



CST, UP



Conference Report

BIOTECHNOLOGY: BUSINESS OPPORTUNITIES IN UTTAR PRADESH

Date: Monday 1st June, 2015

Venue: Hotel Clarks Avadh, Lucknow



Co-organizer:



CDRI, CIMAP, IITR, NBRI

BIOTECH PARK

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CONFERENCE
ON
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VENUE : HOTEL CLARKS AVADH

Report and Recommendations

ORGANISED BY



INTRODUCTION

Biotechnology is a sunrise industry with application in all sectors of life, be it health, agriculture, environment or energy. States like Andhra Pradesh and Gujarat Karnataka, Maharashtra have embraced Biotechnology very early and today are the home of major biotech industries.

The capital of Uttar Pradesh, Lucknow because of its strengths in biotechnology- four CSIR laboratories, namely CDRI, NBRI, IITR, CIMAP and four ICAR laboratories, namely IISR, CISH, NBFGR, CSSRI, century old King's George Medical University & Lucknow University; and SGPGI has been declared as Biotechnology City of the country. These institutes have excellent expertise and infrastructure in the area of biomedical sciences, drug development, toxicology environment protection and production of pest resistant plants, high yielding crop and fruit varieties.

The State is an upcoming hub of biotechnology in the North India. The Biotech Park set up with the support of Department of Biotechnology, Govt. of India and Department of Science & Technology, Govt of Uttar Pradesh is catalyzing the bio - entrepreneurship. The State has accorded significant importance to biotechnology and has plans to set up five regional centers of biotechnology to take the biotech fruits to its various regions, (Dilip ji to add 4-5 selected pics of the entire function)

The state has drawn up a Roadmap for the Biotechnology in U.P. and charted a Biotech Policy 2014, aimed to boost biotech research, improve infrastructure and provide attractive physical and financial incentives for industries and start ups. In order to attract investments in the state the Department of Science & Technology and Council of Science & Technology have been participating in BIO Events like Bio- Bangalore, Bio- Asia, at Bangalore and Hyderabad respectively. Recently Hon'ble Minister for Science & Technology, Dr. Manoj Kr. Pandey, Principal

Secretary, Deptt of Science & Technology and Director , UPCST visited Atlanta and Washington DC to participate in a US – India Business Summit and also attended biotechnology and science & technology related events.

In continuation with the promotional of Biotechnology in the State , the Department of Science & Technology, UP in collaboration with Council of Science & Technology, UP and the Association of Knowledge Workers of Lucknow organized a Conference on “**Biotechnology Business Opportunities in Uttar Pradesh**” at **Hotel Clarks Avadh, Lucknow**. The co-organizers of the events were CSIR laboratories (CDRI, CIMAP, IITR & NBRI) & ICAR laboratories (CISH, NBGR, IISR & CSSRI) and Biotech Park

The event was planned by the Organizing Committee in a thematic manner. The Inaugural session exhibited the commitment of the Government in promoting Bio-business in the state. The first session ‘**Enabling bio-business**’ highlighted the initiatives taken by the state government in building infrastructure, its plans, strengths, the new policies drawn- specially the biotech policy and resources available. The second session- ‘**U. P. – A hub for Bio-Agri and Aroma Business**’, discussed business opportunities worldwide and the current status of U.P. in aroma business. The third session highlighted the potential of U.P. to become a new hub of biopharma, its strengths & weakness and the way forward. Each session had lively interaction among participants from industries, academia and government. In the Panel Discussion which followed the technical sessions, experts deliberated on factors affecting the bio-business growth in the state and identified short and long term needs and prioritized them.

The Chief Guest on the occasion was Honorable Minister, Science & Technology, Govt. of UP, Dr. Manoj Kumar Pandey and the Guest of Honor was Chief Secretary, Govt of UP, Shri Alok Ranjan. The officials representing the government were Agriculture Production Commissioner, Shri. Anand Misra,

Principal Secretary, Department of Science & Technology, UP, Dr. Har Saran Das, Joint Executive Director, Udyog Bandhu, Ms. Kanchan Verma . The participants from the industry were Dr. SPS Khanuja, Director, SKIES, Dr. Raju Barwale, MD, Mahyco Ltd, Mumbai, Dr. Maharaj Kishen Sahib, Director, Wockhardt, Aurangabad and Dr. Sanjay Singh, Director, Gennova Biopharma, Pune. 100 delegates were nominated by National CSIR & ICAR laboratories and state government departments. In addition other delegates, there were 25 students and 20 farmers and many invitees, 30 volunteers attended the event.

