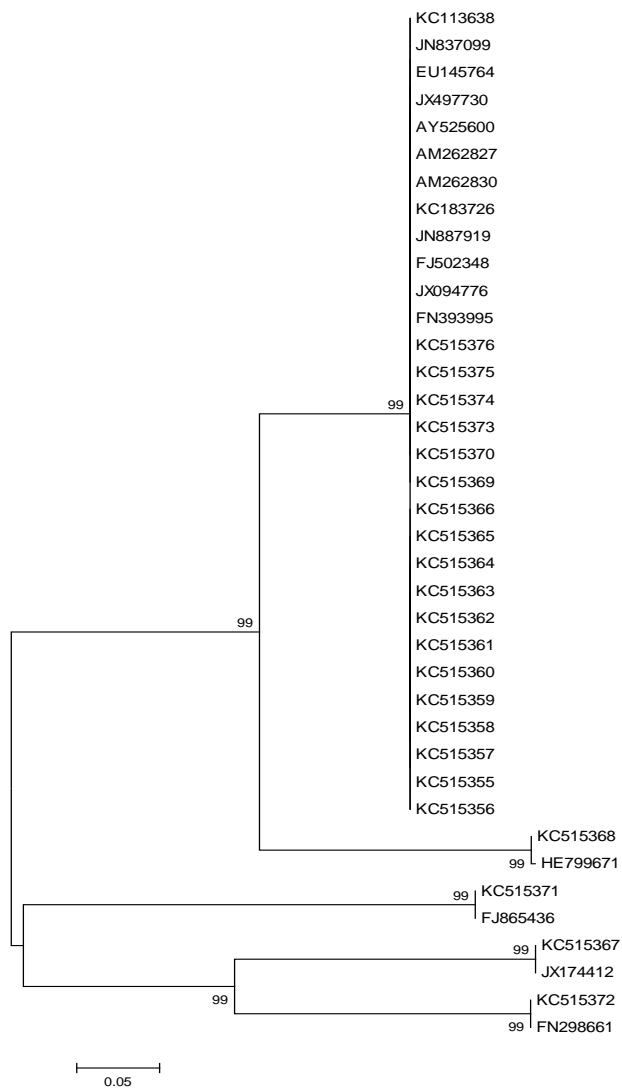
The minimum and maximum values for crude protein were observed in 13.12 (IC-258382 & NIC-22504) to 17.5% (NIC-22516 & IC-328854) in that order. The average value for crude protein in chenopod genotypes was found to be 15.2%. The range of variation in ash content was observed from 2.9 (IC-258382) to 6.2 (NIC-22510) %. The calcium and iron content in chenopod genotypes ranged from 166 (IC-258253) to 249 (IC-329184, NIC-22508 & NIC-22503) mg/100g and 3.4 (IC-328877) to 13.3 (IC-258382) mg/100g, respectively.

**Research highlight-II:**  
**Indigenous nucleotide sequences and cultures**

The department has submitted 27 Nucleotide sequences of the following indigenous microorganisms to Gen Bank of National Centre for Biotechnology Information, USA.

S.No.	Organism	NCBI Accession No.
1	<i>Bacillus subtilis</i>	JF772826
2	<i>Lactobacillus plantarum</i>	JN162674
3	<i>Enterococcus durans</i>	JN162675
4	<i>Staphylococcus saprophyticus</i>	JN162676
5	<i>Staphylococcus saprophyticus</i>	JN162677
6.	<i>Saccharomyces cerevisiae</i> (18 isolate)	KC515355- KC515366, KC515369, KC515370, KC515373-KC515376
7.	<i>Cryptococcus albidus</i>	KC515372
8.	<i>Rhodotorula mucaligonosa</i>	KC515367
9.	<i>Torulaspora delbrueckii</i>	KC515368
10.	<i>Pichia neoformans</i>	KC515371

Indigenous yeast strains were identified on the basis of ITS region sequencing:



**Research highlight-III:**

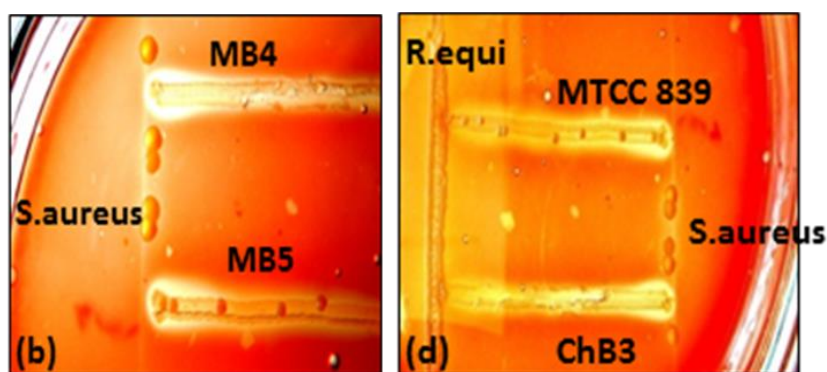
Studies on liquid biofertilizer developed under RKVY

**Important observations generated from the above project are:**

- Indigenous efficient PGPR isolates were identified as *Stenotrophomonas maltophilia*, *Bacillus licheniformis*, *Azospirillum brasilense*, *Pseudomonas aeruginosa* and *Burkholderia cepacia*.
- Matka Khaad was found to be superior to other liquid carriers in maintaining higher microbial load.
- The developed liquid formulation maintained recommended number of microbes ( $10^8$ - $10^9$ cfu/ml) upto 180 days at room temperature (15-37°C) and was found effective even in stress conditions like temperature, pH change and desiccation.
- In protected cultivation, two years data revealed that T10 (Seed + Seedling + Soil + Foliar + Basal Dose) and T1 treatments (Seed + Basal Dose) showed better results for tomato crop (Avtar-7711) and could be recommended under such condition

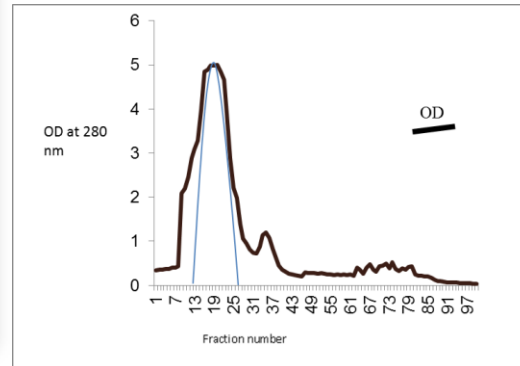
**Research highlight-IV:****Screening of dairy products for *Listeria* spp.**

Two fifty samples of dairy products like milk, curd, butter, cheese and ice cream were analyzed for the presence of *Listeria* by using standard techniques. Overall 100 *Listeria* like isolates were obtained on PALCAM medium. Out of these, 6 isolates were found to be *Listeria* on the basis of morphological and biochemical characteristics. The above 6 isolates were further screened for their pathogenic potential by using hemolysis and CAMP tests, and 3 (MB4, MB5 and ChB3) isolates were found to be *Listeria monocytogenes*. On the basis of PCR assay by using *Listeria* specific primer targeting virulence gene (hlyA), above three isolates were confirmed as *Listeria monocytogenes*. These identified organisms were further evaluated for their interaction with the indigenous probiotic organisms along with the reference strain *Lactobacillus rhamnosus* GG (ATCC 53103), and it was found that the highest antagonistic activity was shown by *Enterococcus faecium* (AdF1, AdF2), *Lactobacillus fermentum* (AdF8) and *Lactobacillus plantarum* (AdF10) which was almost at par with the reference strain.

CAMP test showing hemolytic enhancement of *Listeria* species

**Research highlight-V:**  
**Bacteriocins production from indigenous probiotics**

All the 11 indigenous probiotics were screened for bacteriocins production and were studied for their interaction with the pathogenic bacteria. The conditions for the bacteriocins production were standardized and bacteriocins from different organisms were purified by using ammonium sulphate precipitation, gel filtration chromatography and SDS PAGE Electrophoresis.



