



FINAL REPORT

National Agricultural Innovation Project
(Indian Council of Agricultural Research)

Business Planning & Development Unit

Business Planning & Development Unit, CCSHAU, Hisar



CCS Haryana Agricultural University

Hisar, Haryana, India, 125004

<http://hau.ernet.in>

2014



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Cover page photographs : First Photo is of building of Directorate of Human Resource Management where the BPD Unit has been established at CCS Haryana Agricultural University, Hisar and other photo depicts linkage between CCSHAU and public/private sector.

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Foreword

It has become obvious that the infusion of new technologies along with increasing scale of production and marketing of improved technologies would enhance the efficiency of research institutions vis-a-vis entire agriculture sector and attract higher level of investment in value addition and marketing. Further, it has been realised that development and promotion of agribusiness sector, which has strong linkages with the agricultural production, agro-processing, and service sectors, is capable of influencing private sector for adequate investment in production and marketing activities. If this happens, a valuable contribution in terms of creating additional employment in the non-farm sector and improving agricultural economy can be attained.

Despite several interventions at the CCSHAU and the Government levels, the production and marketing system for farm products continued to suffer from several weaknesses. The private sector, for long, did not invest or shied away from investment in the agricultural production and marketing activities. It is only during the past few years or so, *i.e.* the second phase of liberalization, that the agricultural marketing reforms were initiated. One of the outcomes of these initiatives has been the entry of private sector in agribusiness activities on a substantial scale. A shift from 'agriculture' to 'agribusinesses' is being viewed as an essential pathway to revitalize Indian agriculture. While the share of pure agriculture in GDP may decline, the share of agribusiness will not and is bound to go up as the demand for value added products is continuously increasing.

I believe that the recent intervention of ICAR through the establishment of Business Planning and Development Unit at this University and other institutions will certainly revitalize the commercialization activities and help in widening the catchment area of university technologies in order to benefit the stakeholders.

K.S. Khokhar
Vice Chancellor

Preface

CCS Haryana Agricultural University, Hisar recognized the need of becoming competitive in technology generation and its faster transfer to the stakeholders. Keeping this in view the university reviews its research and extension programs time to time and necessary amendments if any are made in the approach. The technology transfer system of this university is considered as a model in the country as it has benefited the farmers and helped in ushering agricultural revolution in the state. However, the establishment of “**Business Planning and Development Unit**” (BPD) at CCS HAU in October 2009, with the financial support of ICAR under NAIP, has further boosted the effectiveness of extension system. Now the University has made its reach easy to the industry and entrepreneurs.

The BPD Unit of CCS HAU, Hisar has been able to attract seed, fertilizers, Farm implements, Food, Public Health, Veterinary, livestock (meat & milk) *etc.* industries located not only in Haryana but also in other States like Uttarakhand, Rajasthan, Maharashtra, Chattisgarh, Karnataka, West Bengal, Andhra Pradesh, Odisha, *etc.* This Unit has been instrumental in getting eighteen MoUs signed with prominent companies for the production and marketing of eleven hybrids of Maize, three hybrids of Bajra, one hybrid of Rice and four varieties of wheat and one of Dhaincha. The companies have also signed MoU for the production and marketing of milk urea detection kit, liquid biofertilizers, PHB (bio-degradable plastic technology). With this initiative the University has generated revenue of more than Rs. 1.6 Crores.

The impact of the BPD activities can be closely seen at CCSHAU. Two technologies (*i.e.* Milk Urea kit & Rice Hybrid HKRH 1) were developed about ten years back, but these remained unnoticed and unrecognized. BPD Unit brought these into limelight resulting in their national recognition. A number of awareness programmes were organized by the BPD Unit to make the respective industries and entrepreneurs aware of potential technologies available with the university. As a result the companies working in the area of food, biotechnology, agricultural engineering *etc.* are also getting in touch with CCSHAU. Besides, seventy six entrepreneurs/ companies/ NGOs have been registered for training and incubation. The BPD Unit has also identified the potential technologies developed by various departments which can be commercialized. Further, the process of valuation of technologies has been initiated.

All these initiatives under the NAIP project have given new dimensions to the commercialization of research technologies of the university and stimulated the research pursuits in order to develop competitive technologies. By this not only the farmers of the Haryana state but of all the states of the country have been benefitted a lot.

S.K. Sethi
Principal Investigator

Executive Summary

The sub-project “Business Planning & Development Unit”, CCS Haryana Agricultural University, Hisar (Sub-project code: 12033). After the fierce competition amongst the SAUs, the ICAR sanctioned a prestigious mega project “**Business Planning & Development Unit**” under NAIP amounting Rs. 250.82 lacs which strengthened the ongoing activities of commercialization and Intellectual Property protection at this University.

The major objectives of the sub-project were: 1) To identify the potential technologies ready for commercialization and licensing of technology to private sector, new technology entrepreneurs and start-up companies; 2) Development of entrepreneurship and agri-business enterprise through training & incubation facilities for young, small and medium size entrepreneurs to promote university’s technologies; 3) Promotion of partnership with institutions in public and private sectors in order to develop novel and commercially viable technologies/products and business ideas through backward linkage from industry and 4) Fastening the technology transfer.

The objective wise achievements are: 1) Concerted efforts have been made by the unit to identify commercializable potential crop hybrids/varieties and the technologies related to the development of agri. processing machines, PHB, biotechnologies, liquid biofertilizers, pest management, food products, animal products, diagnostic kits, *etc.* and more than 130 technologies have been identified for commercialization. 2) Capacity Building and Incubation Services have now been made available in Seed Production of Field & Vegetable Crops; Farm Machinery for processing; Biofertilizers & other Biotech Products; Diagnostic Kits and Vety Public Health (Milk Urea) Kit. This unit has taken initiatives in developing entrepreneurship through training & incubation facilities for young, small and medium size entrepreneurs to promote the technologies developed by the University. Incubation training programs have also been organized for the prospective entrepreneurs in the fields of vegetable seed production, liquid biofertilizers, biotechnologies, food products, dairy products, *etc.* A total of twelve entrepreneurship development programs have been organized in which 74 entrepreneurs have registered themselves as members of the BPD Unit. Apart from this, 97 companies and two NGOs have also joined hands with the BPD Unit, CCSHAU, Hisar as members. Five entrepreneurs have graduated and successfully running their respective businesses by adopting various technologies developed by the University. Eight Radio & TV programmes have also been broadcasted to spread awareness about the BPD activities. 3) Twenty one University-Industry Interaction workshops have been organized and a few funding assistance programs have also been arranged. The demonstrations of all the commercializable technologies developed by different departments have been done for entrepreneurs and industries, during the promotional programs organized at main campus of the University, outreach stations and KVKs. Besides, these exhibitions were also organized at various places like Kisan Melas, ICRISAT Hyderabad, NDRI Karnal, Parade Grounds Chandigarh, Amul Dairy Gujarat, Nijanand Dairy (Simardha Village), GSFC Baroda, HAMETI Jind, Kiloj Rohtak, NASC Complex New Delhi, RRS Uchani Karnal, Sonapat Sugar Mill, Shahbad Sugar Mill, Aterna, Murthal, Indri. *etc* in order to attract

the stakeholders. In total, 75 technology sensitization programs have been conducted along with two workshops in collaboration with MSME. 4) Forty nine ready to commercialize technologies have been assessed for valuation for which 117 MoUs have been signed with both public and private sector. More than 600 companies have contacted which has also resulted in some collaborative partnership with public sector units like Haryana Seeds Development Corporation (HSDC), Chandigarh, National Seeds Corporation (NSC), New Delhi, National Bureau of Plant Genetics Resources (NBPGR), New Delhi, Anand Agricultural University (AAU), Gujarat and National Research Development Corporation (NRDC), New Delhi.

The University has taken early initiatives to adopt ICAR guidelines for Intellectual Property protection which has resulted in a way that the University has so far submitted 46 patent/protection applications for its intellectual properties, out of which 10 have been protected/granted. Two technology documents, along with a couple of papers have been published and presented in various national and international conferences.

The equipments procured to accomplish the sub-project program include: Field Demonstration Display Boards, Variable Volume Micropipettes, Vortex Mixer, Magnetic Stirrer with hot plate, Revolutionary Universal Cooling Centrifuge, Deep Freezer, Refrigerated Cold Cabinet, Incubator shaker, Electrophoresis Unit, Autoclave, pH meter, PCR Machine, Acrylic Panel Display- and digital printing with laminations, ELISA Reader, Hydraulic Harrow, Digital Camera, Air conditioners, Electric Air Curtains, Bioreactor for bacterial cell culture and furniture. In works renovation of space (Office & lab) for the establishment of BPD Unit under NAIP at CCS HAU Hisar has been done.

The BPD Unit has also published bulletins/brochures on commercializable technologies developed by the university. The unit has been able to attract seed, fertilizers, public health, food, biotechnology, agricultural engineering, *etc.* industries located not only in Haryana but also from other states like Punjab, Uttrakhand, Uttar Pradesh, Himachal Pradesh, Rajasthan, Maharashtra, Chhattisgarh, Karnataka, West Bengal, Andhra Pradesh, Odisha, *etc.*

A documentary has also been prepared to support the ongoing popularization/ awareness activities on CCSHAU's technologies. A number of companies are in contact for getting non exclusive license for our varieties/ hybrids and other technologies.

Part-I: General Information of Sub-project

1. Title of the sub-project : **Business Planning & Development Unit, CCS HAU**
2. Sub-project code : **12033**
3. Component : **1**
4. Date of sanction of sub-project : **10 February, 2010**
5. Date of completion : **31 March, 2012**
6. Extension (if granted) :
- i. First Extension : **From 1st April 2012 to 31st March 2013**
- ii. Second Extension : **From 1st April 2013 to 31st March 2014**
7. Total sanctioned amount for the sub-project : **Rs. 248.22 lacs; Rs. 303.52880 lacs (revised)**
8. Total expenditure of the sub-project : **Rs. 222.74284/- lacs**
9. Consortium leader : **Dr. K.S. Khokhar, Vice-Chancellor
CCS Haryana Agricultural University,
Hisar, 125004, Haryana, India,
vc@hau.ernet.in, http://hau.ernet.in
01662-231640, 284301**

10. List of consortium partners:

	Name of CPI/ CCPI with designation	Name of organization and address, phone & fax, email	Duration (From-To)
CPI	Dr. S.K. Sethi, Principal Investigator	9416239506, 01662-289532, sethiskccshau@gmail.com	Oct 2012 - Mar 2014
CPI	Dr. R.B. Srivastava, Principal Investigator	9416388650, rbsri512@gmail.com	Oct 2009 - Sept. 2012
CCPI	Dr. S.K. Sethi, CCPI, BPD Unit (CDU)	9416239506, 01662-289532, sethiskccshau@gmail.com	Oct 2009 - Sept. 2012
CCPI	Dr. R.C. Yadav, CCPI, BPD Unit (B&M)	9416336394, 01662-289519, rcyadavbiotech@rediffmail.com	Oct 2009 - Mar 2014
CCPI	Dr. N.K. Kakker, CCPI, BPD Unit (VPU)	9466265761, 01662-289517, nkmkksk@rediffmail.com	Oct 2009 - Mar 2014

CPI-Consortia Principal Investigator; CCPI-Consortia Co-Principal Investigator

11. Statement of budget released and utilization partner-wise (₹in Lakhs):

	CPI/ CCPI Name, designation & address)	Total budget sanctioned	Fund released (up to December 2013)	Fund utilized (up to December 2013)
CPI	Dr. S.K. Sethi	Rs.303.52880/- lacs	Rs. 240.23359/- lacs	Rs. 222.74284/- lacs
Total		Rs. 303.52880/-lacs	Rs. 240.23359/- lacs	Rs. 222.74284/- lacs

CPI-Consortia Principal Investigator; CCPI-Consortia Co-Principal Investigator

Part-II: Technical Details

1. Introduction

The agriculture is emerging as knowledge based industry. The developmental phase requires plenty of creative effort, know-how and financial resources, for which outside expertise is usually needed. In advanced countries, business incubators have become an integral part of the support systems for the growth of knowledge based entrepreneurship.

The primary goal of a business incubator is to improve the entrepreneurial base and thus to facilitate economic development. CCSHAU is also actively involved in R&D activities in agriculture with a record of excellence in teaching, research and extension leading to significant contributions to agricultural revolution in the state and nations. It is strategically located in Haryana and has taken initiatives to connect with leading institutions all over the world and also with private sector for capacity building of its faculty to develop cutting-edge technologies.

After the TRIPS agreement, the markets are open to all member countries and therefore the competition for quality and cost-effectiveness is increasing. The need in agri-sector today is to produce cost-effective, economically viable, environmentally feasible, socially acceptable agricultural technologies and products to compete in global market. The research activities supported by dynamic agri-business will substantially contribute to employment generation and return on investment.

A business incubator would create a mechanism to assist the uptake, adaptation and commercialization of agricultural research products for public and private research institutions. The goal of such programs would be to develop and commercialize new products, technologies and services, bring greater practical impact to the research from India's academic institutions, better leverage the significant R&D resources and existing infrastructure, generate wealth, and ultimately create income in the agriculture-dependent rural regions.

The ICAR sanctioned this mega project in October 2009 amounting Rs. 2.5 Crores as financial support under NAIP to further strengthen the commercialization activities by way of establishing "Business Planning & Development (BPD) Unit" which gave further stimulus to the commercialization at the University.