INAUGURAL SESSION



Dr MKJ Siddiqui, Director CST, U.P. welcoming the guests said that this is the first time that the Department has organized a conference where the economic potential for development of state is being discussed and business opportunities in biotech sector are being highlighted . There are more than 400 biotech industries in India majority of these are these are in three major hubs of Biotechnology

mostly located in southern part of the country. Lucknow is emerging as a new biotech hub in North India.

Dr. Ram Vishwakarma, Director, CDRI in his address said that Lucknow is a powerful destination for internationally recognized institutes and Lucknow is the only city having four national CSIR institutions. The city lags behind in IT and pharmaceutical industry revolution. The evolution of new generation of medicine, protein therapy and monoclonal antibody should be adopted for the growth of the Biotech Sector in the state.

Dr. P. K. Seth, CEO, Biotech Park, said that biotechnology is a green and clean technology. Setting up of a Biotech Park, which is predominantly an incubator, has attracted two pharma and several other industries which are undertaking innovative R&D work. The Park has also benefitted the rural economy. For example, park produced 20 lakh banana plantlets through tissue culture this year. Due to Park's tissue culture facility, the cost of banana plantlets has been reduced from Rs. 22 to Rs.14 in the state.

Prof. Ravi Kant, VC, KGMU, emphasized on the production of essential and life saving drugs within the state.

The Principal Secretary, Department of Science & Technology, U.P., Dr. Har Sharan Das, observed that the conference organized to attract investors will help in enhancing the bio-economy of the state. He emphasized the need for organizing such type of program at regular interval.

Sri. Alok Ranjan, Chief Secretary, Government of U.P., who graced the occasion as the Guest of Honor, said that about 3000 scientists are working in U.P. combining all national and state institutes. He emphasized that Uttar Pradesh should not miss the upcoming opportunities; otherwise it will lag behind other states. The implementation of the Biotech Policy 2014 should be done in a time

bound and efficient manner. He also said that land for setting up a Biotech Cluster for industries will be made available in Trans-Ganga project in Kanpur which will be starting soon.

Dr. Manoj Kumar Pandey, Hon'ble Minister of Science and Technology, UP the Chief Guest, said that biotechnology is an important emerging science and would be helpful in improving the social and economic conditions of U.P having a population of 22 crores. He emphasized that implementations policies be framed accordingly and therefore investors in the biotech sectors should be invited. He said during 2012–2015 there is a tremendous improvement in all sectors including science, . People who are interested and want to participate in biotech business should be promoted and brought forward.

President, AKWL. Mr. Ajay Singh proposed the Vote of thanks.

The inaugural session was followed by technical session

SESSION 1: Enabling Bio-bussiness



The chairman of the session Dr. V. P. Kamboj, Chairman, Biotech Consortium India Limited (BCIL) and Former Director of Central Drug Research Institute (CDRI), Lucknow, in his opening remarks said India is one of the largest producer of vaccines which accounts to almost 70% of the total global produce and there are many upcoming young innovators and start-ups in this area. Uttar Pradesh is an agro-based state and it tops the production of sugarcane, potato milk etc. However, the per acre yield of produce is low. He said that there is a need for a seed producing units in state to produce better quality seeds. The state should have both types of industries i.e. Biopharma and Bioagri. The Uttar Pradesh is leader in natural fragrances, where Central Institute for Medicinal & Aromatic Plants (CIMAP) along with Fragrance & Flavour Development Centre (FFDC), Kannauj are working to produce high value scents and are providing a big push to the fragrance industry.

Dr. Harsharan Das, Principal Secretary, Department of Science & Technology, U.P., presented silent features of the Biotech Policy of the state. He said policy aims to promote the growth of biotech, bio-pharma and bio-agri industries for which various incentives and concessions are available.. He said besides other sectors, biotech intervention is needed in diary and animal husbandry. The state has a requirement of 60% of animal vaccines. With reference to dairy industry, he enlightened the matter with example of yogurt. The entire dairy industry is dependent on the imported culture of yoghurt, which could be easily produced in the state as well and would save a large amount of the foreign exchange. He said that the Department of Science & Technology, UP along with other institutions can work together and lot more could be done in the area of agriculture and pharma sectors. India stands third in the agri- production, because of the large scale production of Bt cotton. He said that new innovations can be made with collaborative research within the biotech sector, leading to the growth of UP. Further highlighting the provisions of Biotech Policy of U.P, he said that the state government is committed to take 30% of the produce of the Biotech Industry subject to its competitive qualities and rates. He also discussed about the funding of projects by government and informed that funding of mega projects are for units who will make investment of Rs. 100.00 crores or more and relaxation will be given on such projects on case to case basis. The assistance will also be given towards commercialization of technology in form of, 50% assistance for patent registration. For participation in trade fair the state government will provide assistance. With respect to science promotion the state will provide assistance in the form of visiting fellowship and contingency grant of Rs. 15,000. The overseas scientists will also be invited to work with scientists of state. The implementation of Biotech Policy will give a great push to growth of biotechnology and development of U.P. as a new hub of Biotechnology.