Activity shown by *L. plantarum* at 80% saturation level  
 Elution profile of bacteriocin of *Enterococcus faecium* AdF2

**Research highlight-VI:**  
**Evaluation of *Ajuga bracteosa* ( Neelkanthi) for antimicrobial activity**

In the present study antimicrobial activity of different extracts of neelkanthi was screened *in vitro* against some selected microbial pathogens. At vegetative stage maximum inhibitory activity was found in leaves of this plant. Out of three tested phytopathogenic fungi, *Ajuga bracteosa* possessed antifungal activity against one strain i.e. *Fusarium oxysporum* only.



ANTIMICROBIAL ACTIVITY OF *Ajuga bracteosa* (Neelkanthi)

**Research highlight-VII:**  
**GIS based Agriculture Resource Information System**

Under this project, GIS based single window information system **AgGIS (Agriculture Geo-spatial Information System)** is being developed. It is being developed as a part of the Department of Agriculture, Govt of Himachal Pradesh, Shimla sponsored project "GIS based Agriculture Resource Information System". The Software application is being designed and consists of two components: **Stand alone application** and **Web based application** with modules at State level, district level and block level.

The available Geo-database at district level and block level has been collected and normalized as per the requirement for the customized GIS software. The spatial Agriculture Geo database

(Administrative boundaries, Contours, spot heights, Digital elevation Model, Climatic spatial patterns for rainfall & temperature, Landcover, Drainage , Census indicators, Agro-socio-economic data, Spatial Disease/pests insects information (crops & livestock) and other allied information derived through need based spatial analysis as Agro-climatic Zones, niche areas, suitability maps) for the entire state/ districts/blocks level is being attached to both the applications. The information is now being represented in state level maps.

### **Research highlight-VIII:**

#### **Integrated Geo Database model for effective planning of DRDA**

Following data at Block level/Gram Panchayat level has been generated under this project for WATERSHED DEVELOPMENT/ IDENTIFICATION FORMULATION

- No. of schemes
- Panchayats covered/ Villages Served
- Land Use and Land cover mapping
- Assets Mapping of Various assets like check dams, irrigation canal, Crate Structures, Land development.
- Area under Watershed
- Beneficiary Population
- Drainage Network
- Irrigation and Fisheries (Site selection for Ponds, Reservoirs, Check Dams)
- Lift irrigations , Tube wells, Kuhl, Canals Spatial Locations
- Roads and transportation Networks
- Thematic Mapping for the policy planners of various schemes and projects

Currently, GPS based mapping of various assets has been completed for thirteen blocks of district kangra. The data thus collected is now being ported on the internet (WebGIS for DRDA) from where it is being used by the Block officials for planning the rural development schemes.



DRDA WEB GIS portal

### **Research highlight-IX:**

#### **Impact, adaptations and vulnerability of Indian Agriculture to climate change**

- The study on water balance clearly showed decreasing trends in all the agro climatic zones during past three decades. Maximum availability of surplus water balance showed a shift from July during 1974-84 to August during recent five years period (2004-09) and registered a decrease.

- The snowfall trend analysis indicated significant decrease in monthly average snowfall of December and May. The Mann-Kendall trend test showed increasing trends of snowfall during January and February reflecting delay in snowfall during winters.
- The significant decrease of surface water flow of Beas and Sutlej river water flow observed in trend analysis. Thus, the studies clearly indicated that water resources have been impacted due in changes in climatic conditions in mountains of Himachal Pradesh during past two to four decades.
- Farmers are expecting more and more forecast information in order to minimize their losses due to abnormal and abrupt changes in weather conditions.

#### **Research highlight-X:**

#### **Application of Extended Range Forecast in Crop Planning and Operations under Sub-humid and Temperate Wet Conditions of H.P.**

In the project “Application of Extended Range Forecast in Crop Planning and Operations under Sub-humid and Temperate Wet Conditions of H.P” At state, district and sub-divisional level, the one month advance forecast for SW monsoon, 2011 was more consistent than two months advance forecast while the forecast received for individual months is more accurate than the seasonal forecast received for 2 to 3 months. The verification of SW monsoon revealed a positive trend with varying magnitude in % deviation leading some values to negative. The verification of winter rainfall forecast revealed higher forecast values than the observed rainfall except in January, 2012. The verification of temperature forecast revealed that the forecasted values were near to the observed values however, the magnitude of % deviation varies. The weather based tailor made Agro advisory for wheat and apple as a target crop were issued and value addition in Medium range weather based Agro-advisory were done

#### **Research highlight-XI:**

#### **Impact of climate change on mountain Agriculture**

In the project “Impact of Climate Change on Mountain Agriculture” The local knowledge (ITKS) with respect to weather information and climate resilient practices followed by farmers of Kangra, Chamba Una and Hamirpur were documented. The climate resilient practices regarding protection from seed borne diseases and insect pest followed by farmers of Kangra, Una, Chamba Hamirpur in agricultural activities, like treating the seeds with mixture of ash & cow urine and dung before sowing or mixed cropping during rainfed conditions or the use of chullah ash, Rambaan and ankhari leaves for pest disease protection are not only beneficial but they also contribute less towards climate change. Leaves of Dreka Plant (Melia azadirach) and extract of Tobacco leaves can be used to cure skin diseases of animals. Likewise, dry leaves of Bangru (Wild pudina), Kali Basuti or safeda (Eucalyptus sp.) can be used to protect the stored grains, which are again effective low cost remedies to combat negative effects of climate change.

#### **Research highlight-XII:**

#### **Integrated Experimental Agro meteorological Advisory Service at Palampur in H.P**

The five days forecasts on different weather parameters viz. rainfall, temperature, cloud cover, relative humidity and weekly cumulative rainfall for our study districts (Chamba, Kangra, Hamirpur and Una ) were validated and accordingly advisories were issued. The reliability of rainfall forecast varied from 46.15 to 98.65% for all the districts. The total 72 AAS bulletins were prepared in English and Hindi and published in university and [www.imd.gov.in](http://www.imd.gov.in) and [www.cropweatheroutlook.com](http://www.cropweatheroutlook.com) of CRIDA (ICAR) websites. In addition to this 269 SMS were aired for 5000 farmers in Himachal Pradesh by IFFCO Kisan Seva Limited (Agency Identified for SMS by IMD) under the services.

## V. RESEARCH PUBLICATIONS

### A. Paper Published

1. Usha Rana and Sonika Choudhary.2013. Physiological and biochemical evaluation of *Brassica* species for drought tolerance. *Himachal Journal of Agricultural Research*.**39 (1)** 63-69.
2. K Nishi, Gupta NK and Sharma SC 2012. Study on the incidence of hypertension and Migraine in ABO blood groups. *ISCA Journal of Biological Sciences* 1(2): 12-16,
3. Priyanka and Chauhan R. 2012. Water quality parameters and their relationships in Poon stream Distt. Kangra, H.P. *Aquacult.* 13 (2): 115– 20.
4. Patial, V., Asrani, R., Patial, R., Singh, V., Ledoux, D.R. and Rottinghaus, G.E., (2012) Anti-oxidant efficacy of seabuckthorn (*Hippophae rhamnoides* L.) leaves against ochratoxins A-induced toxicity in liver and kidney tissues of Japanese quail chicks. *Haryana Vet.* 51: 24-28.
5. Kanwar S.S. and Devi Sunita (2012). Thermostable xylanases of microbial origin: Recent insights and biotechnological potential. *The International Journal of Biotechnology* 1 (1):1-20.
6. Sourabh Aditi, Kanwar S.S., Sud,R.G., Ghabru Arti , Sharma O. P.(2013) Influence of phenolic compounds of Kangra tea [*Camellia sinensis* (L) O Kuntze] on bacterial pathogens and indigenous bacterial probiotics of Western Himalayas. *Brazilian Journal Microbiology* (In press)
7. Aditya, Ranbir Singh Rana, R.C.Chauhan and Vijayshri Sen.2012 , Farmers' Perception in relation to Climate Variability in Apple Growing Regions of Kullu District of Himachal Pradesh. *Journal of Agricultural Physics*. Vol.12 No 1-2 pp1-12 (Impact Factor =3.7\_2013).

