

# Annual Progress Report



2013-14



**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 497 credit hours of teaching to the Undergraduates and 231 credit hours to the Postgraduate students of all the constituent colleges of the university during the period of report. Fifty five B. Sc., 9 M. Sc. and 03 Ph.D. students completed their degrees during the academic year 2013-2014. Merit scholarships were awarded to 20 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.10,40,678/- 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, Department of Physical Sciences and Languages through Statistical Analysis and Audio-Visual Aides charges and Centre for Geo-informatics, Research and Training through GIS/RS based services.

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 National Science Day Celebrations, Communal Harmony Fortnight which was observed from 20<sup>th</sup> August to 3<sup>rd</sup> September, 2013. National Integration Day, Communal Harmony Campaign week and Flag Day was celebrated from 19<sup>th</sup> to 25<sup>th</sup> November, 2013. A special seven day camp of NSS was organized at village Badehar from 28.12.2013 to 3.1.2014 in which 58 NSS volunteers participated. National Science Day was celebrated in the month of February, 2013. ThreeFive days INSPIRE Internship Camps of five days duration were organised by the deptt of Microbiology at CSK HPKV, Palampur from 22.10.2013 to 26.10.2013, 12.11.2013 to 16.11.2013 and 3.04.2014 to 7.04.2014.

Dr.(Mrs.)Sharda Singh, Professor & Programme Director, Center for Geoinformatics Research and Training and Sh. Kapil Sharma, Computer Teacher, Department of Physical Sciences and Languages deserve 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 2013-2014)**

**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 2013-14**

Name of the Department	Over all		COBS		COA		COHS		COVAS	
	UG	PG	UG	PG	UG	PG	UG	PG	UG	PG
<b>Total</b>	<b>497</b>	<b>231</b>	<b>414</b>	<b>190</b>	<b>22</b>	<b>54</b>	<b>59</b>	<b>17</b>	<b>2</b>	<b>14</b>
<b>Biol. &amp; Env. Sciences</b>	165	129	144	105	05	24	14	00	02	00
<b>Chem. &amp; Biochem</b>	96	38	84	38	3	-	9	-	-	-
<b>Microbiology</b>	31	34	3	31	3	-	25	3	-	-
<b>Phys. Sci. &amp; Lang.</b>	202	24	183	16	8	24	11	14	-	14
<b>C.G.R.T.</b>	3	6	-	-	3	6	-	-	-	-

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 2013-2014 are as below:

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

## Student Total Strength

In total 224 UG students and 27 PG students registered during the academic year and the break-up is:

Programme	Boys	Girls	Total
B. Sc.	60	164	224
M. Sc.	02	17	19
Ph.D.	-	08	08

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

## Students Passed Out

The degrees were awarded to 55 UG and 12 PG students as given below

Programme	Boys	Girls	Total
B. Sc.	15	40	55
M. Sc.	01	08	09
Ph.D.	-	03	03

## Scholarships Awarded

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

B. Sc. (I)	Merit Scholarship		Amar Shaheed Capt. Saurabh Kalia Scholarship
	B. Sc. (II)	B. Sc. (III)	
1. Priyashi Dogra	1. Vimal Samkaria	1. Baljeet Singh	1. Anshul Kapoor
2. Nikhil	2. Anuradha Sharma	2. Sheetal	2. Mamta Rani
3. Anmol	3. Ishita Mehta	3. Damini Nayital	3. Shalini Attri
4. Shalini Jaryal	4. Reema Bharti	4. Shweta	
5. Aakash Thakur	5. Nandita Sharma	5. Shefali Sharma	
6. Rubbal Duggal	6. Priyanka Dogra	6. Shilpi	
7. Gurjeet Kaur			
8. Shital Kumari			

### Budget for Teaching Schemes

The budget expenditure incurred during the year 2013-2014 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.	3,29,07,033/-
2.	APL-009-25 (Agri.)	-do-	39,58,975/-
3.	APL-076-25	-do-	/-
4.	APL-19-25	-do-	6,99,245/-
<b>Total</b>			<b>3,75,65,253/-</b>
<b>Budget 2011-2012 Detail</b>			
<b>I. Deptt. of Biology and Environmental Sciences</b>			
1.	APL-011-25(iii)	State Govt.	1,27,39,715/-
<b>Total</b>			<b>1,27,39,715/-</b>
<b>II. Deptt. of Chemistry &amp; Biochemistry</b>			
1.	APL-011-25(ii)	State Govt.	43,30,790/-
2.	APL-19-25	-do-	6,99,245/-
<b>Total</b>			<b>50,30,035/-</b>
<b>III. Deptt. of Microbiology</b>			
1.	APL-011-27	State Govt.	21,65,986/-
2.	APL- 009-27	-do-	5,68,766/-
<b>Total</b>			<b>27,34,752/-</b>
<b>IV. Dean, College of Basic Sciences</b>			
1.	APL-011-25(Agri)(i)	State Govt.	1,36,21,842/-
2.	APL-009-25(Agri.)	-do-	33,90,209/-
3.	APL-076-25	-do-	/-
<b>Total</b>			<b>1,70,12,051/-</b>

### REPERSENTATION TO VARIOUS UNIVERSITY BODIES FROM COLLEGE

#### Academic Council

Dr. Kamlesh Singh                      Dean  
 Dr. Manoj Bhargava                      Professor & Head, Dept. of Physical Sciences and Languages

#### Research Council

Dr. Kamlesh Singh                      Dean  
 Dr.C.K.Oberoi                              Professor & Head, upto Jan.,2014

#### Extension Council

Dr. Kamlesh Singh                      Dean  
 Dr. S.S.Kanwar                              Professor & Head , Dept. of Microbiology

#### Educational and Resident Instructions Advisory Committee

Dr. Kamlesh Singh                      Dean

### Constitution of the Board of Studies of College

Dr. Kamlesh Singh	Dean	Chairman
Dr. Manoj Bhargava	HOD, Physical Sciences & Languages	Member
Dr. S.S. Kanwar	HOD, Microbiology	Member
Dr. (Mrs.) Sharda Singh	Programme Director, CGRT,	Member
Dr.(Mrs.) Neelam Sharma	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-charges for various activities were as:

1.	Teacher Incharge (Games & Sports)	Dr. R.C. Chauhan
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	Sh. Vaibhav Kalia
9.	Badminton	Sh. Kapil Sharma
10.	Chess	Dr. Manoj Bhargava
11.	Mountaineering & Hiking	Dr. Manoj Bhargava
12.	Cultural Activities	Dr.(Mrs.) Anita Singh & Dr.(Mrs.) Usha Rana
13.	Literary Activities	Dr.(Mrs.) Sharda Singh & Dr.(Mrs.) Suman Sharma

### Educational Tour

An Educational Tour to South India for B.Sc. 2<sup>nd</sup> Year students of the college was conducted by Dr. Virender Singh (Tour In-charge) and Dr. (Mrs.) Usha Rana from 28-12-2013 to 7-01-2014. A total of 57 students (15 boys and 42 girls) alongwith four attendants 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.	Dr. Navneet K Gupta	Professor and Head upto 30-04-2014
2.	Dr. G.L.Bansal	Professor and Dean upto 31-08-2013
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 ( <i>promoted to Assoc.Prof. w.e.f. 1.1.2014</i> )
<b>II. DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY</b>		
1.	Dr. C.K.Oberoi	Professor and Head upto 31-03-2014



2.	<b>Dr.(Mrs.) Neelam Sharma</b>	<b>Professor and Head w.e.f. 10-02-2014</b>
3.	Dr. Kamal Mohini	Associate Professor
4.	Dr. Nageswer Singh	Assistant Professor (Ad-hoc)
5.	Dr. Suman Sharma	Assistant Professor (Contract)
<b>III. DEPARTMENT OF MICROBIOLOGY</b>		
1.	<b>Dr. S.S. Kanwar</b>	<b>Professor &amp; Head</b>
<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
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 (Computer)

#### Department-wise staff position in the College

Sr.No	Name	Designation
<b>I. DEAN OFFICE</b>		
<b>A. Ministerial Staff</b>		
1.	Sh.R.P.Bist	Supdt. (upto 4-09-2013)
2.	Sh. Yudhbir Singh Rana	Supdt (from 27-11-2013 to 30-06-2014)
3.	Sh. P.C. Changra	Sr. Scale Stenographer (upto 6-08-2013)
4.	Sh. Shanti Swaroop Sharma	P.S. (from 6-08-2013 to 18-11-2013)
5.	Sh. Moti Ram	Sr. Scale Stenographer (w.e.f. 1-11-2013)
6.	Sh. Kalyan Chand	Sr. Assistant (Promoted to Supdt Gr-II ExCdr on 30-01-2014)
7.	Sh. Uttam Chand	Sr. Assistant
8.	Sh. Satish Kumar	Jr. Assistant
9.	Sh. Surjeet Kumar	Jr. Assistant
10	Sh. Randir Singh	Jr. Assistant
<b>B. Technical Staff</b>		
1.	Sh. Jyoti Swaroop	STA-II (Transferred to CPDU on 4-03-2014)
2.	Sh Hukum Singh	STA-II
<b>C. Class – IV</b>		
1.	Sh. Hari Singh	Peon
2.	Sh. Ramesh Chand	Peon (Transferred on 11-02-2014)
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 (Promoted and Transferred)
<b>II. LAND SCAPPING SECTION (COBS)</b>		
<b>A. Class-IV</b>		
1.	Sh. Keshav Ram	Beldar
2.	Sh. Kuldeep Kumar	Beldar (w.e.f. 21-12-2013)
3.		
<b>III. BAMBOO SECTION (COBS)</b>		
<b>A. Technical staff</b>		

1.	-	-
<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 <i>Promoted as Supdt. Transferred to Dean Office, CoBS</i>
<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 ( <i>Transferred to CoVAS</i> )
<b>B. Technical Staff</b>		
1.	Sh. Dharm Chand	Lab. Assistant
2.	Sh. Shakti Chand	Lab. Assistant ( <i>Transferred to CoVAS</i> )
<b>C. Class-IV Staff</b>		
1.	Sh. Santosh Kumar	Lab Helper ( <i>Transferred</i> )
2.	Sh. Manohar Lal	Lab Helper
3.	Sh. Om Parkash	Peon ( <i>Now Posted in Physical Sci. &amp; Lang., CoBS</i> )
<b>VI. DEPARTMENT OF MICROBIOLOGY</b>		
<b>A. Ministerial Staff</b>		
1.	Smt.Usha Rani	Sr. Assistant ( <i>upto 26-08-2013</i> )
2.	Smt.Sunita Devi	Sr. Assistant ( <i>w.e.f. 23-08-2013 to 2-12-2013</i> )
3.	Sh. Raj Kumar Sharma	Sr. Assistant ( <i>w.e.f. 29-11-2013</i> )
4.	Sh. Sushil Kumar	Sr. Scale Stenographer ( <i>upto 17-06-2014</i> )
5.	Sh. Sat Pal	Sr. Scale Stenographer ( <i>w.e.f. 17-06-2014</i> )
<b>B. Technical Staff</b>		
1.	Sh.Roshan Lal	Lab. Assistant ( <i>Transferred</i> )
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 ( <i>(Transferred to CoVAS)</i> )
<b>B. Technical Staff</b>		
1.	Sh. Surjeet Kumar	Lab. Assistant ( <i>(Transferred to CPDU on 4-03-2014)</i> )
2.	Sh. Ashok Kumar	Jr. Technician ( <i>Joined on 11-03-2014</i> )
<b>C. Class-IV staff</b>		
1.	Sh. Satish Kumar	Beldar ( <i>Now Posted in Chemistry &amp; Biochemistry., CoBS</i> )
<b>VIII. CENTRE FOR GEO-INFORMATICS RESEARCH AND TRAINING</b>		
<b>A. Ministerial staff</b>		
1.	-	-

## 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. 111 (old)	Algae, Fungi and microbes	2+1	Dr.(Mrs.) Anita Singh
3.	Bot.112	Bryophytes and Pteridophytes	2+1	Dr.(Mrs.) Usha Rana
4.	Bot.211	Diversity of Seed Plants-Gymnosperms	2+1	Dr.(Mrs.) Anita Singh
5.	Bot. 211 (old)	Diversity of seed plants- Gymnosperms	2+1	Dr.(Mrs.) Anita Singh
6.	Bot.212	Diversity of Seed Plants-Angiosperms	2+1	Dr.(Mrs.) Usha Rana
7.	Bot.212(old)	Diversity of Seed Plants-Angiosperms	3+1	Dr Usha Rana
8.	Bot.321(old)	Plant Physiology	3+1	Dr Usha Rana
9.	Bot.311	Plant Ecology	2+1	Dr. K. P.Singh
10.	Bot.312	Biochemistry and Biotechnology	2+2	Dr.K.P.Singh / Dr. Navneet K. Gupta
12.	Zoo.111	Invertebrates-I	3+1	Dr(Mrs.) Meena Kumari
13.	Zoo.112	Cell Biology	1+1	Dr(Mrs.) Meena Kumari
14.	Zoo.211	Genetics-I	1+1	Dr(Mrs.) Meena Kumari
15.	Zoo.212	Animal Physiology-I	3+1	Dr. Navneet K. Gupta
16.	Zoo.311	Applied Zoology-I	2+2	Dr(Mrs.) Meena Kumari
17.	Zoo.312	Ecology	2+1	Dr. Navneet K. Gupta
18.	Zoo.121 ( R )	Life and Diversity of Animals-II	3+1	Dr. Navneet K. Gupta
19.	Zoo.122( R )	Genetics-II	2+1	Dr. Navneet K. Gupta
20.	Zoo.221( R )	Animal Physiology-I	3+1	Dr. Navneet K. Gupta
21.	ENV 311	Introduction to Environmental Science	2+0	Dr. Ramesh C. Chauhan
22.	FST. 247	Environmental Sciences	2+0	Dr. Ramesh C. Chauhan
<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	Anita Singh/Usha Rana
6.	Pl.Physiol.502	Plant Developmental Biology: Physiological and molecular aspect	2+0	Dr (Mrs.)Usha Rana
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 505	Physiology of growth and yield and	1+1	Dr. K.P.Singh

		Modelling		
11.	PP 507	Phoyosynthesis and respiration	2+1	Dr. K.P.Singh
12.	PI Physiol 591	Credit Seminar	1+0	Dr. K.P.Singh
13.	Env 501	Definitions and Concepts in Environmental Sciences	2+0	Dr. Ramesh C. Chauhan
14.	Env 504	Environmental Impact Assessment	2+1	Dr. R. C. Chauhan & Sh. Vaibhav Kalia
15.	Env 506	Global Climate Change	2+0	Dr. Ramesh C. Chauhan
16.	ENV. 509	Pesticides and Environment	2+1	Dr. Ramesh C. Chauhan
17.	ENV.512	Biodiversity/ Wildlife Conservation and Himalayan Ecosystem	2+0	Dr. Ramesh C. Chauhan
18.	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. 221 (old)	Structure and Development of flowering plants	2+1	Dr. Anita Singh
5.	Bot.222	Reproductive Biology	2+1	Dr Usha Rana
6.	Bot.222 (old)	Reproduction in Flowering Plants	2+1	Dr. Usha Rana
7.	Bot.2 12 (old)	Diversity of Seed Plants-Angiosperms	3+1	Dr Usha Rana
8.	Crop Physiol.241	Crop Physiology	2+1	Dr Usha Rana
9.	Bot. 321	Plant Physiology	3+1	Dr. K.P. Singh
10.	Bot.322	Economic Botany and utilization of Plants	2+1	Dr. Anita Singh
11.	Zoo.121	Invertebrates-II	3+1	Dr. Meena Kumari
12.	Zoo.122	Developmental Biology	1+1	Dr. Meena Kumari
13.	Zoo.221	Genetics-II	2+1	Dr. Meena Kumari
14.	Zoo.222	Animal Physiology-II	3+1	Dr. Navneet K. Gupta
15.	Zoo.321	Applied Zoology-II	2+2	Dr. Meena Kumari
16.	Zoo.322	Evolution	2+1	Dr. Navneet K. Gupta
17.	Zoo.121HSc	Human Physiology and Hygiene	2+1	Dr. Navneet K. Gupta
18.	ENV.321	Introduction to Environmental Sciences	2+0	Dr. R.C. Chauhan
19.	FST. 247	Environmental Sciences	2+0	Dr. Ramesh C. Chauhan
20.	ENV 311	Introduction to Environmental Sciences	1+1	Dr. Virendra 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. Usha Rana
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. Usha Rana