It has organized several programs to attract industries and entrepreneurs in order to meet out its objectives of technology licensing and capacity building. BPD at CCSHAU is a place where the process of starting agribusiness venture has been catalyzed. Through supporting entrepreneurs with agri-technology, consultancy, consulting with management experts and licensing of technologies.

2. Overall Sub-project Objectives

1. To identify the potential technologies ready for commercialization and licensing of technology to private sector, new technology entrepreneurs and start-up companies
2. Development of entrepreneurship and agri-business enterprise through training & incubation facilities for young, small and medium size entrepreneurs to promote university's technologies
3. Promotion of partnership with institutions in public and private sectors in order to develop novel and commercially viable technologies/products and business ideas through backward linkage from industry
4. Fastening the technology transfer

3. Sub-project Technical Profile

I. To identify the potential technologies ready for commercialization and licensing of technology to private sector, new technology entrepreneurs and start-up companies

Monitoring indicators:

- To identify potential technologies ready for commercialization
- To classify the technologies in sub-groups
- To club the similar technologies and make sub-units of the BPD Unit

Expected output:

- Meeting the inventors of various technologies in the University
- Identification of commercializable technologies developed by the University
- Establishment of sub-units of BPD Unit at the University

Expected outcome:

- More than 130 technologies have been identified
- Three sub-units of the BPD Unit have been established:
 - Crop-Display Unit (CDU) for Crop Hybrids, Varieties & Agri-Engineering Technologies
 - Biotech & Microbiology Unit (B&MU) for Biotech, Microbio & Food Products Technology
 - Veterinary Products Unit (VPU) for Veterinary and Dairy technologies
- The technologies have been identified as under:
 - Nearly 44 technologies under CDU have been identified
 - Nearly 55 technologies under B&MU have been identified
 - Nearly 31 technologies under VPU have been identified

II. Development of entrepreneurship and agri-business enterprise through training & incubation facilities for young, small and medium size entrepreneurs to promote University's technologies

Monitoring indicators:

- To identify the areas for incubation & provide incubation service
- To organize entrepreneurship development programs

Expected output:

- Enrolling incubatees and providing them with incubation services

- Development of entrepreneurship and supporting the budding entrepreneurs
- Organizing employment generation training for entrepreneurs

Expected outcome:

- Capacity building & incubation services have been made available in:
 - Seed Production of Field & Vegetable Crops
 - Farm Machinery for processing
 - Biofertilizers & other Biotech Products
 - Diagnostic Kits
 - Vety Public Health (Milk Urea) Kit
- 12 trainings/entrepreneurship development programs have been organized
- 173 members registered:
 - 97 companies
 - 2 NGOs
 - 74 entrepreneurs
- 8 Radio & TV programmes have been broadcasted
- 5 entrepreneurs have graduated
 - DKS Incorporate in Milk Urea Detection
 - YS Sons Agrotech in Liquid Biofertilizers
 - Anurag Sharma in PHB
 - DKS Incorporate in Food Products Technology
 - Shubh Karan Kamboj in Food Products Technology

III. Promotion of partnership with institutions in public and private sectors in order to develop novel and commercially viable technologies/products and business ideas through backward linkage from industry

Monitoring indicators:

- To organize University-Industry Linkages
- To conduct technology sensitization programs for promotion of partnership and to assist companies and entrepreneurs in funding

Expected output:

- Organizing Technology shows
- Conducting Commercialization & Patent awareness programs
- Arranging University-Industry Linkage Workshops

Expected outcome:

- 21 University-Industry Interaction workshops have been organized
- 75 Technology sensitization programs have been conducted
- Funding assistance programs have also been arranged.
- 2 workshops in collaboration with MSME have also been organized

IV. Fastening the technology transfer

Monitoring indicators:

- To look for and to contact companies interested in technologies commercialization

- To establish partnership linkages with both public and private sector
- To sign license agreements with regard to the technologies available for commercialization and incubation
- To assess the value of technologies

Expected output:

- Identifying prospective incubatees or licensees
- Converting the prospective aspect of the above into reality
- Negotiating the deals and finally signing the agreements
- Valuation of technologies ready for commercialization

Expected outcome:

- 117 MoUs have been signed with both public and private sector
- Collaborative partnership with public sector units like
 - Haryana Seeds Development Corporation (HSDC), Chandigarh
 - National Seeds Corporation (NSC), New Delhi
 - National Bureau of Plant Genetic Resources (NBPGR) , New Delhi
 - Anand Agricultural University (AAU), Gujarat
 - National Research Development Corporation (NRDC), New Delhi
- More than 600 companies have been contacted
- 49 technologies have been assessed for valuation

4. Baseline Analysis

CCS Haryana Agricultural University, Hisar has been developing technologies in all potential areas covering crops, bio-technology, food products, engineering goods, veterinary sciences *etc.* for research and extension purpose. The University is consistently trying to reach the real clients of its technologies through its extension net work of KVKs. Although these efforts yielded significant results, yet to compete in the emerging global scenario of commercialization, an addition of agri-business activities was needed.

Over the years, several crop varieties have been released by CCSHAU for sustaining agricultural growth in the country, some of these include the most sought after pest resistant varieties. Very few of technologies were transferred to the private sector as there was no proper method to license the technologies developed by the University. Before inception of the BPD Unit, only 7 memorandum of agreements were signed out of which only two MoU's were related to commercialization and five for the linkage between the University and public/private sector. Only eight technologies were identified for commercialization. No incubatee was registered for any technology.

In order to expedite the process of commercialization of potential technologies, workshops, brainstorming sessions and exhibitions needed to be organized at a vast level. It was felt to set technology incubator having necessary physical infrastructure to launch business by offering furnished offices and lab space to private sector and sharing of resources such as specialized equipment and support services in order to license the technologies.

After the fierce competition among the SAUs, the ICAR sanctioned a prestigious mega project “**Business Planning & Development Unit**” under NAIP amounting Rs. 250.82 lacs which strengthened the ongoing activities of commercialization and Intellectual Property protection at this University. After the establishment of BPD Unit at CCSHAU, Hisar, not only a lot of technologies have been commercialized but BPD Unit has also incubated a number of entrepreneurs in various technologies, like crop hybrids and varieties; biotechnologies; food products technologies and veterinary technologies. BPD-CCS HAU has also organized and participated in major agricultural exhibitions, workshops and symposia to promote BPD-CCS HAU activities and services in India.

5. Research Achievements with Summary

CCS Haryana Agricultural University has developed and released over 170 varieties of field crops and over 40 varieties of vegetables. A large number of them have been accepted by farmers of Haryana and other states too. However, many of the potential varieties suitable for various uses either could not reach to the appropriate end-users or they reached very late.

With the changing food habits and awareness for quality food, the emphasis has shifted to increasing production of new varieties/hybrids and the use of good quality seed, food & health security. Accordingly, the good quality seed requirement in India is growing very fast and private seed sector has been expanding its base. A number of MNCs are also looking for entering into the seed business in India. The varieties/hybrids developed by CCSHAU, Hisar have greater scope for commercialization. Since the day of its inception, the BPD unit at CCS Haryana Agricultural University, Hisar has been constantly promoting technology licensing and entrepreneurship development programs.

The following technologies are a part of research achievements that relate to technology commercialization through licensing:

a.) Maize (*Zea mays* L.)

The increasing demand throughout the world for high energy and value added foods has prompted considerable interest in the growing of maize crop whose full potential being exploited. The Regional Research Station, Uchani, Karnal, CCS Haryana Agricultural University, Hisar, has developed high value maize varieties/hybrids such as HQPM 1, HQPM 5, HQPM 7, HM 4, HM 5, etc. Quality Protein Maize (QPM) contains nearly twice the quantity of the essential amino acids, lysine and tryptophan, which are essential building blocks of protein in humans, and mono-gastric animals like poultry and pigs. Other nutritional benefits of QPM include higher niacin availability due to higher tryptophan and lower leucine content, higher calcium and carbohydrate and carotene utilization. These maize hybrids have been licensed to private companies and 17 non-exclusive license agreements have been signed. The production and consumption of QPM based value



added products in the state/country would have a beneficial impact on the nutritional status of the people leading to better health. The maize varieties/hybrids developed by this university are very good in quality and yield. All these varieties and their products can fetch high prices in domestic and global markets. Many of the Maize hybrids have now crossed the borders of the state and they are being demanded by public and private organizations of other states.

b.) Liquid Biofertilizer Technologies

Environmental Soil fertility is depleting due to widened gap between nutrient removal and supplies. The use of bio-fertilizers, in preference to chemical fertilizers, offers economic and ecological benefits by way of soil health and fertility to farmers. These are the products containing living cells of different types of microorganisms, which have the ability to convert nutritionally important elements from unavailable to available form through biological processes.



The Business Planning & Development (BPD) Unit, CCSHAU, Hisar has given stimulus for the commercialization of the Liquid Biofertilizer Production technology. After establishment of the unit, this technology has been brought in the focus of stakeholders. It has organized several programs to sensitize scientists and attract industries and entrepreneurs in order to meet out its objectives of technology licensing, capacity building and Intellectual Property management.

The unit also focused on development of entrepreneurship and agri-business enterprise through training & incubation facilities. The University has developed bio-fertilizers like:

i) Rhizobium biofertilizer (**Rhizoteeka**)

For nitrogen fixation in different pulses and other legumes like moong, urd, pigeonpea, soybean, pea, chickpea, berseem and groundnut etc.

ii) Azotobacter biofertilizer (**Azoteeka**)

For nitrogen fixation in different crop plants including vegetables, flowers and fruits etc.

iii) PSB biofertilizer (**Phosphoteeka**)

For solubilisation of insoluble/ fixed P in the soil for all crop plants.

iv) **Bio-control bio-inoculants**

For nematode control- Azotobacter HT-54 for wheat and Gluconoacetobacter for cotton.

The importance of biofertilizers has been recognized in Indian agriculture since last three decades in view of their low cost, effectiveness, contribution in crop productivity, soil sustainability and eco-friendly nature. Peat, lignite and charcoal, in India are mainly used as carrier materials in the biofertilizers industry.

These biofertilizers increase the yield by 5 to 10% in addition to the saving of chemical fertilizer to the tune of 25%. These liquid biofertilizers production technologies have been licensed to companies from West Bengal, Chhattisgarh & Himachal Pradesh. There is a lot of scope for marketing of biofertilizers and these companies are successfully selling the biofertilizers in these states.



c.) Milk Urea Detection kit:

Urea is a very toxic chemical affecting all the vital organs of the body *viz.* liver, kidneys, lungs, heart, brain, *etc.* It is, therefore, very important to prevent entry of urea in human food chain. Urea is one of the important constituent of synthetic milk for making up the SNF and protein content. So, the synthetic milk can not be made without urea. Considering the toxic effects of urea in human food chain, the Scientists of COVS developed a test to detect urea in milk, more than a decade ago, way back in 1999. The Department used to charge Rs. 10/- only per milk sample, when brought to the lab for testing of urea.



The Milk Urea Detection Technology could not be commercialized in spite of best efforts till the establishment of the Business Planning and Development (Vety. Products) Unit (BPD-VPU) at COVS, CCS HAU Hisar. However, a patent application was filed through National Research Development Corporation, New Delhi vide patent application No. 822DEL/2004 dated 5.5.2004 and the patent has been granted on 06.01.2012 with the patent number - 250500. Kit contains indicator (Milk Urea Detection Reagent) solution, filter paper disc, and dropper, forceps, and rubber ring for holding

filter paper disc. The same has now been commercialized to two companies (M/s. DKS Incorporate, Hisar and M/s.Vanshika Milk Agro & Plastics), Hisar, Haryana.

d.) **Wheat Variety WH 1105:**

CCS Haryana Agricultural University, Hisar, has developed new bread wheat variety **WH 1105** which has recently been notified during January, 2013 for cultivation in North Western Plain Zone of India consisting of Punjab, Haryana, Delhi, Rajasthan (except Kota & Udaipur divisions) and Western UP (except Jhansi division), parts of J&K (Jammu & Kathua distt.) and parts of HP (Una distt. and Paonta valley) and Uttarakhand (Tarai region) and has been recommended for cultivation under timely sown, high fertility, irrigated conditions.



Besides high yield **WH 1105** exhibited excellent degree of resistance to yellow and brown rusts, flag smut, leaf blight and powdery mildew diseases prevalent in the area. This new variety also possesses better quality characters in terms of the higher Sedimentation Value (53 ml), gluten index (71) and good biscuit quality spreading factor (7.80). It is also better in nutrient uptake possessing the maximum content of Iron (32.7 ppm), Zinc (32.3 ppm) and Copper (5.26 ppm).

Moreover, an overwhelmingly response has been received from the seed companies of Haryana, Punjab, Rajasthan and Andhra Pradesh, regarding commercialization of recently released new Wheat Variety WH 1105. The **Business Planning & Development Unit**, CCSHAU has successfully commercialized the wheat variety WH 1105 in two phases. During the first phase, it was commercialized to 38 companies and during the second phase to 36 companies *i.e.* to a total of 74 companies.