### B. Papers Presented in Conferences and Workshops

1. Usha Rana and Sumita Rana. 2013. Morphophysiological and yield responses of *Brassica campestris* L. Genotypes to water stress. Proceedings of National Seminars on “Indian Agriculture: Present Situation, Challenges Remedies and Road Map, Aug 4-5,2012 at CSK HPKV, Palampur pp:72-75.(Adarsh et al.,ed).
2. Usha Rana and Kavita Kumari.2012. Morphophysiological characterization of pea (*Pisum sativum* L.) genotypes for drought tolerance. Proceedings of World Congress for Man and Nature-Global Climate Change & Biodiversity Conservation, held at Gurukul Kangri Vishwavidyalaya, Haridwar from Nov 11 – 13, 2011 pp:135-146. (D R Khanna et al., ed ).
3. Kanwar S.S. and Keshani (2012). Bio-prospecting of indigenous microbes of fermented foods of North-Western Himalayas. Paper in Proceedings of Indo-Italian Workshop on Food and Biotechnology: Industrial Processing, Safety & Health, held at Punjabi University, Patiala from November 21-23, 2012, pp. 23-24
4. Sharda Singh, Kunal Sood, Arun Kumar, Vaibhav Kalia, R.S. Rana, “WebGIS based Agriculture Geospatial Information System for the state of Himachal Pradesh” Adjudged as BEST PAPER in NATIONAL SYMPOSIUM ON SPACE TECHNOLOGY FOR FOOD & ENVIRONMENTAL SECURITY (ISRS & ISG 2012 SYMPOSIUM), December 5 -7,2012, NASC Complex, New Delhi



5. Ranbir Singh Rana, Nevell Chander, Kunal Sood, Aditya and Ruchi Sood. 2012. Role Of Remote Sensing And Geographic Information System In Climate Management. Presented in National Seminar on Indian Agriculture: Present Situation, Challenges, Remedies and Road Map organised by August 04-05, 2012. Abstract published in Souvenir & Abstract ( Abstract Page 62)
6. Ranbir Singh Rana, J. Shekhar, Aditya and Ruchi Sood. 2012. Weather Based Agro-Advisory Services For Sustainable Agriculture Presented in National Seminar on Indian Agriculture: Present Situation, Challenges, Remedies and Road Map organized by August 04-05, 2012. Abstract published in Souvenir & Abstract (Abstract Page 63) .
7. R. S. Rana, S. K. Sharma, S. Singh and J. Dev. 2013. Simulating Impact of Climate Change on Maize (Zea Mays) Production under Rainfed Conditions of Western Himalayas, India. Paper presented ( Oral Presentation) in The International Conference On "Crop Management In Changing Climate" To Be Held W.E.F. February 11-13, 2013, At University Of Agriculture, Faisalabad . Abstract published in Abstracts pp157
8. R. S. Rana, P. Sharma and P. Kanwar. 2013. Indigenous Farmers' Perception on Climate Resilient Practices in Mountain Agriculture Paper presented ( Poster Presentation) in The International Conference On "Crop Management In Changing Climate" To be held W.E.F. February 11-13, 2013, At University Of Agriculture, Faisalabad Abstract published in Abstracts pp 158
9. P.K. Sharma, S. K. Sharma, R. S. Rana, and J. Dev. 2013. Impact of climate variability on insects –pests. Paper presented ( Oral Presentation) in the International Conference On "Crop Management In Changing Climate" To be held w.e.f. February 11-13, 2013, At University Of Agriculture, Faisalabad Abstract published in Abstracts pp 179
10. S. K. Sharma, R. S. Rana, P.K. Sharma and J. Dev. 2013. Spatial Variability of soil Micronutrients status in relations to changing climatic conditions in north – western Himalayas. Paper presented (Oral Presentation) in the International Conference On "Crop Management In Changing Climate" To be held w.e.f. February 11-13, 2013, At University Of Agriculture, Faisalabad Abstract published in Abstracts pp 180
11. Ranbir Singh Rana, Bhosale Arjun Baijnath, Ruchi Sood, And Manoj Bhargava Thermal Requirement In Different Phenophases Of Mustards Under Different Growing Environments In Himachal Pradesh. Presented in National Symposium on Climate change and Indian Agriculture: Slicing down the uncertainties held at CRIDA Hyderabad, w.e.f. 22-23 January, Abstract published in Souvenir & Abstract ( Abstract S2-15 Page 46).
12. Sharda Singh, Kunal Sood, Arun Kumar, R.S. Rana, Vaibhav Kalia and Promila Kanwar. 2013. Changing Climatic Impacts on the biomass using Remote Sensing and Relationship to agriculture suitable areas. Paper presented in International seminar on "International seminar on "Crop Management in Changing Climate 11 to 13, February, 2013 organised by Department of Agronomy, University of Agriculture, FAISALABAD, Pakistan -38049 (LEAD LECTURE), Abstract published pp184-185.
13. R. S. Rana, S. K. Sharma, Sharda Singh and J. Dev. 2013. Simulating Impact of Climate Change on Maize (Zea Mays) Production under Rainfed Conditions of Western Himalayas, India. Paper presented (Oral Presentation) in International seminar in International Seminar on "Crop Management in Changing Climate" 11-13 February, 2013 organised by Department of Agronomy, University of Agriculture, FAISALABAD, Pakistan -38049. Abstract published pp157

14. Sharda Singh, Kunal Sood, Arun Kumar, Vaibhav Kalia and R. S. Rana.2012. Adjudged As Best Paper In The Poster-Session In National Symposium On Space Technology For Food & Environmental Security & Annual Convention of Indian Society Of Remote Sensing & Indian Society Of Geomatics, December 5-7, 2012 New Delhi India “web GIS based Agriculture Geospatial Information System for the state of Himachal Pradesh”
15. Sharda Singh, Kunal Sood, Arun Kumar, R.S.Rana, Vaibhav Kalia and Promila Kanwar 2013. Changing Climatic Impacts on the biomass using Remote Sensing and relationship to agriculture suitable areas. Paper presented in International seminar in International Seminar on “Crop Management in Changing Climate” 11-13 February, 2013 organised by Department of Agronomy, University of Agriculture, FAISALABAD, Pakistan -38049 (LEAD LECTURE), Abstract published pp184-185

### **C. Technical Reports Submitted**

1. Final Report of RKVY funded project entitled, “Development of liquid biofertilizer and bio-fertilizer based integrated nutrient management in District Kangra” submitted to the funding agency through Director of Research.
2. Ranbir Singh Rana and Ruchi Sood 2013. Consolidated report for 2009-13 Application of Extended Range Forecast in crop Planning and Operations under Sub-humid and Temperate Wet Conditions of Himachal Pradesh. Submitted to CAS, IIT New Delhi.
3. Ranbir Singh Rana and Navell Chander 2013. Consolidated (2008-12), 2004-07) and annual report (2012) and report for 2009 of project “Impact, Vulnerability and Adaptation of Mountain Agriculture to Climate Changes’ submitted to ICAR New Delhi.
4. Ranbir Singh Rana, Vinod Sharma, S.K. Upadhaya, Bhupinder Mankotia, and Sharda Singh 2013. Annual Project report for 2011-12 Application of Extended Range Forecast in crop Planning and Operations under Sub-humid and Temperate Wet Conditions of Himachal Pradesh. Submitted to CAS, IIT New Delhi.
5. Ranbir Singh Rana, Sharda Singh, Sanjay Sharma and Vaibhav Kalia. 2013. Annual Project report for 2011-12 “Impact, Vulnerability and Adaptation of Mountain Agriculture to Climate Changes’ submitted to ICAR New Delhi.
6. Ranbir Singh Rana, 2012-13 Annual progress report of project entitled “Sixth Annual Review Meeting of Integrated Agromet Advisory Services project to be held at ICAR ,NEH region. Lembuchera, Agartala, Tripura w.e.f. 18-20 October, 2011.
7. Ranbir Singh Rana, Suresh Kumar Sharma and Bhupinder Singh Mankotia. Annual Project report for 2012-13 Forecasting Agricultural Output using Space, Agro meteorology and Land based observations (FASAL).