Smt. Kanchan Verma, Executive Director of Udyog Bandhu spoke about U.P. Infrastructure and Industrial Policy – 2012. She discussed how Udyog Bandhu is facilitating the growth of start up industries which are coming up in Uttar Pradesh. The Industrial Policy was made in 2012 and its incentives are for every sector not only the biotech sector. Udyog Bandhu work as a single table for industries Any industry can avail the facility through website NIWESH. Interested companies can register at website and apply online after registration, a unique ID is provided. The application of the industry is monitored by Udyog Bandhu which has set a time frame to for clearances. The industries which have a budget above 5 crores are selected. Besides registering through the website, interested industries can also contact Udyog bandhu. use. The clusters of industries are also entertained and given land facility if required. The main issue in Uttar Pradesh is availability of land and for industrial development there are designated bodies which allot land. These are UPSIDC, Noida authority, Greater Noida authority, Yamuna Express Way, Agra Express Way and GIDA (Gorakhpur Industrial Development Authority). She said that land can be given to industries upto an area of 500 acres along Lucknow Agra Express Way and Yamuna Express Way. She also highlighted various incentives of the policy. The policy is differentiated into categories, based on investments upto . For investments 200 crores . The incentives include Capital interest subsidiary, Infrastructure interest subsidiary, EPF subsidiary, Research subsidiary and Vat reimbursement. For the mega projects which are above 200 crores, and the benefit of depends on case to case basis. The selection of mega projects procedure involves Council of Steering Committee headed by Chief Secretary, UP and the committee recommendation go to the Cabinet. The benefit of the policy is VAT reimbursement in three year duration; sometimes it goes to 80 to 100 percent. She said the feedback from industries association are encouraging and she suggested organization of similar workshops, where feedback of

industries can be obtained and changes, required by industry if any can be made. The session ended with an interactive session in which audience actively participated.

SESSION 2 U. P. – A hub for Bio-Agri and Aroma Business



The session was chaired by Dr. Anil Kumar Tripathi, Director, Central Institute of Medicinal and Aromatic Plants (CIMAP). **Dr. S. P. S. Khanuja**, Director, Suman Khanuja Innovation Enterprises (SKIES) Life Technologies, Lucknow/Delhi and Former Director, Central Institute of Medicinal and Aromatic Plants (CIMAP) spoke on the benefits of Nutraceutical. He said that traditional production of crops is known as farming whereas development of new variety of crops can be considered as pharmaceuticals. The secondary metabolites of the plant are usually used in Pharmaceutical industry for production of medicines. He quoted few examples of secondary metabolites such as terpenoids, mono, di, tri terpenoids etc. Beta carotene taken from bacteria was incorporated in rice for the production of 'golden rice'. There are number of diseases like obesity which can be cured by alterations in diet and nutrition which has been termed as cultivating health in farm. For example garlic (lehsun) can decrease number of calories. The aroma therapy used in facial care medicines and herbal extracts in the form of capsules.

These all can be utilized for business promotion. The micro-industry of Nutraceuticals can be established and farmers can use the horticulture plant produced by them to make a number of value added food as well as can also produce probiotics, which is also known as cellulose fibre, the use of these probiotic in food will be beneficial. Farmers can also be trained to market online. Biotechnology in UP can be beneficial by establishing business in nutrition. The “Hausla campaign” launched by state government to boost up maternal and child health care under National Rural Health Care (NRHM), is to ensure proper medical services to mothers and children living in interior parts of the district. As malnutrition is a major problem of the state, it should be eradicated and emphasis on proper nutrition must be made.

Dr. Raju Barwale, Managing Director, Mahyco Seeds Limited, Mumbai in his address said that there are many problems which farmer face like low income, less land and scarcity of water . The science can offer solutions intofor these problems and production can be increased in agriculture. The government is not giving adequate importance to science and technology in agriculture. Genetic engineering can boostagriculture, with novel traits which had to be applied and further research has to be done for applied agriculture. One of the best examples is Bt cotton. Biotechnology is complex and challenging to explain toand understand by the judiciary and for government policy support. The GM crop production should be adopted in big way. The production of gram pea in UP is done in 10 million hectre land and due to pests its production has decreased and leads to a loss of about 40 percent, resulting in reduced production by 4 million ton. With application of new technologies , Bt chick peas seed can be produced and their use could lead to a profit of Rs. 3-4 million. Thus, the farmers will be benefited and also approximately Rs. 25 thousand crore profits will go to the government. In UP water is a problem. Therefore crops can be modified in such a way that it can be planted in water affected area, which will increase the productivity. The current

approval procedure of the state government takes 6-8 months or even 12 months and the season for planting by that time is over. Dr. Barwale further said that state and central government should work in harmony so that production and planting time should not lapse. The use of fertilizer is significantly high. Almost Rs. 70 thousand crore is invested in chemical fertilizers nitrogen and phosphorous. The fertilizers should be applied to the soil at appropriate time period so that there is optimum yield with less use of fertilizer. Nitrogen should be given thrice and at proper time period. Fertilizer production could also be adopted as a business model.