II. Success Stories

a.) **Healthy Bites:** Mr. Anurag Sharma, common man, having a vision of being an entrepreneur. He is a Biology graduate and having a MBA degree. His success story is quite amendable. He started his successful journey by registering himself as a **BPD member**



and there after engaged himself in a ‘**Training and Entrepreneurship Program in Bio-Technology, Food Products and Liquid Bio-fertilizers Technology**’ from **9th - 13th May, 2011** but his unending quest of being an entrepreneur led him to sign **MoU’s** on ‘**Food Products Technology**’ on **25th April, 2013** and eventually ending up in starting his own business and now his business has grown up from teething to biting stage as he is able to provide employment to a bunch of people. Presently, he is engaged in providing his food products to Ministry of Agriculture, Krishi Bhawan, New Delhi, National Seeds Corporation and National Fertilizers Corporation Limited and is selling his products with brand names Memory Bite, Healthy Bite, *etc.*

b.) Liquid Biofertilizers: Mr. Manoj Kumar, a budding entrepreneur had zeal of setting up his own business. It was quite observable when he registered himself as a member of **BPD Unit**. He was clear in his ideas and bringing them into action, a true business minded person. He took part in ‘**Training and Entrepreneurship Development Program in Self Employment Generation Training for Entrepreneurs in Bio-Technology, Food Products and Liquid Bio-fertilizers Technology**’ from **3rd- 7th Jan, 2012** which helped him presenting his



ideas in a more feasible way. He further signed **MoU** on **Liquid Biofertilizer Technology** on **17th November 2012** and successfully started his own production unit (**Y.S. Sons AGROTECH, Baddi, Himachal Pradesh**) and currently providing employment to scores of people.

c.) Milk Urea Detection Kit Technology: After the establishment of IPR Cell-cum-BPD Unit, the technology has been brought in the focus of stakeholders. The Milk Urea Detection technology which was developed about ten years ago has come in limelight of the dairy sector and masses. Mr. Anurag Sharma, an entrepreneur from Hisar showed a keen interest in the milk urea detection technology and his quest lead him to become a member of incubation programme for the milk urea detection technology organized by the CCS Haryana Agricultural University, Hisar and finally he ended up in signing up a **MoU** on **20th April, 2011** with the CCS Haryana Agricultural University, Hisar

6. Innovations

- I. **Milk Urea Detection Kit:** One of the major innovations is the transformation of the milk urea detection technology into milk urea detection kit as it is more handy and portable and the queries are coming from throughout the country. Various components of the kit are in ready to use form and stable at room temperature:

- Test fast and long shelf life (tested for 3 years)
- Better reproducibility due to stability at room temperature
- No need of highly trained manpower
- Ensures bio safety & chemical safety
- The kit can be used to test urea instantaneously, the most damaging constituent in synthetic and adulterated milk
- Requires only one drop of suspected milk sample
- Cost of sample testing very low
- Can be applied on large sample size in most economic way in field by big dairies as well as households
- Widely tested on large sample size in the field and routinely employed in the department for detecting Urea adulteration/ synthetic milk

II. QPM & Pearlmillet Food Products

Technology: In spite of high nutrient profile, utilization of pearlmillet is low due to various constraints. One of the major constraints for the utilization of pearlmillet is the property of its flour to acquire a rancid odour within a few days of milling because of high concentration of lipids that contribute to the development of fat acidity, lipolytic activity and accumulation of peroxide of lipids in the meal during storage. People are willing to consume pearlmillet flour because of its nutritional superiority but due to non-availability of packed flour, it is not possible to consume.



The QPM biscuits developed by CCSHAU, Hisar are consumer acceptable and field acceptable. They can have economic benefits to the farmer/entrepreneur as are very easy to prepare, nutritious and shelf-life is also good. Quality protein maize taste like normal maize and contains double the lysine and higher tryptophan than normal maize. Being low in cost and having long shelf-life, these products can generate more profits to the entrepreneur as people now-a-days have become more conscious towards health related food products, so the market for such food products is very promising.

III. Shelf-stable Pearlmillet flour:

This flour has more good market potential as shelf stable flour is not available in market. Flour such developed can be successfully incorporated in variety of products including traditional, baked and



extruded products. People are willing to use the pearl millet flour. Shelf stable flour can be packed in polythene bags and sold in commercial shops. This will add to convenience of consumer to get shelf stable pearl millet flour for ready consumption

7. Process/ Product/Technology Developed

(List partner-wise major Process/ Product/Technology developed and their outcome in quantifiable terms)

S. No.	(Process/Product/Technology Developed)		Responsible Partner
1.	Maize Hybrids (HQPM 1, HQPM 5, HM 4 & HM 5)	Commercialized	<i>Kamboj Exports, Karnal, Haryana</i>
2.	Maize Hybrids (HQPM 1, HQPM 5, HM 4 & HM 10)		<i>M/s PI Industries, Gurgaon, Haryana</i>
3.	Maize Hybrids (HQPM 1 & HQPM 5)		<i>Akash Seeds & Co., Ambikapur, Chattisgarh</i>
4.	Maize Hybrids (HQPM 1 & HQPM 5)		<i>Bhartiya Beej Nigam Ltd., Uttarakhand</i>
5.	Maize Hybrids (HM 8, HM 9 & HM 10)		<i>Nuziveedu Seeds Pvt. Ltd., Ranga Reddy Distt, Andhra Pradesh</i>
6.	Maize Hybrids (HQPM 1, HQPM 7, HM 4, HM 5 & HM 10)		<i>Arpan Seeds Pvt. Ltd., Udaipu, Rajasthan</i>
7.	Maize Hybrids (HQPM 1 & HM 5)		<i>Charoen Pokphand Seeds Pvt Ltd., Bangalore, Karnataka</i>
8.	Maize Hybrids (HQPM 1)		<i>Balaji Seeds, Kurnool, Andhra Pradesh</i>
9.	Maize Hybrids (HQPM 1 & HQPM 5)		<i>Sansar Agropol Pvt. Ltd., Bhubaneswar, Odisha</i>
10.	Maize Hybrids (HM 9 & HM 11)		<i>Vibha Agrotech Ltd. Hyderabad, Andhra Pradesh</i>
11.	Maize Hybrids (HM 9, HM 10 & HM 11)		<i>Nath Bio Genes India Ltd., Aurangabad, Maharashtra</i>
12.	Maize Hybrids (HM 8, HM 10 & HM 11)		<i>Bhartiya Beej Nigam Ltd., Udham Singh Nagar, Uttarakhand</i>
13.	Maize Hybrids (HQPM 1 & HQPM 5)		<i>Siri Seeds (India) Pvt. Ltd., Hyderabad, Andhra Pradesh</i>
14.	Maize Hybrids (HQPM 1 & HQPM 5)		<i>Balaji Agri Biotech Pvt. Ltd., Bargarh, Odisha</i>
15.	Maize Hybrids (HQPM 1 & HQPM 5)		<i>J.K. Agri Genetics Limited, Hyderabad, Andhra Pradesh</i>
16.	Maize Hybrid (HQPM 1)		<i>Bioseed Research India, Hyderabad, Andhra Pradesh</i>
17.	Maize Hybrids (HQPM 1 & HQPM 5)		<i>Sampoorna Seeds, Adoni, Kurnool District, Andhra Pradesh</i>
18.	<i>Bajra Hybrid (HHB 226)</i>	Commercialized	<i>M/s Pacific Seed (India) Pvt. Ltd., Jaipur, Rajasthan</i>
19.	<i>Bajra Hybrids (HHB 223 & HHB 67 improved)</i>		<i>M/s Shiv Ganga Hybrid Seeds P.Ltd., Hisar, Haryana</i>
20.	Rice Hybrid (HKRH 1)	Commercialized	<i>Akash Seeds & Co., Ambikapur, Chattisgarh</i>
21.	Wheat Varieties (WH 1021 & WH 1080)	Commercialized	<i>J.K. Agri Genetics Ltd., Hyderabad, Andhra Pradesh</i>
22.	Wheat Varieties (WHD 943, WH 1021 & WH 1080)	Commercialized	<i>Supreme Seeds, Fatehabad, Haryana</i>

23.	Wheat Variety WH 1105	Commercialized	Super Seeds Pvt. Ltd., Hisar
24.	Wheat Variety WH 1105		Supreme Seeds, Fatehabad
25.	Wheat Variety WH 1105		Sharda Enterprises, Fatehabad
26.	Wheat Variety WH 1105		Genetic Seeds, Fatehabad
27.	Wheat Variety WH 1105		Haryana Seeds, Sirsa
28.	Wheat Variety WH 1105		Golden Seeds & Chemicals, Sirsa
29.	Wheat Variety WH 1105		Sandhu Seeds Farm, Sirsa
30.	Wheat Variety WH 1105		M/s Bhatti Agri Seeds, Sirsa
31.	Wheat Variety WH 1105		Nirankari Agri Seed, Sirsa
32.	Wheat Variety WH 1105		Hi Tech Kamboj Seeds, Karnal
33.	Wheat Variety WH 1105		M/s Harbir Agrotech Pvt.Ltd., Karnal
34.	Wheat Variety WH 1105		M/s Janak Seeds, Karnal
35.	Wheat Variety WH 1105		Kamboj Export, Karnal
36.	Wheat Variety WH 1105		M/s Hans Modern Agri Seeds , Karnal
37.	Wheat Variety WH 1105		M/s Pusa Super Seeds, Karnal
38.	Wheat Variety WH 1105		M/s Raj Enterprises, Karnal
39.	Wheat Variety WH 1105		Kadiyan Seed Corporation, Karnal
40.	Wheat Variety WH 1105		Arjun Seeds Corporation, Karnal
41.	Wheat Variety WH 1105		Semenis Seeds Co., Panipat
42.	Wheat Variety WH 1105		Dhaliwal Seeds Pvt. Ltd., Kurukshetra
43.	Wheat Variety WH 1105		Agricon Exports, Yamunanagar
44.	Wheat Variety WH 1105		M/s Ganga Seed Farm, Bathinda
45.	Wheat Variety WH 1105		Satguru Seeds, Bathinda
46.	Wheat Variety WH 1105		Bathinda Seed Farm, Bathinda
47.	Wheat Variety WH 1105		M/s Shree Ganesh Seeds Farm, Bathinda
48.	Wheat Variety WH 1105		Shree Balaji Seeds Farm, Bathinda
49.	Wheat Variety WH 1105		Punjab Crop Seed Farm, Bathinda
50.	Wheat Variety WH 1105		Tulsi Seeds Farm, Bathinda
51.	Wheat Variety WH 1105		Shree Ganpati Seeds Farm, Bathinda
52.	Wheat Variety WH 1105		Bhagat Seed Farm, Ludhiana
53.	Wheat Variety WH 1105		San Seed Farm, Moga
54.	Wheat Variety WH 1105		Sandhu Seeds Farm, Muktsar
55.	Wheat Variety WH 1105		Fine Line Hybrid Seeds, Muktsar
56.	Wheat Variety WH 1105		Satgur Seed Company, Sangrur
57.	Wheat Variety WH 1105		Krishi Vikas Sahakari Samiti Ltd., Hanumangarh
58.	Wheat Variety WH 1105		J K Agri Genetics Ltd., Hyderabad
59.	Wheat Variety WH 1105		Yamuna Seeds, Karnal
60.	Wheat Variety WH 1105		M/s Bharat Hybrid Seeds Company, Bathinda
61.	Wheat Variety WH 1105		M/s Karnal Seeds Corporation, Ambala
62.	Wheat Variety WH 1105		CCR Agro Seeds Pvt. Ltd., Hisar
63.	Wheat Variety WH 1105		Chetak Seeds, Hisar
64.	Wheat Variety WH 1105		Shaktivardhak Seeds, Hisar
65.	Wheat Variety WH 1105		Shiv Ganga Hybrid Seed, Hisar
66.	Wheat Variety WH 1105		Shanker Seeds Anta, Jind
67.	Wheat Variety WH 1105		M/s Amar Seeds, Kaithal
68.	Wheat Variety WH 1105		Indian Seeds, Karnal
69.	Wheat Variety WH 1105		Kamboj Foods Pvt. Ltd., Karnal
70.	Wheat Variety WH 1105		Sahib Seeds Ltd., Karnal
71.	Wheat Variety WH 1105		Bharat Seeds, Sirsa
72.	Wheat Variety WH 1105		M/s Soami Seeds, Sirsa