### **VI. WORKSHOPS/ SEMINARS/ TRAINING PROGRAMMES ATTENDED**

1. Usha Rana : National seminars on “Indian Agriculture: Present Situation, Challenges Remedies and Road Map,” Aug 4-5, 2012 at CSK HPKV, Palampur
2. Ramesh C Chauhan: National Seminar as an Invited Speaker on “Biodiversity, Green Economy And Sustainable Development at IIHS, H.P. University Shimla w.ef.21st. – 22nd. Sep.2012.
3. Ramesh C Chauhan attended 2 days Biodiversity workshop as an Invited speaker on a) “Wetlands of H. P.: Status, Threats, Issues and Conservation” b) “Fisheries of H. P.: Status, Threats, Issues and Conservation”
4. Ramesh C Chauhan attended training on Management of Emerging Environmental Problems for Enhancing Agricultural Productivity” in IARI at CISCRA, New Delhi, 17 -24 December, 2012

5. Dr. Virendra Singh attended Indo-Russia Round Table Meeting on joint collaboration on R&D on Oct. 16-18, 2012.
6. Dr. S.S. Kanwar attended National Seminar on “Role of Teachers in Quality Higher Education” and delivered a talk as a resource person on 5.10.2012 in the Auditorium of Himachal Pradesh University, Shimla and also co-chaired a session.
7. Dr. S.S. Kanwar attended International Conference on Industrial Biotechnology(ICIB-2012) held at Punjabi University, Patiala w.e.f. 21.11.12 to 23.11.12 and delivered an invited talk on the topic “Bioprospecting of indigenous microbes of fermented foods of North-Western Himalayas”
8. Dr. S.S. Kanwar delivered Eighth Dr. Hans Raj Memorial Lecture in IHBT, Palampur, Himachal Pradesh on 29<sup>th</sup> November, 2012.
9. Dr. S.S. Kanwar attended a lecture on ‘Radiation in Processing of Foods: Developments in India’ by Dr Arun K Sharma , Head , Food & Engineering Division, Bhabha Atomic Research Division , on 22-12-2012 at College of Home Science, COA, CSK HPKV, Palampur
10. Dr. S.S. Kanwar attended a lecture delivered by Prof. Alok Bhattacharya, An eminent Scientist and Bhatnagar Awardee, SLSIT, Jawahar Lal Nehru University, New Delhi on the topic “Science Pursuits in India” on 7.2.2013 in the Seminar Hall, Department of Vety Physiology and Biochemistry, COVAS, CSK HPKV, Palampur.
11. Dr. S.S. Kanwar attended an address on “Rootonic: the magic fungus” delivered by Dr. Ajit Verma, Director General, Amity Institute Microbial Technology, Amity University, Nodia on 19.11.2012 at 3.00 PM in the Seminar Hall of the Director of Extension Education, CSK HPKV, Palampur.

## VII. BOOKS/ BOOK CHAPTERS

### i) Book:

1. Book entitled “tyok;q ifjorZu ,oa ioZrh; [ksrh” Edited by Ranbir Singh Rana, Published from Directorate of Research, CSKHPKV, Palampur, October, 2012.

### ii) Book Chapter:

1. Sharda Singh, Kunal Sood , Arun Kaushal, Vaibhav Kalia and Ranbir Singh Rana entitled “Agriculture Spatial Info and Decision Support System – A Customised Application for the State of Himachal Pradesh” in Book namely “Geospatial Technolgies for Natural Resources Management” edited by S.K.Soam, P.D. Sreekanth and N.H.Rao (2013); ISBN:978-93-81450-80-2; pp 395-405.
2. Sharda Singh, Ranbir Singh Rana, Kunal Sood, Arun Kumar, Sunil Kumar and Nutan Sharma 2012. fgekpy izns'k esa cSo th vkÃ ,l ,ao LFkkuh; Hkw lwpuk ra= % fdlkuks dks Ñf"i; lwpuk igqapkus dk ,d izHkko'kkyh fodYiA In Edited book “tyok;q ifjorZu ,oa ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published by Directorate of Research CSKHPKV, Palampur. page 85-102
3. Ranbir Singh Rana, Rajiv Mohan Bhagat, Ruchi Sood and Rohit Sharma 2012. fgekpy izns'k esa tyok;q ifjorZu% izHkko ,ao lwpdA In Edited book “tyok;q ifjorZu ,oa ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Directorate of Research CSKHPKV, Palampur. page 01-06
4. Ranbir Singh Rana, Naval Chander, Ruchi Sood and Vijayshree sen 2012. tyok;q ifjorZu ds izeq[k dkj.k ,ao uqdlkuA In Edited book “tyok;q ifjorZu ,oa ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 07-12

5. Ranbir Singh Rana, Rajeev Mohan Bhagat, Vaibhav Kaliya and Harvans Lal 2012. fgekpy izns'k ds ioZrh; {ks=ksa esa tyok;q ifjorZu% fdlluks dh jk;! In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 13-16
6. Ranbir Singh Rana, Naval Chander, Rohit Sharma and Ruchi Sood 2012. fgekpy izns'k dh Qlyksa ij tyok;q ifjorZu ds izHkko In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 17-20
7. Pawan Kumar Sharma, Ranbir Singh Rana and Sunil Kumar 2012. dhVpiraxksa o chekfj;ksa ij tyok;q ifjorZu ds laHkkfor izHkkoA In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 26-32
8. Naval Chander, Ranbir Singh Rana and Ruchi Sood 2012. cjkud [ksrh ij tyok;q ifjorZu dk izHkkoA In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 33-34
9. Ruchi Sood and Ranbir Singh Rana 2012. tyok;q ifjorZu ,ao ICth mRiknuA In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 35-38
10. Ranbir Singh Rana, Naval Chander, Ranu Pthaniya and Vijay shree sen 2012. tyok;q ifjorZu ls fuiVus dk ,d fodYi% tSfod [ksrh A In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 39-42
11. Ranbir Singh Rana, Anup Katoch, Naval Chander, Sunil Kumar and Atul Thakur 2012. ekSle iqokZuqeku lECU/kh ikjEifjd Kku ,ao tyok;q izfrjks/kh vH;klA In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 43-47
12. Ranbir Singh Rana, Rajender Prasad, Ruchi Sood and Vasudha Katoch 2012. \_rq vlarqyu ds ifj-'; esa e/e vof/k ekSle iwokZuqeku dh [ksrh esa HkwfedkA In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 48-54
13. Ruchi Sood, Ranbir Singh Rana and Aditya Rana 2012. \_rq vlarqyu ds ifjn`'; esa nh?kZ vof/k ekSle iwokZuqeku dh [ksrh esa HkwfedkA In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 55-58
14. Ruchi Sood and Ranbir Singh Rana 2012. ekSle iwokZuqeku ij vk/kkfjr ICth mRiknu essa ijkeZ'k Isok,aA In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 59-62
15. Ranbir Singh Rana and Ranu Pthaniya 2012. Ik'kqikyus esa ekSle iwokZuqeku vk/kkfjr —f" k ekSle ijkeZ'k Isokvksa dk egRoA In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 63-66
16. Ranbir Singh Rana, Sunil Kumar, Vijay shri sen, Nutan Sharma and Ranu Pthaniya and 2012. Nf" k chek ;kstuk,a% tyok;q ifjorZu ls vkfFkZd uqdlku dh HkjikA dk fodYiA In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh

- Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 67-70
17. Ranbir Singh Rana, Manmohan Singh and Atul thakur 2012. fdlku ekSle iwokZuqeku vk/kkfjr —f" k lykg dgka ls izklr djsa\ In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 71-75
  18. Ranbir Singh Rana, Naval Chander, Karan Verma and Sunil Kumar 2012. tyok;q ifjorZu ls lnhZ vkSj ikys }kjk Qlyksa ij gksus okys uqdlku ls dSls cpko djsa\ In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 76-84
  19. Sharda Singh, Ranbir Singh Rana, Kunal Sood, Arun Kumar, Sunil Kumar and Nutan Sharma 2012. fgekpy izns'k esa cSo th vkÅ ,l ,ao LFkkuh; Hkw lwpuk ra=% fdlkuks dks Ñf" k; lwpuk igqapkus dk ,d izHkko'kkyh fodYiA In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 85-102
  20. Ranbir Singh Rana and Rajender Prasad 2012. Ñf" k ekSle os/k'kkyk ds midj.k&d ifjp;A In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 103-106
  21. Ranbir Singh Rana, Sunil Kumar, Naval Chander and Aditya Rana. tyok;q ifjorZu ds izHkko dks de djus ds fy, fdlku ,ao vke vkneh D;k djsa\ In Edited book “tyok;q ifjorZu ,ao ioZrh; [ksrh” by Ranbir Singh Rana, Sharda Singh and Vaibhav Kalia Published By Director ate of Research CSKHPKV, Palampur. page 107-108

### VIII. COMPENDIUM

1. Sharda Singh, Kunal Sood, Arun Kaushal, Vaibhav Kalia, and Ranbir Singh Rana, Compendium of Special Lecture Notes on “Geospatial Technologies and Applications” 21 days Summer Training Programme sponsored by NRDMS(DST, New Delhi) organized w.e.f. 24 June 2012 to 14 July 2012.
2. Sharda Singh, Kunal Sood, Arun Kaushal, Vaibhav Kalia, and Ranbir Singh Rana “GIS based Agriculture Resource Information System” in Compendium of Special Lecture Notes on NRDMS-DST Sponsored 21 days Summer Training Programme on “Geospatial Technologies and Applications” 25th June 2012 to 14th July 2012.
3. Vaibhav Kalia, Ranbir S. Rana and Nutan Sharma. “GIS Data Structures and File Types”. Special Lecture Notes on NRDMS-DST Sponsored Summer Training Programme on Geospatial Technologies and Applications 25 June 2012 to 14 July 2012.
4. Ranbir Singh Rana, Vaibhav Kalia, and Sunil Kumar. “Electromagnetic energy and Remote Sensing”. Special Lecture Notes on NRDMS-DST Sponsored Summer Training Programme on Geospatial Technologies and Applications 25 June 2012 to 14 July 2012.
5. Vaibhav Kalia, Dr. Ranbir S. Rana and Nutan Sharma. “Topographic Maps”. Special Lecture Notes on NRDMS-DST Sponsored Summer Training Programme on Geospatial Technologies and Applications 25 June 2012 to 14 July 2012.

6. Ranbir S. Rana, Vaibhav Kalia, Kunal Sood and Arun Kumar. “Global Positioning System (GPS) and its application”. Special Lecture Notes on NRDMS-DST Sponsored Summer Training Programme on Geospatial Technologies and Applications 25 June 2012 to 14 July 2012.
7. Ranbir Singh Rana, Aditya, Ruchi Sood and Kunal Sood. “Role of Remote Sensing and GIS in Agrometeorology”. Special Lecture Notes on NRDMS-DST Sponsored Summer Training Programme on Geospatial Technologies and Applications 25 June 2012 to 14 July 2012.
8. Ranbir Singh Rana, Ruchi Sood and Navell Chander. “Crop Growth and Productivity Monitoring and Simulation Using Remote Sensing and GIS”. Special Lecture Notes on NRDMS-DST Sponsored Summer Training Programme on Geospatial Technologies and Applications 25 June 2012 to 14 July 2012.
9. Ranbir Singh Rana, Sunil Kumar, Sanjay Kumar and Arun. “Concepts of Radiometric and Geometric Corrections of Image Data”. Special Lecture Notes on NRDMS-DST Sponsored Summer Training Programme on Geospatial Technologies and Applications 25 June 2012 to 14 July 2012.

#### **IX. INFORMATION BROCHURE/ PAMPHLET PREPARED**

1. Agro-advisory services Brochure in Hindi
2. Agro-advisory services Brochure in English
3. Booklet on research highlights of Network Project On Climate Change from 2004 to 2012

## EXTENSION

### A. Extension projects

Sr. No	Title of the Project	PI or Co-PI	Funding source	Budget (Lakhs)	Duration
1.	INSPIRE Internship camp	Dr. S.S.Kanwar (Coordinator)	DST	Rs. 9.00	24.7.2012 to 28.7.202012
2.	INSPIRE Internship camp	-do-	DST	Rs. 9.00	21.8.2012 to 25.8.12
3.	INSPIRE Internship camp	-do-	DST	Rs. 9.00	17.10.2012 to 21.10.2012

### B. Extension Highlights

1. Dr.Ramesh C Chauhan organized 4 Farmers awareness camps and 2 technical training camps at Khanora and Lahroo in Bhatiyat, at Dand and Bhandal in Salooni block, Holi in Bharmour block of Chamba District. About 100 farmers participated in awareness camp and 5 farmers in technical camps.
2. Dr. G.L.Bansal organized 24 training camps in which 815 farmers from 36 villages participated and 150 vermitechnology units were established in their farms and culture packets distributed under DBT Project Vermitechnology based Tribal Women Empowerment in Himachal Pradesh.
3. 21 days Summer Training Programme on “Geo-spatial Technologies and Applications” sponsored by Natural Resources Data Management Division of DST, New Delhi w.e.f. 24/06/12 to 14/07/12.
4. Training programme to the GIS/MIS operators of HPCDP project and officials of DOA, GoHP, on the operational functioning of establishment of MIS and spatial linkages to the GIS w.e.f. 1/11/12 to 6/11/12.
5. International Training “Applications of Geo-informatics and Remote Sensing in Agriculture Land use Management” NAIP New Delhi w.e.f. 27/12/12 to 09/01/13
6. Tenth Satellite Based Learning Programme on “Geoweb services-Technology and Applications” sponsored by NNRMS, Department of Space, Govt of India & Organised by IIRS, Dehradun w.e.f. 11/02/13 to 15/03/13.
7. Organized One day Awareness programme on “Weather, Climate and Farmers “Under RKVY Project” organized at RRS & Seed Production Farm, Akhrot Una, CSKHPKV, on 6.3.2013. About 286 farmers from Una and 10 Faculty, Media persons and civil society members participated in the seminar
8. Organized One day Awareness programme on “Weather, Climate and Farmers “Under RKVY Project” at ADO headquarter at Kotla, Kangra, on 13.3.2013. About 140 farmers from District Kangra and 8 Faculty, Media persons and civil society members participated in the seminar.
9. Organized One day Awareness programme on “Weather, Climate and Farmers “Under RKVY Project” at SMS Headquarter at Sujampur Distt Hamirpur, on 15.3.2013. About 294 farmers from District Hamirpur and 6 Faculty , Media persons and civil society members participated in the seminar.

10. Training programme to the GIS/MIS operators of HPCDP project and officials of DOA, GoHP, on the operational functioning of establishment of MIS and spatial linkages to the GIS w.e.f. 20/5/2013 to 24/5/2013.
11. Organized One day Awareness programme on “Weather, Climate and Farmers “Under RKVY Project” at KVK Kukumseri CSKHPKV on 27.9 2012. About 120 farmers from Lahual and 15 Faculty, Media persons and civil society members participated in the seminar.