11.	Bio 591	Credit Seminar	1+0	Dr. Anita Singh
12.	PI Physiol 501	Principles of plant physiology	2+1	Dr. K.P.Singh
13.	PI Physiol 591	Credit Seminar	1+0	Dr. K.P. Singh
14.	PP 501	Cellular physiology and Plant Water Relations	2+1	Dr. K.P. Singh
15.	PP 508	Mineral Nutrition	2+1	Dr. K. P. Singh
16.	PP. 504	Hormonal regulation of plant growth and Development	2+1	Dr. Usha Rana
17.	ENV.509	Pesticides and Environment	2+1	Dr. Ramesh C Chauhan
18.	ENV.510	Environment Conservation	2+0	Dr. Ramesh C Chauhan
19.	ENV.512	Biodiversity/Wildlife Conservation and Himalayan Ecosystem	2+0	Dr. Ramesh C Chauhan
20.	ENV. 591	Credit Seminar	1+0	Dr. Virendra Singh

## II. 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	Dr. Rakesh Kumar
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	Mr. Sanjay Kumar
8.	Chem-213	Chemistry of Functional Groups-I	2+0	Dr. (Mrs.) Suman Sharma
9.	Chem-311	Quantum Mechanics & Photochemistry	2+0	Dr.(Mrs.) Suman Sharma
10.	Chem-312	Advanced Inorganic Chemistry -I	2+1	Mr. Sanjay Kumar
11.	Chem-313	Heterocyclics, Pericyclics and Spectroscopy	2+0	Dr.Rakesh Kumar
12.	Chem.-122	Representative Elements and Noble Gases	2+0	Dr.(Mrs.)Suman Sharma
13.	Chem.-123	Hyrocarbons & Organic Halides	2+0	Dr.C.K.Oberoi
14.	Chem.-221	Electrochemistry and Phase Equilibrium	2+0	Dr.(Mrs.)Suman Sharma
14.	Chem.-222	Coordination Chemistry and Non-Aqueous solvent	2+0	Dr.(Mrs.)Neelam Sharma
15.	Chem.223	Chemistry of Functional Group-II(o)	1+1	Dr. C.K. Oberoi
16.	Chem.-323	Natural Products, Synthetic Polymers and Dyes	2+0	Dr.C.K.Oberoi
17.	Biochem-111	Biochemistry (Home Sc)	2+1	Dr.Kamal Mohini
18.	FST-111	Biochemistry (B.Tech.)	2+1	Dr.Kamal Mohini/ Dr.Nageswer Singh
19.	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.	Biochem-503	Human Biochemistry	3+0	Dr.Rajan Katoch
3.	Biochem-511	Carbon & Nitrogen Metabolism	2+1	Dr..Nageswer Singh
4.	Biochem-541	Immunochemistry	2+0	Dr..Nageswer Singh
5.	Biochem-551	Techniques in Biochemistry	1+3	Dr. Nageswer Singh
6.	Biochem-591	Master's Seminar	1+0	Dr. Nageswer Singh
7.	Biochem-603	Biomembranes	2+0	Dr.Kamal Mohini
8.	Biochem-604	Advanced Enzymology	2+0	Dr. Manoj Acharya
9.	Biochem-621	Genomics, Proteomics & Metabolomics	2+0	Dr. Manoj Acharaya
10.	Biochem-691	Doctoral Seminar-I	1+0	Dr. Nageswer Singh

11	Biochem-693	Special problems in Ph.D	0+1	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.Rakesh Kumar
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. (Mrs.) Suman Sharma
6.	Chem-221	Quantum Mechanics and Photochemistry	3+0	Dr.(Mrs.) Suman Sharma
7.	Chem-222	Advanced Inorganic Chemistry	2+1	Dr. Rakesh Kumar
8.	Chem-221	Electrochemistry and Phase Equilibrium (old)	2+0	Dr.(Mrs.) Suman Sharma
9.	Chem-222	Coordination Chemistry and Non Aqueous Solvents (old)	2+0	Dr.(Mrs.) Neelam Sharma
10.	Chem-223	Chemistry of Functional Groups-II (old)	1+1	Dr.(Mrs.) Suman Sharma
11.	Chem-321	Solutions and Spectroscopy	1+1	Dr. (Mrs.) Suman Sharma
12.	Chem-322	Advanced Inorganic Chemistry -II	2+0	Dr. Rakesh Kumar
13.	Chem-323	Natural Products, Synthetic Polymers& Dyes	2+0	Dr . Rakesh Kumar
14.	Chem-324	Analytical Techniques in Chemistry	0+1	Dr.(Mrs.) Neelam Sharma
15.	Chem-113	Physical Organic Chemistry (Old)	1+1	Dr.(Mrs.) Suman Sharma
16.	Chem-212	Transition and Inner Transition Elements (Old)	2+1	Dr.(Mrs.) Neelam Sharma
17.	Chem-213	Chemistry of Functional Groups-I (Old)	2+0	Dr.(Mrs.) Suman Sharma
18.	FST-125	Basic Biochemistry (H.Sc.)	2+1	Dr.Nageswer Singh
<b>B. Postgraduate Courses</b>				
1.	Biochem-502	Plant Biochemistry	3+0	Dr Kamal Mohini
2.	Biochem-504	Enzymology	2+1	Dr.Rajan Katoch
3.	Biochem-505	Intermediary Metabolism	3+0	Dr Kamal Mohini
4.	Biochem-521	Food & Nutritional Biochemistry	2+1	Dr Kamal Mohini
5.	Biochem-591	M.Sc. Seminar	1+0	Dr.Rajan Katoch

### III. 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-118	Fundamentals of 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. C.R. Sharma
5.	FST-355	Food Safety and Microbial standards	2+1	Dr. M.K.Gupta

<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. S.S.Kanwar
3.	Micro-511	Soil Microbiology	2+1	Mr.Rajinder Kumar
4.	Micro-531	Food Microbiology	2+1	Dr. C.R. Sharma
5.	Micro-551	Introduction to Human Microbial Pathogens	2+1	Dr. M.K. Gupta
6.	Micro-591	M.Sc. Seminar	1+0	Dr.S.S. Kanwar
7.	Micro-599/600	M.Sc. Research		Respective Advisor
8.	Micro -602	Advances in Microbial Physiology	2+1	Dr. M.K. Gupta
9.	Micro 612	Advances in Environmental Microbiology	2+1	Dr. C.R. Sharma
10.	Micro-621	Advances in Fermentation Technology	2+1	Dr.S.S.Kanwar
11.	Micro-622	Advances in Food Microbiology	2+1	Dr. S.S. Kanwar
12.	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.123	Food Microbiology	2+1	Dr.C.R.Sharma
3.	Ag.Micro.121	Agricultural Microbiology	2+1	Dr.M.K.Gupta / Sh.Rajinder Kumar
<b>B. Postgraduate Courses</b>				
1.	Micro-502	Microbial Taxonomy	2+1	Dr. C.R. Sharma
2.				
3.	Micro-503	Microbial Physiology and Metabolisms	2+1	Sh. Rajinder Kumar
4.	Micro-504	Microbial Genetics	2+1	Dr. M.K. Gupta
5.	Micro-532	Dairy Microbiology	2+1	Dr. M.K. Gupta
6.	Micro-541	Industrial Microbiology	2+1	Dr. C.R. Sharma
7.	Micro-601	Current topics in Microbiology	2+1	Dr. S.S. Kanwar
8.	Micro-603	Advances in Molecular Microbiology	2+0	Dr. C.R. Sharma
9.	Micro-599/600	M.Sc. Research		Respective Advisor
10.	Micro-691	Seminar	1+0	Dr. S.S. Kanwar

#### IV. 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>				
<b>B.Sc.I yr</b>				
1.	Phys 111	Mechanics & Theory of Relativity	4+0	Mrs Sushila Devi
2.	Phys 112	Current Electricity and Magnetism-I	2+1	Dr (Mrs) Sheela Thakur



3.	Math 111	Algebra and Trigonometry	3+0	Sh V P Sood
4.	Math 112	Calculus	3+0	Dr (Mrs) Sharda Singh
5.	Comp 111	Principles of Computers-I	1+1	Sh Vaibhav Kalia
6.	Eng 111	Communicative and Functional English	2+0	Sh Rajesh Kumar
<b>Old Syllabus</b>				
7.	Phys 111	Mechanics and Theory of Relativity	3+0	Mrs Sushila Devi
8.	Phys 112	Vector Calculus and Electrostatics	2+0	Dr (Mrs) Sheela Thakur
9.	Math 111	Matrices, Trigonometry and Vector Analysis	3+0	Sh V P Sood
10.	Math 112	Calculus	3+0	Dr (Mrs) Sharda Singh
11.	Comp 111	Principles of Computer-I	1+1	Sh Vaibhav Kalia
12.	Eng 111	Prose, Poetry and Functional English	2+0	Sh Rajesh Kumar
<b>B.Sc.II yr</b>				
13.	Phys 211	Optics and Lasers	4+0	Dr (Mrs) Sheela Thakur
14.	Phys 212	Oscillation and Waves	2+1	Dr Ravinder Gupta
15.	Math 211	Advanced Calculus	3+0	Sh V D Vasishtha
16.	Math 212	Mechanics	4+0	Sh V P Sood
<b>Old Syllabus</b>				
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 213	Physics Laboratory-III	0+1	Dr (Mrs) Sheela Thakur
20.	Math 211	Advanced Calculus	4+0	Dr (Mrs) Sharda Singh
21.	Math 212	Dynamics	3+0	Dr (Mrs) Sharda Singh
<b>B.Sc.III yr</b>				
22.	Phys 311	Solid State Physics	3+0	Dr Ravinder Gupta
23.	Phys 312	Nuclear Physics-I	3+0	Dr (Mrs) Sheela Thakur
24.	Phys 313	Physics Laboratory-V	0+1	Dr (Mrs) Sheela Thakur
25.	Math 311	Analysis	3+0	Dr (Mrs) Sharda Singh
26.	Math 312	Abstract Algebra	4+0	Sh V D Vasishtha
<b>B.Sc. (Agriculture)</b>				
27.	Stat 351	Statistics	1+1	Dr Manoj Bhargava
28.	Eng 111	Comprehension and Communication Skills in English	1+1	Sh Rajesh Kumar
<b>B.Sc. (Home Science)</b>				
29.	Comp 111	Computer Science	1+2	Sh Kapil Sharma
30.	Stat 231	Elementary Statistics	1+1	Dr Manoj Bhargava
31.	Comp 115	Application of Computers	2+2	Sh Kapil Sharma
<b>Odd Semester Courses</b>				
32.	Math 121	Algebra and Ordinary Differential Equation	3+0	Dr (Mrs) Sharda Singh
33.	Comp 221	Computer Programming-C (Non-Medical)	2+1	Sh Kapil Sharma
34.	Phys 221	Optics and Lasers	3+0	Dr (Mrs) Sheela Thakur
35.	Phys 222	Atomic, Molecular and X-rays Spectra	2+0	Dr (Mrs) Sheela Thakur
36.	Math 321	Metric and Inner Product Spaces	3+0	Sh V P Sood
37.	Math 322	Numerical Analysis	3+1	Dr (Mrs) Sharda Singh/ Sh Vaibhav Kalia
38.	Phys 322	Electronics	3+0	Dr (Mrs) Sheela Thakur
<b>B. Postgraduate Courses</b>				
1.	Comp 501	Computer Fundamental and Programming	2+1	Sh Kapil Sharma

2.	Stat 491	Introduction to Statistics	1+1	Dr Manoj Bhargava
3.	Stat 511	Statistical Methods for Applied Sciences	3+1	Dr Kamlesh Singh
<b>Semester-II</b>				
<b>A. Undergraduate Courses</b>				
<b>B.Sc. I yr</b>				
1.	Phys 121	Statistical Physics and Thermodynamics	3+0	Mrs Sushila Devi
2.	Phys 122	Current Electricity and Magnetism-II	2+1	Dr (Mrs) Sheela Thakur
3.	Math 121	Ordinary Differential Equations and Vector Analysis	3+0	Dr (Mrs) Sharda Singh
4.	Math 122	Geometry	3+0	Sh V P Sood
5.	Comp 121	Principles of Computers-II	1+1	Sh Vaibhav Kalia
6.	Eng 121	Comprehension, Composition and Translation	2+0	Sh Rajesh Kumar
<b>Old Syllabus</b>				
7.	Phys 121	Statistical Physics and Thermodynamics	3+0	Mrs Sushila Devi
8.	Phys 122	Current Electricity and Magnetism	2+0	Dr (Mrs) Sheela Thakur
9.	Math 121	Algebra and Ordinary Differential Equation	3+0	Dr (Mrs) Sharda Singh
10.	Eng 121	Comprehension, Translation and Composition	2+0	Sh Rajesh Kumar
<b>B.Sc. II yr</b>				
11.	Phys 221	Quantum Mechanics and Spectroscopy	3+0	Dr Ravinder Gupta
12.	Phys 222	Electrodynamics	2+1	Dr (Mrs) Sheela Thakur
13.	Math 221	Partial Differential Equations	3+0	Sh V D Vasishtha
14.	Math 222	Calculus of variation and Laplace Transform	3+0	Sh V P Sood
15.	Comp 221	Computer Programming-C (Non-Medical)	2+1	Sh Vaibhav Kalia
16.	Comp 222	Application in FoxPro and Programming in BASIC (Medical)	2+1	Sh Kapil Sharma
<b>Old Syllabus</b>				
17.	Phys 221	Optics and Lasers	3+0	Dr (Mrs) Sheela Thakur
18.	Phys 222	Atomic, Molecular and X-rays Spectra	2+0	Dr (Mrs) Sheela Thakur
19.	Math 221	Differential Equation	4+0	Sh V D Vasishtha
20.	Math 222	Statics	2+0	Dr (Mrs) Sharda Singh
<b>B.Sc. III yr</b>				
21.	Phys 321	Nuclear Physics-II	3+0	Dr Ravinder Gupta
22.	Phys 322	Electronics	3+0	Dr (Mrs) Sheela Thakur
23.	Phys 323	Physics Laboratory-VI	0+1	Mrs Sushila Devi
24.	Math 321	Metric and Inner Product Spaces	3+0	Sh V D Vasishtha
25.	Math 322	Numerical Analysis	3+1	Dr (Mrs) Sharda Singh/ Sh Vaibhav Kalia
<b>B.Sc. (Agriculture)</b>				
26.	Comp 241	Introduction to Computer Application	1+1	Sh Kapil Sharma
27.	Stat 351	Statistics	1+1	Dr Manoj Bhargava
<b>B.Sc. (home Science)</b>				
28.	Eng 121	English and Technical writing	1+1	Sh Rajesh Kumar
<b>Odd Semester Courses</b>				
29.	Math 112	Calculus (old syllabus)	3+0	Sh V D Vasishtha
30.	Math 112	Calculus (new syllabus)	3+0	Sh V P Sood
31.	Phys 211	Oscillation and Waves	3+0	Dr (Mrs) Sheela Thakur