73.	Wheat Variety WH 1105	Commercialized	<i>Sadbhawna Seeds Corporation, Sirsa</i>
74.	Wheat Variety WH 1105		<i>P.C.S. Agrotech Industries, Sonipat</i>
75.	Wheat Variety WH 1105		<i>Shakti Seeds, Bathinda</i>
76.	Wheat Variety WH 1105		<i>M/s Shri Krishna Seeds Farm, Bathinda</i>
77.	Wheat Variety WH 1105		<i>M/s Pakka Seeds, Bathinda</i>
78.	Wheat Variety WH 1105		<i>Rama Seeds, Bathinda</i>
79.	Wheat Variety WH 1105		<i>Ashoka Seeds, Bathinda</i>
80.	Wheat Variety WH 1105		<i>M/s. Mittal Seeds, Bathinda</i>
81.	Wheat Variety WH 1105		<i>Shri Ram Traders, Bathinda</i>
82.	Wheat Variety WH 1105		<i>M/s Punjab Agro Seeds, Faridkot</i>
83.	Wheat Variety WH 1105		<i>Dashmesh Agro Seed Farm, Gurdaspur</i>
84.	Wheat Variety WH 1105		<i>Bains Seed Farm, Jalandhar</i>
85.	Wheat Variety WH 1105		<i>Kartar Seed Farm, Ludhiana</i>
86.	Wheat Variety WH 1105		<i>Sardar Seed Farm, Muktsar</i>
87.	Wheat Variety WH 1105		<i>Jindal Hybrid Seed Co., Muktsar</i>
88.	Wheat Variety WH 1105		<i>Akal Seed Farm, Mansa</i>
89.	Wheat Variety WH 1105		<i>Jyoti Seed Production Farm, Mansa</i>
90.	Wheat Variety WH 1105		<i>Gill Seeds Farm, Moga</i>
91.	Wheat Variety WH 1105		<i>Sarv Seeds Corporation, Moga</i>
92.	Wheat Variety WH 1105		<i>Punjab Agriculture Seed Farm, Ropar</i>
93.	Wheat Variety WH 1105		<i>Gee Agri Seeds, Sangrur</i>
94.	Wheat Variety WH 1105		<i>Bhawani Seeds & Biotech., Mathura</i>
95.	Wheat Variety WH 1105		<i>Krishak Bharti Cooperative Ltd., Gautam Budh Nagar</i>
96.	Wheat Variety WH 1105	<i>M/s Ifsa Seeds, Sri Ganganagar</i>	
97.	Dhaincha Variety DH 1	Commercialized	<i>Bhartiya Beej Nigam Ltd., Uttarakhand</i>
98.	Raya Variety RH 0749	Commercialized	<i>M/s Ifsa Seeds, Sri Ganganagar</i>
99.	Liquid Biofertilizers	Commercialized	<i>M/s Micro-Bac India, Kolkata, West Bengal</i>
100.	Liquid Biofertilizers		<i>Bharat Bio-Con Pvt. Ltd, Raigarh, Chhattisgarh</i>
101.	Liquid Biofertilizers		<i>Y.S. Sons Agrotech, Baddi, Himachal Pradesh</i>
102.	Milk Urea Detection Kit	Commercialized	<i>M/S DKS Incorporates, Hisar, Haryana</i>
103.	Milk Urea Detection Kit		<i>Vanshika Milk Agro & Plastics Pvt. Ltd., Hisar, Haryana</i>
104.	Schizont Cell Culture Vaccine against bovine topical Theileriosis	Commercialized	<i>M/s Hester Bio Sciences Ltd., Ahmedabad, Gujarat</i>
105.	For foundation Seed production	MoU signed	<i>Haryana Seeds Development Corporation, Chandigarh, Haryana</i>
106.	For the promotion of commercializable technologies between CCSHAU & AAU	MoU signed	<i>Anand Agricultural University, Gujarat</i>
107.	For the production and marketing of Bajra, Maize and other Crop Hybrids/Varieties	MoU signed	<i>National Seeds Corporation, New Delhi</i>
108.	For Germplasm in Wheat	MoU signed	<i>National Bureau of Plant Genetics Resources, New Delhi</i>
109.	For Promotion of commercializable technologies available with CCSHAU	MoU signed	<i>National Research Development Corporation</i>
110.	For Incubation: Pilot Plant Production for Milk Urea Detection Kit	Agreement signed	<i>M/s DKS Incorporates, Hisar, Haryana</i>

111.	Non-Exclusive Incubation Agreement for the Pilot Scale Production of Eco friendly PHB towards Production of Bio-Degradable Plastic	Agreement signed	<i>M/s DKS Incorporates, Hisar, Haryana</i>
112.	Non-Exclusive Lab Usage/Incubation Agreement for Bakery lab of the Department of Foods and Nutrition	Agreement signed	<i>M/s DKS Incorporate, Hisar</i>
113.	Non-Exclusive Incubation Agreement for Usage of Office Space in BPD Unit, Directorate of Human Resource Management	Agreement signed	<i>Mr. Anurag Sharma, M/s DKS Incorporate, Hisar</i>
114.	Food Products technology developed by the Department of Foods and Nutrition , namely Bajra Biscuits (two variants), Bajra cake (two variants), Shelf-stable pearl millet flour and Extruded snacks (two variants)	Commercialized	<i>M/s DKS Incorporate, Hisar</i>
115.	Food Products technology developed by the Centre for Food Science and Technology , namely Beverages (two variants) and Brahmi Biscuits		<i>M/s DKS Incorporate, Hisar</i>
116.	Food Products technology developed by the Department of Foods and Nutrition , namely Pearl Millet Biscuits (eight variants), Quality Protein Maize Biscuits (eight variants), Bajra cake (two variants) and Namak Paare	Commercialized	<i>M/s Kamboj Foods Pvt. Ltd., Indri, Karnal</i>
117.	Food Products technology developed by the Centre for Food Science and Technology , namely Brahmi Biscuits		<i>M/s Kamboj Foods Pvt. Ltd., Indri, Karnal</i>

8. Patents (Filed/Granted)

The University has taken early initiatives to adopt ICAR guidelines for Intellectual Property protection. Accordingly, a document “Intellectual Property Rights: Policy and Regulations” was prepared by this unit which was approved by the Board of Management. The same have been implemented by the University. This cell organized awareness programs on IP management for faculty members and students of the university and also for all the SAUs and ICAR Institutes in the country. The University has so far submitted **46** patent/protection applications (which include 19 filed since inception of the BPD Unit) for its intellectual properties and out of which **10** patents/ protection have been granted. The following achievements were made in IP protection after the establishment of BPD Unit:

a.) List of Patents/Protection Filed: (after inception of BPD Unit)

Sr. No.	Year	Title of Patent	Invention (s) (Name & Address)	Responsible Partner
1.	2010	Antistress effect of Indian gooseberry (<i>Emblica officinalis</i>) and probiotic on the performance of broilers during hot humid weather	R.K.Sharma, Madeeha Untoo	CCSHAU, Hisar
2.	2010	SCAR marker based identification of sex in	Pushpa Kharb, Charu Mitra	CCSHAU, Hisar

Sr. No.	Year	Title of Patent	Invention (s) (Name & Address)	Responsible Partner
		date palm		
3.	2010	SCAR marker based identification of sex in Jojoba	Pushpa Kharb, Surender, Charu Mitra	CCSHAU, Hisar
4.	2010	Expeditious fermentation of wheat grains into ethanol for fuel use	S.S.Dhamijia, Seema Sangwan	CCSHAU, Hisar
5.	2010	A renewable resource drives starchy raw materials to ferment fast into ethanol	S.S.Dhamijia, Seema Sangwan	CCSHAU, Hisar
6.	2010	Fractionated renewable reject boosts ethanolic fermentations of starchy and sugary raw materials	S.S.Dhamijia, Seema Sangwan	CCSHAU, Hisar
7.	2010	An eco-friendly way of surface sterilization of explant in tissue culture	Pushpa Kharb, Praveen Batra, Pavitra, Manjula Vasudeva, V.K. Chowdhury	CCSHAU, Hisar
8.	2011	Educational media in form of a CD to educate the women and adolescents girls regarding causes and symptoms of developmental disabilities	Shakuntla Punia, Rashmi Goyal	CCSHAU, Hisar
9.	2011	Effect of organic sulphate supplementation on performance of turkey broilers in fish meal free ration	Vishal Sharma, R.K.Sharma	CCSHAU, Hisar
10.	2011	Novel biochemical technique to estimate alpha1 acid glycoprotein concentration in cow and buffalo milk	Sandeep Gera, Anirban Guha	CCSHAU, Hisar
11.	2011	Novel biochemical technique to estimate calcium concentration in cow and buffalo milk	Sandeep Gera, Anirban Guha	CCSHAU, Hisar
12.	2011	Novel biochemical technique to estimate magnesium concentration in cow and buffalo milk	Sandeep Gera, Anirban Guha	CCSHAU, Hisar
13.	2011	Novel biochemical technique to estimate milk urea nitrogen concentration in cow and buffalo milk	Sandeep Gera, Anirban Guha	CCSHAU, Hisar
14.	2011	Detection of Alpha1 Acid Glycoprotein in healthy and subclinical mastitis milk in buffalo	Sandeep Gera, Anirban Guha	CCSHAU, Hisar
15.	2012	Simple and cost effective method for identification of Pearl millet hybrids for purity assessment	Neelam Rani Yadav, Sandeep Yadav, Ram Chander Yadav, Hari Prakash Yadav	CCSHAU, Hisar
16.	2012	An efficient method for transformation in Tomato Variety Hisar Arun	R.C. Yadav, Teena Rani, Neelam Rani Yadav	CCSHAU, Hisar
17.	2012	De-stoning of <i>Ber (Ziziphus mauritiana Lamk)</i> fruits and its value addition	Mukesh Kumar, Devi Singh, R.K. Godara	CCSHAU, Hisar
18.	2012	Water Application attachment on Seed Drill for Dryland Farming (DESIGN)	Vijaya Rani, Yuvraj Kasal	CCSHAU, Hisar
19.	2013	Scar Marker based identification of sex in <i>Simarouba glauca DC</i>	Santosh Dhillon, Chetan Kumar Choudhary, Khazan Singh Boora, Pushpa Kharb, Ravinder Dhillon	CCSHAU, Hisar

b.) List of Patents Granted: (after inception of BPD Unit)

Sr. No.	Title of Patent	Inventor	Granted on	Patent/ Protection Details	Responsible partner
1.	A new laboratory method for production of <i>Pasteuria penetrans</i>	Raman K. Walia, Anil Kumar, Satish Kumar Mehta, Deptt. of Nematology	Patent Granted on 11.11.2010	Patent No. - 243958	C C S H A U H I S A R
2.	A Process of preparation of Tissue Culture Medium for enhancing <i>in-vitro</i> Plantlet Regeneration in Air Yam Plant using Bacterial Culture Supernatant	Pushpa Kharb, K. Dahiya, V. Yadav, P. Batra, N. Narula, S. Dhillon, V.K. Chowdhry, Deptt. of MBB	Patent Granted on 22.07.2011	Patent No. 248511	
3.	A process of testing urea in Milk & Solutions thereof	Gulshan Narang, R.S. Khokhar, Deptt. of VPHE	Patent Granted on 06.01.2012	Patent No. 250500	
4.	A Novel Process of Genetic Transformation in Chickpea using <i>Agrobacterium</i>	Pushpa Kharb & Team, Deptt. of MBB	Patent Granted on 23.05.2012	Patent No. 252590	
5.	Development of low cost liquid formulation of native strains of <i>Bacillus thuringensis</i> against <i>Helicoverpa armigera</i>	Kamla Chaudhary, Harish Dhingra, K.S. Boora	Patent Granted on 03.08.2012	Patent No. 253532	
6.	A method for the estimation of Multi Residue in Milk & Milk Products	Beena Kumari, Deptt. of Entomology	Patent Granted on 10.12.2013	Patent No. 258152	

9. Linkages and Collaborations

Public sector companies:

S. No.	Linkages developed (Name & Address of Organization)	Date/Period From-To	Responsible Partner
1.	Haryana Seeds Development Corporation, Chandigarh	02.02.2011 (5 years)	CCS HAU, Hisar
2.	Anand Agricultural University, Anand (Gujarat)	30.09.2011 (5 years)	CCS HAU, Hisar
3.	National Seeds Corporation, New Delhi	31.12.2011	CCS HAU, Hisar

		(5 years)	
4.	National Bureau of Plant Genetics Resources, New Delhi	29.01.2012 (5 years)	CCS HAU, Hisar
5.	National Research Development Corporation, New Delhi	30.10.2013 (5 years)	CCS HAU, Hisar

Private sector companies:

S. No.	Linkages developed (Name & Address of Organization)	Date/Period From-To	Responsible Partner
Seed companies			
a) Maize Hybrids			
1.	Kamboj Exports, Karnal, Haryana	28.07.2010 (5 years)	CCS HAU, Hisar
2.	M/s PI Industries, Gurgaon, Haryana	16.02.2011 (5 years)	CCS HAU, Hisar
3.	Akash Seeds & Co., Ambikapur, Chattisgarh	18.06.2011 (5 years)	CCS HAU, Hisar
4.	Bhartiya Beej Nigam Ltd., Uttarakhand	18.06.2011 (5 years)	CCS HAU, Hisar
5.	Nuziveedu Seeds Pvt. Ltd., Ranga Reddy Distt, Andhra Pradesh	27.06.2011 (5 years)	CCS HAU, Hisar
6.	Arpan Seeds Pvt. Ltd., Udaipu, Rajasthan	02.07.2011 (5 years)	CCS HAU, Hisar
7.	Charoen Pokphand Seeds Pvt Ltd., Bangalore, Karnataka	08.09.2011 (5 years)	CCS HAU, Hisar
8.	Balaji Seeds, Kurnool, Andhra Pradesh	01.10.2011 (5 years)	CCS HAU, Hisar
9.	Sansar Agropol Pvt. Ltd., Bhubaneswar, Odisha	01.12.2011 (5 years)	CCS HAU, Hisar
10.	Vibha Agrotech Ltd. Hyderabad, Andhra Pradesh	22.12.2011 (5 years)	CCS HAU, Hisar
11.	Nath Bio Genes India Ltd., Aurangabad, Maharashtra	29.05.2012 (5 years)	CCS HAU, Hisar
12.	Bhartiya Beej Nigam Ltd., Udhm Singh Nagar, Uttarakhand	20.06.2012 (5 years)	CCS HAU, Hisar
13.	Siri Seeds (India) Pvt. Ltd., Hyderabad, Andhra Pradesh	15.03.2013 (5 years)	CCS HAU, Hisar
14.	Balaji Agri Biotech Pvt. Ltd., Bargarh, Odisha	17.06.2013 (5 years)	CCS HAU, Hisar
15.	J.K. Agri Genetics Limited, Hyderabad, Andhra Pradesh	10.07.2013 (5 years)	CCS HAU, Hisar
16.	Bioseed Research India, Hyderabad, Andhra Pradesh	07.08.2013 (5 years)	CCS HAU, Hisar
17.	Sampoorna Seeds, Adoni, Kurnool District, Andhra Pradesh	14.08.2013 (5 years)	CCS HAU, Hisar
b) Bajra Hybrids			
18.	M/s Pacific Seed (India) Pvt. Ltd., Jaipur, Rajasthan	20.04.2011 (5 years)	CCS HAU, Hisar
19.	M/s Shiv Ganga Hybrid Seeds P.Ltd., Hisar, Haryana	20.04.2011 (5 years)	CCS HAU, Hisar
c) Rice Hybrids			
20.	Akash Seeds & Co., Ambikapur, Chattisgarh	18.06.2011 (5 years)	CCS HAU, Hisar
d) Wheat Varieties			
21.	J.K. Agri Genetics Ltd., Hyderabad, Andhra Pradesh	20.04.2011 (3 years)	CCS HAU, Hisar
22.	Supreme Seeds, Fatehabad, Haryana	20.04.2011 (3 years)	CCS HAU, Hisar

