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BioAgri gets a new look

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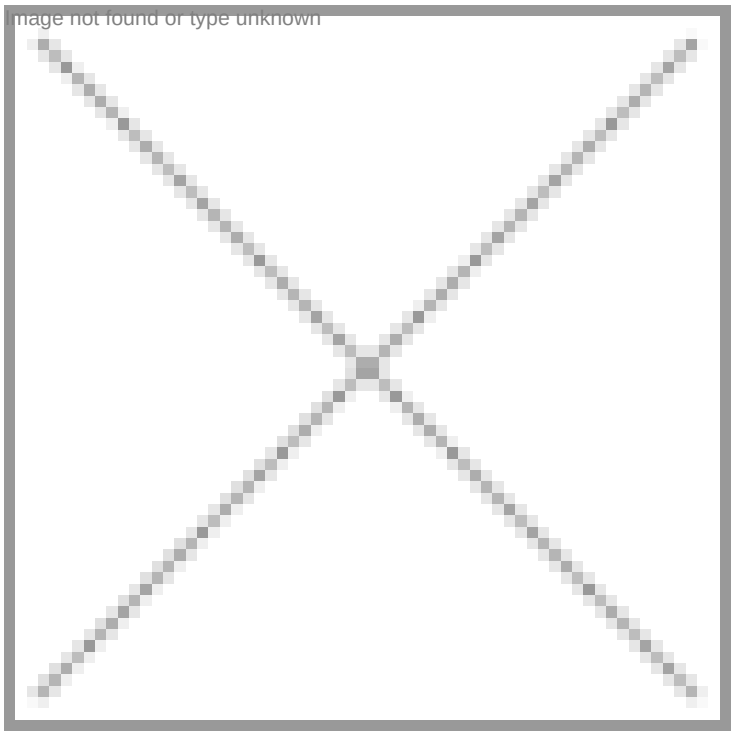


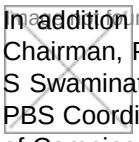
BioAgri gets a new look

The days of huge foodgrain mountains are long gone. From foodgrain exporter in the last years of 20th century, India's mounting agriculture crisis has forced it to float global tenders to import 3 million tons of wheat. Poor productivity levels and inadequate investments in infrastructure in the last two decades were masked by the huge surpluses, caused partly by low foodgrain buying capacity and change in lifestyle patterns shifting food patterns. But these problems cannot be wished away anymore. So the nation's top policy makers gathered in the Capital under the aegis of TERI to chalk out a comprehensive plan to revitalize Indian agriculture using the latest available technology tools, including biotechnology. Here is a BioSpectrum special report on the outcome of the meeting.

The three-day scientific delibera tions at the conference on "Agriculture for Food, Nutritional Security and Rural Growth", focused in a big way on the use of modern technologies to fight the odds in agriculture.

Presently Indian agriculture appears to have reached a plateau and policymakers, to right from the Prime Minister to agriculture officials in various states, have been emphasizing the need for new initiatives to boost agricultural outputs. This would not only be essential for ensuring healthy economic growth in the country but also for improving the livelihoods of the poor in rural India. This formed the focal theme of the international conference, which was organized by The Energy and Resource Institute (TERI) in New Delhi on the occasion of the birth centenary of Dr BP Pal, the first Director-General of the Indian Council of Agricultural Research and a great visionary who initiated the Green Revolution during the 1960s.

During the event, scientists, economists as well as policymakers pinned their hopes on technology driven knowledge to boost agricultural production. Particularly, research advances in biotechnology were seen as a major tool of ushering in the second green revolution in the country. The presence of Dr Manmohan Singh, Prime Minister of India, at the valedictory session reiterated the commitment of the government towards agriculture and rural development.


Prime Minister, Dr Manmohan Singh releasing a book on Biotechnology by Prof M S Swaminathan and Dr KL Chadha, titled Environment and Agriculture.

In addition to the Prime Minister, the conference attracted a host of luminaries like Dr Montek Singh Ahluwalia, Deputy Chairman, Planning Commission; Kapil Sibal, Hon'ble Minister of Science and Technology and Ocean Development; Prof. M S Swaminathan, Chairman, MSSRF; Dr Prodipto Ghosh, Secretary, Ministry of Environment & Forest; Dr Idah Sithole-Niag, PBS Coordinator Southern Africa, Biochemistry Department, University of Zimbabwe; Dr Jose Maria FJ da Silveria, University of Campinas, Brazil, Dr William Dar, Director-General ICRISAT, Dr Thomas A Lumpkin, Director-General, AVRDC, The world vegetable Centre, Prof Ingo Potrykus, professor, Swiss Federal Institute of Technology, Dr Derek Russell, University of Melbourne, among others.