32.	Phys 212	Quantum Mechanics	3+0	Dr (Mrs) Sheela Thakur
33.	Math 211	Advanced Calculus	4+0	Sh V P Sood
34.	Math 311	Analysis	3+0	Dr (Mrs) Sharda Singh
<b>B. Postgraduate Courses</b>				
1.	Comp 501	Computer Fundamental and Programming	2+1	Sh Kapil Sharma
2.	Stat 491	Introduction to Statistics	1+1	Dr Manoj Bhargava
3.	Stat 511	Statistical Methods for Applied Sciences	3+1	Dr Kamlesh Singh
4.	Stat 513	Sampling Techniques	2+1	Dr Manoj Bhargava
5.	Stat 541	Mathematical Statistics	3+0	Dr Manoj Bhargava

#### V. 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-471	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 / Sh. Vaibhav Kalia
<b>Semester-II</b>				
<b>A. Postgraduate Courses</b>				
1.	GIS-501	Geographic Information System 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.	Meena Kumari S-2011-30-005	Morphophysiological and Biochemical Evaluation of Common Bean ( <i>Phaseolus vulgaris</i> L.) for Drought Tolerance	Dr. (Mrs.) Usha Rana

#### M. Sc. (Environmental Sciences)

Sr. No.	Name of student & Admission No.	Title of Thesis	Name of Major Advisor
1.	Mr. Babit Kumar Thakur S-2011-30-009	Water Quality and its Impact on the Species composition and abundance of Cladocerans in Pond Ecosystem.	Dr. Ramesh C. Chauhan

2.	Ms. Shallini S-2011-30-010	Physico Chemical Regime and Its Effect on the Seasonal abundance of Diatoms in Pond Ecosystem.	Dr. Ramesh C. Chauhan
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## II. Department of Chemistry and Biochemistry

### M.Sc. (Biochemistry)

Sr. No.	Name of student & Admission No.	Title of Thesis	Name of Major Advisor
1.	Ms. Priya Kapoor S-2011-30-001	In vitro studies on metabolism of saponins in rumen fluid	Dr O. P. Sharma
2.	Ms. Shilpa Devi S-2011-30-002	Isolation, purification and bioactivity of proanthocyanidins from tree leaves	Dr. T.K.Bhat

### 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 Khosla (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. Akriti Sharma (S-2011-30-011)	Biodiversity of <i>Listeria</i> spp. in meat and meat products and their interaction with indigenous probiotics.	Dr. S.S. Kanwar
2.	Ms. Aditi Chauhan (S-2011-30-012)	Studies on exopolysaccharides production by indigenous lactic acid bacteria.	Dr. S.S. Kanwar

### Ph. D. (Microbiology)

Sr. No.	Name of the Student and Admission No.	Title of Theses	Name of Major Advisor
1.	Ms. Ruchi (S-2009-40-003)	Evaluation of indigenous Plant Growth Promoting Rhizobacteria of Himachal Pradesh and optimization of conditions for their mass cultivation.	Dr. S.S. Kanwar
2.	Ms. Sohini Walia (S-2009-40-004)	Evaluation of indigenous probiotics of Himachal Pradesh for functional and protective attributes.	Dr. S.S. Kanwar

### 3. SHORT TRAININGS

#### I. Department of Chemistry and Biochemistry

- Imparted two trainings to the students of the Himachal Pradesh University , Shimla and Punjab University, Chandigarh

#### II. Department of Microbiology

- Imparted training to the students of the Lovely Professional University, Phagwara (Pb)
- A policy has been introduced for providing bench space to the international students @ Rs. 20,000.00 per month. Presently, Mr. Isaac Ayanniran Adesokan, The Polytechnic, Ibadan, Nigeria is availing this facility in the department of Microbiology

### 4. MANUAL

#### I. Department of Microbiology

- Laboratory Manual on Fundamental Microbiology, 2014 by S.S. Kanwar, Rajinder Kumar, Keshani and Sohini Walia. Printed by: JMD Printers, Rajpur (Palampur)

### 5. NATIONAL ELIGIBILITY TEST (NET)

#### I. Department of Microbiology

- Ms. Natasha (S-2009-40-02)
- Ms. Ruchi (S-2009-40-03)
- Ms. Keshani (S-2010-40-02)

### 6. INSPIRE FELLOWSHIP

#### I. Department of Chemistry and Biochemistry

- Ms. Kanika Sharma (S-2008-40-01)
- Ms. Shweta (S-2009-40-01)

#### II. Department of Microbiology

- Ms. Kalpana Rana (S-2010-30-28) -Microbiology

### 7. ICAR - SRF

#### I. Department of Chemistry and Biochemistry

- Ms. Reetu (S-2012-40-002) Ph.D. student

### 7. AWARDS

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

- Prof. Ramesh C. Chauhan represented the university for the *first time as a nominee HRD Ministry, Govt. of India* in the capacity of member expert in Environmental Studies on November 25, 2013 to select the candidates *for the award of common Wealth Fellowship – 2014.*

## 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. Nageswer Singh	Evaluation of nutritionally important biochemical constituents of promising buckwheat, chenopod and Azukibean.	0.8 Annually	AICRP, Network on Underutilized Crops, NPBGR, Pusa Campus, New Delhi	2008 to till date continuing
2.	Dr S.S.Kanwar	Probiotic potential of indigenous isolates obtained from traditional fermented foods of Himachal Pradesh”	27.95	DST	July 2012 2 years
3.	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
4.	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
5.	Dr. Sharda Singh, Dr. R.S. Rana, Mr. Vaibhav Kalia	Establishment of GIS & MIS and Monitoring System	45.49	HPCDP, JICA India	2012 to till date continuing
6.	Dr. Sharda Singh, Dr. R.S. Rana, Mr. Vaibhav Kalia	Spatial disaggregation of agricultural statistical data & food security analysis through SPOT VEGETATION datasets for a mountainous state of H.P	8.75	University Grants Commission, New Delhi	2012 to till date continuing
7.	Dr. Ranbir Singh Rana Dr Suresh Kumar Sharma and Dr B.S. Mankotia	Forecasting Agricultural Output Using Space, Agro Meteorology and Land Based Observations (FASAL) (2013-14) (Fasal)	30.00	Indian Meteorological Department (IMD), GOI, New Delhi	2012-2018
8.	Dr. Ranbir Singh Rana	Thematic paper on Climate Change and Agriculture in Himachal Pradesh	7.06	Indo Swiss Programme	2013-2015

**II. RESEARCH PROJECTS SACTIONED**

<b>Sr. No.</b>	<b>P.I./Co-P.I.</b>	<b>Title of the Project</b>	<b>Budget outlay (in lakhs)</b>	<b>Funding Agency</b>
1.	Dr. Virendra Singh	Introduction and evaluation of Russian seabuckthorn varieties in cold deserts of Himachal Pradesh	38.00	DST
2.	Dr. Ranbir S. Rana	Vulnerability Assessment of Agriculture-Horticulture Sector in Kullu District, Himachal Pradesh funded by IHCAP under the Swiss Agency for Development and Cooperation (SDC)	12.15	Embassy of Switzerland
3.	Dr. Ranbir S. Rana	Climate Change Impact on Productivity of Food grain and Plantation crops	39.00	IIRS Dehradun, Ministry of Space
4.	Sh. Vaibhav Kalia	Integrated Geodatabase Model for DRDA-Chamba	1.50	DRDA

**III. RESEARCH PROJECTS COMPLETED**

<b>Sr. No.</b>	<b>P.I./Co-P.I.</b>	<b>Title of the Project</b>	<b>Budget outlay (in lakhs)</b>	<b>Funding Agency</b>
1.	Dr. Virendra Singh	A value chain on seabuckthorn ( <i>Hippophae L.</i> )	411.00	NAIP/ICAR
2.	Dr. Ramesh C. Chauhan	Harmonizing Biodiversity Conservation and Agricultural Intensification through Integration of Plant, Animal and Fish Genetic Resources for livelihood Security in Fragile Ecosystems	3472804	NAIP/ICAR

**IV. RESEARCH PROJECTS SUBMITTED**

<b>Sr.No.</b>	<b>P.I./Co-P.I.</b>	<b>Title of the project</b>	<b>Budget outlay Lakhs</b>	<b>Funding Agency</b>
1.	Dr S.S.Kanwar	Bio-prospecting of Lactic Cultures from 'Cold Desert Regions' to develop Functional Fermented Milk Products with Potential Health Benefits (Project in collaboration with NDRI, Karnal)	71.49	DST
2.	Dr S.S.Kanwar	A consortium approach to strengthening the profile of natural fibres through innovative technology interventions to enhance their industrial use (Multi-institutional project)	142.77 Crores	ICAR

3.	Dr S.S.Kanwar	Bio-prospecting of indigenous yeast isolates of fermented foods of Himachal Pradesh	15.26	State Council of Science and Technology, Himachal Pradesh
4.	Dr S.S.Kanwar	Production and distribution of liquid biofertilizers for cash crops under protected cultivation	25	RKVY
5	Dr. Nageswer Singh	Phytochemicals, antioxidant properties and free radical-scavenging activity of <i>Valeriana jatamansi</i>	19.19	Chief Executive Officer, NMPBH, New Delhi – 110 001
6.	Dr. Ranbir S. Rana	Climate Change Project in National Mission for Sustaining Himalayas Ecosystem (NMSHE)	184.23	National Action Plan on Climate Change
7.	Dr. Ranbir S. Rana	Impact Assessment adaptations and mitigation options of climate change in North western Himalayas	64.46	TIME LEARN Programme of DST

## V. Research Highlights

**Research highlight-1** The department of Chemistry & Biochemistry in collaboration with IHBT, Palampur has submitted 6 gene sequences to embl database and received accession number

S.No.	Organism	GenBank	Accession No.
1	Cucumber mosaic virus CP gene for coat protein, isolate Valeriana	HG425124.1	HG425124
2	Cucumber mosaic virus MP gene for Movement protein, isolate Ghatasni	HG965233.1	HG965233
3	Cucumber mosaic virus CP gene for Coat protein, isolate Ghatasni	HG965232.1	HG965232
4	Cucumber mosaic virus CP gene for Coat protein, segment RNA3, isolate Palampur	HG965234.1	HG965234
5	Cucumber mosaic virus MP gene for Movement protein, segment RNA3, isolate Palampur	HG965235.1	HG965235
6.	Cucumber mosaic virus MP gene for Movement protein, segment RNA3, isolate Palampur (Billing)	HG965236.1	HG965236

### **Research highlight-2**

Molecular characterization of infecting viruses from the samples showed that *Cucumber mosaic virus* and *Bhendi yellow vein mosaic virus* were frequently present in *Valeriana*. To characterize them further, the complete nucleotide sequences gene of CP and MP genes of the infecting *Cucumovirus* (RNA virus) and partial DNA-A of begomoviruses (DNA virus) were obtained. Bir/Billing isolate belongs to subgroup II and Herbal garden CSIR-IHBT and Ghatasni isolate belonged to subgroup I and these groups showed mild and severe symptoms, respectively. **Partial DNA-A of Ghatasni isolate showed  $\leq 98\%$  identity with all other BVYMV sequence available in Gene Bank, which is the first report of begomovirus infection from *Valeriana*.**



**Research highlight-3** variation in biochemical constituents of buck wheat, chenopod and adzuki bean genotypes

Biochemical evaluation of 29 genotypes of buckwheat, 28 genotypes of chenopods and 27 genotypes of adzuki bean obtained from NBPGR, Phagli, Shimla was carried out for following quality parameters by following standard procedures and the pertinent data is presented as under:-

**1. Variation in crude protein, total phenol and minerals content of buckwheat genotypes**

The crude protein, total phenols, calcium, iron, potassium and sodium content in buckwheat genotypes varied from 10.5 to 14.0%, total phenols 130 to 270 mg/100, 56.8 to 98.5 mg/100, 3.0 to 7.6 mg/100, 1.2 to 3.4 mg/100 and 1.9 to 4.8 mg/100, respectively.

The genotype(s) PRB-1 & VL-7 in crude protein; EC-341661 & IC-276627, in total phenols; IC-329194, EC-329495 & IC-026598 in calcium; IC- 036914 & EC-329495 in iron; IC-286396 & EC- 329200 in potassium & VL-7; EC-329200 in sodium content were adjudged superior over the rest.

**2. Variation in crude protein and minerals content of Chenopods genotypes**

Average range of crude protein, calcium, iron, potassium and sodium content in chenopod genotypes were found to be 14.0 to 17.8%, 166 to 506 mg/100, 277.7, 5.4 and 2.9 mg/100g in that order. The minimum and maximum values for crude protein, calcium, iron, sodium and potassium content in chenopod genotypes were observed in 14.0(IC-258332) to 17.8%(NC-58233), 166(IC-109249) to 506(IC-109235), 7.3(NIC-22489) to 13.0mg/100g(IC-341704), 1.6(EC-359449) to 3.2mg/100g(NIC-22498) and 1.5(NIC-22489) to 7.7mg/100g (IC-109235) in that order.

**3. Variation in crude protein and total phenol content of Adzuki bean genotypes**

The crude protein and total phenol content in adzuki bean genotypes ranged from 20.5 to 23.6% and 140 to 275 mg/100g, accordingly. The genotype(s) IC-087071, IC-000249, IC-080850 & IC-340245, IC-341941 in total phenol and IC-008707, IC- 000249 & EC-340245 in crude protein emerged promising genotypes over others, in that order. Average crude protein and total phenol content in adzuki bean genotypes was found to be 23.6% and 275 mg/100g, respectively.

**Research highlight-4** Monitoring of pesticide residues in vegetable crops

- Total 106 vegetable samples were analysed in Kangra district for different pesticides . Among organochlorines, residues of aldrin (19 samples), heptachlor (2 samples),  $\beta$ -HCH (2 samples),  $\delta$ -HCH (2 samples) and  $\gamma$ -HCH (1 sample) were detected in 26 vegetable samples. Organophosphate group based pesticides, malathion (1 samples), ethion (3 samples) and chlorpyrifos (2 samples) were found in total six samples. 17 Samples showed presence of herbicides i.e. alachlor (11 samples) and metribuzin (6 samples). Bifenthrin, a synthetic pyrethroids insecticide was present in eight vegetable samples. Out of those , 12 samples showed presence of pesticide residues levels above MRL values.
- Out of 57 contaminated samples with dithiocarbamate based fungicides, levels of residues in 14 samples were found to be above prescribed MRL values.