23.	Super Seeds Pvt. Ltd., Hisar	28.09.2013 (3 years)	CCS HAU, Hisar
24.	Supreme Seeds, Fatehabad	28.09.2013 (3 years)	CCS HAU, Hisar
25.	Sharda Enterprises, Fatehabad	28.09.2013 (3 years)	CCS HAU, Hisar
26.	Genetic Seeds, Fatehabad	28.09.2013 (3 years)	CCS HAU, Hisar
27.	Haryana Seeds, Sirsa	28.09.2013 (3 years)	CCS HAU, Hisar
28.	Golden Seeds & Chemicals, Sirsa	28.09.2013 (3 years)	CCS HAU, Hisar
29.	Sandhu Seeds Farm, Sirsa	28.09.2013 (3 years)	CCS HAU, Hisar
30.	M/s Bhatti Agri Seeds, Sirsa	28.09.2013 (3 years)	CCS HAU, Hisar
31.	Nirankari Agri Seed, Sirsa	28.09.2013 (3 years)	CCS HAU, Hisar
32.	Hi Tech Kamboj Seeds, Karnal	28.09.2013 (3 years)	CCS HAU, Hisar
33.	M/s Harbir Agrotech Pvt.Ltd., Karnal	28.09.2013 (3 years)	CCS HAU, Hisar
34.	M/s Janak Seeds, Karnal	28.09.2013 (3 years)	CCS HAU, Hisar
35.	Kamboj Export, Karnal	28.09.2013 (3 years)	CCS HAU, Hisar
36.	M/s Hans Modern Agri Seeds , Karnal	28.09.2013 (3 years)	CCS HAU, Hisar
37.	M/s Pusa Super Seeds, Karnal	28.09.2013 (3 years)	CCS HAU, Hisar
38.	M/s Raj Enterprises, Karnal	28.09.2013 (3 years)	CCS HAU, Hisar
39.	Kadiyan Seed Corporation, Karnal	28.09.2013 (3 years)	CCS HAU, Hisar
40.	Arjun Seeds Corporation, Karnal	28.09.2013 (3 years)	CCS HAU, Hisar
41.	Semenis Seeds Co., Panipat	28.09.2013 (3 years)	CCS HAU, Hisar
42.	Dhaliwal Seeds Pvt. Ltd., Kurukshetra	28.09.2013 (3 years)	CCS HAU, Hisar
43.	Agricon Exports, Yamunanagar	28.09.2013 (3 years)	CCS HAU, Hisar
44.	M/s Ganga Seed Farm, Bathinda	28.09.2013 (3 years)	CCS HAU, Hisar
45.	Satguru Seeds, Bathinda	28.09.2013 (3 years)	CCS HAU, Hisar
46.	Bathinda Seed Farm, Bathinda	28.09.2013 (3 years)	CCS HAU, Hisar
47.	M/s Shree Ganesh Seeds Farm, Bathinda	28.09.2013 (3 years)	CCS HAU, Hisar
48.	Shree Balaji Seeds Farm, Bathinda	28.09.2013 (3 years)	CCS HAU, Hisar
49.	Punjab Crop Seed Farm, Bathinda	28.09.2013 (3 years)	CCS HAU, Hisar
50.	Tulsi Seeds Farm, Bathinda	28.09.2013 (3 years)	CCS HAU, Hisar
51.	Shree Ganpati Seeds Farm, Bathinda	28.09.2013 (3 years)	CCS HAU, Hisar
52.	Bhagat Seed Farm, Ludhiana	28.09.2013 (3 years)	CCS HAU, Hisar
53.	San Seed Farm, Moga	28.09.2013 (3 years)	CCS HAU, Hisar
54.	Sandhu Seeds Farm, Muktsar	28.09.2013 (3 years)	CCS HAU, Hisar
55.	Fine Line Hybrid Seeds, Muktsar	28.09.2013 (3 years)	CCS HAU, Hisar
56.	Satgur Seed Company, Sangrur	28.09.2013 (3 years)	CCS HAU, Hisar
57.	Krishni Vikas Sahakari Samiti Ltd., Hanumangarh	28.09.2013 (3 years)	CCS HAU, Hisar
58.	J K Agri Genetics Ltd., Hyderabad	28.09.2013 (3 years)	CCS HAU, Hisar
59.	Yamuna Seeds, Karnal	28.09.2013 (3 years)	CCS HAU, Hisar
60.	M/s Bharat Hybrid Seeds Company, Bathinda	28.09.2013 (3 years)	CCS HAU, Hisar
61.	M/s Karnal Seeds Corporation, Ambala	26.10.2013 (3 years)	CCS HAU, Hisar
62.	CCR Agro Seeds Pvt. Ltd., Hisar	26.10.2013 (3 years)	CCS HAU, Hisar
63.	Chetak Seeds, Hisar	26.10.2013 (3 years)	CCS HAU, Hisar
64.	Shaktivardhak Seeds, Hisar	26.10.2013 (3 years)	CCS HAU, Hisar
65.	Shiv Ganga Hybrid Seed, Hisar	26.10.2013 (3 years)	CCS HAU, Hisar
66.	Shanker Seeds Anta, Jind	26.10.2013 (3 years)	CCS HAU, Hisar
67.	M/s Amar Seeds, Kaithal	26.10.2013 (3 years)	CCS HAU, Hisar
68.	Indian Seeds, Karnal	26.10.2013 (3 years)	CCS HAU, Hisar
69.	Kamboj Foods Pvt. Ltd., Karnal	26.10.2013 (3 years)	CCS HAU, Hisar
70.	Sahib Seeds Ltd., Karnal	26.10.2013 (3 years)	CCS HAU, Hisar
71.	Bharat Seeds, Sirsa	26.10.2013 (3 years)	CCS HAU, Hisar
72.	M/s Soami Seeds, Sirsa	26.10.2013 (3 years)	CCS HAU, Hisar
73.	Sadbhawna Seeds Corporation, Sirsa	26.10.2013 (3 years)	CCS HAU, Hisar
74.	P.C.S. Agrotech Industries, Sonipat	26.10.2013 (3 years)	CCS HAU, Hisar
75.	Shakti Seeds, Bathinda	26.10.2013 (3 years)	CCS HAU, Hisar
76.	M/s Shri Krishna Seeds Farm, Bathinda	26.10.2013 (3 years)	CCS HAU, Hisar

77.	M/s Pakka Seeds, Bathinda	26.10.2013 (3 years)	CCS HAU, Hisar
78.	Rama Seeds, Bathinda	26.10.2013 (3 years)	CCS HAU, Hisar
79.	Ashoka Seeds, Bathinda	26.10.2013 (3 years)	CCS HAU, Hisar
80.	M/s. Mittal Seeds, Bathinda	26.10.2013 (3 years)	CCS HAU, Hisar
81.	Shri Ram Traders, Bathinda	26.10.2013 (3 years)	CCS HAU, Hisar
82.	M/s Punjab Agro Seeds, Faridkot	26.10.2013 (3 years)	CCS HAU, Hisar
83.	Dashmesh Agro Seed Farm, Gurdaspur	26.10.2013 (3 years)	CCS HAU, Hisar
84.	Bains Seed Farm, Jalandhar	26.10.2013 (3 years)	CCS HAU, Hisar
85.	Kartar Seed Farm, Ludhiana	26.10.2013 (3 years)	CCS HAU, Hisar
86.	Sardar Seed Farm, Muktsar	26.10.2013 (3 years)	CCS HAU, Hisar
87.	Jindal Hybrid Seed Co., Muktsar	26.10.2013 (3 years)	CCS HAU, Hisar
88.	Akal Seed Farm, Mansa	26.10.2013 (3 years)	CCS HAU, Hisar
89.	Jyoti Seed Production Farm, Mansa	26.10.2013 (3 years)	CCS HAU, Hisar
90.	Gill Seeds Farm, Moga	26.10.2013 (3 years)	CCS HAU, Hisar
91.	Sarv Seeds Corporation, Moga	26.10.2013 (3 years)	CCS HAU, Hisar
92.	Punjab Agriculture Seed Farm, Ropar	26.10.2013 (3 years)	CCS HAU, Hisar
93.	Gee Agri Seeds, Sangrur	26.10.2013 (3 years)	CCS HAU, Hisar
94.	Bhawani Seeds & Biotech., Mathura	26.10.2013 (3 years)	CCS HAU, Hisar
95.	Krishak Bharti Cooperative Ltd., Gautam Budh Nagar	26.10.2013 (3 years)	CCS HAU, Hisar
96.	M/s Ifsa Seeds, Sri Ganganagar	26.10.2013 (3 years)	CCS HAU, Hisar
e) Dhaincha Variety			
97.	Bhartiya Beej Nigam Ltd., Uttarakhand	23.07.2011 (5 years)	CCS HAU, Hisar
f) Raya Variety			
98.	M/s Ifsa Seeds, Sri Ganganagar	26.10.2013 (3 years)	CCS HAU, Hisar
Biofertilizer companies			
g) Liquid Biofertilizers			
99.	M/s Micro-Bac India, Kolkata, West Bengal	31.03.2010 (10 years)	CCS HAU, Hisar
100.	Bharat Bio-Con Pvt. Ltd, Raigarh, Chhattisgarh	15.09.2010 (10 years)	CCS HAU, Hisar
101.	Y.S. Sons Agrotech, Baddi, Himachal Pradesh	17.11.2012 (3 years)	CCS HAU, Hisar
h) Milk Urea Detection Kit			
102.	M/S DKS Incorporates, Hisar, Haryana	20.04.2011 (5 years)	CCS HAU, Hisar
103.	Vanshika Milk Agro & Plastics Pvt. Ltd., Hisar, Haryana	23.07.2011 (4 years)	CCS HAU, Hisar
i) Schizont Cell Culture Vaccine against bovine topical Theileriosis			
104.	M/s Hester Bio Sciences Ltd., Ahmedabad, Gujarat	01.11.2011 (7 years)	CCS HAU, Hisar
j) Incubation			
105.	M/s DKS Incorporates, Hisar, Haryana	28.07.2010	CCS HAU, Hisar
106.	M/s DKS Incorporates, Hisar, Haryana	20.04.2011	CCS HAU, Hisar
107.	M/s DKS Incorporate, Hisar	25.04.2013	CCS HAU, Hisar
108.	Mr. Anurag Sharma, M/s DKS Incorporate, Hisar	25.04.2013	CCS HAU, Hisar
Food Products companies			
k) Food Products Technology			
109.	M/s DKS Incorporate, Hisar	25.04.2013	CCS HAU, Hisar

110.	M/s DKS Incorporate, Hisar	25.04.2013	CCS HAU, Hisar
111.	M/s Kamboj Foods Pvt. Ltd., Indri, Karnal	08.05.2013	CCS HAU, Hisar
112.	M/s Kamboj Foods Pvt. Ltd., Indri, Karnal	08.05.2013	CCS HAU, Hisar

10. Status on Environmental and Social Safeguard Framework

- The farmer can earn more profit by using the crop hybrids/ varieties developed by CCS HAU, Hisar.
- The scientists of the University have developed plant based product formulations containing probiotic cultures with such microbes which when consumed offer potential health benefits *viz.* increased resistance to infectious diseases-particularly of the intestine, decreased duration of diarrhea and reduction in serum cholesterol concentration
- In the attempts towards value addition in eco-friendly micro organisms, the scientists of the University have exploited rhizobia for Polyhydroxybutyrate (PHB) production, which is an important component of biodegradable plastics at a much higher levels. Bioplastics development in a renewable and environment friendly manner can alleviate principal causes of pollution of modern life. Polyhydroxy-alkanotes (PHA)/Polyhydroxybutyric acid (PHB) are promising candidates for the development of environment friendly, totally biodegradable plastics. Polyhydroxybutyric acid (PHB) has been produced by using agribyproducts/waste from agriculture or processing industry. Recycling of byproducts proves an effective management option because it doesn't involve the emission of many greenhouse gases and water pollutants.
- The liquid biofertilizer production technology developed by CCS HAU, Hisar is viable and is in the interest of farmers as the technology is not only cheap but eco friendly also. Farmers are benefitted in terms of income from the agricultural produce.
- The public knowledge of the menace of milk adulteration and synthetic milk has serious repercussions on the export of milk and dairy products. Therefore, considering the intensity and gravity of the problem of milk adulteration and synthetic milk; the spot test developed by Scientist of CCS HAU Hisar will be of immense value in detection of urea in milk thereby preventing economic losses and health hazards to consumers.