Mr. Shailendra Jain, Member and Past President of Essential Oil Association of India speaking on the prospects of aroma industry, said we use from morning to evening nearly 80% of the commodities like soaps, perfumes, detergents and many others, which contain fragrances. Many people nowadays are going towards natural products for fragrances. China used to be first in production, but currently India contributes to about 90% of the production, out of which 80-90% production is in Uttar Pradesh. Raibareilly is good in Khus production. U.P. is hub for aroma business. This is due to favorable climatic conditions. for the production of aromatic plants. In Lucknow there is CIMAP which helps the farmers by providing quality planting material for better production of medicinal and aromatic plants. In UP specially, Lucknow there are number of institutions and Kannauj has a Flavour & Fragrance Development Centre. The farmers should be educated by these institutions about the best method and time for collection of material for extraction of oil to get high yields.

Dr. S. C. Varshney, President of Essential Oil Association of India said that he worked on essential oils and set up an industry in 1973, Earlier in 1999 menthol was imported, now China takes raw material from India and process it and do value addition to the same, While India is the largest producer of mentha and 90

percent production is in U. P. Nearly 4000 crore export was done, 30,000 ton production was from U. P. The Country should go for value addition which will improve the economic conditions of farmers. Green house gas consumption for mint is 22360 metric ton. The contribution of scientist from CIMAP has been tremendous in this area. This led to the establishment of the industry for the production of mentha successful in U. P. and now China lags behind. The left over after mentha oil separation is usually sold at Rs. 40-50 per kg and the price value of oil was also less and due to which farmers gets low price. The With further processing of TMO and its value increases to Rs. 40 to 80 per kg and the quality improved. Naturally, with increase of whole oil value, one gets better market price leading to increased demand of the product and profit. The production of chemical mentha, will adversely affect the mentha industry in the state. Government should come forward to stop the industry setup for production of chemical mentha oil and promote the farmers to plant more mentha, because it gives Rs. 4 thousand crore export value. Mentha production is decreasing and synthetic mentha is taking place of natural mentha. Mentha used in therapy due to different secondary metabolites like alkaloids and these metabolites are formed by proper growth and sunlight. Dr. Varshney discussed some other problems affecting the Mentha business like land, transportation and lack of technology. He said Kanpur is hub for mentha and there should be proper connectivity between Kanpur and Delhi so that business should not face any problem during transportation and businessman can travel. He said that his company produces 2 to 3 thousand tons byproduct, which other countries are taking, but we lack facilities and technology for their further processing. Aroma business includes aroma therapy and natural cosmetics. He emphasized that like in other countries technologies should be developed for value addition, waste utilization to boost the aroma industry. There are number of other natural products used for business and production should be increased.

SESSION 3: Making U.P. Hub For Health Care



The Chairman, Dr. Ram Vishwakarma, Director of Central Drug Research Institute (CDRI), Lucknow, opening the session, talked about API and drug intermediates, He focused on leveraging chemistry strength of UP, non-GLP and GLP synthesis of clinical trial batches, cGMP manufacturing of off-patent drugs, new processes for ANDA /para -4 filing, new processes for drug intermediates, new combinations for approved drugs (bioequivalence studies: CDRI/KG/SG), US FDA approved cGMP facilities and Global market access

He said with respect to botanical & herbal Drugs; the state has unique advantage and positioning them. Bio resource can be under captive cultivation, with the guidance of (CIMAP/NBRI) their biological activity can be evaluated at CDRI and

pre- and studies can be undertaken at IITR which has a GLP- approved animal facility and clinical studies can be undertaken at SGPGI and KGMU which following GLP guide lines. . Generation of knowledge database, CMC, QC/QA formulation and validation in animal models needs to be undertaken. He said that pharmaceutical sector was literally started by CSIR investment in late 60s and 70s, which is now world meter. CSIR created single handedly the aroma industry in the country.

Platform for new investments are new required, as another area which is really ignored, is to positioned botanical/ herbal drugs for animal health care. New opportunities for product development re-positioning of natural products (pure compounds as well as extracts) for treatment of number of diseases, mastitis, parasitic infections, para-TB, arthritis, rheumatoid arthritis, performance enhancer, value addition and improvement in form productivity and health exists. These are like hanging fruits with huge market.