**Research highlight-5** Conservation Microbial diversity  
Nucleotide sequences of Indigenous isolates

During the period under report, the following nucleotide sequences of 20 yeasts and 32 bacteria isolated from different sources of Himachal Pradesh were submitted:

**Nucleotide sequences of different microorganisms submitted to NCBI, USA**

S.No.	Organism	Gene	Accession No.
1	<i>Saccharomyces cerevisiae</i>	ADH1	KF429720
2	<i>Saccharomyces cerevisiae</i>	ADH1	KF429721
3	<i>Saccharomyces cerevisiae</i>	ADH1	KF429722
4	<i>Saccharomyces cerevisiae</i>	ADH1	KF429723

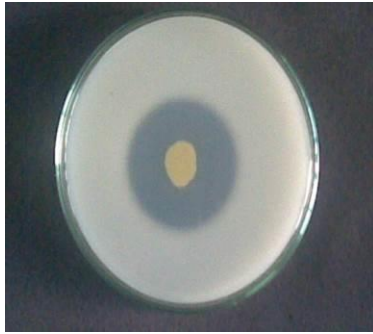
5	<i>Saccharomyces cerevisiae</i>	ADH1	KF429724
6	<i>Saccharomyces cerevisiae</i>	ADH1	KF429725
7	<i>Saccharomyces cerevisiae</i>	ADH1	KF429726
8	<i>Saccharomyces cerevisiae</i>	ADH1	KF429727
9	<i>Saccharomyces cerevisiae</i>	ADH1	KF429728
10	<i>Saccharomyces cerevisiae</i>	ADH1	KF429729
11	<i>Saccharomyces cerevisiae</i>	ATF1	KF429730
12	<i>Saccharomyces cerevisiae</i>	ATF1	KF429731
13	<i>Saccharomyces cerevisiae</i>	ATF1	KF429732
14	<i>Saccharomyces cerevisiae</i>	ATF1	KF429733
15	<i>Saccharomyces cerevisiae</i>	ATF1	KF429734
16	<i>Saccharomyces cerevisiae</i>	ATF1	KF429735
17	<i>Saccharomyces cerevisiae</i>	ATF1	KF429736
18	<i>Saccharomyces cerevisiae</i>	ATF1	KF429737
19	<i>Saccharomyces cerevisiae</i>	ATF1	KF429738
20	<i>Saccharomyces cerevisiae</i>	ATF1	KF429739
21	<i>Bacillus aquimaris</i>	16SrRNA	KJ024368
22	<i>Bacillus aquimaris</i>	16SrRNA	KJ024369
23	<i>Bacillus vietnamensis</i>	16SrRNA	KJ024370
24	<i>Bacillus vietnamensis</i>	16SrRNA	KJ024371
25	<i>Enterobacter cloacae</i>	16SrRNA	KF498699
26	<i>Enterobacter ludwigii</i>	16SrRNA	KF429740
27	<i>Enterobacter cloacae</i>	16SrRNA	KF498698
28	<i>Bacillus pumilus</i>	16SrRNA	KJ438145
29	<i>Bacillus pumilus</i>	16SrRNA	KJ438146
30	<i>Arthrobacter pascens</i>	16SrRNA	KJ438147
31	<i>Pseudomonas brassicaceaurm</i>	16SrRNA	KJ438148
32	<i>Bacillus aryabhatai</i>	16SrRNA	KJ438149
33	<i>Thermoactinomyces vulgaris</i>	16SrRNA	KJ862845
34	<i>Bacillus subtilis</i>	16SrRNA	KJ78117
35	<i>Bacillus cereus</i>	16SrRNA	KJ78118
36	<i>Bacillus thuringiensis</i>	16SrRNA	KJ78119
37	<i>Bacillus mojavensis</i>	16SrRNA	KJ78120
38	<i>Bacillus tequilensis</i>	16SrRNA	KJ78121
39	<i>Bacillus axarquiensis</i>	16SrRNA	KJ78122
40	<i>Bacillus amyloliquefaciens</i>	16SrRNA	KJ78123
41	<i>Bacillus methylotrophicus</i>	16SrRNA	KJ78124
42	<i>Bacillus pumilis</i>	16SrRNA	KJ78125
43	<i>Bacillus subtilis</i>	16SrRNA	KJ78126
44	<i>Bacillus cereus</i>	16SrRNA	KJ78127
45	<i>Bacillus cereus</i>	16SrRNA	KJ78128
46	<i>Bacillus thuringiensis</i>	16SrRNA	KJ78129
47	<i>Enterococcus faecium</i>	nhaA	KJ569453
48	<i>Bacillus aquimaris</i>	nhaA	KJ569457
49	<i>Enterobacter ludwigii</i>	nhaA	KJ569455
50	<i>Enterobacter cloacae</i>	nhaA	KJ569454
51	<i>Enterobacter cloacae</i>	nhaA	KJ569458
52	<i>Bacillus aquimaris</i>	nhaA	KJ569456

In addition, the Department has also submitted seven bacterial and eleven yeast isolates of Himachal Pradesh which were agriculturally important were submitted to National Bureau of Agriculturally Important Microorganisms, Mau Nath Bhanjan, UP.

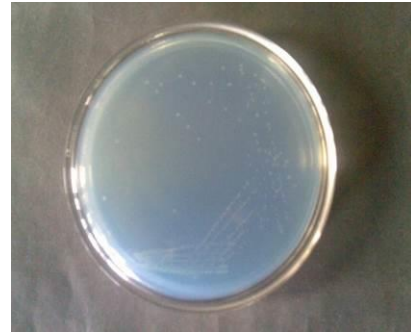
<b>Research highlight-6 Biofertilizer</b>
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### Liquid Biofertilizers

In view of the advantages of liquid biofertilizer over solid carrier based formulations, Department of Microbiology, College of Basic Sciences, CSKHPKV has prepared formulation with indigenous microorganisms identified as *Stenotrophomonas maltophilia*, *Bacillus licheniformis*, *Azospirillum brasilense*, *Azospirillum brasilense*, *Pseudomonas aeruginosa* and *Burkholderia cepacia* using Matka khad as liquid carrier. Formulation was found to be effective in sustaining the required number of organisms under stress conditions like temperature, pH and desiccation. This formulation was then tested on vegetables crop i.e. tomato under protected cultivation and found that seeds treated with biofertilizer significantly increased the growth and quality of crop over control and other treatments.



**P- solubilization by *Burkholderia cepacia*  
*Azospirillum brasilense***



**Nitrogen fixing**

### Mass cultivation of Plant Growth Promoting Rhizobacteria of Himachal Pradesh in a formulated medium for liquid biofertilizer

A cheap medium was formulated by adopting One Variable at a Time approach (OVAT) followed by Response Surface Methodology (RSM). The best carbon source was molasses. Growth conditions for mass cultivation of these bacteria were standardized in a fermenter and interaction of one organism over the growth of other was also studied.

### Installation of 100 liters Fermenter

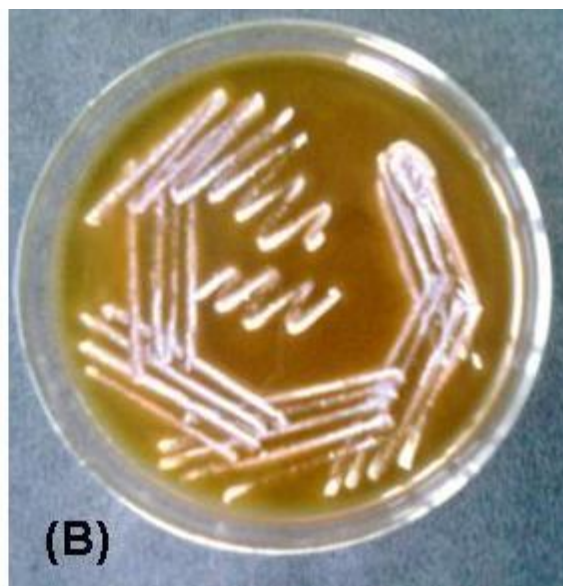
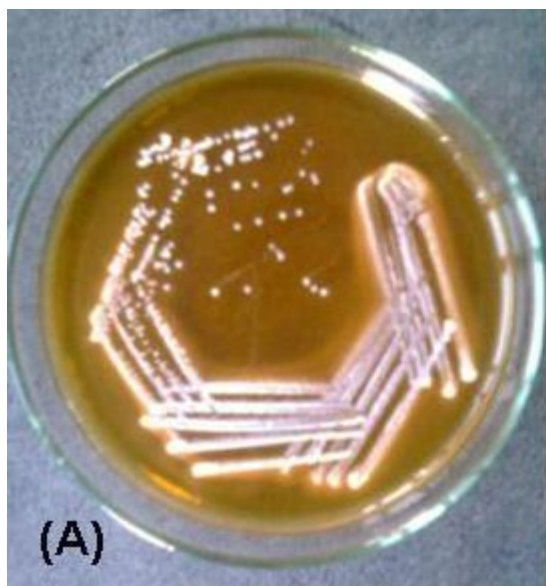
For mass cultivation of microorganisms to be used in the preparation of liquid biofertilizers, , 100 liters fermenter has been installed in the Department as Pilot Plant Unit with a total cost of Rs. 76.00 lakhs under the RKVY Project.



### **Research highlight-7 Food Microbiology**

#### **Probiotic potential of indigenous isolates obtained from traditional fermented foods of Himachal Pradesh**

Out of 102 bacteria, 11 bacterial isolates i.e. ADF1, ADF2, ADF3, ADF4, ADF5, ADF6, ADF7, ADF8, ADF9, ADF10 and ADF11 were found positive for various probiotic traits. The antagonistic activity of these selected bacterial isolates was tested against pathogenic organisms *Listeria monocytogenes*--MTCC 839 and *Staphylococcus aureus*-MTCC 96. The antagonistic substance produced by most of the bacterial isolates was characterized as bacteriocin like inhibitory substances. All the selected bacterial isolates were tested for bile salt deconjugation activity in presence of different glycine and taurine conjugated bile salts. All bacterial isolates expressed  $\beta$ -Galactosidase enzyme activity as detected by qualitative and quantitative methods. All the isolates except Adf7 and Adf8 showed cholesterol reduction.



## **Precipitation of bile salts through deconjugation activity of probiotic bacterial isolate (AdF2)**

### **Protective Attributes of indigenous Probiotics**

Eleven indigenous potential probiotic bacteria were screened for their functional and protective attributes. Eight out of eleven indigenous probiotics were able to inhibit the activity of genotoxins (4-NQO and furazolidone). On the basis of *in vitro* antigenotoxic and antimutagenic attributes, *Lactobacillus plantarum* and *Lactobacillus rhamnosus* GG (LGG) were found to be the best and tested for *in vivo* anticarcinogenic potential during 1, 2-dimethylhydrazine (DMH) induced colon carcinogenesis in rats. A significant reduction in total sialic acid (TSA) and  $\beta$ -glucuronidase activity was observed in DMH-treated animals supplemented with probiotics. Probiotics supplementation was also able to reduce the tumor incidences, tumor multiplicity and tumor size in DMH-treated groups. Probiotic supplementation to DMH-treated animals modulated protein expression of various genes involved in pathogenesis of colon cancer such as p53, p21, COX-1, COX-2 and GLUT 2. The probiotics supplementation was also able to modulate immune system and behavior of animals.

### **Testing of *Listeria* as a Food-borne Pathogen**

The prevalence of *Listeria* species in the meat and meat products of Himachal Pradesh was investigated. One hundred samples of meat and meat products like chicken, meat, fish and pork were collected from different regions of Himachal Pradesh and were analyzed for the presence of *Listeria* Spp. by using standard techniques. Overall 50 *Listeria* like isolates were obtained and eleven were identified as *Listeria* species on the basis of morphological and biochemical characteristics. Above 11 isolates were further screened for their pathogenic potential by using hemolysis and CAMP tests, and 5 were found to be *Listeria monocytogenes*. On the basis of PCR assay by using *Listeria* specific primer targeting virulence gene *hlyA* and 16S rRNA sequencing, these five 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*, *Lactobacillus fermentum* and *Lactobacillus plantarum* which was almost at par with the reference strain.

### **Exopolysaccharide Production**

Eleven potential probiotic bacteria isolated from traditional fermented foods of Himachal Pradesh were screened for exopolysaccharide (EPS) production. Three out of 11 isolates *viz.*, AdF1, AdF2, and AdF3 (strains of *Enterococcus faecium*) were found positive for EPS production. In quantitative analysis AdF3 showed highest EPS production (0.737 mg/mL), followed by AdF2 (0.650 mg/mL) and AdF1 (0.557 mg/mL). Five parameters *i.e.* carbon source, nitrogen source, pH, temperature and incubation time were optimized by using One Variable at a Time approach (OVAT) followed by Response Surface Methodology (RSM) for EPS production. Under optimized conditions, an overall increase of 1.55, 1.37 and 1.42 folds in EPS production was observed with AdF1, AdF2 and AdF3, respectively.

### **Research highlight-8 Impact of climate change on mountain Agriculture**

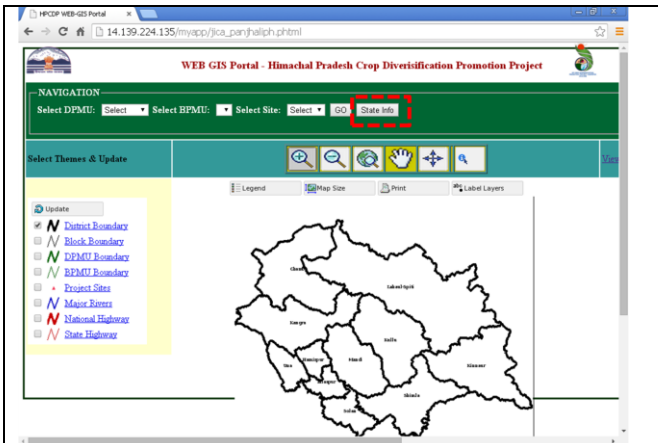
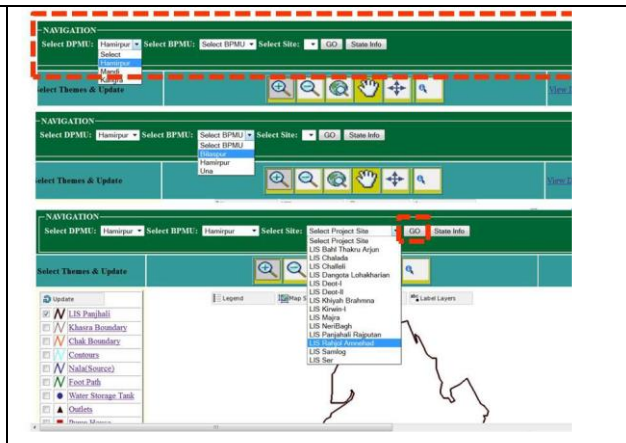
Three Climate change awareness programme has been conducted at Kinnaur, Mandi and Chamba. About 349 farmers and 21 faculty and civil society members participated in the melas. In all three places PRA was conducted for documenting and validating climate resilient practices. The geospatial data from Carosat-1 was used to develop the DEM of the state

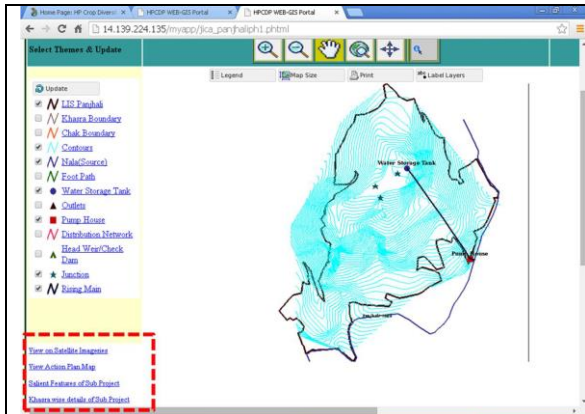
### **Research highlight-9 Thematic paper on Climate Change and Agriculture in Himachal Pradesh;**

The thematic paper on agriculture has been prepared and draft submitted to DEST Shimla and Embassy of Switzerland New Delhi. The various issues related to impacts, and adaptation of climate change has been has been documented.