11. Constraints, if any and Remedial Measures Taken

- SAUs have limited technologies available for commercialization
- Big industries showed interest only in seed sector
- The time period of the project was short to support its sustainability
- Revenue Model for BPD sustainability
- Quick mechanism to share technology commercialization benefits to the inventors

12. Publications (As per format of citation in Indian Journal of Agricultural Sciences)

A. Research papers in peer reviewed journals

S. No.	Authors, Title of the paper, Name of Journal, Year, Vol. & Page No.	Responsible Partner
1.	Bhardwaj,M., Uppal,S., Jain,S., Kharab,P., Dhillon,R. and Jain, R.K. (2011). Comparative assessment of ISSR and RAPD marker assays for genetic diversity analysis in jojoba (<i>Simmondsia chinensis</i> (Link) Schneider). Journal of Plant Biochemistry and Biotechnology 19:255-258 .	C C S H A U
2.	Brar,B., Jain,S., Singh,R. and Jain,R.K. (2011). Genetic diversity for iron and zinc contents in a collection of 220 rice (<i>Oryza sativa</i> L.) genotypes. Indian J. Genet. 71: 67-73 .	
3.	Chahr,O.P., Kharab,P., Ali,S.F., Batra,P. & Chowdhury,V.K. (2010).Development of protocol for Micropropagation in Ker. World Applied Sciences Journal 10 (6): 95-98 .	
4.	Gupta,P., Singh,R., Malhotra,S., Boora,K.S. and Singal,H.R. (2010). Seed storage proteins Characterization in high protein genotypes of cowpea [<i>Vigna unguiculata</i> (L.) Walp.]. Physiol. Mol. Biol. Plants. 16: 53-58 .	
5.	Ikbal, Boora,K.S. and Dhillon,R.S. (2010). Evaluation of genetic diversity in <i>Jatropha curcus</i> using RAPD markers. Indian Journal of Biotechnology. 9: 50-57 .	H I S A R
6.	Kaushik,A., Jain,S., McCouch,S.R., Jain,R.K. (2011). Phylogenetic relationships among various groups of rice(<i>Oryza sativa</i> L.) as revealed by microsatellite & transposable element- based marker analysis. Indian J. Genet, 71: 139-150 .	
7.	Kumar,D., Boora,K.S. and Chaudhary,K. (2010). Characterization of native Bt strains by PCR RAPD based fingerprinting. Ind J. Microbiol. 50: 27-32 .	
8.	Saharan,V., Yadav,R.C., Yadav,N.R. & Wiesman,Z. (2011). Somatic embryogenesis and plant regeneration of <i>Balanites aegyptiaca</i> Del.(L): An industrial important arid tree. Journal of Cell & Tissue Research. 11:2529-2534 .	
9.	Sharma,A. & Sikka,V.K. (2009). Maximization of poly- -hydroxy butyrate production by rhizo-bacteria using ecofriendly agri-byproducts. The South Pacific Journal of Natural Sciences, pp 38-40 .	
10.	Singh,R., Yadav,R.C., Yadav,N.R., Yadav,A. & Sharma,P. (2010).	

11.	Effect of plant growth regulators and silver nitrate on female papaya using shoot tip as explant. Indian J. Hort. 67: 51-54 Upadhyaya,H.D., Yadav,D., Dronavalli,N., Gowda,C.L.L., and Singh,S. (2010). Mini core germplasm collections for infusing genetic diversity in plant breeding programs. Electronic Journal of Plant Breeding, 1(4): 1294-1309	C C S H A U
12.	Upadhyaya,H.D., Yadav,D., Dronavalli,N., Gowda,C.L.L., and Singh,S. (2010). Mini core germplasm collections for infusing genetic diversity in plant breeding programs. Electronic Journal of Plant Breeding, 1(4): 1294-1309 .	
13.	Upadhyaya,H.D., Yadav,D., Reddy,K.N., Gowda,C.L.L. and Singh,S. (2011). Development of Pearlmillet minicore collection for enhanced utilization of germplasm. Crop Science, 51: 217-223	

B. Books/ Book chapters/ Abstracts/ Popular articles, Brochures, etc.

S. No.	Authors, Title of the papers Name of Book/ Seminar/ Proceedings/Journal, Publisher, Year, Page No.	Responsible Partner
1.	Arya, R.K., Dhanda,S.S., Sethi,S.K. and Sharma, B.D. (2009) – “Haryana me Gehun ki Pachheti Bijaai ki Unnat Kismein” – Haryana Kheti: 42(12) :	C C S
2.	Arya, R.K., Sharma, B.D. and Panwar,I.S. (2009) “Gehun ki Adhik paidavaar lene ke sootra” – Haryana Kheti: 42(12) :	
3.	Arya,R.K., and Sethi,S.K. (2010) “Haryana me Kathia Gehun ki kheti: kaise kare” - Haryana Kheti: 43 (12):2-3	H A U
4.	Sethi,S.K. and Arya,R.K., (2011): “Badalte Paryavaran mein Kathia Gehun Utpaadan: Ek Vikalp” Mor,B.S., Yadav,H.P. and Kumar,A. (2011): “Bajra ki unnat sankar kismein” – Haryana Kheti: 43 (6)	
5.	Raj,K., Leela Wati and Yadav, H.P. (2011): Diseases of pearl millet and integrated management. Indian farming :P 15-18	H I S A R

6.	Srivastava,R.B., Yadav,R.C., Sethi,S.K., Kakker,N.K. Mani, M., Gautam,M., Khurana,N. Singh,A., Raina,P. (2014): Changing Landscape of Technology Transfer & IP Management at CCSHAU, Sent for Publication as a book chapter at Michigan State University, USA	C C S H
7.	Yadav,N.R. & Yadav,R.C. (2011). Plant Tissue Culture: Fundamentals & Applications In:Physio- Biochemistry and Biotechnology of Vegetables (editor: MK Rana, New India Publishing Agency, New Delhi) pp 536-551.	A U H
8.	Yadav,N.R., Yadav,R.C., Jain,R.K. & Choudhary,V.K. (2011) Transgenic approaches for the improvements of vegetable crops. In:Physio-Biochemistry and Biotechnology of Vegetables (Editor: MK Rana, New India Publishing Agency, New Delhi) pp 552-579	I S A R

13. Media Products Developed/Disseminated

S. No.	CD, Bulletins, Brochures, etc. (Year wise)	No. of Copies	Distribution	Responsible Partner
1.	A Documentary prepared on Commercialization of Potential Technologies of CCSHAU, Hisar. 2011	More than 300	Distributed in National and International conferences (Uploaded on YouTube)	C C S
2.	Business Planning & Development Unit at a Glance 2011	10 CDs	Presented before Dr. Bangali Baboo, Former National Director, NAIP and Dr. R.C Agrawal, Former National Coordinator, NAIP	H A U
3.	Training manual prepared namely “Training & Entrepreneurship development in Biotechnology, Liquid Biofertilizers & Food products” in May, 2011	50	Distributed to entrepreneurs and faculty members	H I S A R
4.	CD prepared on “Success story of Milk Urea Detection Kit” 2011	50	Distributed to entrepreneurs and Visitors	
5.	CD prepared on ‘Success story of Baby corn (HM4)’ Maize 2011	50	Distributed to entrepreneurs and Visitors	
6.	Training manual prepared namely	50	Distributed to	

	“Incubation Training in Biotechnology, Liquid Biofertilizers & Food products” in January, 2012		entrepreneurs, faculty members and visitors
7.	CD prepared on ‘Dairy Entrepreneurship Development Program’ in March 2012	50	Distributed to entrepreneurs and Visitors
8.	Training Manual prepared namely on ‘Dairy Entrepreneurship Development Program’ in March 2012	50	Distributed to entrepreneurs and faculty members
9.	Technology Pamphlets prepared during ‘Food Safety Issue’ in collaboration in August 2012	100	Distributed to entrepreneurs
10.	Commercialization of Potential Technologies document of CCSHAU, Hisar NIABI Mentor Program, ICRISAT in December 2012	10	Distributed to dignitaries
11.	Training manual prepared during “Employment Generation Training for Entrepreneurs” in January 2013	30	Distributed to entrepreneurs & faculty members
12.	Commercialization of Potential Technologies document of CCSHAU, Hisar during 12th Implementation Support Mission: National Agricultural Innovation Project; Indian Council of Agricultural Research at NDRI, Karnal during January 2013	10	Distributed to dignitaries & other members
13.	Training manual prepared during “Entrepreneurship Development Program on Hybrid Seed Production in Vegetable Crops” during October 2013	30	Distributed to entrepreneurs & faculty members

14. Meetings/Seminars/Trainings/Kisan Mela, etc. organized

S. No.	Details of Meetings/Seminars/Trainings, etc.	Duration (From-To)	No. of Personnel Trained	Budget (Rs.)	Organizer (Name & Address)
1.	Launching of BPD Unit & Workshop on Commercialization of Technologies	10.03.2010	Over 300 participants including industry representatives, progressive farmers Scientists from KVKs and CCSHAU along with staff of various BPD Units participated	57650/-	BPD Unit CCSHAU, Hisar

2.	Workshop on Commercialization of Technologies in collaboration with PPV&FRA	13.03.2010	Over 100 participants including seed industry representatives, progressive farmers Scientists from KVKs participated	30,000/-	BPD Unit CCSHAU, Hisar
3.	Meeting with Selected Seed Growers	08.06.2010	1. M/s Golden Seeds and Chemicals - Mr Krishan Garg 2. M/s Unnat Beej Co. - Mr Shyam Mehta 3. M/s Punjab Agro Seeds - Mr Atul Goyal 4. M/s Namdhari Agro Seeds - Mr Malkit Singh 5. M/s Haryana Seeds - Mr Rishi Makkar	-----	BPD Unit CCSHAU, Hisar
4.	CCSHAU - Seed Industry Linkage Programme	14.09.2010	Around 100 participants including industry representatives, Deans, Directors, HODs, Scientists from KVKs and CCSHAU along with staff of various BPD Units participated in the brain storming session	39,000/-	BPD Unit CCSHAU, Hisar
5.	CCS HAU -Industry Linkage Programme	25.10.2010	Nearly 100 representatives from various biotech, micro-bio and animal product industries participated in the mega event along with Deans, Directors, HODs, Scientists from KVKs and CCSHAU	35,000/-	BPD Unit CCSHAU, Hisar
6.	Entrepreneurship Development Workshop for Veterinary and Livestock Products	14.01.2011	Eighty participants from various vety industries & faculty members participated in the programme	35,000/-	BPD Unit CCSHAU, Hisar
7.	Kisan Mela 2011	19 th -20 th March, 2011	Demonstration of Commercializable Technologies at Kisan Mela	-----	BPD Unit CCSHAU, Hisar
8.	Hybrid Seed Production of Vegetable and Other Field Crops	19 th -20 th April 2011	14 registered entrepreneurs were trained	39,000/-	BPD Unit CCSHAU, Hisar
9.	Training Programme for Entrepreneurship Development in Bio-technology, Liquid Biofertilizer and Food	9 th -13 th May 2011	16 registered entrepreneurs were trained	30,000/-	BPD Unit CCSHAU, Hisar

	Products				
10.	Awareness Campaign at KVK Sonapat for farmer entrepreneurs	25th July 2011	Nearly 20 farmer entrepreneur attended the campaign	-----	BPD Unit CCSHAU, Hisar
11.	University Industry Interaction Program on Sugarcane	30 th Sep 2011	Around 100 participants from Industry, Govt. Organizations, KVKs and CCSHAU	55281/-	BPD Unit CCSHAU, Hisar
12.	University Industry Interaction Program on Maize	1 st Oct 2011	Around 100 participants from Industry, Govt. Organizations, KVKs and CCSHAU		BPD Unit CCSHAU, Hisar
13.	One Day Entrepreneurial/ Industrial Motivational Program	29 th Nov 2011	More than 100 participants registered themselves for the program including farmer entrepreneurs, student entrepreneurs and selected scientists from various departments having potential technologies and also from vibrant KVKs	19,000/-	BPD Unit CCSHAU, Hisar
14.	Demonstration of technologies developed by the University by BPD	01st Dec. 2011	A two member BPD team visited various dairies & industries (Amul Dairy, Nijanad Dairy, GSFC Ltd., GGRC Ltd., other local dairies) in Anand and Baroda and also demonstrated the technologies developed by the University	16000/-	BPD Unit CCSHAU, Hisar
15.	Incubation Programme in Bio-technology, Liquid Biofertilizers and Food Products	3 rd Jan to 7 th Jan 2012	30 registered entrepreneurs were trained	25,000/-	BPD Unit CCSHAU, Hisar
16.	SFAC Agribusiness Camp in collaboration with ABI, ICRISAT Hyderabad	22 nd Feb.2012	Around 140 Participants registered their presence.	The Payment was made by the sponsors.	BPD Unit CCSHAU, Hisar
17.	Dairy entrepreneurship development programme	2 nd to 3 rd March 2012	Around 55 Participants registered their presence.	25,000/-	BPD Unit CCSHAU, Hisar
18.	Food Safety Issue program	09 th August 2012	Around 100 Participants registered their presence	20,000/-	BPD Unit CCSHAU, Hisar
19.	SAU-ICAR-CII Industry Meet (Northern Region)	04 th Sept. 2012	More than 300 Participants registered their presence	4,35,500/- -	Funded by ICAR & CII