Addressing the inaugural session, Dr Ahluwalia, stressed on the need for a total revamp of the agriculture sector. He said "During the 10th five year plan the growth rate in agriculture has been less than two percent, which is a grave matter of concern. The present economic environment is not supportive of agriculture and there needs to be a systematic reorientation right from the policies, institutional credit, agri marketing to the extension services so that we have an agricultural system which is more sustainable, less water dependent." For boosting the agricultural research system, Ahluwalia assured that steps towards the implementation of the two committee reports-one headed by Dr RA Mashelkar, and another by Dr MS Swaminathan will be taken in the 11th plan. These reports elaborately address the maladies in agriculture and agri research.

Overcoming Salinity

Prof. Swaminathan, elaborated on the concept of ever green revolution, he said, "What land hungry, but population rich countries need is the enhancement of productivity in perpetuity, without associated ecological or social harm. The green revolution should become an ever-green revolution rooted in the principles of ecology, economics and social and gender equity."

Highlighting the vagaries of Indian agriculture, he said, "Though Punjab agriculture has progressed, but farmers have become poor. The production of wheat, rice and cotton in Punjab has plateaued, become input-intensive and the water table has gone down considerably. He went on to enumerate several instances of how biotechnology is helping to perpetuate the evergreen revolution. Like Prosopis juliflora, which has wide adaptation to water stress and drought conditions, is being used as source material for drought tolerant genes or rice plants with a gene from mangrove species for salinity tolerance which is currently under trials.

Emphasizing on the need for partnerships, he opined, "There have been considerable talks about public-private partnership, but private-private partnership is most important in the Indian context. As in India, agriculture is the largest private venture. Leading private companies should come together with small private farmers."

Kapil Sibal, Union Minister for Science & Technology and Ocean Development, in his presidential address stated, "Yields in India are significantly lower than in most other nations and the current production growth rate will have to triple if India is to feed its growing population. The solution is in the form of biotechnology and gene revolution. Biotechnology is needed to combat challenges facing India's farmers, and could spur another Green Revolution or more appropriately ever-green revolution."

However, cautioning against a hasty approach, he said "We can't close our eyes to biotechnology for agriculture but at the same time we must ensure sustainable development in terms of environment and the basic interest of the farmer and consumer safety. To strike a balance, our approach should be a case-by-case basis. We have to be very careful about safety standards and ensure that the regulatory procedures are such that we don't damage our biodiversity."

Genes to the rescue

Elaborating on the rapid strides made by Indian agri biotech sector, he shared, "The development of several GM food crops is on the anvil to catapult India towards an evergreen revolution. India has been producing genetically modified cotton for three years now and 13 other crops - including rice, chick peas, potatoes, cauliflower and eggplants â€“ may be approved in the near-term. Biotechnology, besides creating engineered crops for stress tolerance, pest resistance and better yields, has also spilled its benefits to pharmaceuticals and energy sector. The triumph of the Indian pharmaceutical industry is exemplary. Modern biotechnology has enabled production of 99 percent of the drugs that the country needs and exports 40 percent of its production in a highly competitive global scenario. Bringing the concept of biopharmaceuticals into practice would further

boost this sector".

A discussion on "Green revolution to Gene revolution" kick started the technical rounds, where the contribution of traditional breeding practices in solving issues related to food security and the need for new technological inputs was analyzed. Dr CR Bhatia, former secretary, Department of Biotechnology, emphasized on the fact that all genetic improvements have been aimed at the above ground parts of the plant. The hidden half or the root has been neglected, which needs more intensive research. He said, "Genetic engineering could be used to modify plant root exudates. There is a need to emphasize on soil biotechnology, high through put DNA sequencing of soil DNA, etc. There is an urgent need for gene revolution for the areas bypassed by the green revolution like the drylands". Dr Abha Agnihotri, Fellow, TERI, shared the developments in the nutritional improvement program in Rapeseed-Mustard and genetic improvement program in soybean at the institute.