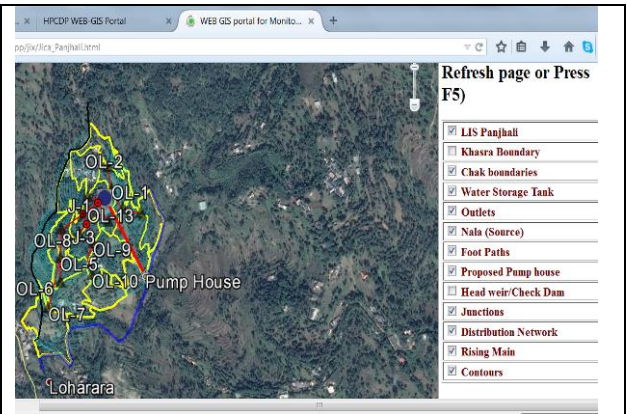
### **Research highlight-10 Establishment of GIS & MIS and Monitoring System**

Web GIS Portal for Himachal Pradesh Crop Diversification Project (HPCDP) developed by CGRT, CSKHPKV-Palampur contains spatial and attribute information of the 1<sup>st</sup> and 2<sup>nd</sup> priority project sites spread over 5 districts namely Kangra, Mandi, Bilaspur, Una and Hamirpur of Himachal Pradesh. Georeferenced layers namely Project Site boundary, Chak boundary, Khasra boundary, Contours, Source (Nala/River), Check Dam, Power House, Main Channel, Distribution Network, Outlets etc are being generated and uploaded on web portal regularly. All drawings of the assets to be created, action plan maps, salient attributes of project sites, khasra-wise details of project sites along with attribute data of all the layers are also available on the portal for the DPRs being provided by HPCDP, ODA, Hamirpur (HP). All these layers can be interactively explored along with their attribute data on the click of the 'i' tool. These layers can be labeled for different parameters like Name, Cost, Ownership etc as the case may be. Helpfile for HPCDP Website Portal provides whole interactive walkthrough the portal. The web Portal link is [http://14.139.224.135/myapp/jica\\_panjhaliph.phtml](http://14.139.224.135/myapp/jica_panjhaliph.phtml)

	
<p><b>STATE INFO</b></p> <p>The page will open with State Info as default page having District Boundaries of Himachal Pradesh. Other State level single layer (multiple layers) may be opened by marking the check box (boxes) and clicking Update</p>	<p><b>PROJECT SITE INFO</b></p> <p>To go to a particular project site, In the NAVIGATION pane, first of all select respective DPMU, then respective BPMU and then respective Project Site and then strike Go button. The outer boundary of the Project Site will get displayed as default.</p>



**ADDITIONAL INFORMATIONS** In addition to the layers, there are following information available  
 LIS Panjhal on Satellite Imagery  
 Action Plan Map of LIS Panjhal  
 Salient Features of LIS Panjhal  
 Khasra wise details of LIS Panjhal  
 Helpfile for HPCDP Website



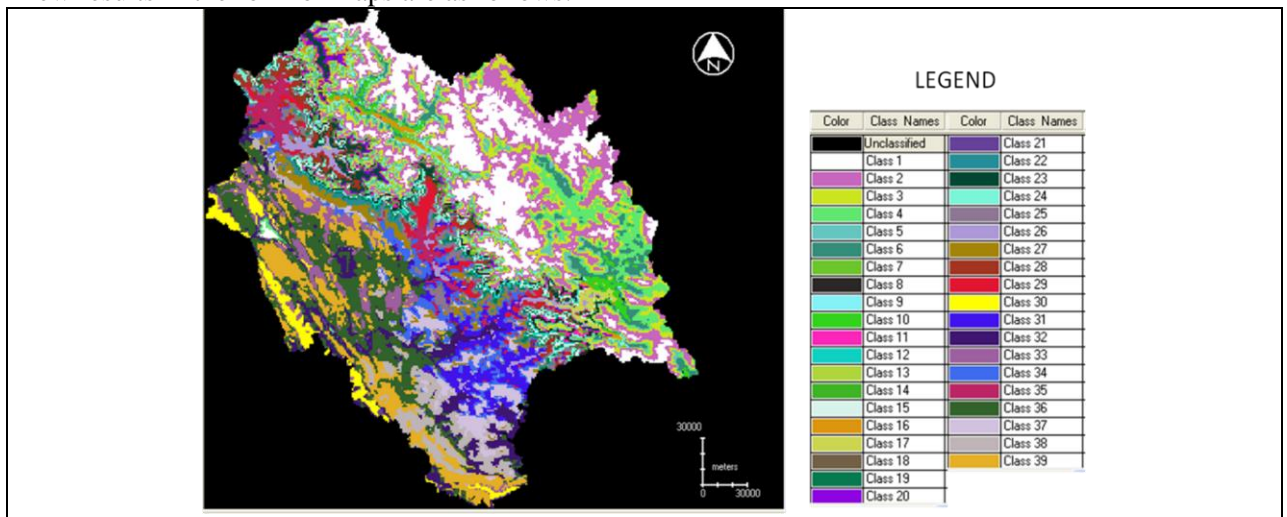
**PROJECT SITE ON SATELLITE IMAGERY**  
 By clicking on the respective links, respective information shall be displayed. e.g by clicking on LIS Panjhal on Satellite Imagery displays layers in LIS Panjhal on Satellite imagery / Google Earth.

**Research highlight-11 Spatial disaggregation of agricultural statistical data & food security analysis through SPOT VEGETATION datasets for a mountainous state of H.P**

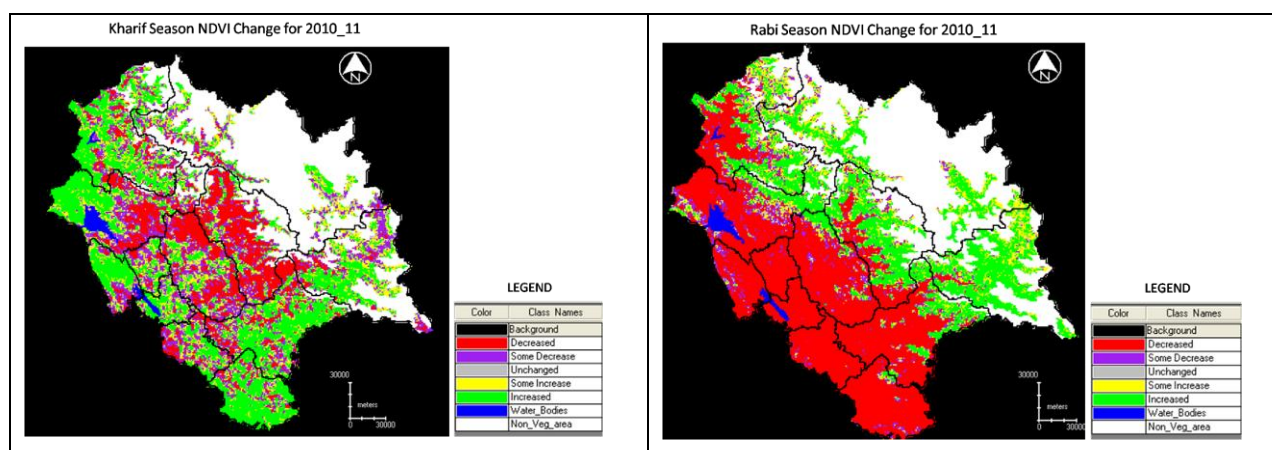
Objectives of the Study:

1. Spatial disaggregation of Agricultural statistical data (area & production)
2. Quantify biomass through NDVI approach & relate it with climatic data for food security or early warning & production assessment.

Few results in the form of maps are as follows:



NDVI Unit Map of Himachal Pradesh with 39 classes and 1 sq.km spatial resolution



It is definitely an integrated index that captures the variability of the real situation while not explaining exactly what the true differences are or why they are different. The intermediate legend consists only of NDVI-profiles that are indicative of when what (which mix) is where. Considering the low spatial resolution of the input imagery, the NDVI-profiles almost always represent land cover/use complexes. Only use of additional data will translate the intermediate legend into a practical and informative legend.

### **Research highlight-12 Forecasting Agricultural Output Using Space, Agro Meteorology and Land Based Observations (FASAL) (2013-14) (Fasal)**

#### **Maize:**

- Crop yield forecast for maize crop predicted for district Una and Hamirpur using statistical models. Crop yield forecasting carried out for four districts (Hamirpur, Kangra, Chamba and Una districts) for *kharif* season maize crop and *rabi* season wheat crop of Himachal Pradesh. Higher pre-harvest maize yield of 1928.4 kg/ha was predicted for the Una district followed by Kangra district i.e. 1570.3 kg/ha. The yield of wheat crop 1948.6 kg/ha was predicted for the Una district with an error %age of -6.3. The pre-harvest forecast obtained for wheat in Kangra district was 1532.7 kg/ha with an error %age of 1.2 and R-square values ranged between 0.66 and 0.79. The forecast obtained through the statistical model analysis was submitted in the Union Ministry Budget which was acceptable at National level. The low yield obtained during some of the years in district Hamirpur, variations were obtained in the forecast model leading to a higher error percentage.
- The Info crop simulation model was validating for new crop varieties for wheat crop and pre harvest forecasting model for district Kangra. The data of production and area for maize and wheat at district scale shall be used for validating the simulation yield predictions and statistical models. The model predicted 12 percent variation in actual yield and predicted.

#### **Wheat Field experiment:**

- The field experiment on “Modeling and forecasting yield of wheat for Kangra District of Himachal Pradesh was conducted during *Rabi* 2011-12 and 2012-13 comprising of four dates of sowing *viz.* October 20, November 10, November 30 and December 20, and three genotypes *viz.* HPW-249, HPW-155 and HPW-42 in silty clay loam, acidic soil, medium in available nitrogen, phosphorus, organic carbon and high in potassium. The growth and yield attributes *viz.* plant height, number of tiller m<sup>-2</sup>, number of grains tillers<sup>-1</sup> and 1000-grain weight were highest in variety HPW-249 during both the years. Amongst sowing environments, October 20 sown crop gave significantly highest values of growth and yield attributes during both the years. In the present investigation it was concluded that early sown crop averaged over two years took 35, 25 and 24 more days for maturity, heading and



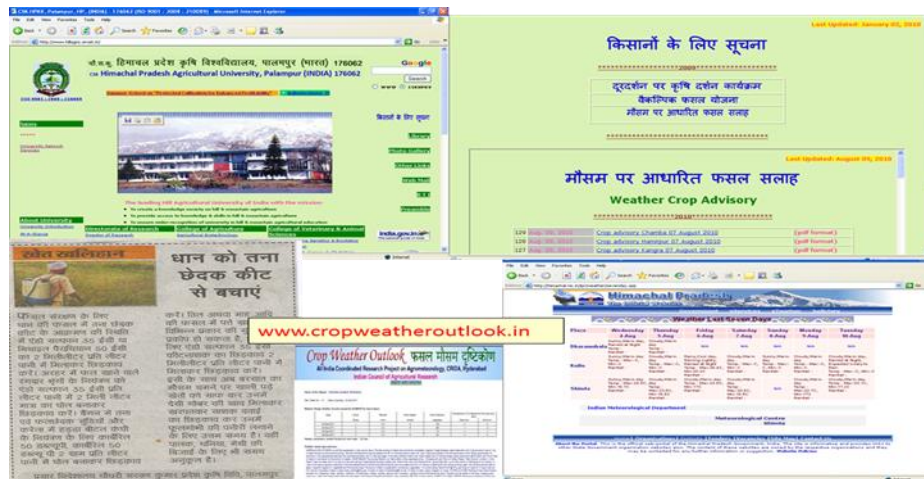
vegetative stages, respectively compared to with sowing delayed up to December 20. The decrease in grain yield averaged over two years was 3.4 percent in November 10, 7.9 percent in November 30 and 19.6 percent in December 20 sown crop compared to October 20 sown crop. The variety HPW-249 out yielded all other varieties whereas yields of HPW-155 and HPW-42 was at par with each other. The economic returns and benefit cost ratio were also significantly highest in HPW-249. Likewise, grain yield, net returns and B: C ratio was significantly highest in 20<sup>th</sup> October sown crop compared to subsequent dates of sowing. The agrometeorological indices indicated more values for October 20 to November 30 sown crops and lowest values in late sown crop. The simulated LAI, dry matter accumulation, grain yield, days to physiology maturity and vegetative stage matched closely with observed values for all sowing environments. The RMSE values for grain yield were 258 kg ha<sup>-1</sup> in 2011-12 and 302 kg ha<sup>-1</sup> in 2012-13. The model performance was somewhere under estimated or overestimated but found within acceptable limits. The predicted yields of wheat using validated statistical regression model indicated 1.5, 15.2 and 3.7 percent deviation at mid season (F2) stage during 2009-10, 2010-11 and 2011-12, respectively and 1.3, 10.9 and 2.0 percent errors during 2009-10, 2010-11 and 2011-12 at pre-harvest stage. The yield was more reliable in pre-harvest (F3) stage of district Kangra.

- **Maize Experiment:** The field experiment on Maize was completed during Kharif 2013 and second year experiment has been planted in order to validate new crop varieties for maize crop and pre harvest forecasting model. The experiment is conducted to develop the yield forecast mechanism for maize crop in four district of H.P ( Chamba, Kangra, Hamirpur and Una) .

#### **Research highlight-13 GRAMIN KRSIHI MAUSAM SEWA**

*(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. The reliability of rainfall forecast was different for districts. The reliability was higher during post monsoon season. For all the districts accuracy for maximum and minimum temperature was more than 50 percent for all the season. The accuracy for wind speed forecast was more than 90% in all the seasons. Whereas, the wind direction reliability was found lower in all the seasons for all the districts.
- The total 96 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. 269 Messages aired every week to 5000/ farmers since June 2012 to June 2013 under the services in Himachal Pradesh sent by IFFCO Kisan Seva.



## VI. RESEARCH PUBLICATIONS

### A. Paper Published

- Singh, V. and R.Gupta 2014. Micropropagation of seabuckthorn (*Hippophae spp* L.). *Int. J. Med. Arom. Plant* 6 (2): 131-139.
- Singh, K.P. and Angiras, N.N. (2012): Seed production potential of major weeds in different cropped and uncropped ecosystems under north western Himalayas. *Annals of Plant Physiology* 26(1): 8-10 (released in June 2014).
- Srihari, J.M., B. Verma, N. K, R. K. Chahota, V. Singh, R. Rathour, Sunil K. Singh, S. K. Sharma and T. R. Sharma 2013. Analysis of molecular genetic diversity and population structure in sea buckthorn (*Hippophae spp* L.) from north-western Himalayan region of India. *Journal of Medicinal Plants Research* 7 (43): 3183-3196.
- Usha Rana and Sapan Kumar 2011. Morphophysiological criteria for drought tolerance in wheat (*Triticum aestivum* L). *Annals of plant Physiology*. 25 (2):148-152.
- Usha Rana and Sonika Chaudhary. 2013. Physiological evaluation of Brassica species differing in drought tolerance. *Indian Journal of Agricultural Research*. 47 (3): 200-206.
- Usha Rana and Sumita Rana 2013 Biochemical responses of brown sarson (*Brassica campestris* L.) genotypes to water stress under mid hill conditions. *International Journal of plant Sciences* 8(2):385-390.
- Mandakini and Singh, K.P (2013) Physiological studies of growth, development and yield in wheat. *Journal of Environment and Biosciences* 27) 197-200
- Kaundal Arti and Singh. K.P (2013) Physiological analysis of yield variation in soybean under north western Himalayas. *Journal of Environment and Biosciences* 27(2): 215-17.
- Singh, K.P. (2013) Agro physiological impact of Eupatorium (*Chromolaena adenophorum*) compost on growth and productivity of wheat under north western Himalayas. *Journal of Environment and Biosciences* 27 (2): 207-209.
- Chopra, P. Angiras, N.N. Kumar S and Singh K.P. (2013) Phenology of Maize (*Zea mays* L.) and associated weeds as influenced by tillage and weed control methods under mid hill conditions of north western Himalayas. *Journal of Ecophysiology and Occupational HEALTH* 13 (3&4): 13-19.