20.	Employment Generation Training for Entrepreneurs	21 st to 25 th Jan 2013	15 trainees registered for the training	30,000/-	BPD Unit CCSHAU, Hisar
21.	First Phase of Non-Exclusive Licensing of Wheat Variety WH 1105	28 th Sept. 2013	Representatives from 38 companies	27,000/-	BPD Unit CCSHAU, Hisar
22.	Entrepreneurship Development Program on Hybrid Seed Production in Vegetable Crops	09-11 Oct. 2013	14 trainees registered for the training	34,210/-	BPD Unit CCSHAU, Hisar
23.	Second Phase of Non-Exclusive Licensing of Wheat Variety WH-1105	26 th Oct. 2013	Representatives from 36 companies	12,500/-	BPD Unit CCSHAU, Hisar

15. Participation in Conference/ Meetings/Trainings/ Radio talks, etc.

S. No.	Details of Meetings/Seminars/ Trainings/Radio talk, etc.(Name &Address)	Duration (From-To)	Budget (₹)	Participant (Name & Address)
1.	Induction Training – BPDs	10 th -17 th May, 2010	5466/-	Business Manager
2.	ICAR-Industry Meet 2010	28 th -29 th July, 2010	6532/-	Dr. S. K. Sethi, Co PI Dr. N. K. kakker, Co-PI Business Manager Dr. Dharamveer, BA
3.	Leadership Development Programme	18 th -22 nd Oct, 2010	-----	Dr. R. B. Srivastava, CPI, Dr. P. Kharab, Co PI
4.	Capacity Building Training on IP Management & Commercialization	14 th -22 nd Dec, 2010	80508/-	Dr. N. K. Kakker Dr. Nita Khanna Dr. R. S. Dabur Dr. Gulshan Narang Dr. Ashwani Dr. B. S. Beniwal Dr. A. K. Bhatia Er. S. Mukesh Dr. Raj Bala Grewal Dr. S. S. Sindhu Dr. Sangeeta Chahal Dr. Shikha Yashveer
5.	Handholding & Mentoring of BPD Units of NARS	19 th -24 th Dec, 2010	64740/-	Dr. R. C. Yadav, Co PI Ms. Manisha Mani, BM Ms. Approva, SBF
6.	Sensitization Programme for ADOs on PPP	8 th Jan, 2011	-----	Agriculture Development Officers as they can be linkage between BPD and stakeholders

7.	Sensitization Programme for ADOs on IPR & Commercialization	18 th Jan, 2011	-----	Agriculture Development Officers as they can be linkage between BPD and stakeholders
8.	NIABI 2011 Global Agri-Business Incubation Conference	8 th – 10 th Mar, 2011	1,30000/-	Dr. R.B. Srivastava, PI Dr. S. K. Sethi, Co PI and Dr. N. K. Kakker, Co PI
9.	Agribusiness Development Camp	11th August 2011	-----	National Institute of Research on Jute and Allied Fibre Technology (NIRJAFT), Kolkata
10.	Global Agri-Connect 2011	14th -16th Oct. 2011	29624/-	Dr. Narender Kumar (KVK Sadalpur) Dr. S.P. Yadav (KVK Fatehabad) Dr. Vikram (Plant Breeding) Dr. Rajpal Singh Dalal (Horti.) Dr. Dharampal Malik (Agri. Eco.)
11.	One Day Entrepreneurial/ Industrial Motivational Program	29 th Nov 2011	19000/-	More than 100 participants
12.	NAIBI, 2 nd Global Agri-business Incubation Conference, New Delhi	6-8 th Feb. 2012	8469/-	Dr. R.B. Srivastava, PI Dr. N. K. Kakker, Co-PI Ms. Manisha Mani BM Mr. Mohan Gautam BA Ms. Purnima Raina SBF Mr. Abhender Singh SBF
13.	83 rd Annual General Meeting ICAR (New Delhi)	6 th March 2012	2080/-	Dr. Gulshan Narang, Scientist Dr. M. C. Kamboj, Scientist Ms Manisha Mani BM Mr. Mohan Gautam BA
14.	Kisan Mela 2012 Organized by CCSHAU, Hisar	14 th to 15 th March 2012	-----	Dr. R.B. Srivastava, PI Dr. S. K. Sethi, Co-PI Dr. R.C. Yadav, Co-PI Dr. N. K. Kakker, Co PI Ms. Manisha Mani BM Mr. Mohan Gautam BA Ms. Purnima Raina SBF Mr. Abhender Singh SBF
15.	Mini Kisan Mela at Rohtak (Haryana)	17 th March 2012	760/-	Dr. S. K. Sethi, Co-PI Dr. R.C. Yadav, Co-PI Dr. N. K. Kakker, Co PI Ms Manisha Mani BM Mr. Mohan Gautam BA Ms Purnima Raina SBF Mr. Abhender Singh SBF
16.	Kisan Mela at Hisar, LUVAS (Haryana)	23 December 2012	-----	Dr. N.K. Kakker, Co-PI

17.	Kisan Mela at Hisar, LUVAS (Haryana)	23 December 2013	-----	Dr. N.K. Kakker, Co-PI
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16. Foreign Trainings/Visits:

S. No.	Name, Designation, Address of the Person	Visit/Training/Seminar its Place, Organization and Duration (From-To)	Dates of Seminar Delivered and Report Submitted on Return	Follow up Action	Total Cost (₹)
NA					

17. Performance Indicators

(As per the enclosed format in Appendix-1: Component-wise; and Sub-component-wise)

S. No.	Indicator	Total No.
1.	No. of technologies commercialised	49
2.	No. of entrepreneurs/companies/NGO (incubated/enrolled)	173
3.	No. of incubatees graduated	5
4.	No. of entrepreneurs supported/ trained	74
5.	Client servicing (commitment/delivered)	More than 250: Client servicing (free of cost) is being practiced for support & guidance in areas of Seed Production, Agro Practices, etc. as per the policy of the University
6.	Revenue generated for the BPD (₹ lakhs)	> Rs. 1. 6 crores
7.	Amount of funding mobilized for incubates	-
8.	No. of consultancy assignments undertaken	Five
9.	Farmers directly benefitted with value addition	> 15,000
10.	No. of local employment generated (direct) through incubatees	25 (approx)
11.	No. of mergers & acquisitions, joint ventures, tie-ups made	5
12.	BPD surplus fund (₹ lakhs)
13.	a. Number of applications filed for patent	19
	b. Number of patents granted	6
14.	Number of scientists trained overseas in the frontier areas of science	NIL: Funds were not provided for International Training under the project
15.	Number of scientists trained overseas in consortium-based subject areas	NIL :Funds were not provided for International Training under the project
16.	No. of scientists participated in conference/seminar etc. abroad	NIL
17.	Number of novel tools/protocols/methodologies developed	1
18.	Publications	
	Articles in NAAS rated journals	0
	Articles in other journals	13

Book(s)	0
Book chapter(s)	3
Thesis	0
Popular article(s) (English)	0
Newspaper article(s)	3
Seminar/Symposium/Conference/Workshop Proceedings	32
Technical bulletin(s)	6
Manual(s)	5
CDs/Videos	4/1
Popular article(s) in other language	6
Folder/Leaflet/Handout	3/32/2= 37
Report(s)	22
Success stories	3

18. Employment Generation (man-days/year)

S. No.	Type of Employment Generation	Employment Generation up to End of Sub-project	Responsible Partner
1.	Contractual Services through incubatee (Mr. Anurag Sharma)	15-20	CCS HAU, Hisar
2.	Contractual Services through incubatee (Mr. Shubh Karan Kamboj)	20-25	CCS HAU, Hisar

19. Assets Generated

(Details to be given on equipments and works undertaken in the sub-project, costing more than ₹ 10,000/- in each case)

(i) Equipment

S. No.	Name of the Equipment with Manufacturers Name, Model and Sr. No.	Year of Purchase	Quantity (Nos.)	Total cost (₹)	Responsible Partner
1.	(Laptop) H.P. Pro Book Computer Note Book- HP Agmatel India Ltd. Delhi Model No. P-8700 Sr. No. CNU01141C6 CNU011419X CNU01141KL CNU0113H5D @52015/-Each Inclusive VAT	2010	4	208060.00	CCS HAU, Hisar
2.	Desktop Series with VPRO-HP Agmatel India Ltd. Delhi Model No. HPDC 7000/8000 Series Sr. No. INA00807J4 INA008079P	2010	4	1,78,980.00	CCS HAU, Hisar and LUVAS

	INA008077KT INA00807JL <u>TFT Digital colour Monitor</u> Sr. No. CNC003Q6CW CNC003Q4ZQ CNC003Q5V9 CNC003Q6MX <u>DVD Writer</u> <u>HP Laser JET –P1007</u> Sr. No.VNF6F82205 VNF6M74108 VNF6F82241 VNF6F82222				
3.	L-160 Canon Fax Machine- Canon India Pvt. Ltd. Model No. L-160 Sr. No. GRU02435 GRU02048 GRU02456 GRU02459 GRU02051	2010	5	76323.00	CCS HAU, Hisar and LUVAS, Hisar
4.	Magnetic Stirrer with hot plate- M/s Bharat Inst & Chem. Hisar Model No. MC02 Sr. No. 357	2011	1	16,044.00	CCS HAU, Hisar
5.	Revolutionary Universal Cooling Centrifuge- Remi sales M/s Bharat Inst & Chem. Hisar Model No. C-30BL Sr. No. VCCL-3484	2011	1	166,084.00	LUVAS, Hisar
6.	Deep Freezer- 265 liter capacity M/s Bharat Inst & Chem. Hisar Model No. RQF 265 Sr. No. BDI-1726 Model No. RQF 265 Sr. No.BDI-1785	2011	2	1,34,022.00	CCS HAU, Hisar and LUVAS
7.	Refrigerated Cold Cabinet- M/s Bharat Inst & Chem. Hisar Remi sales Model No. CC-10S Sr. No. IHC-1632	2011	1	90,203.00	CCS HAU, Hisar
8.	Orbital Shaker Incubator shaker– M/s Bharat Inst & Chem. Hisar Model No. CIS-24BL Sr. No.-IHC-1633 Model No. CIS-24 Model No. IHC-1667	2010	2	326182.00	CCS HAU, Hisar and LUVAS, Hisar

9.	Electrophoresis Unit - M/s Labline Hisar Max. Horizontal Electrophoresis (1) Cat No. H815184 Min. Horizontal (2)Electrophoresis Cat No.H815182 Power Supply (3) CAT No. GX300C	2011	1	66,337.00	CCS HAU, Hisar
10.	Autoclave- M/s Sandeep Inst New Delhi Sr. No.22876	2010	1	85,387.00	CCS HAU, Hisar
11.	PCR Machine - M/s Labline Sci Corp Hisar Sr. No. 2990211306	2011	1	499,411.00	CCS HAU, Hisar
12.	Micro Balance- M/s Sandeep Inst New Delhi Model No. CY120 Sr No. -0112347	2011	1	27,562.00	CCS HAU, Hisar
13.	Microwave- M/s Shashi Radio Hisar Model No. MC 8082PRR Sr. NO.-101EMTT002657	2010	1	14,990.00	CCS HAU, Hisar
14.	Autoclave- Horizontal M/s Satguru Enterprise Hisar Make Esteem	2010	1	84,832.00	CCS HAU, Hisar
15.	Fermenter- M/s Bioage Equip Mohali Model No. BS-05A-1161 Sr. No.-SDBTJ-101849	2011	1	425,000.00	CCS HAU, Hisar
16.	Laser Land Leveller- M/s Elcome Technologies Gurgaon E07/IN/11/000103	2011	1	309,109.00	CCS HAU, Hisar
17.	ELISA Reader- M/s Labline Sci. Corp. Hisar Model No. Sunrise Basic tecan Sr No. -1006001576	2011	1	294,700.00	LUVAS, Hisar
18.	Hydraulic Harrow M/s Beri Udyog Pvt. Ltd Karnal Sr. No. FKHH16	2011	2	213,500.00	CCS HAU, Hisar
19.	Digital camera M/s Swift solutions Cannon-DS126271 Model No. EOS 550D Sr. No. 1333704494	2011	1	49,495.00	CCS HAU, Hisar
20.	Air conditioners M/s M.K.Traders, Hisar 1. Blue Star AC Split 2 Ton Capacity Sr. No. IWAE011B5791 Model No. IWAE24	2010	12	5,32,750.00	CCS HAU, Hisar and LUVAS, Hisar