### **C. Lectures delivered by the faculty members**

#### **By Dr. S.S. Kanwar, Professor and Head**

- Delivered lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 24th July-2012 to 28th July-2012
- Delivered lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 21st Aug-2012 to 25th Aug-2012
- Delivered lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 17th Oct-2012 to 21st Oct-2012
- Delivered lecture in Staff training course organized by BDTC for officials of Agricultural dept. H.P.Govt. at CSKHPKV, Palampur from 22nd Jan-2013 to 24<sup>th</sup> Feb, 2013
- Delivered lecture in Biogas Turnkey Workers Training Course organized by BDTC at CSKHPKV, Palampur from 21st March to 4<sup>th</sup> April 2013

#### **Dr. M.K. Gupta, Associate Professor**

- Delivered lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 24th July-2012 to 28th July-2012
- Delivered lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 21st Aug-2012 to 25th Aug-2012
- Delivered lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 17th Oct-2012 to 21st Oct-2012

#### **Dr. Sharda Singh**

- Delivered Invited Lecture “Change Detection using Remote Sensing--” at Indian Agricultural Statistical Research Institute (IASRI), New Delhi on 31.08.12
- Counseling and guidance lecture to B.Sc. 3rd Year students of COBS on 25.04.12

#### **Dr. Ranbir Rana**

- Invited Lecture on “Weather Based Agro-advisory services of CSKHPKV, Palampur ” in Training on Climate Change –its impact and management for improved agricultural productivity in North West Himalayas Organized by Department of AFGM COA Palampur. w.e.f. 10-17th September, 2012
- Invited Lecture on “Estimation of Evaporation” in Training on Climate Change –its impact and management for improved agricultural productivity in North West Himalayas Organized by Department of AFGM COA Palampur. W.e.f. 10-17th September, 2012.
- Invited Lecture on “Weather Based Agro-advisory services and Participatory Irrigation Management (PIMS) ”in two days training on Participatory Irrigation Management to official JICA Organized by Department of Agril Engineering, COA Palampur. w.e.f. 11-12th June, 2013



- Invited Lecture on “Weather based agro-advisories and contingent crop planning for H.P.” on 20.9.2012 Organized by Directorate of Extension Education, CSKHPKV, Palampur. w.e.f. 18-20th September, 2012. (Letter no. QSD.3-23/CSKHPKV/DEE/Tech/7720-36 dated 10.9.2012)
- Invited Lecture on “Estimation of Evaporation” Organized by Directorate of Extension Education, CSKHPKV, Palampur on 18.9.2012. w.e.f. 18-20<sup>th</sup> September, 2012. (Letter no. QSD.3-23/CSKHPKV/DEE/Tech/7720-36 dated 10.9.2012)

#### **D. Other Activities**

1. Kisan Mela -2013- Dr. Ranbir Rana worked as Coordinator of the Centre and COBS w.e.f. 20-21 April 2013 at Directorate of Extension Education CSKHPKV, Palampur ( Vide letter no SCSTE RSC DISASTER Management /VI1239 dated 24-6-2011 )
2. At Doordarshan Kendra Shimla, Dr. Ranbir Rana coordinated in the innovative programme series “Weather forecast and Agro advisory” on 28.5.2013 at 6.30pm to 7.0pm

## MISCELLANEOUS ACTIVITIES

### A. INCOME GENERATION

Department	Income Generated
Department of Microbiology	22,875/-
Department of Biology & Environmental Sciences	5,59,094/-
Department of Physical Sciences and Languages	22,000/-
Centre for Geoinformatics Research and Training	2,15,000/-
<b>Grand Total</b>	<b>8,19,169/-</b>

### B. PAPER SETTER/EVALUATOR/EXTERNAL EXAMINER

Sr.No.	Faculty Name	Institution Name
1.	Dr. Navneet K Gupta	i. Himachal Pradesh University, Shimla ii. Punjabi University, Patiala iii. University of Rajasthan, Jaipur iv. Dr.Y.S.Parmar University of Horticulture and Forestry, Solan v. Punjab Agricultural University, Ludhiana vi. SKAUST, Jammu vii. CSA University of Agri. & Tech., Kanpur
2.	Dr.(Mrs.) Anita Singh	i. Punjab Agricultural University, Ludhiana ii. CSA University of Agriculture & Technology, Kanpur iii. Dr Y S Parmar University of Horticulture and Forestry, Solan
3.	Dr. R.C. Chauhan	i. Dr.Y.S.Parmar University of Horticulture and Forestry, Solan
4.	Dr.(Mrs.) Usha Rana	i. Dr.Y.S.Parmar University of Horticulture and Forestry, Solan
5.	Dr.Kamlesh Singh	i. Shri Kanshi Ram University of Agri. & Tech., Banda (UP). ii. Dr Y S Parmar University of Horticulture and Forestry, Solan
6	Dr. Manoj Bhargava	i. Sher-e-Kashmir University of Agricultural Sciences and Technology, Jammu.
7	Dr. S.S. Kanwar	i. Punjab Agricultural University, Ludhiana ii. Himachal Pradesh University, Shimla iii. HNB University, Garhwal iv. Dr. Y.S.Parmar University of Horticulture and Forestry, Solan
8	Dr. M. K. Gupta	i. Himachal Pradesh University, Shimla ii. Dr. Y.S.Parmar University of Horticulture and Forestry, Solan
9.	Dr.(Mrs.) Sharda Singh	i. NIT, Hamirpur.

10.	Sh. Vaibhav Kalia	i. KLB DAV College for Women, Palampur. ii. GGSDS College, Rajpur
11.	Dr.Ranbir Singh Rana	i. Dibrugarh University, DIBRUGARH Assam. ii. HAU, Hissar
12.	Sh.Kapil Sharma	i. Dr. Y.S.Parmar University of Horticulture and Forestry, Solan

### C. FACULTY AS REFEREE/REVIEWER FOR SCIENTIFIC JOURNALS

i.	Dr. Navneet K Gupta	<ul style="list-style-type: none"> <li>• Reviewer for International Journal of Radiation Biology</li> <li>• Reviewer for Indian Journal of Experimental Biology</li> </ul>
ii	Dr.(Mrs.) Anita Singh	<ul style="list-style-type: none"> <li>• Executive Editor of Biosciences and Agriculture Advancement Society</li> <li>• Committee member for preparation of “Hand Book of Agriculture Education” by ICAR, New Delhi</li> </ul>
iii.	Dr. S.S. Kanwar	<ul style="list-style-type: none"> <li>• Member, Editorial Board of Himachal Journal of Research w.e.f. 14-2-2011.</li> <li>• Member, Editorial Board of International Journal of Food &amp; Fermentation Technology.</li> <li>• Reviewer Annals of Applied Biology</li> <li>• Reviewer Bio-technology and Applied Bio-chemistry</li> <li>• Reviewer Proceedings of National Academy of Sciences</li> <li>• Reviewer Journal of Food Science &amp; Technology</li> <li>• Reviewer, African Journal of Biotechnology</li> <li>• Reviewer, Brazilian Journal of Microbiology</li> <li>• Reviewer African journal of Microbiology Research</li> </ul>
iv.	Dr.Ranbir Singh Rana	<ul style="list-style-type: none"> <li>• Journal Referee in the Journal of Agrometeorology for 2012</li> </ul>

### D. HONOURS/AWARDS

- Dr.Virendra Singh was conferred Golden Jubilee Endowment Visiting Fellowship Award” by ICT, Mumbai on 8.3.13

### E. OTHER ACTIVITIES

#### Dr.Virendra Singh

- Conducted a Workshop of NAIP Project on Seabuckthorn, Bhunter for a group of 300 farmers of Lahaul-Spiti on 13.3.13

#### Dr Manoj Bhargava

- In addition to the departmental duties the Head of the Department has also been assigned the duties of Nodal Officer (Statistics) by the University which is being performed sincerely. The main responsibility of the Nodal Officer is in collecting, compiling the information related to Higher Education from various offices of the University and supplying the same to UGC, New Delhi and other Governmental organizations which is a continuous process. The major work during the period was to complete the assignments for All India Survey on Higher Education.

- He has been assigned the duties of Nodal Officer (SAS) by the University which is being performed sincerely. The main responsibility of the Nodal Officer is installation, maintenance and upkeep of SAS software at CSKHPKV, Palampur under NAIP research project on “Strengthening Statistical Computing for NARS”.
- The data analysis related to the research of ten (10) postgraduate students and scientists was done using statistical software available in the department. Statistical analysis of the data related to some on-going research projects of the University were also carried out.
- Statistical helps were provided to the postgraduate students, research scientists of the University and research scholars of IHBT (CSIR), Palampur in their research problems.
- Is the member of the Sale and Purchase Committee of the College of Basic Sciences during the year 2012-13.
- Has been nominated as a member of University Publication Committee by Hon’ble Vice-Chancellor.
- Was assigned duties by the Dean, COBS for counseling and registration for admission to first year of B.Sc. programme during July, 2013.
- Has been nominated as a Secretary, Science Club, College of Basic Sciences.