Fermentation Technology will include antibiotic production for Indian market, high potency anti-cancer drug of microbial origin (Rapamycin, FK-506 etc), DHA and Gluconate salts for nutraceuticals and food industry. Bio-fertilizer, is a big opportunity and a huge success story, API intermediate by enzyme technology and stable and scalable enzymes can be another area for business.

Fermentation process for production of docosahexanoic acid (DHA) can be improved. DHA: cis -4,7,10,13,16,19-Docosahexanoic acid is an omega-3-fatty acid present in cold water fish oil. Our body needs DHA for proper brain development and visual abilities. In addition omega-3-fatty acids are part of the healthy diet that helps to lower rise of heart diseases. DHA helps to lower blood pressure, to increase anti-coagulant property and reduced glucose level in the body when given in combination with drugs. It also decreases coronary heart diseases in combination with aspirin.

There are a number of vegetarian sources of DHA which comes from seaweeds as well and they can be used as alternatives.

A CSIR technology based on fermentation process, has been developed where in a marine isolate from *Schizochytrium* sp. is used. The technology for production of 15-20 g/L of PUFA containing 30-35% DHA and this will be transferred to Ms. Avesthagen Pvt. Ltd. DHA with CSIR technology can be produced from microbial sources as well.

There is a need for public system for regulatory system to develop drugs and vaccines. Small companies prepare the product and big companies do clinical trial and validation of products which go to market. Major issue in the drug industry is of quality control Human Resources in drug development is needed.

Dr. Sanjay Singh, Director, Gennova Biopharma, Pune in his talk said that biotech projects are expensive and would not be less than Rs. 1000 crore project. Being a scientist like him, he can get loan of Rs. 1000 crore and start a new project. He said that I am pleased with the efforts of the Principal Secretary, Department of Science & Technology, UP, Dr. Harsharan Das in taking useful steps for promoting Biotechnology in the state. He said U.P. has to make big investments for promoting bio-pharmra and other biotech industries. Emphasizing the fact, he said that Maharashtra, has allocated 400 acre land for establishment of a biotech park, whereas the Lucknow Biotech Park is having only 7-8 acre of land, which is very small. He emphasized, that Park should be expanded to attract more biotech industries, including space for the expansion of his own clients. To develop an industry, many things should be kept in mind like quality and continuous supply of water and power supply. The sub- standard quality of water creates many problems for a pharmaceutical company. Dr. Singh just to illustrate the point cited told that his company uses approximately 40, 000 gallon water per day.

There are four CSIR institutions, one of them is CDRI and it is one of the best institutes according to him, in the world for drug development even in comparison to with the National Institute of Health, USA. Apart from that SGPGI and KGMU, are also good organizations. U.P. is the biggest consumer of medicines and has biggest market, which will be helpful in attracting big biotech companies He said like other industries, biotech industry has lot of hope with the state's policies and he has confidence in the government.

Dr. Maharaj Kishan Sahib, Director, Wockhardt, Aurangabad said it is very encouraging to note that U.P. government is providing land and has drawn good policies for promotion of biotechnology and attracting investments. There are number of institutions in city like CDRI, KGMU and SGPGI that all together can make a medical hub. There are number of diseases on which research can be done. Scientists take up problems specific to the state aimed to find solutions.. He congratulated Dr. Das for bringing so many positive policies and assured that it will bring revolution in the field of medicine. Skilled people should be collected and knowledge and information for best practices be utilized. Today people are asking for next best practices. UP government is sincere and he hoped that all will work together for the best. The most important for the country is to create the people who are ready for employment, there is a gap and UP government should put efforts to strengthen the areas related to diagnostic industry management and develop bio-pharma clusters.

Dr. Rishendra Verma, Ex-scientist, Indian Council of Agriculture Research (ICAR), talked about bio-pharmaceuticals, its current status nationally and internationally.. He said , Indian National Federation of Health consists of nine thousand manufacturing units. The retail and the whole shops in India, are the 6th largest suppliers of HIV drugs after Germany. In India the drugs are exported to more than 200 countries. The vaccines from India are exported to 151 countries. In