- Shalini Rana and Anita Singh Effect of organic manures on morphological and biochemical parameters of different Aloe species. *Journal of Scientific and Applied Research*. Accepted for publication.
- Sharma Neelam, Sharma Swati, Kumar Suresh and Joshi Robin 2013 Dissipation and harvest time residue studies of 2,4-D in soil and wheat crop. *Indian Journal of Weed Science* Vol 45(1) 68--70
- Kumar Suresh, Rana S.S., Chander Navell and Sharma Neelam 2013 Integrated weed management in garlic. *Indian J. Weed Sci.* Vol 45(2) 126-130
- Sharma Neelam, Reetu and Thakur Nitasha. 2013 Persistence studies of Pretilchlor in soil and its terminal residues in rice crop. *Pesticide Research Journal* Vol. 25(2): 177-180.
- Sharma Neelam, Kumar Suresh, Chopra Pankaj, Joshi Robin and Thakur Nitasha 2013 Residues of dithiocarbamate based fungicides in vegetable crops of Himachal Pradesh *Ne bio* Vol 4 (7)
- Sharma Neelam, Sharma Swati and Nitasha Thakur. 2014 influence of 2, 4-D application on chlorophyll and sugar content in wheat leaves and its relationship with grain sugar content *J. Env. Bio-Sci.*, 2014: Vol. 28 (1): 1-3
- Walia S, Keshani, Sood S, Kanwar SS. (2014) Exhibition of DNA-bioprotective activity by microflora of traditional fermented foods of North-Western Himalayas. *Food Research International* 55: 176-180
- 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 of Microbiology* 44:709-715
- Kanwar SS and Keshani (2014) Bio-prospecting of indigenous yeast isolates of fermented foods of North-Western Himalayas. *Advances in Industrial Biotechnology*. Ram Sarup Singh, Ashok Pandey & Christian Larroche (Eds.) *IK International Publishing House Pvt. Ltd., India*, pp 180-195 (ISBN 978-93-82332-76-3)
- Kanwar SS and Keshani (2014) Microbial colors: the new generation additives. *Applied Microbiology*. Sampat Nehra (Ed.). *Pointer Publishers*, pp 11-21 (ISBN 978-81-7132-767-6)
- Walia S, Kamal R, Kanwar SS and Dhawan DK. (2014) Cyclooxygenase as a target for chemoprevention by probiotics during 1,2-dimethylhydrazine induced colon cancer. *Nutrition and Cancer- An International Journal* (under revision).
- Keshani, Sharma PN, Sharma KD and Kanwar SS. (2014) Molecular and functional diversity of *Saccharomyces cerevisiae* strains of traditional fermented foods of North-Western Himalayas. *Yeast* (under review).
- Ranbir Singh Rana Sharda Singh, Navell Chander, and Ruchi Sood, 2013. Impacts of changes in climate on mountain water resources of Himachal Pradesh. *MAUSAM*, 65, 2 (April 2014), 153-160. (Impact Factor=6.14\_2014)
- Ranbir Singh Rana, RM Bhagat, Vaibhav Kalia, Harbans Lal & Vijayshri Sen. 2013. Indigenous perceptions of Climate change vis-a-vis Mountain Agricultural activities in Himachal Pradesh, India. *Indian Journal of Traditional Knowledge* Vol.12 (4), October 2013, pp.596-604 (Impact Factor =6.8\_2013).
- Ranbir Singh Rana, Ruchi Sood, Aditya and J Shekhar, 2013. Validation of medium range weather forecasts in sub-temperate and sub-humid climate of western Himalayas. *Indian Journal of Agricultural Sciences*. Vol.83 (12):1357-63 pp 81-87 (Impact Factor=6.6\_2013).

## B. Papers Presented in Conferences and Workshops

- Usha Rana and Meena Kumari. 2014. Screening of common bean (*Phaseolus vulgaris* L.) genotypes for drought tolerance based on physiological indices. Paper presented In ISTS-IUFRO Conference on “Sustainable Resource Management for Climate Change Mitigation and Social Security” held from 13<sup>th</sup> March to 15<sup>th</sup> March, 2014 at IT Park, CHANDIGARH Abstract pp 31.
- Sharma Neelam, Kumar Suresh, Chopra Pankaj, Joshi Robin and Thakur Nitasha 2013 Residues of dithiocarbamate based fungicides in vegetable crops of Himachal Pradesh Paper presented in National Conference on Biodiversity and Environment of India held on 6<sup>th</sup> October, 2013 org. by NECEFR, Imphal in association with Modern college Of arts, Science and Commerce, Shivanagar, Pune and MSA, Pune
- Badiyala, D Kumar Suresh and Sharma, Neelam 2014 Studies on herbicides combinations for control of complex weed flora in direct seeded rice under mid hill condition in HP. Paper presented in Biennial Conference on Emerging Challenges in weed management 15-17 Feb, 2014 org. by Indian Society of Weed Science at DWSR Jabalpur (MP)
- Kanwar S.S. and Natasha, Thakur Sapana, Sood Gaurav and Gupta M.K. (2014) Evaluation of plant growth promoting and biocontrol potential of microbial diversity present in various inputs used in organic farming systems. Proc. Of National Seminar on Organic Agriculture held at CSKHPKV, Palampur from May 28-29; pp 80-84
- Natasha, Gupta M.K and Kanwar S.S. (2014) Anaerobic microbial diversity of cow horn manure in exhibiting plant growth promoting traits. Proc. Of National Seminar on Organic Agriculture held at CSKHPKV, Palampur from May 28-29; pp 154
- Sharma Aakriti, Sharma Meghna, Kanwar S.S., Mane B.G. and Barbuddhe SB (2013) Biodiversity of *Listeria* spp in dairy and meat products of Himachal Pradesh and their interaction with indigenous probiotics. International Symposium on Problems of Listeriosis held on Sept. 19-22 at ICAR Research Complex for Goa, pp 71
- Sharda Singh, Kunal Sood, Arun Kaushal, Vaibhav Kalia and R S Rana. (2014) Paper entitled “Agriculture Geospatial Information Systems (AgGIS) for Himachal Pradesh: A mountainous state of India” presented in National conference on Role of statistics, Computer and applications in Women Empowerment (XVI Annual conference of society of statistics, computer and applications) held on 24-26 February, 2014 Organized by Bhagat Phool Singh Mahila Vishwavidyalaya Khanpur Kalan, Sonapat, Haryana (Abstract published in Souvenir pg 41)

## C. Technical Reports Submitted

- Sharda Singh, Vaibhav Kalia, Kunal Sood, Arun Kumar Consolidated Report of the Project “Integrated Geodatabase model for the effective planning of DRDA-Kangra” submitted to DRDA Kangra at Dharmshala (2010-2014)
- Sharda Singh, RS Rana, Vaibhav Kalia, Kunal Sood, Arun Kumar Bi-Annual Report for the Project “Establishment of GIS & MIS and Monitoring System –HP Crop Diversification Project, JICA, ODA” and “Walkthrough for HPCDP Website” Submitted to HPCDP, JICA, ODA, Hamirpur, (2012-14)
- Sharda Singh, RS Rana, Vaibhav Kalia, Devender Thakur Annual for the Project “Spatial disaggregation of agricultural statistical data & food security analysis through SPOT Vegetation datasets for a mountainous state of Himachal Pradesh” submitted to UGC, New Delhi (2013-2014)

- Ranbir Singh Rana, Annual progress report of project entitled “Seventh Annual Review Meeting of Integrated Agromet Advisory Services project held MPUAT, Udaipur (2013-14)
- Ranbir Singh Rana, Suresh Kumar Sharma and Bhupinder Singh Mankotia. Annual Project report Forecasting Agricultural Output using Space, Agro meteorology and Land based observations (FASAL). (2013-14)
- Department of Chemistry & Biochemistry submitted Annual Progress Report of AICRP on underutilised crops.
- Department of Chemistry & Biochemistry submitted Annual Progress Report of UGC Adhoc Project.
- Department of Chemistry & Biochemistry submitted Mid Term Evaluation Report of UGC Project.
- Department of Chemistry & Biochemistry submitted Annual Progress Report of AICRP on Weed Control

## VII. WORKSHOPS/ SEMINARS/ TRAINING PROGRAMMES ATTENDED

- Dr. Anita Singh attended workshop on awareness and use of e-Granth products strengthening of digital library and information management on 7th December 2013 held at CSKHPKV, Palampur.
- Dr. Sharda Singh, attended National conference on Role of statistics, Computer and applications in Women Empowerment ( XVI Annual conference of society of statistics, computer and applications) held on 24-26 February, 2014 Organized by Bhagat Phool Singh Mahila Vishvavidyalaya Khanpur Kalan, Sonapat, Haryana
- Prof. Virendra Singh presented paper and also chaired a session in “International Seabuckthorn Association’s Conference”, October 14-17, 2013, Potsdam, Germany
- Dr. Neelam Sharma attended and Participated in Agricultural Officers workshop on rabi crops-2013 held on 21.9.2013, organized by DEE, CSKHPKV, Palampur.
- Dr. Neelam Sharma attended and Chaired a session & also presented an oral paper in a National Conference on Biodiversity and Environment of India held on 6<sup>th</sup> October, 2013 held at Pune organized by NECEFR, Imphal in association with Modern college Of arts, Science and Commerce, Shivanagar, Pune and MSA, Pune
- Dr. Neelam Sharma attended one day workshop on awareness and use of e-granth products for faculty of CSKHPKV, Palampur on December 7, 2013.
- Dr. Neelam Sharma attended Annual Group meeting of All India Co-ordinated Project on Weed Control on 12-14 February, 2014 held at Directorate of weed Science Research, Jabalpur (MP)
- Dr. Neelam Sharma attended Biennial Conference on emerging Challenges in weed management 15-17 February, 2014 Organized by Indian society of weed Science at DWSR, Jabalpur (MP)

## VIII. BOOKS/ BOOK CHAPTERS

### i) Book:

- Singh, V. 2014. Seabuckthorn-A Multipurpose Wonder Plant-Vol. IV. Emerging Trends in Research and Technologies. Daya, Publishing House, New Delhi, 617p.

- Sharma, Neelam, 2014. Associate Editor of the book entitled ‘‘Seabuckthorn –A Multipurpose wonder Plant’’ Vol. IV Emerging Trends in Research & Technologies

**ii) Book Chapter:**

- Malik Sudha Sambyal and Chauhan Ramesh C.2014. Impact of Organic Farming in Enhancing the Soil Microbial Pool. In: Proceedings of I.G.U. Rothak Conference on Climate Change and Biodiversity Vol. I; Advances in Geographical and Environmental Sciences. (M.Singh et al. eds.); *Springer Japan*. P 183-196.
- Singh, V., Sonika Choudhary, R.K. Rana and L.K. Sharma 2014. Propagation Technologies of Seabuckthorn (*Hippophae rhamnoides* L.) from Softwood Cuttings. In: *Seabuckthorn-A Multipurpose Wonder Plant-Vol. IV. Emerging Trends in Research and Technologies*, pp.3-21, Daya, Publishing House, New Delhi, 617p.
- Singh, V. and Eury Zubarev 2014. Breeding strategies of Russian seabuckthorn varieties and their global introduction. In: *Seabuckthorn-A Multipurpose Wonder Plant-Vol. IV. Emerging Trends in Research and Technologies*, pp.71-88, Daya, Publishing House, New Delhi, 617p.
- Rana, R.K., Ashok Singh, Virendra Singh, L.K. Sharma, Reena Devi, Pankaj Katoch and Manohar Lal 2014. Seabuckthorn (*Hippophae* L.) Propagation and Plantation is a New Avenue to Farmers and Future Scope of Cultivation in Cold Desert Area of Himachal Pradesh, India. In: *Seabuckthorn-A Multipurpose Wonder Plant-Vol. IV. Emerging Trends in Research and Technologies*, pp.59-70, Daya, Publishing House, New Delhi, 617p.
- Sharma, V.K., A. Sharma, D. Wadhwa and Virendra Singh 2014. Seabuckthorn residue (Cake) feeding to the poultry birds and cattle calves for nutrients utilization and production. In: *Seabuckthorn-A Multipurpose Wonder Plant-Vol. IV. Emerging Trends in Research and Technologies*, pp.545-575, Daya, Publishing House, New Delhi, 617p.
- Vatsa, D.K. and Virendra Singh 2014. Development of Seabuckthorn Fruit Harvesting Tools and Devices. In: *Seabuckthorn-A Multipurpose Wonder Plant-Vol. IV. Emerging Trends in Research and Technologies*, pp.584-591, Daya, Publishing House, New Delhi, 617p
- Bose, C., N. Pandurangan, Virendra Singh\* and A. Banerji 2014. Isolation, Characterization and Chemical Fingerprinting of Bioactives from Indian Seabuckthorn (*Hippophae* L.) Species. In: *Seabuckthorn-A Multipurpose Wonder Plant-Vol. IV. Emerging Trends in Research and Technologies*, pp.262-274, Daya, Publishing House, New Delhi, 617p
- Sharma, A., Virendra Singh, Manohar Lal, Ashok Singh and S.P. Dixit 2014. Status of Soil Nutrients under Seabuckthorn (*Hippophae rhamnoides*) Vegetation in Lahaul Valley, Himachal Himalayas. In: *Seabuckthorn-A Multipurpose Wonder Plant-Vol. IV. Emerging Trends in Research and Technologies*, pp. 521-532, Daya, Publishing House, New Delhi, 617p.
- Tulsawani, R., Manimaran Manickam, Koganti Praveen, Kshipra Misra and Virendra Singh 2014. Anti-oxidative and Anti-inflammatory activities of *Hippophae rhamnoides* and *Hippophae salicifolia*: An *in vitro* and *in vivo* Comparative Study. In: *Seabuckthorn-Multipurpose Wonder Plant-Vol. IV. Emerging Trends in Research and Technologies*, pp. 427-441, Daya, Publishing House, New Delhi, 617p.

• **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 (PI cum Coordinator)	DST	Rs. 9.00	22.10.2013 to 26.10.2013
2.	INSPIRE Internship camp	-do-	DST	Rs. 9.00	12.11.2013 to 16.11.2013
3.	INSPIRE Internship camp	-do-	DST	Rs. 6.50	3.04.2014 to 7.04.2014

**B. Popular Articles**

- Ranbir Singh Rana, Ruchi Sood, Aditya.Yudhbir Singh Chauhan, and Navell Chander. Impact of climate change on vegetable crops production” Jalvayu paribartan ka sabji utpadan man prabhav” 2013 pp 15-16 Parvatiya Khetibari. Vol (3), July-August ,2013.
- Ranbir Singh Rana and Navell Chander, Sunil Kumar, Man Mohan Singh and Karan Verma. 2011 Symptoms and prevention of frost and winter impacts on crops ( Pale evam sardi se fasalon par hone vale nukshan: lakshan evam bchav ) Krishi Vistar Samiksha, July- September Issue , 2011 Vol. (03), DARE, Ministry of Agri., New Delhi ( Published in 2013)

**C. Organization of Summer Schools/workshops/seminars/symposia/Extension Activity/One day Awareness programme etc.**

- Dr. R.C. Chauhan organized one awareness cum technical training camp at Holi in Bharmour block on August, 21, 2013. Around about 66 farmers participated in the camp.
- Dr. R.C. Chauhan organized one Farmers awareness camp at Lahroo in Bhatiyat, block. Around about 71 farmers participated in the camp.
- Dr. V. Singh trained over 90 farmers in seabuckthorn cultivation during 5th to 6th August 2013 in Lahaul.
- Dr.(Mrs.) Neelam Sharma held field demonstrations to collect Samples from Farmer’s field for herbicide residue analysis.
- CGRT Organized 5<sup>th</sup> Regional Forecasting Agricultural output using Space, Agrometeorology and Land based observations (FASAL) Project review meeting at Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya (CSKHPKV), Palampur, Himachal Pradesh during 8-9 November, 2013. (28 participants from SAUs, IITs, IMD and ICAR.
- CGRT Organized International Consultation Workshop on Climate Change and Agriculture in Himachal Pradesh in collaboration with DEST Shimla, and Embassy of Switzerland, Chanakyapuri, New Delhi-110021at Holiday Home Shimla supported by Indian Himalayas Climate Change Adaptation Programme (IHCAP) under the Swiss Agency for Development and Cooperation (SDC),Climate Change and Development

programme section, Embassy of Switzerland, Chanakyapuri, New Delhi-110021- (40 Participants, Scientist from DEST, Embassy of Switzerland and research institution and Universities.