Many speakers stressed the need for a public private partnership especially in the area of agricultural biotechnology. Dr Sanjay Saxena, Fellow, TERI, outlined the urgent need for this kind of partnership due to increasing stakes of private sector in agriculture /horticulture sector due to patent protection and higher returns as well as limited infrastructure, finances and trained manpower resources. Dr Thomas A Lumpkin, DG, The World Vegetable Centre elaborated on an efficient public-private partnership model in the case of vegetables and fruits-Owning to proprietary research, the private sector can provide high quality seeds, which the public sector delivery system could supply to the farmers for bringing about higher and more efficient production of fruits and vegetables.

Dr Jose Maria Fj da Silveira, University of Campinas, Brazil, spoke about the agricultural public private partnership corporation-"Embrapa" and how genetic engineering has provided benefits through virus resistant papaya and common beans as well as herbicide resistant soya bean. While Dr Kiran K Sharma spoke about the private-public partnerships at ICRISAT. Taking the case study of the Agri-Science Park there, he said, "The Agri-Science park at ICRISAT is a convergence of agricultural partnerships, innovations and products for the poor. The park enhances the development, promotion and utilization of technologies from the institute and its research partners. Its components, agri-biotech park, agri-business incubator, bio-pesticides research consortium and a hybrid seed research consortia are creating synergies for the farmers and entrepreneurs through its partnerships.

Utilization of current technologies, including modern biotechnology, to achieve high productivity in a sustainable manner coupled with promoting complementation of traditional technologies with modern day tools saw active participation from both the public and private sector. Dr SC Bose from Syngenta India spoke about marker assisted trait selection for accelerated breeding in crop plants. Dr Ananda Kumar, principal scientist at Plant Biotechnology Cnetre in IARI said, "Globally the area of transgenic crops in 2005 was 90 million hectares in 21 countries. Tolerance to drought and salinity, improvement of protein quality, vitamins and micronutrients, post-harvest traits, metabolic manipulation, therapeutics, edible vaccines, apomixis, and phytoremediation are some of the traits which can be worked upon in the future".

Animated sessions on: Agriculture extension mechanism scenario by 2020, problem of rural migration into cities and how appropriate extension activity can reverse this trend; Case studies wherein spin-off technologies from modern agricultural research have been efficiently adopted by various end users; Balanced promotion of biotechnology through integration of scientific knowledge with proper regulatory mechanisms, impact of GMOs on the environment and human health; and Status of future crops and future needs of agricultural research were held.

New Roadmap

The conference served as a forum in which a road map for food and nutritional security based on sustainable agricultural practices was discussed and debated. Over 40 eminent speakers from government/various research institutions and the corporate sector shared their experiences and nearly 350 participants including postgraduate and doctoral students, and young scientists from India and overseas deliberated on important issues related to food and nutritional security. Overall the conference saw well rounded discussions in all areas touching agriculture, adoption of modern technologies for better yield, nutritional security and rural growth.

TERI, which facilitates policy development both at the local and global level apart from conducting research in the energy, environment and sustainable development segment, would soon bring forward the recommendations emerging from the wide ranging discussions. Looking at the success of the event, TERI has proposed to make this an annual conference.

While summing up the proceedings of the conference Dr RK Pachauri, Director General, TERI, stated, "The new paradigm for agricultural development in India has to be the sustainability of natural resources and emphasis on bringing about a revolution in rainfed agriculture. We need much greater research and experimentation, for which the upgradation of science is essential. Efficient use of groundwater, crop diversification and enhancing the seed replacement rate are necessary and overdue. Overall, the efficient use of inputs including energy, water, nutrients and pesticides should form the major objectives

of innovation in agriculture. Fruit and vegetable cultivation needs to be expanded by providing the right infrastructure and incentives to farmers."

He added, "Agriculture in this century has to be driven by science and knowledge. This would require enhancing various forms of infrastructure in rural areas. TERI itself has been involved in promoting a program called INSTEP Integration of New and Sustainable Technologies for Elimination of Poverty. For instance cold chains, ICT based education and knowledge dissemination and improved management of water and other natural resources would require large scale harnessing of decentralized energy resources through the use of renewable energy technologies. This would require dissemination of knowledge and empowerment of local communities, for which the NGO sector as well as private enterprises could be harnessed effectively."

At the valedictory function, The Prime Minister, Dr Manmohan Singh presented the BP Pal Centenary Award to Prof MS Swaminathan to commemorate the BP Pal Centenary celebrations. He also released a book co-authored by Prof MS Swaminathan and Dr. KL Chadha titled â€“ "Environment and Agriculture" on the occasion.