Indian drugs, equipments, etc all come under one sector and that is very broad. The Regulatory agency monitors quality of drug. Manufacturing and quality control, assurance, the requirement of WHO and GMP, are difficult to meet said Dr. Verma that the pharmacopeia commission was constituted in 2005 and works independently has several expert committees and head offices is located in Ghaziabad. He said that the institutes which located outside Lucknow like IVRI, National Institute of Animal Health should work together. Now India pharma sector is estimated to increase from \$ 30 million (US) in year 2000 \$ 49 million (US) by 2020. Quality control is very stringent and Indian pharmaceutical industry ranked 3rd in globe production. Maharashtra and Gujarat are main areas accounting for 44% of total number of pharmaceutical industry event and UP account for (not clear to be verified) which is very small manufacturers by FDA. The India bio-pharmaceuticals industry is growing 25-30% per year annually. Export has increased to 47%. He said that drug development process involves university and Research institutes and then pharmaceutical company then regulatory company, new product and customers. There is a long process of drug development. The 12th plan involved a detailed SWOT analysis of Indian Pharmaceutical Industry which has some strength like low cost of products significant breadth and depth of product expertise, low cost of growing human resources. Weakness like high emphasis on generic drugs both for domestic and international markets,, in-adequate R&D infrastructure, poor industry academia linkage, lack of required high end product development, capable human resources and lack of time driven regulatory infrastructure, poor small and medium sized enterprises (SME) base for high end manufacturers. Some opportunities like increase per capita global demand and threats are like lack of animal testing R and D, other low cost lack of investment in infrastructure.

He suggested following for consideration and adoption for grant of industry: Lesson should be learnt from Haridwar, Baddi and Sikkim. Economic zone, peaceful area

- Priority of research area and Translation platform
- Research scholar work on Bio-pharma collaboration funding private and public sector projects.
- Utilize the expertise already available in UP and India.
- “Bio-pharma City” to develop with road, train and air connectivity by the state government.
- State government in Biotech Policy- 2014 should exempt custom excise duty.
- Single window clearance should be adopted
- Provision of uninterrupted electric supply, and most of all the security to the industry and industrialist.

This was followed by brief Panel Discussion on bio-aroma demand is in UP by Shri Anand Mishra, IAS, Agriculture Production Commissioner, U. P.,

Shri Anand Mishra, APC,UP, in his opening remarks said that policies have been made Industry should come forward. Whatever further concession and facilities are required by the industry government will be willing to consider. He said that these types of discussions are very fruitful. There is a huge gap between demand and supply of products in U.P. and efforts should be made to fill the gap. He said he and his department will always be available whenever required. The staff will help the people of the state and the industry in their establishment within the state.

Dr. Harsharan Das, Principal Secretary, Department of Science & Technology, U.P., said that the state is rich in resources but they are not utilized properly. Animal husbandry is one area that is left untouched. where Biotech intervention is needed in livestock health sector. He illustrated this further with example of TB in

bovine sheeps. He pointed out the need of for a proper diagnostic test for it as well as the antibiotics for the treatment of animals the treatment protocol with the required dose is needed. If proper dose not given, then the bacteria/fungi/virus will become resistant to the drug. Another major problem is food security, which should also be discussed and kept in mind while going for the establishment of industry or start-ups.

SESSION 4

THE PANEL DISCUSSION was chaired by Dr. Chandra Shekhar Nautiyal, Director of National Botanical Research Institute (NBRI) and Indian Institute of Toxicology Research, Lucknow



Dr. Chandra Shekhar Nautiyal, triggered the discussion by his personal experience with state, Dr. Nautiyal said that he has been working in close association with bureaucracy for last 12 years and has been associated with the Department of Agriculture for a long time. Lucknow has four CSIR, four ICAR laboratories, KGMU and SGPGI while is a great strength in biotechnology and can be leveraged He assured all support on behalf of these institutions and said that we will work hard and do our best for the state. he was confident that with this synergy U.P. will mark significant progress.

Mr. LK Jhunjhunwala, Chairman, U.P. State FICCI and KM Sugar Mills, Faizabad said that if UP adopts the model of other states such as Maharashtra and Gujarat, then Rs. 200-500 crore industries would easily come to the state, provided states amends the prices for granting permission. Bureaucracy should work in the interest of the industry. Conferences should be organized where international delegates should also participate and discuss with the people of UP to come forward, He said that by doing all this UP is going to be benefited greatly.

Mr. Virendra Singh Rawat, Special Correspondent, Business Standard, Lucknow said that he is not a biotechnologist but a journalist. He also emphasized the fact that Lucknow has many CSIR institutes and for a common man these institutes are a mystery. He had attended conferences which are beyond the understanding of a common man and press conferences in these regards are also superficial. He said that as a journalist he should be able to understand the scientific findings then only the message can be carried forward to a common man. It is important that people should understand it as no one knows that anyone can become an entrepreneur and by studying these findings could develop interest in biotech and set up an industry as well. In UP there are number of opportunities, besides biotechnology as there are several other emerging fields There should be single window clearance for all the fields. There is lack of co-ordination between CSIR institutes and Biotech Park too. There should be common meeting place, not in isolation and combine decisions should also take place. UP is leading in crops, fruits, milk, sugarcane but the productivity is low, so biotechnology should come forward to work in these areas. The scientist should integrate with the farmers, and this would help in boosting this productivity and income.