<p>2.Blue Star AC Split 1.5 Ton Capacity Sr. No. 2WAE4110B7095 Model No. 2WAE18</p> <p>3.Blue Star AC Split 1.5 Ton Capacity Sr. No. 2WAE4110B7099 Model No. 2WAE18</p> <p>4.Blue Star AC Split 1 Ton Capacity (In Door Unit) Sr. No. 2WAEAW925B011 Model No. 2WAE12</p> <p>5.Blue Star AC Split 1.5 Ton Capacity (In Door Unit) Sr. No. CI01270490310B11130045 Model No. 2HW18RA110A01845</p> <p>6.Blue Star AC Split 1.5 Ton Capacity (In Door Unit) Sr. No. C1012704903110BA11130086 Model No. 2HW18RA110A01886</p> <p>Automatic Voltage Stabilizer 4KVA Logic state Sr. No. 4763</p> <p>Automatic Voltage Stabilizer 4KVA Logic state Sr. No. 4740</p> <p>Automatic Voltage Stabilizer 5KVA Logic state</p> <p>Automatic Voltage Stabilizer 4KVA Logic state Sr. No. 2595</p> <p>Automatic Voltage Stabilizer 4KVA Logic state Sr. No. 9137</p> <p>Automatic Voltage Stabilizer 4KVA Logic state Sr. No. 2596</p> <p>7.Blue Star Window AC 2 Ton Capacity Model No. IWAE241YA2010</p>				
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	<p>Sr. No. IWAE24011B6721 Automatic Voltage Stabilizer Sr. NO. 9191 <u>Room No. 58</u></p> <p>8.Blue Star Split AC 1.5 Ton Capacity (In Door Unit) Sr. No. C101270A0111011130140 Model No. 2HW18RA110A01940 Automatic Voltage Stabilizer 4KVA Logic state Sr. No. 9131</p> <p>9.Blue Star AC Split 2 Ton Capacity (In Door Unit) Sr. No. C101246330710810130121 Model No. 2HW241YBDU11011100</p> <p>Automatic Voltage Stabilizer 5KVA Logic state Sr. No. 3702</p> <p>Electric Air Curtains Sr. NO. KEM-17 Model NO. CG-HV2M</p> <p><u>(B&MU)</u> 10.Blue Star AC Split 1.5 Ton Capacity (In Door Unit) Sr. No. C101270490310B12130052 Model No.2HW18RA110A02452</p> <p>11.Blue Star AC Split 1.5 Ton Capacity (In Door Unit) Sr. No. C101270790310B11131095 Model No. 2HW18RA</p> <p>12.Blue Star AC Split 1.5 Ton Capacity (In Door Unit) Sr. No. C1012704903108B1113091 Model No. 2HW18RA110A01891</p> <p><u>+ Air conditioners Fixing with Air curtains</u></p>				
21.	<p>Furniture Sofa set five Seater with centre table (1) Sofa sets five Seater with centre table (4)</p>	2012		Rs.7,95,017/-	CCS HAU, Hisar and LUVAS, Hisar

	Office table (5) Executive chair (2) High back chair (4) Low back chair (26) Front chair (14) Storage Unit (14) Modular Work station (8)				
22.	Bioreactor for bacterial cell culture (imported) IEAM13691165 with accessories Autoclave Chiller Air compressor 5KVA online UPS with battery	2012		Estimated \$35,222/- Rs. 80000/- Rs. 78000/- Rs. 40000/- Rs. 62000/-	LUVAS, Hisar

(ii) Works

S. No.	Particulars of the Work, Name and Address of Agency Awarded the Work	Year of Work Done	Quantity (Nos.)	Total Cost (₹)	Responsible Partner
1.	Renovation of Space (Office & lab) for the establishment of BPD Unit under NAIP at CCS HAU Hisar	2010-11	*DHRM- Room No. 26,27,30 (BPD office) *CDU (College of Agriculture) - Room No. 64, Lab no.10; Lab no.77; Lab no. 137; UG Lab no.134; PG Lab.130; C type lab of wheat section in farm area and APE work shop in the COAE&T *B&MU (College of Basic Sciences and Humanities)- Lab no.117; Lab no.120; Biofertilizers production lab *VPU, LUVAS (College of Veterinary Sciences)- Lab no.1 and Lab no. 58	Rs. 2286012/-	

(iii) Revenue Generated

(Details may be given on revenue generated in the sub-project viz., sale of seeds, farm produce, products, patents, commercialization, training, etc.)

S. No.	Source of Revenue	Duration	Total amount (in Rs.)	Responsible Partner
1.	Technology Licensing, Membership Fee Incubation Fee, Royalty fee & Sale at ATIC	2009-2014	> Rs. 1.6 Crores	CCS HAU, HISAR

(iv) Livestock

(Details of livestock procured/produced in the sub-project) **N/A**

S. No.	Details of Livestock (Breed, etc.)	Year of Procurement/Production	Nos.	Total Cost (₹)	Responsible Partner

20. Awards and Recognitions N/A

S. No.	Name, Designation, Address of the Person	Award/ Recognition (with Date)	Institution/ Society Facilitating (Name & Address)	Responsible Partner

21. Steps Undertaken for Post NAIP Sustainability

- i. Compulsory Membership of BPD
- ii. Non Exclusive License Fees from Private and Public Sector companies for new research technologies.
- iii. Rental/Custom Hiring Services
- iv. Enhancement of Membership Fee for Companies/Corporate Members
- v. International Entrepreneurship
- vi. Development of Commercializable and Market- Competitive Technologies by the Departments

22. Possible Future Line of Work

- i. Commercialization of newer products and potential technologies (like food products and meat products, *etc.* continuously being added under the ambit/ umbrella of BPD Unit)
- ii. Awareness programme for small, medium and large scale Seed Industries
- iii. Training for new and young entrepreneurs
- iv. Awareness workshops in various agriculture and agriculture allied sectors
- v. Incubation in Biotechnologies
- vi. Technologies of Centre For Food Science and Technology & Department of Food and Nutrition to be commercialized at a larger scale
- vii. MoUs in the offing

23. Personnel

	From – To (DD/MM/YYYY)
Research Management (CL)	
1. Dr. K.S. Khokhar (Vice – Chancellor)	October 2009 – 31 st March 2014
Scientific (CPI, CCPI, others)	
2. Dr. R. B. Srivastava, CPI	October 2009 – 30 th Sept. 2012
3. Dr. S.K. Sethi, CPI	1 October 2012 – 31 st March 2014
4. Dr. S.K. Sethi, CCPI, CDU	October 2009 – 30 th Sept. 2012
5. Dr. R.C. Yadav, CCPI, B&MU	October 2009 – 31 st March 2014
6. Dr. N.K. Kakker, CCPI, VPU	October 2009 – 31 st March 2014
Contractual	
7. Manisha Mani, Business Manager	15 Dec 2010 – 31 March 2014
8. Saideep Mehta, Business Manager	05 Mar 2010- 16 Oct 2010
9. Mohan Gautam, Business Associate	25 Apr 2011 – 31 March 2014
10. Dharamveer Singh, Business Associate	18 Feb 2010- 25 Aug 2011
11. Kedar Vishawanath, Business Associate	02 Mar 2010- 15 April 2010
12. Manisha Mani, Business Associate	21 Aug 2010- 14 Dec 2010
13. Abhender Singh, Senior Business Fellow	25 Apr 2011 – 31 March 2014
14. Nikhil Khurana, Senior Business Fellow	02 Sep 2013 – 31 March 2014
15. Neelash Sindhu ,Senior Business Fellow	16 Feb 2010- 09 Jun 2010
16. Apoorva Arora, Senior Business Fellow	25 Feb 2010- 10 Jan 2011
17. Pankaj Kumar, Senior Business Fellow	10 Aug 2010- 20 Jan 2011
18. Praveen Kumar, Senior Business Fellow	16 Aug 2010- 31 Oct 2010
19. Moloshrie Bora, Senior Business Fellow	22 Apr 2011- 03 Aug 2011
20. Praveen Kumar, Senior Business Fellow	28 Apr 2011- 30 Aug 2011
21. Purnima Raina, Senior Business Fellow	02 May 2011- 24 Jun 2013
22. Asa Ram, Office Assistant	19 Feb 2010 – 04 Jan 2014

24. Governance, Management, Implementation and Coordination

A. Composition of the various committees (CIC, CAC, CMU, etc.)

Sr. No.	Committee Name	Chairman	Members
1.	IPR-cum-BPD Advisory Committee	Vice-Chancellor, CCSHAU Hisar	All the Deans/Directors and concerned Inventors, Principal Investigator BPD, Heads of the concerned departments, Industry representatives/ progressive entrepreneurs etc. are the members
2.	MoU Committee	Director of Human Resource Management, CCSHAU, Hisar	DHRM, DR, Registrar, CAU, LR, Concerned Inventors/HODs, PI BPD, Special Invitees
3.	Sub-Unit Committee	Dean of the concerned College	Dean of the concerned college, HODs, Sectional Heads, PI BPD, Concerned Inventors, Co-PI BPD (concerned sub-unit), Business Manager

B. List of Meetings organized

S. No.	Details of the meeting	Date	Place & Address
1. (a.)	First Advisory Board Meeting	28.06.2010	Directorate of HRM, CCS HAU Hisar
1. (b.)	Second Advisory Board Meeting	31.12.2011	Directorate of HRM, CCS HAU Hisar
2.	MoU Committee	As and when required	Directorate of HRM, CCS HAU Hisar
3.	Sub-Unit Committee	Monthly	In the committee room of the Dean of the concerned college

Part-III: Budget and its Utilization

STATEMENT OF EXPENDITURE (Final)

(Period from October 2009 to December 2013)

(Date of start: 01-10-2009)

(Date of completion: 31-03-2014)

Sanction Letter No. F.No.30(63)/2009/CCS HAU/BPD/NAIP/O&M dt.09/10/2009

Total Sub-project Cost : Rs. 303.52880/

(Three crores three lakhs fifty two thousand eight hundred eighty only)

Sanctioned/Revised Sub-project cost (if applicable) ₹ _____

Date of Commencement of Sub-project :10.02.2010

Duration: From 01 /10/2009 to 31/03/2014 (DD/MM/YYYY)

Funds Received in each year

I Year (2009-10) Rs. 13536500/-

II Year (2010-11) Rs. 5113425/-

III Year (2011-12) Rs. 3648634/-

IV Year (2012-13) Rs. 1724800

V Year (2013-14) Rs. 0000/- (Funds are not released)

Bank Interest received on fund (if any) ₹ _____

Total amount received ₹ Rs. 24023359/-

Total expenditure ₹ Rs. 22274284/ - (October 2009 to December 2013)

Expenditure Head wise:

Sanctioned Heads	Funds Allocated (*) Rs.	Funds Released (Rs.)						Expenditure Incurred (Rs.)					Total Expenditure (Rs.) (October 2009 to December 2013)	Balance as on date 1.01.2014 (Rs.)	Requirements of additional funds
		1 st Year (2009-10)	2 nd Year (2010-11)	3 rd Year (2011-12)	4 th Year (2012-13)	5 th Year (2013-14)	Total released funds	1 st Year (2009-10)	2 nd Year (2010-11)	3 rd Year (2011-12)	4 th Year (2012-13)	5 th Year (Up to 31 Dec, 2013)			
A. Recurring Contingencies															
(1) TA	1242252	50000	347062	254124	150000	0	801186	88128	254124	52361	194015	21530	610158	191028	
(2) Workshops	1317550	80000	337550	-80000	250000	0	587550	57550	180000	204780	34404	66210	542944	44606	
(3) Contractual Services/RA/SRF	7281749	539000	1970628	1621985	843000	0	4974613	18428	1593185	1987051	1686000	1086453	6371117	-1396504	
(4) Operational cost	5192649	255000	1576185	1382525	325000	0	3538710	340124	952525	259614	423921	586985	2563169	975541	
Sub-Total of A (1-4)	15034200	924000	4231425	3178634	1568000	0	9902059	504230	2979834	2503806	2338340	1761178	10087388	-185329	
B. HRD Component						0									
(5) Training	800000	0	300000	0	0	0	300000	0	150000	150000	0	0	300000	0	
(6) Consultancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sub-Total of B (5-6)	800000	0	300000	0	0	0	300000	0	150000	150000	0	0	300000	0	
C. Non-Recurring						0									
(7) Equipment	8070000	8070000	0	0	0	0	8070000	482172	4421543	2061646	0	0	6965361	1104639	
(8) Furniture	800000	800000	0	0	0	0	800000	0	0	795018	0	0	795018	4982	
(9) Works (new renovation)	3500000	3500000	0	0	0	0	3500000	0	1521626	978177	0	0	2499803	1000197	
(10) Others (Animals, Books, etc.)	300000	150000	150000	0	0	0	300000	0	226114	0	0	0	226114	73886	
Sub-Total of C (7-10)	12670000	12520000	150000	0	0	0	12670000	482172	6169283	3834841	0	0	10486296	2183704	
D. Institutional Charges*	1848680	92500	432000	470000	156800	0	1151300	185000	432000	470000	313600	0	1400600	-249300	
Grand Total (A+B+C+D)	30352880	13536500	5113425	3648634	1724800	0	24023359	1171402	9731117	6958647	2651940	1761178	22274284	1749075	

* Institutional charges will be 10% of the recurring contingencies for the Lead Consortium and 5% for Consortia Partners.

Name & Signature of CPI :

Name & Signature of Competent Financial authority:

Date:_____

Date:_____

Date:_____

Signature, name and designation of Consortia Leader

PART-IV: DECLARATION

This is to certify that the final report of the Sub-project has been submitted in full consultation with the consortium partners in accordance with the approved objectives and technical programme and the relevant records, note books; materials are available for the same.

Place: Hisar

(Dr. S.K. Sethi)

CCS HAU, Hisar

Date: February,15,2014

Consortium Principal Investigator

Signature & Date

(Dr. R.C. Yadav)

CCS HAU, Hisar

Consortium Co-Principal Investigator

Signature & Date

(Dr. N.K. Kakker)

CCS HAU, Hisar

Consortium Co-Principal Investigator

Comments & Signature of Consortium Leader

Date:

Dr. K.S. Khokhar

Vice Chancellor

CCS HAU, Hisar