- CGRT Training programme to the GIS/MIS operators of HPCDP project on the operational functioning of establishment of MIS and spatial linkages to the GIS 01/02/2014.
- CGRT Satellite Based Learning Programme on “Remote Sensing, Geographical Information System and Global Navigation satellite system” sponsored by NNRMS, Department of Space, Govt of India & Organised by IIRS, Dehradun.
- CGRT Organized One day Awareness programme on “Weather, Climate and Farmers “Under RKVY Project” on 2.09.2013 at Village Lagga, District Chamba. About 104 farmers from Chamba and 6 Faculty, Media persons and civil society members participated in the seminar.
- CGRT Organized One day Awareness programme on “Weather, Climate and Farmers “Under RKVY Project” on 27.09.2013 at MARES, Sangla, District Kinnaur. About 112 farmers from Kinnaur and 9 Faculty, ATMA Media persons and civil society members participated in the seminar.
- CGRT Organized One day Awareness programme on “Weather, Climate and Farmers “Under RKVY Project” on 18.12.2013 at Village Bohar, Sundernagar, Distt Mandi. About (Total 141) 133 farmers from Mandi and 8 Faculty, SMS. ADOs, ATMA staff and Media persons participated in the seminar.
- CGRT organized one Stall in KRISHI MAHAUTSAV-2013.

#### **D. Lectures delivered by the Faculty Members**

##### **Dr. R.C. Chauhan**

- Was a Chief guest and delivered a lecture as a key speaker on International Biodiversity Day At GSSS, Banuri.

##### **Dr. Neelam Sharma**

- Delivered a lecture on Technology to control Parthenium to NSS volunteers of COA and NCC cadets of all four colleges on 16.8.13
- Delivered a lecture on Technology to control Parthenium to NSS volunteers of College of Basic Science, CSKHPKV, Palampur and NCC cadets of all four colleges on 17.8.13
- Delivered a lecture on Management technology to control Parthenium to farmers of village Dargela, Goju & Thamba Tehsil Shahpur Kangra on 19.8.13
- Delivered a lecture on Management technology to control Parthenium to farmers & students of Govt., High School Thandol, The. Palampur Distt. Kangra (HP) on 20.8.13
- Delivered a lecture on Management technology to control Parthenium to farmers of village Chadhiar Teh. Jaisinghpur Distt. Kangra (HP) on 21.8.13
- Delivered a lecture on Management technology to control Parthenium to students of Govt, Sr Sec School. Makol (Buhana), Teh. Palampur Distt. Kangra (HP) on 22.8.13
- Delivered a lecture in One day training for farmers of village Kupa and Chansu district Kinnaur under Tribal Sub plan December 11, 2013
- Delivered a lecture in One day training for farmers of village Kammru district Kinnaur under Tribal Sub plan December 12, 2013



- Delivered a lecture in One day training for farmers of village Badsrai district Kinnaur under Tribal Sub plan December 13, 2013
- Delivered a lecture in One day training for farmers of village Urni district Kinnaur under Tribal Sub plan December 14, 2013
- Delivered a lecture in One day training for farmers of village Rockcham and Chitkul district Kinnaur under Tribal Sub plan December 15, 2013

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

- Delivered lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 22nd Oct-2013 to 26th Oct-2013
- Delivered lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 12th Nov-2013 to 16th Nov-2013
- Delivered lecture in INSPIRE Internship camp organized by Sri Guru Gobind Singh College, Sector 26, Chandigarh on 29th Dec-2013
- Delivered lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 3rd Apr-2014 to 7th Apr-2014
- Gave inaugural address as a Chief Guest during the starting of a new academic session(2014-15) of Mount Carmel School, Thakurdwara on 21<sup>st</sup> Mar 2014

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

- Delivered Invited Lecture “Agriculture Geo-spatial Information System for Himachal Pradesh” in National Conference on Role of Statistics, Computer and Applications in woman empowerment organized by Bhagat Phool Singh Mahila Vishwavidyalaya, Khanpur Kalan, Sonapat 24-26 Feb 2014

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

- Invited lecture on topic “Climate Change Adaptation and Mitigation Options for Agriculture and Forestry in North West Himalayas” in ICAR Sponsored winter school at SKUAST Chhatha Jammu on 2.12.2013 .
- Invited lecture on Climate change and its impacts on Agriculture on 7.8.2013 in the training to officers of the state “Climate change Induced hazards Risk Assessment and Management” w.e.f. 6-8 August, 2013 organized by Institute of Public Administration, GOHP, Fairlawns Shimla. (HIPA) ( 26 Participants).
- Invited on Climate change and adaptations in H.P to Indo Swiss representative on INDIAN HIMALAYAS CLIMATE ADAPTATION PROGRAMME, DST, GOI and INDO-SWISS Corporation 22nd July, 2013 at CSKHPKV, Palampur.
- Invited lecture on “Shift of Himalayan Orchards associated with Climate Change” in 5th annual workshop on "CLIMATE SCIENCE: RECENT RESEARCH", in collaboration with the ESSO-MoES, during 4-5 October, 2013 at New Delhi to the Directors , Secretary MOES and other senior scientist of MOES organisations, SAC, IITs etc.
- Invited lecture on “ Indicative impacts, adaptations and mitigation under changed climate scenarios in the two days training on “ Agriculture in North West Himalayas Climate change adaptation in Agriculture in Himalayan Regions”” organized by HFRI Shimla on October 3, 2013 to Officers and scientist of state ICRFE and HFRI. Invited Lecture on topic entitled “Adaptation and mitigation strategies under changed Climatic scenarios in Agriculture” in the 21 days Refresher Course on Climate Change: Scenario, Impact on Agriculture and Strategies for Mitigation organized by Directorate of Human Resource Development, S.K. Rajasthan Agricultural University, Bikaner on 3rd March, 2014 ( 18 scientists participants)

- Invited Lecture on topic entitled “Geographic Information System (GIS), Remote Sensing( RS) & Global Positioning System (GPS) applications in Climate management and a case study from H.P.” in the 21 days Refresher Course on Climate Change: Scenario, Impact on Agriculture and Strategies for Mitigation organized by Directorate of Human Resource Development, S.K. Rajasthan Agricultural University, Bikaner on 4th March, 2014 ( 18 scientists participants)

#### **E. Other Activities**

- Department of Chemistry & Biochemistry prepared exhibits for Krishi Mahatosav
- Department of Chemistry & Biochemistry prepared exhibits for Parthenium awareness week
- S.S.Kanwar and Natasha (2013) Technical Bulletin-I on Biofertilizers (Phosphobacteria) prepared under RKVY project for the Agricultural Officers of Himachal Pradesh.

#### **F. Packages of practices:**

- Dr. V.Singh published revised Package & Practice on Seabuckthorn cultivation (in Hindi), 2013. 48p. and provided to over 200 farmers in Lahaul.

#### **G. Pamphlets prepared**

##### **Dr. Virendra Singh**

- Scientific Methods of Cultivation of Seabuckthorn (Hippophae L.). 2013. CSK HPKV, Palampur, 4p.
- “Seabuckthorn Based Value Added Products”. 2013. CSK HPKV, Palampur, 4p.
- Development of Anti-microbial Agents for Skin and Wound Infections of Animals”. 2013. CSK HPKV, Palampur, 4p.
- “Russian Method of Fast Propagation of Seabuckthorn through Soft Wood Cuttings”. 2013. CSK HPKV, Palampur, 4p.
- “Utilization of seabuckthorn in the healing and prevention of gastric erosions and ulcers in animals” “. 2013. CSK HPKV, Palampur, 4p.
- “Seabuckthorn (Hippophae salicifolia) cultivar “Tashi” as a commercial crop of cold desert of Himachal Pradesh”. 2013. CSK HPKV, Palampur, 4p.
- “Seabuckthorn Harvesting Tools ”. CSK HPKV, Palampur, 4p.
- “VALUE ADDED ANIMAL FEED PRODUCTS FROM SEABUCKTHORN”. 2013. CSK HPKV, Palampur, 4p.
- “Diseases and their management of seabuckthorn”. CSK HPKV, Palampur, 4p.

## MISCELLANEOUS ACTIVITIES

### A. INCOME GENERATION

Department	Income Generated
Department of Biology & Environmental Sciences	7,38,838/-
Department of Chemistry and Biochemistry	20,000/-
Department of Microbiology	1,01,750/-
Department of Physical Sciences and Languages	34,050/-
Centre for Geoinformatics Research and Training	1,46,040/-
<b>Grand Total</b>	<b>10,40,678/-</b>

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

Faculty Name	Institution Name
1. 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 iv. CCS University, Meerut
2. Dr. R.C. Chauhan	i. IHBT, Palampur ii. G.B. Pant Institute of Himalayan Environment and Development, Himachal unit, Mohal (Kullu) iii. H.P. University, Summer Hill, Shimla
3. Dr.(Mrs.) Usha Rana	i. Dr.Y.S.Parmar University of Horticulture and Forestry, Solan
4. Dr. Neelam Sharma	i. Himachal Pradesh University, Shimla
5. Dr Kamal Mohini	i. Dr.Y.S.Parmar University of Horticulture and Forestry, Solan
6. Dr. Nageswer Singh	i. Dr.Y.S.Parmar University of Horticulture and Forestry, Solan ii. Punjab Agricultural University, Ludhiana iii. SKAUST, 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. Manoj Bhargava	i. Sher-e-Kashmir University of Agricultural Sciences and Technology, Jammu. ii. Punjab Agricultural University, Ludhiana
9. Sh.Kapil Sharma	i. Dr. Y.S.Parmar University of Horticulture and Forestry, Solan
10. Sh. Vaibhav Kalia	i. KLB DAV College for Women, Palampur.

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

i.	Dr. R.C. Chauhan	<ul style="list-style-type: none"> <li>• Himachal Journal of Agriculture Research</li> <li>• Flora and Fauna</li> <li>• environmental Journal, Springer Japan</li> </ul>
ii.	Dr.(Mrs.) Neelam Sharma	<ul style="list-style-type: none"> <li>• Indian Journal of Weed Science</li> </ul>
iii.	Dr. S.S. Kanwar	<ul style="list-style-type: none"> <li>• Member, Editorial Board of Himachal Journal of Research</li> <li>• Member, Editorial Board of International Journal of Food &amp; Fermentation Technology.</li> <li>• Member, Editorial Board of Biomedical Research International</li> <li>• Reviewer Annals of applied biology</li> <li>• Reviewer Food Research International</li> <li>• Reviewer Journal of Food Science &amp; Technology</li> <li>• Reviewer African Journal of Biotechnology</li> <li>• Reviewer, Nutrition and Cancer- An International Journal</li> <li>• Reviewer African Journal of Microbiology Research</li> </ul>

**D. OTHER ACTIVITIES****Dr. Anita Singh**

- Warden Vageeshvari PG Girls hostel
- Member Academic council.
- Member advisory committee University Library.
- Incharge Cultural Activities college level
- Convener anti ragging committee college level
- Performed duties in verification of central store, CGRT, Bio. & Env. Sciences department of the College
- Conducted visits of the Herbal Garden and Bamboo plantation area for farmers, agriculture officers, college students and other dignitaries
- Incharge Bamboo Revolving Fund Scheme
- Executive editor of Journal of Scientific and Applied Research
- Performed duties during Science Day celebrations 2013 as convener of various committees

**Dr. R. C. Chauhan**

- 20 numbers of trout culture race ways/ponds in Salooni and Bharmour Block and 9 numbers of carp culture ponds in Bhatiyat block have been established and made functional to produce quality fish.
- Fish seed transportation technology has been developed which has been adopted by fish farmers and the line department to transport fish seed

- Labeo dera locally known as Gid fish an indigenous threatened species has been identified as a species to be recruited to the culture fisheries in Bhatiyat block in particular and lower Kangra valley in general.
- Snow trout (Schizothorax sp) commonly known as Gungli or Deshi Macchee has been recorded the dominant indigenous fish species of all the target blocks/ District Chamba.
- Member expert for Project Assessment Committee of IHBT Palampur on May19,2014.

#### **Dr. Usha Rana**

- Committee member in Botany in the Board of Studies for Under Graduate Classes in Himachal Pradesh University, Shimla.
- Warden Parvati girl's hostel of the university.
- Incharge Cultural of the college, Discipline Committee (In Krishi Mahautsav and for the smooth conduct of Inter colleges matches),as student councillor at the university level committee.
- Conducted educational tour to Mumbai of BSc. II<sup>nd</sup> yr (57) students.
- Member advisory committee of MSc.& Ph.D students of COA & COBS and advisor of 1<sup>st</sup> yr BSc. Students (10) .
- Duty was assigned to facilitate the admission committee in checking and scrutinizing the original document seeking admission to BSc.degree COBS.
- In Anti-Ragging Committee of College of Basic Sciences and also in the committee of monitoring cell on ragging at university level.
- Lab and store incharge of the department.
- As committee member to verify the degree, gold medal and certificate of honour of BSc. ,Degree of College of Basic Sciences for the convocation.
- Editor of Art and Culture section of college magazine "Vigyan Punz".

#### **Dr. Neelam Sharma**

- Chairperson, Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 ,CSKHPKV,Palampur
- Chaired a session in the National Conference on Biodiversity and Environment of India held on 6th October,2013.
- Organised of a Quiz contest on weeds on 4 Feb,2014
- Member, Board of studies, College of Agriculture, CSKHPKV, Palampur
- Co-convener, Technical Networking Programme of Herbicide Residue Studies of AICRP (WC) at National Level
- Evaluator, PhD(Chemistry) thesis Himachal Pradesh University, Shimla
- Convener, Declamation Contest In National Science Day Celebrations , COBS, CSKHPKV
- Councillor, Indian Society of Weed Science
- Co-ordinator ISAB ,Palampur Chapter
- Secretary, ISA ,Palampur Chapter

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

- Nominated as an Outside Expert on the Board of Under Graduate Studies in Biotechnology of Punjabi University, Patiala for a period of two years i.e. w.e.f. 28.12.2013 to 27.12.2015.
- Member Educational and Resident Instructions Advisory Committee of the University.
- Member Academic Council of the University

- Member Research Council of the University
- Member Extension Council of the University
- Member of Institutional Animal Ethic Committee
- Attended Assessment Committee meeting as an External Expert regarding up gradation of Jr. Research Fellows to Sr. Research Fellows at IHBT, Palampur, on 3rd June,2014.
- Attended Selection Committee meeting as an External Expert regarding filling up of Research Associate positions at IHBT, Palampur, on 5th June ,2014.
- As Liaison Officer of the University upto 16th Nov.,2013
- Chairman of the University IPR Committee
- 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 2013-14 to UG & PG students

#### **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 twenty (20) 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.
- 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, 2014.
- Has been nominated as a Secretary, Science Club, College of Basic Sciences.
- Acted as Centre Superintendent for conducting ICAR’s 19<sup>th</sup> All India Entrance Examination for admission to undergraduate degree programme.
- Acted as Centre Supervisor for conducting CSKHPKV’s Entrance Examination-2014 for admission to BVSc & AH and BSc Agriculture degree programme.
- Member of the Sale and Purchase Committee of the College of Basic Sciences during the year 2013-14.
- Secretary, Board of Studies, COBS
- Member of Academic Council.