Mr. Shivendra Singh, Progressive Farmer said he is a farmer and is thankful to AKWL and Dr. Huma Mustafa, Department of Science and Technology, UP for giving him a chance to be one of the speakers of the day. Quoting the example of

CIMAP working on Mentha, he said that such revolution can take place for other crops as well. He said that he is a sugarcane grower for the last 5 years and there is need of a better palnting material. He emphasized that sugar cane developed by tissue culture could be adopted by the state for better and higher yields. There is one sugarcane institute in Lucknow while other is in Shajahanpur and both these institutes are working on this but with little success. Soil testing and bio-fertilizers facilities are on papers only and not properly implemented. If proper checking is carried out as per the program laid down by the government then definitely the productivity in farms will lead to the growth of the region.

There is a gap between farmers, scientists and bureaucrat and none are perfect. Soil experts should explain the importance of soil testing to farmers and the government is not able to implement modern technologies. This should be looked into and some concrete steps should be undertake. Technocrats should also explain it properly to the government and bureaucrat about the proper and timely implementations of the various schemes for farmers. The discussions like this will be able to fill gaps and the problems could be greatly reduced. CST, UP should take Lead in arranging such conferences.

**Concluding Remarks given by Dr. Huma Mustafa, Joint Director,
Council of Science & Technology, U. P.**



Looking back on the events of the day and the discussions held in various sessions the following recommendations made by the speakers were concluded. First of all discussing about the inaugural session, she quoted the Minister, Science and Technology, U. P. and Chief Secretary, UP about their assurance to provide all the help required as well as those mentioned in policy will be provided to all the investors.

She emphasized the remark made by the Principal Secretary, Department of Science & Technology, UP that all institutions should work together and in harmony which would lead to innovation and things will move forward in the positive direction. Focusing on conducive environment for attracting industries as has been remarked by the Director, CDRI, Lucknow and also emphasize on the fact that more small investments should be made for start-ups which are of higher

value and also informed that the bio-pharmaceutical bio-incubator is going to be established in the new block of the old building of CDRI.

Looking of the recommendations made during the first session which was on bio-business where the biotech and industrial policies were presented and deduced from it that a time bond implementation of the policy should take place.

Discussing the recommendations of the second session of Bio-agriculture she said that efforts should be made on part of the government where natural mentha should be given the due as compared to the synthetic mentha. She referred to the industry calling for the implementation of GM crops within the State as it would lead the State towards tremendous progress.

Talking about the third session on Bio-pharma: UP hub for bio-pharma industry she said that the remark made by the industry about the establishment of Biotech Park on large piece of land which will be beneficial and helpful to the investors. She also emphasized on the remark made during the conference on organizing of the yearly foreign investors meet as it will enable the foreign investors to invest in the state. The demand and supply gap should be filled by industry and assurance should be provided to investors mostly in the areas of agriculture or animal husbandry. UP is a state of Bio-resources and these are available and it could provide lot of opportunities to the industry. Which has to be explored and utilized by them where CST, UP could do the hand holding. Everyone appreciated the effort done by Department of Science & Technology, UP and CST,UP as untiring efforts were made by this conference which was successful and helpful for the progress of the State.

In the end memento were distributed to all the speakers and organizers.

Finally vote of thanks was delivered by Dr. Huma Mustafa, Joint Director, Council of Science & Technology, UP.

The day ended in a happy note and more promises for the future.

Participants Photographs



Recommendations by Association of Knowledge Workers, Lucknow

The Biotech Policy should be implemented in a time bound and impressive manner. A Biotech policy implementation Unit may be created on lines of the IT policy implementation unit, which included expert consultants for effective implementation..

1. A biocluster should be developed to attract investments and support the growth of Biotechnology.
2. Road shows, investor's meet should be held on regular intervals.
3. The strength of U.P. in the field of biotechnology should be showcased at national and international level.
4. Besides, banana tissue culture should be adopted for potato, sugarcane and other crops to boost productivity.
5. The state should give major thrust to agro and pharma sector in the state.
6. A big push to fragrance industry be given by improving the quality of planting material, bio-processing and value addition.
7. Biotech Park should be expanded to 150-200 acres to attract industry in area of biomedical devices, diagnostics etc.
8. Effective single window clearances mechanism should be put in place.
9. Human Resource Development should be taken in a big way.

Council of Science & Technology (UP) "VIGYAN BHAWAN"

9, Nabiullah Road, Surajkund Park, Lucknow-226018 CST was established on 1 of May, 1975 by Govt. of U.P. as an autonomous body registered under Societies Registration Act 1860 The main aim of the Council is to promote overall development of S&T in the State. Research Promotion; Technology Development, Upgradation and Transfer; Entrepreneurship Development; and S&T Communication and Popularisation are the main activities of the Council.