#### **Dr Kamlesh Singh**

- Is performing the additional duties of the Dean, Postgraduate Studies w.e.f. 01.05.2012.

#### **Dr. S.S. Kanwar**

- Member Educational and Resident Instructions Advisory Committee of the University.
- Outside Expert on the Board of Under Graduate Studies in Biotechnology for the term 28.12.2011 to 27.12.2012 of Punjabi University, Patiala.
- Member of Institutional Animal Ethic Committee and attended a meeting in the office of the Chairman-cum-Convener (Dean, COVAS), CSK HPKV, Palampur on 12.11.2.12.
- Attended the Assessment Committee meeting regarding upgradation of Jr. Research Fellows to Sr. Research Fellows at IHBT, Palampur, on 18.4.2013.
- Attended Assessment Committee meeting regarding promotion of Associate Professor to Professor in the chamber of the Vice-Chancellor, CSK HPKV, Palampur on 23.4.13.
- Acted as an Expert in the interview of Union Public Service Commission for the post(s) of Jr. Scientific Officer at Dholpur House, Shahjahan Road, New Delhi on 16<sup>th</sup> and 17<sup>th</sup> January, 2013.
- Evaluated bio-data and research publications of Dr. (Mrs.) Neelam for promotion to the post of Professor under CAS, Kurukshetra University, Kurukshetra(Haryana).
- Appointed as Liaison Officer of the University to exercise proper check over the matters relating to reservation in services as applicable from time to time in the University
- Chairman of University Development Committee to finalize the documents pertaining to the University Financial Health Status
- Member, College Purchase Committee, College of Basic Sciences, CSK HPKV, Palampur
- Member, Board of Studies, COBS, CSKHPKV, Palampur
- Performed duties as Head of Department
- Member Merit Scholarship/Stipend during the Academic Year 2012-13 to UG & PG students

#### **Dr. Sharda Singh**

- Chaired Technical Session in International seminar in International Seminar on “Crop Management in Changing Climate” 11-13 February, 2013 organised by Department of Agronomy, University of Agriculture, FAISALABAD, Pakistan -38049.
- Nodal Officer for Geoinformatics System and Remote sensing from CSKHPKV-Palampur for Aryabhat Geo-informatics Space Application Centre, Shimla

- Member, Team of Scientists for Climate Change from CSKHPKV-Palampur in the State of Himachal Pradesh
- Member, Intellectual Property Rights Committee (IPRs)
- Member College Purchase Committee, College of Basic Sciences
- Member, Board of Studies, College of Basic Sciences
- Member Screening Committee for hiring teachers
- Chairman, Interview Committees for Research staff in CGRT
- Supporting PG students for their study area and thematic maps for their thesis work
- Accreditation team visit 5th of Oct 12 to 7th of 12.

#### **Dr. Ranbir Singh Rana**

- Attended Regional Review Meeting of “FASAL” project at IARI, Delhi during 8-9 Nov. 2012 Improvement of yield forecasting by the use of advance statistical methods and crop simulation models.
- Attended Sixth annual review meeting of adhoc Project “Intergraded Agro Met Advisory Services” Project being held on 21-23 November, 2012 BHU, Varanasi
- Attended International Workshop on “Scaling up Climate Services for Farmers in Africa and South Asia”, December 10 to 12, 2012 at DAKAR, Senegal under Climate Change: Agriculture and Food Security program (CCAFS)
- Attended International Conference on Crop Management in Changing Climate at University of Agriculture, Faisalabad , Pakistan w.e.f. February 11-13, 2013
- Dr. Ranbir Singh attended the Brainstorming workshop on snow and glaciers and the Himalayan river systems at Shimla on 29-30 May, 2013.
- Attended annual review meeting of FASAL Project at ANGRAU, Hyderabad w.e.f. 18-20 March, 2013 and 2 days exposure meeting on e-agromet under AAS Project on 18-20 March, 2013.
- Appointed as State level member of Advisory group for “Indian Himalayas Climate adaptation Programme (IHCAP) Under Indo – Swiss collaboration Programme in DEST, Shimla by the order of worthy Chief Secretary GOI Himachal Pradesh. (Vide letter no ENV.S&T(F) Indo-Swiss –DST/2012-1987 dated 7th December, 2012
- Appointed as panelist for generation of thematic status paper generation of thematic status paper with reference to climate change on Agriculture (all components of Agriculture, Cereals, Pulses, oilseeds, minor cereals. millets and grasses etc. (Vide letter no. SCCTE/CCC/F (7)-7/10-461 dated 18.4.2013 By Dr. H.K.Gupta, IFS ,Joint Member Secretary, State Centre for Climate Change, State Council for Science, Technology & Environment, HP B-34 SDA Complex,Kasumpti Shimla-171011 HP India.
- Appointed as member of COBS sale, purchase and inspection committee (Vide letter no. QSD./COBS/CSKHPKV/Store/17/11/195-202 dated 7.1.2012-continue
- Magazine Chief Editor: Appointed as Editor (Technical Section) of College of Basic Science magazine (Vigyan Punj) for 2012-13 (Vide letter no QSD-3-10/(Acad) (COBS)-CSKHPKV-5184-95 dated 03-10-2012.
- Appointed As a Committee Member Verification of Permanent & Consumed stocks Deptt of Chemistry and Biochemistry, COBS for 2012-13.
- Appointed As a Committee Member Verification of Permanent & Consumed stocks for CGRT, for the year 2012-13
- Appointed As a Committee Member Verification of Permanent & Consumed stocks for Physical Sciences and Languages for the year 2012-13
- Appointed As a Committee Member for quotation opening committee of deptt Microbiology
- Acted as convener in National Science day for Painting competition held on 25 February, 2012. (Vide letter no.QSD/3-63/ COBS/ Sci day /2013-453-63 dated /4-2-2013

- Acted as convener for Painting competition held on 27 August, 2012 to create awareness for anti Ragging. (Vide letter no.QSD/3-63/ COBS/ Sci day /2013-453-63 dated /4-2-2013
- Member of flying squad for COBS final examination ( QSD.3-39 (Acad) COBS/CSKHPKV-2500-2510 dated 22.5.2013
- Member of Technical/Secretarial and Hall arrangement Committee for Annual Group Meeting AICRP-Weed Control w.e.f. April 26-27, 2013 ( Vide Letter no. QSD.9-16-DR-CSKHPKV/Tech-2013/-3911-50 dated 11.4.2013
- Election duty as counting supervisor of GOI on 20-12-2012 (vide letter no. 3-SDP (ELN-2) 2/2012 dated 24.11.2012
- Involved as in administrative work as PIs of the Projects
- Involved as Landscape Incharge of COBS ( Vide Letter no. QSD2-38/2007 CSKHPKV(COBS-Estt)/-5350-62dated19.9.2012

### **Sh. Vaibhav Kalia**

- Contributed in National Science Day Celebrations in the University
- Member COBS Anti-ragging committee.
- UNS LAN segment Incharge of COBS.
- Member of webpage updating committee constituted by Dean PGS
- Data processing supervisor for Entrance Test 2013 of University admissions - responsible for Post-Exam (OMR Answer sheet) processing.
- Committee for purchase and installation of CCTV cameras and other items in the University library under CDA grant.
- Member of the committee for preparation of RESULT FRAMEWORK DOCUMENT (RFD) of CSKHPKV, constituted by the Hon'ble Vice Chancellor, CSKHPKV, Palampur.
- Appointed as Coordinator for EDUSAT based trainings in the University - conducted one training in the report period.
- Provided assistance for Conducting of Typing Test of the post of Clerks in Computer Lab. COBS on 17-02-2013.
- RKVY Data Entry on RKVY MIS National Portal (<http://rkvymis.dacnet.nic.in/>)
- Webmanager COBS website.
- NKN Security Officer for University Internet.
- NISAGNET (COBS) nodal officer.
- Game Incharge COBS - Volleyball.
- Editor, Technical Section of COBS Magazine.
- Student Counselor, COBS
- Performed Invigilation duty in the ICAR's 18th All India Entrance Examination for Admission to UG degree programme (AIEEA 2013-UG)
- Appointed as Subject Expert in the Selection committee appointed for the recruitment to the posts of Project Fellow at Institute of Himalayan Bio-resource Technology (CSIR) Palampur on 10-04-2013.
- Performed ELECTION DUTY in Compilation Section of 14-Sullah constituency at Palampur on 20-12-2013

### **Sh. Kapil Sharma**

- Appointed as Editor ( Technical Section ) of College of Basic Science magazine "Vigyan Punj" for 2012-13
- Treasurer, Science Club, College of Basic Science
- Member, College Canteen Management Committee
- Assisted the Dean, COBS for counseling and registration for admission to first year of B.Sc. programme during July, 2013.
- Assisted in Preparation of Time Table.