#### **Dr Kamlesh Singh**

- Is performing the additional duties of the Dean, College of Basic Sciences
- Member of Academic Council,
- Member of Research Council,

- Member of Extension Council and
- Member of Educational and Resident Instructions Advisory Committee.

### **Sh. Kapil Sharma**

- Entrusted with additional responsibility of managing e-resources of the University Library.
- Entrusted to look after the working of University Network System.
- Redesigned the website of the University Library with the facility for off-campus users to access the e-resources of the library through ezproxy installed in webserver of the library.
- Deployed by Hon'ble Vice Chancellor to accomplish the pre-exam and post-exam data processing work of Entrance Test based and processing of Merit Based admissions to UG as well as PG programmes of the University for the Academic Year 2014-15.
- Acted as Invigilator in CSKHPKV's Entrance Examination-2014 for admission to BVSc & AH and BSc Agriculture degree programme.
- Acted as Invigilator in ICAR's 19<sup>th</sup> All India Entrance Examination for admission to undergraduate degree programme.
- Appointed as Editor (Technical Section) of College of Basic Science magazine "Vigyan Punj" for 2013-14.
- Treasurer, Science Club, College of Basic Science.
- Member, College Canteen Management Committee of the College of Basic Sciences.
- Assisted the Dean, COBS for counseling and registration for admission to first year of B.Sc. programme during July, 2014.
- Committee member in Preparation of Time Table and date sheet of the college of Basic Sciences.
- 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.
- Appointed as a Committee Member Verification of Permanent & Consumed stocks for Centre for Geoinformatics Research and Training.
- Appointed as a Committee Member Verification of Permanent & Consumed stocks for the College of Basic Sciences.
- Game Incharge, Badminton, COBS.

### **Dr. Sharda Singh**

- Member, Team of Scientists for Climate Change from CSKHPKV-Palampur in the State of Himachal Pradesh
- Convener, Entrance and Landscaping, vide Endst No. QSD/DEE/Museum/CSKHPKV/-10015-128 dated 12 Dec 2013 (University Information System was got developed and installed in Kiosk for self-exploration by the visitors)
- Member, Anti-Ragging Committee
- 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

- Convener, Power Point Presentation in National Science Day Celebrations-14 by COBS in the University
- Incharge for Literary Activities in COBS
- Collaborations with IIRS for EDUSAT based trainings in Geoinformatics in the University
- Convener Purchase Committee by Sr. Medical Officer, CSKHPKV-Palampur

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

- Member of opening the quotations. Department of Microbiology college of Basic science. Vide letter no. QSD.HOD.(M)/COBS/RKVY/13/1106-1108. Dated:12-08-2013
- Member of verification of store articles in the Centre of Geo-Informatics Research and Training, College of Basic Science. Vide letter no. QSD/CGRT/Store/CSKHPKV/14/3250-3259 Dated: 21.03.2014.
- Member of verification of store articles in the Department of Chemistry and Biochemistry COBS (Vide letter no. QSD.3-11/DCR/CSKHPKV/store/186097 Dated:26.03.2014.
- Acted as Rapporteur in Session VI: Progress of work at AMFUs in seventh annual review meeting of Integrated Agromet Advisory Services project held at Agricultural Research Station, Directorate of Research, Maharana Partap University of Agriculture and Technology, Udaipur, Rajasthan during 20 – 22 November 2013 and presented the works done of Project. Chairman: Dr.R. Bhagwati, NEH, Basar Rapporteur: Dr Ranbir Singh Rana, CSKHPKV, Palampur.
- Acted as team members of Kiosk display of the museum(vide letter no. QSD.DEE/Museum/CSKHPKV/2013/-10209-35 dated 13.12.2013
- Appointed as member of 12 convocation in committee for preparing university report, Convocation address, and address of the chief guest (Vide letter. QSD/11-2/2013/CSKHPKV(Acad)-60608-779 dated Dec, 2013
- Nominated member of anti ragging squad for session 2014 ( Vide letter no. QSD.3-40/2013-CSKHPKV (COBS-Acad)-3612-47 dated 1.8.2013

#### **Sh. Vaibhav Kalia**

- Coordinator for Edusat based outreach Training Programmes conducted by IIRS Dehradun (QSD/CGRT/CSKHPKV/1746-1748[06.02.2013] )
- Student Counselor for COBS (QSD/Estt/COBS/2013-963-73[06.03.2013] )
- Member from COBS, in preparation of Result Framework Document of CSKHPKV (QSD.10-20/DR-CSKHPKV/Tech(RFD)/3183-98[26.03.2013] )
- Member of the committee for updation of University Website. (QSD.2-14(GC)/CSKHPKV/DPGS/2749-63[08.05.2013] )
- Interview for admission to BSc programme on 03.07.2013 - scrutiny of original documents and creating merit lists of COBS admissions (QSD.3-39/2013-CSKHPKV(COBS-Acad)/2874-80[22.06.2013] )
- COBS Game Incharge - Volleyball for Academic Year 2013-14 (QSD.3-15/2013-CSKHPKV(COBS-Acad)/2908-28[24.06.2013] )
- Prepared Annual Report for CGRT for year 2013-14
- worked on GIS mapping of resources and advisories to farmers on potentials and options available in micro agroclimatic zone on pilot basis - provided GIS mapping support (QSD.DR-CSKHPKV/12-7/Tech/2013/6802[06.07.2013] )



- Member of COBS Anti-ragging committee. (QSD.3-40/2013-CSKHPKV(COBS-Acad)/3612-47[01.08.2013] )
- Member of scrutinizing committee to provide assistance to the Admission Committee for admission through Walk-in-Interview conducted on 03.08.2013 (QSD.3-39/2013-CSKHPKV(COBS-Acad)/3678-81[02.08.2013] )
- Member of Student Counseling Committee at the University Level. (QSD.4-20/SWO/CSKHPKV/3737-50[05.08.2013] )
- Member of committee for UNS agenda items (i) engagement of two skilled category of manpower through existing service contract. (ii) UNS annual subscription charges for 2014-19. (iii) Official UNS Email services for KVK/Research Stations residing outside CSKHPKV campus (QSD-8-80/2010/CSKHPKV/UNS/Misc./1205-12[13.08.2013] )
- Member of committee for inspection of Computers, its peripherals, OFC related service jobs and Electronic Items of UNS, Library (QSD-8-88/2010/CSKHPKV/UNS/Bills-Payments/1213-18[13.08.2013] )
- Member of committee for preparation of datesheet for Mid term examination of Sem.-I 2013-14 of COBS. (QSD.3-1/2013-CSKHPKV(COBS-Acad)/4499-3[10.09.2013] )
- Member of committee (students guidance committee) for making arrangements for 12th Convocation of CSKHPKV (QSD/11-2/2013-CSKHPKV(Acad.)/60608-779[07.10.2013] )
- INSPIRE students visit - arrangements at CGRT. (QSD/HOD(M)/COBS/CSKHPKV/(INSPIRE)/1366[21.10.2013] )
- Member of committees for organization of 5th Regional Review meeting of the project "Forecasting Agricultural output using Space, Agrometeorology and Land based observations (FASAL)" at CSKHPKV, Palampur on November 8-9, 2013. (i)Inauguration and veldictory (ii) Techincal presentations (iii) Local purchase (QSD/PD/CGRT/CSKHPKV/2013/2904-17[06.11.2013] )
- Member of committee for preparation of datesheet for End term examination of Sem.-I 2013-14 of COBS. (QSD.3-1/2013-CSKHPKV(COBS-Acad)/5428-33[20.11.2013] )
- visit to CGRT as a part of the training schedule of IAS Officer Trainees of 2013 batch on one day study tour to CSKHPKV Palampur on 1.1.2014 - GIS lecture delivered. (QSD/CI/COA/Training/5911-5936[29.11.2013] )
- Team Member for Kiosk - preparation of data for COBS (QSD/DEE/Museum/CSKHPKV/2013-10219-35[13.12.2013] )
- Development and programming of application for KIOSK placed in University Museum (QSD/CGRT/CSKHPKV/2013/3002-3012[17.12.2013] )
- Resource person in GIS and RS discipline for Establishment of Museum in University. (QSD/DAB/CSKHPKV/2194-2211[28.12.2013] )
- Attended Meeting of Committee members regarding purchasing books for book bank and Specific Books (text and reference books) (QSD/CDA/CSKHPKV/Lib.2013-14/1-9[01.01.2014] )
- Nodal Officer to IPv6 transition activity programme as per National IPv6 Deployment Roadmap Version-II in CSKHPKV, Palampur (QSD.1-27/2011-CSKHPKV(GA)/1991-96[10.01.2014] )
- COBS college purchase committee (QSD/COBS/CSKHPKV/Store/17/11/127-33[14.01.2014] )
- Rechecking of COBS External Examination re-evaluation. (QSD.3-49(Acad)/COBS-CSKHPKV/261-63[18.01.2014] )

- Member of Sale and Purchase of Store Articles for the year 2014 in CGRT, CSKHPKV (QSD.1-31/DR-CSKHPKV(Acctts)/2013-695-97[20.01.2014] )
- Sending message concerning shortage of attendance through SMS (implemented attendance advisory for COBS) (QSD.11-5(1)/CSKHPKV/Acad/2011/6400-04[03.02.2014] )
- GIS data for Students of Department of Regional Planning in School of Planning and Architecture, Delhi (email[06.02.2014] )
- Member of committee for preparation of datesheet for Mid term examination of Sem-II 2013-14 of COBS. (QSD.3-1/2014-CSKHPKV(COBS-Acad)/921-26[03.03.2014] )
- Member of committee for store verification of Department of Physical Sciences and Languages, COBS (QSD/3-48-2013/CSKHPKV/(PSL)-Store/624-31[21.03.2014] )
- Deployed by Hon'ble Vice Chancellor to accomplish the pre and post work of Entrance Test based and Merit Based admissions for Academic Year 2014-15. [(i) Technical Staff for Requirement analysis for software development, testing, installation and training. (ii) Data Processing Supervisor] (QSD.7-2/Acad/CSKHPKV/6283-16332[24.03.2014] )
- Election Duty - Rehearsals (compiled training videos and prepared presentations for the election duties performed on 08.04.2014, 09.04.2014, 26.04.2014, 27.04.2014, 04.05.2014) (4-SDP-ELN-1/2013[01.04.2014] )
- ICAR 19th All India Entrance Exam (AIEEA 2014-UG) - Invigilation Duty (QSD/HOD/AG ENGG/ICAR/AIEEA-2014531-616[07.04.2014] )
- Member of Committee to formulate a project proposal under Climate Change and Sustainable agriculture Monitoring, modeling and networking (CCSAMMN) component of NMSA (4-2/DR-CSKHPKV/Tech/3469-77[24.04.2014] )
- COBS Website updation (QSD-2-5/2014-CSKHPKV(COBS-Estt)2002-06[08.05.2014] )
- Counting Assistant duty in Result Compilation Section - Genesys Software updation section (4-SDP-ELN-1/2013[09.05.2014] )
- Member of Interview committee for interview of GIS/MIS expert and Project Assistant (QSD/CGRT/CSKHPKV/2014/3381-85[03.06.2014] )
- Member of Counseling for BVSC & AH and B.Sc.(Hons.) Agriculture for the academic year 2014-15 (for 1st and 2nd July, 2014) (QSD.DCOVAS/VIII-9(Acad)/6364-84[24.06.2014] ).

## **E. NATIONAL SCIENCE DAY CELEBRATIONS**

The National Science Day was celebrated in the College from February 25-27, 2014. The faculty and students participated in various activities organized on this occasion whole heartedly.

## **F. NATIONAL SERVICE SCHEME**

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

1. A special seven day camp of NSS was organized at village Badehar from 28.12.2013 to 3.1.2014 in which 58 NSS volunteers participated. The emphasis of the camp was on health awareness and literacy, environment protection, uprooting of parthenium hysterophorus and cleanliness of surrounding. Anti drug rally was taken during the camp on 1.1.2014 to make people aware about effects of smoking, alcohol and drug addiction etc.
2. NSS volunteers of the college actively participated in the programmes organized during parthenium Awareness week (16<sup>th</sup> August-22<sup>nd</sup> August,2013) by the Department of Agronomy, Forage and Grassland Management ,COA,CSKHPKV, Palampur. A rally was organized on 17.08.2013 in the University campus to create awareness among youth about this obnoxious weed.
3. NSS volunteers of the college participated in launching of National Youth policy 2014 and Rajiv Gandhi Khel ahiyan in University campus on 21.02.2014 and took out a rally in the campus and nearby areas.
4. NSS volunteers of the college participated in Systematic Voters Education and Electoral participation (SWEEP) on 2<sup>nd</sup> May,2014 and a rally to create awareness among the voters in exercising their voting right in Lok Sabha elections:
5. A Van Mahotava was organized in the university on 17.08.2014. All the NSS volunteers participated in this activity.
6. The under mentioned days were celebrated by NSS volunteers with faculty and staff of the college of Basic Sciences during the Year 2013-14:
  - A pledge taking ceremony on Sadbhavana Divas on 20<sup>th</sup> August to 3<sup>rd</sup> September, 2013 was held in the college.
  - Communal Harmony Fortnight was observed from 20<sup>th</sup> August to 3<sup>rd</sup> September, 2013.
  - NSS day was celebrated on 24<sup>th</sup> September, 2013.
  - National Integration Day, Communal Harmony Campaign week and flag Day was celebrated from 19<sup>th</sup> to 25<sup>th</sup> November, 2013.
7. A special seven day camp of NSS was organized was organized at village Rajpur from 22.06.2014 to 28.06.2014 in which 43 NSS volunteers participated. The emphasis of the camp was on environment protection health awareness and literacy and uprooting of parthenium hysterophorus (Gaajar Ghaas). A rally was also organized during the camp on 26.06.2014 to create awareness among youth and farmers about obnoxious weeds.

#### G. NAME OF VIP VISITORS

Sr. No.	Date	Name & Address
1	1/01/14	IAS Trainees visited CGRT for overview of Geo-spatial technologies
2	21/11/14	Sh. Sujan Singh Pathania Hon'ble Minister for Agriculture, GOHP, visited CGRT Stall during Krishi Mahautsav on 21 <sup>st</sup> of November 2013
3	22/11/14	Sh. Sudhir Sharma, Hon'ble Minister for Urban Development, GOHP, visited CGRT Stall during Krishi Mahautsav on 22 <sup>nd</sup> of November 2013



## Glimpses



Visit of Sh. Sudhir Sharma, Hon'ble Minister, Govt. of H.P.



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



Visit of IAS Trainees in CGRT



Hon'ble Vice-Chancellor addressing the delegates in Inaugural Function of Fifth Annual Regional Review Meeting Project "FASAL"



Students taking part in Painting Competition and then Judges judging for best Paintings in National Science Celebrations –2014



## Glimpses



**INSPIRE Internship camps**



**INSPIRE Internship camps**



**EDUCATIONAL TOUR**