It sponsors time bound and result-oriented programmes relevant to the state to various Universities, Colleges, Technical Institutions, R&D Laboratories, Voluntary Organisations (VOs) Non-Government Organisations (NGOs) and Individual Innovators. The Council of Science & Technology, U.P. is having it's regional offices at -Agra, Ghaziabad, Moradabad, Gorakhpur

Biotech Networking Facility Center has been established by the Council of Science & Technology, U. P. The Center will help facilitate technology transfer to the farmers at grass root level and is conducting training and demonstration programs for the farmers. The Center will primarily promote projects in Agricultural biotechnology such as Plant Tissue Culture, Bio fertilizer, Vermi composting etc.

Vigyan Samman :The award is categorized as below:-

1. **VIGYAN GAURAV SAMMAN (One)**: This award is given to one scientist The award consists of cash of Rs.1.00 Lakh, a memento and a citation.
2. **VIGYAN RATNA SAMMAN (Two)**: These awards are given to two scientists Each award consists of cash Rs.50,000/- a memento and a citation.
3. **YOUNG SCIENTIST AWARDS (Five)**: These awards are given to five young scientists in the age group of 18 to 35 years Each award consists of cash Rs.25,000/- a memento and a citation.
4. **SCIENCE STUDENT AWARDS**: - Each award consists of cash Rs.2.50 lakh for High School students and Rs. 5.00 lakh for Intermediate students..
5. **BAL VIGYANIC SAMMAN (Five)**: These awards of Rs.10,000/- each and a citation are given to science student upto the age of 18 years
6. **SCIENCE TEACHER AWARD (Five)**: These awards of Rs.25,000/- are given to the Science Teachers of Secondary Schools for highest educational procedures and new educational technologies.
7. **INNOVATION AWARDS (Farmers and Labour Awards) (Five)**: These awards of Rs.25,000/- are given to the innovators of grass root level
8. **Hello young Scientist Phone in Quiz** CST,UP the "Hello young Scientist Phone in Quiz" since 15th September 2013 (Sunday) in order to sensitize young minds towards modern Science & Technology as tool of society's development.

Association of Knowledge Workers,

Website: www.akwl.org , Regn No 1963/2005-06, Dated 21-1-06, PAN : AAAAA7317H,

Address for communication: Dileep Kumar, B-605, Rohtas Apartments, Vikas Nagar, Lucknow 226022, Tel : Res 0522-2332587, M- 09415649067, e mail: contact@akwl.org

Core purpose: “To provide a platform for Knowledge creation & sharing for continuous sustainable societal growth.”

Envisioned Future: Build Lucknow as a World Class Knowledge Economy Centre.

Knowledge would be the primary growth engine of our economy and building competence for the sustainable growth of the country.

Lucknow would become competitive destination for knowledge based industries e.g. Information and Communication Technologies, Biotech & Agribusiness, Electronics manufacturing. Promoted a company Awadh Technology pPrk and SEZ P Ltd to achieve the goal

Objectives: A society registered under Societies Act, not for profit, Charitable (educational) organization

- Bringing together like-minded knowledgeable professionals and promote networking among such workers for knowledge stimulation. Knowledge may be processed by professionals, through experience , to improve their wisdom level
- The Association will act as facilitator for development of Knowledge Process Outsourcing and Business Process Outsourcing activities
- The Association will undertake activities to enhance performance of knowledge workers, e.g. to act as facilitator for research by corporate executives , patents registration , publication of research studies in journals of repute etc, motivate to highly qualified and trained house wives, senior citizens to actualize their potential, by serving from their homes , through computer network
- Creation and maintenance of a web site for dissemination of knowledge.
- To provide capacity building of human resources, with focus on fresh professional graduates and serving young professionals
- To have a 'Think Tank' of high profile persons to guide knowledge process out sourcing services unit.

Membership subscription,

Type Annual/ Life Membership	Rates for annual and Life membership	No.Nominee members
Individual	Rs 1000/ Life Rs 5000	
Large Enterprise	Rs 4000/Life Rs 30000	5
Medium Enterprise	Rs 3000/ LifeRs20000	3
Small Enterprise	Rs 2000/Life Rs 15000	2
Micro Enterprise	Rs 1000/LifeRs 5000	1

Micro & SMEs are defined in the MSME Act 2006.

Additional membership of spouse is also permitted on of 20% extra payment, if she is qualified for membership. For senior citizen, life membership is Rs 3000 only. Annual members may convert to life membership by payment of balance money within a year

Membership strength in May 2015, 200 numbers approximately. Quality of members is high. For details about AKWL's activities, members etc , please visit our web site www.akwl.org

AKWL is one of the promoter for Awadh Technology Park and SEZ P Ltd, which will develop IT Parks, Biotech Parks etc. Please visit www.techparklko.com