- Member of Anti-Ragging Committee, CoBS
- Appointed as member of COBS sale, purchase and inspection committee.
- Appointed as a Committee Member Verification of Permanent & Consumed stocks for Department of Biology and Environmental Sciences.
- Appointed as a Committee Member Verification of Permanent & Consumed stocks for Department of Physical Sciences and Languages.
- Game Incharge, Badminton, COBS.

## **F. NATIONAL SCIENCE DAY CELEBRATIONS**

The National Science Day was celebrated in the College from February 26-28, 2013. The faculty and students participated in various activities organized on this occasion whole heartedly.

## **G. NATIONAL SERVICE SCHEME**

Dr. K.P. Singh, Professor shared the responsibility of NSS Programme Officer, COBS Unit. During the period under report.

1. A Special seven day camp of NSS was organized at village Rajpur from 29.12.2012 to 04.01.2013 in which 61 NSS volunteers participated. The emphasis of the camp was on 150<sup>th</sup> Birth Anniversary of Swami Vivekananda with the theme "Wake up Bharat ! Enlighten the World !! ", environment protection, uprooting of Parthenium hysterophorus (Gaajar Ghaas) from public parks, HIV/AIDs awareness, health awareness and literacy etc. A rally was undertaken by NSS volunteers for conveying the teaching and messages of Swami Vivekananda on 03.01.2013. Parthenium Weed Awareness campaign including a rally was organized at school and village to create awareness among youth about this abnoxious weed.
3. The under mentioned days were celebrated by NSS volunteers with faculty and staff of the College of Basic Sciences during the year 2012-13:
  - A pledge taking ceremony on Sadbhavna Diwas on 17th August, 2012 was held in the College,
  - Hindi Diwas was celebrated on 14th September, 2012.
  - International Peace Day was celebrated on 21st September, 2012.
  - NSS Day was celebrated on 24<sup>th</sup> September, 2012.
  - Communal Harmony Campaign Week including Flag Day was celebrated from 19<sup>th</sup> to 25<sup>th</sup>, November, 2012.
  - World AIDS Day on 01-12-2012.
  - National Youth Week was celebrated during 12-19<sup>th</sup> January, 2013.
  - International Women Day on 8th March, 2013.
  - University Blood Donation camp on 19<sup>th</sup> February, 2013.

## **H. LIAISON/ COLLABORATION WITH NATIONAL/ INTERNATIONAL BODIES**

### **Department of Microbiology:**

- Collaborated with Regional Research Station of IVRI, Palampur for framing an adhoc project submitted to DST, GOI, New Delhi for funding.
- Collaborated with Panjab University Chandigarh for framing one adhoc project submitted to CSIR, New Delhi.
- Collaborated with NDRI, Karnal for framing an adhoc project submitted to DST, GOI, New Delhi for funding.

**I. NAME OF VIP VISITORS**

<b>Sr. No.</b>	<b>Date</b>	<b>Name &amp; Address</b>
1	13/8/12	Sh. Keaneth Gousalves, IIT Mandi
2	17/8/12	Sh. Subroto Talukdar, JICA India
3	15/10/12	Dr. J.H. Kulkarni, Former V.C., University of Agriculture Sciences, Dharwal, Karnataka.
4	19/10/12	Dr. Arvinder Singh, IAS (Election Observer) Secretary, State Information Commissioner Punjab, Chandigarh.
5	11/12/12	Dr. (Mrs.) S.K. Mann, Former Dean, M.Sc. PAU, Ludhiana.
6	10/2/13	Sh. Sujan Singh Pathania, Hon'ble Minister for Agriculture, Govt of Himachal Pradesh



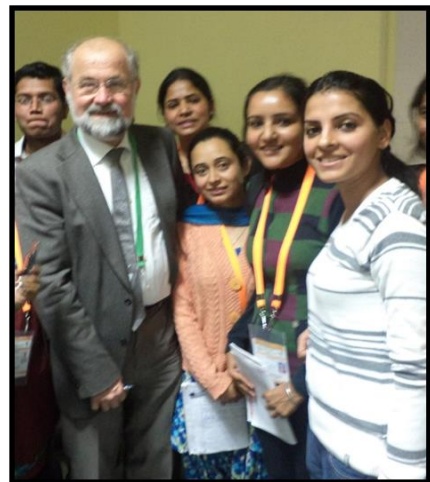
## Glimpses



Visit of Sh. S.S.Pathania, Hon'ble Agriculture Minister, Govt. of H.P.



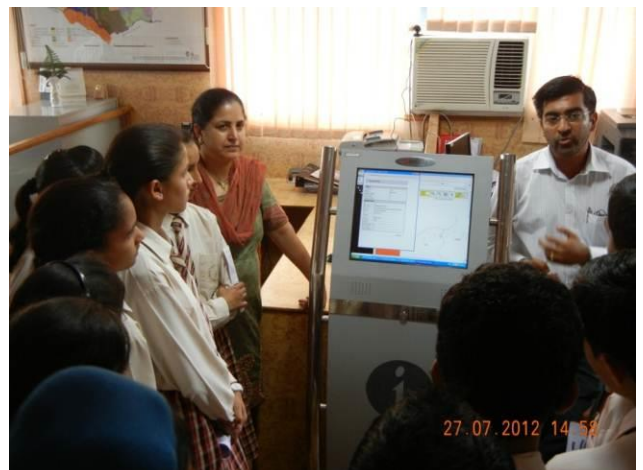
Visit of Dr. D.S. Rathore, Former Vice-Chancellor, CSKHPKV, Palampur



PG students of College of Basic Sciences with Dr. Erwin Neher (An American Scientist and Nobel Prize winner) during 5<sup>th</sup> Science Conclave held at IIT Allahabad w.e.f. 8.12.12to 14.12.12.



Dr S.K. Dhiman, Vice Chancellor of H.P. Technical University inaugurating one of the INSPIRE Internship Camps.



Visit of Students to Centre for Geoinformatics Research and Training, COBS, under INSPIRE programme



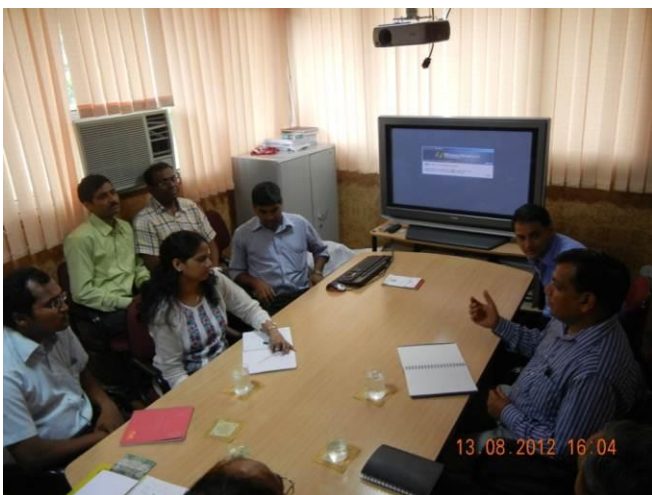
Dr.K.K.Katoch, Director, Extension Education  
Lighting up the lamp before cultural programme on  
National Science Day-2013



Entries from School Children for on the Spot  
Painting Competition organized on National  
Science Day-2013



N.S.S. volunteers during the camp organized in Village Rajpur



Scientists from IIT, Mandi discussing scope for collaboration with CGRT