



# NEWSLETTER



**SDNP-ENVIS NODE**  
**ENVIS CENTRE**  
 ON  
**ENVIRONMENTAL BIOTECHNOLOGY**  
 Department of Environmental Science  
 University of Kalyani

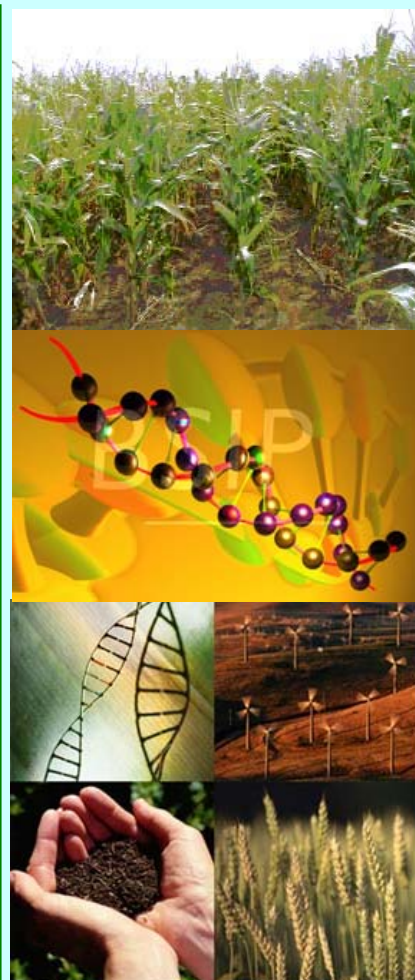


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## Editorial

The field of biotechnology has been given special thrust in 21<sup>st</sup> century to develop a better understanding and insight into life process and sustainable development of mankind. Its application in agriculture, industrial sector, health and environment has been given a new dimension to our developmental process. India is likely to develop national biotech strategy to propel the country into a global power in this sector. Different states also develop their active framework on biotechnology and doing their proper implementation. The coordination between research institutes, scientific organisations with the state administrations has been developed for implementation of these biotech strategies. The creation of infrastructural facilities, promotion of biotech parks and incubators are some of the programmes taken up. Expertise and investments are needed to apply biological resources through biotechnology and technological expertise is to be developed to transform biological resources so that they can serve the needs of sustainable development. In recent years, considerable development in terms of R&D and its application on biotechnology is made in different states. In this special issue different existing state biotech policies are highlighted. Emphasises also has been given main biotech issues especially on agricultural biotechnology.

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### In This Issue:

1. State Biotech Policy .....	2
2. Recent Issues on Agricultural Biotechnology .....	9
4. News & Views.....	11
5. Forth Coming Events .....	12
6. Important Links .....	12

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## State Biotech Policy

There are policy matters of eleven states namely West Bengal, Madhya Pradesh and Andhra Pradesh, Uttaranchal, Kerala, Uttar Pradesh, Maharastra, Karnataka, Orissa, Tamil Nadu, Himachal Pradesh and one union territory Chandigarh are available. Their biotech policy has been highlighted briefly in the following.

The general mission of these policy matters is to ensure scientific and technological empowerment of resources. It aims to create a strong infrastructure both for research and commercialization. It intends to launch a major well directed effort for generation of products, processes and technologies to enhance the cost effectiveness and productivity of agriculture, modern medicine, pollution control, biodiversity conservation and bio-industrial development.

### Andhra Pradesh:

Andhra Pradesh has set itself an ambitious vision on biotechnology. By 2020, the State will achieve a level of development by creating rapid economic growth. Technology like biotech will play a critical role in accelerating the pace of development. Biotechnology is a frontier technology which has the potential to provide very substantial benefits to society in a wide range of sectors such as agriculture, medical and health, forestry, animal husbandry, environment protection, and improving the quality of products and services. Biotechnology can benefit- for instance by increasing the availability and enhancing the nutritional value of food grains, by eliminating the use of harmful pesticides, by facilitating the manufacture of cheaper, safer and more effective drugs, by improving the quality of the livestock, by increasing the tree cover in the State and by treating waste material in a safe and eco-friendly manner.

The intention of the Government of Andhra Pradesh is to facilitate the development of biotechnology in the State by creating high

quality infrastructure through the strategy of setting up specialized Biotech Parks in different parts of the State, encouraging research activities, developing human resources and establishing links between research institutions, academia and industry. The State Government will create a hassle-free environment for the biotech industry through simplification of procedures and a single window clearance mechanism. With any new cutting-edge technology, the possible adverse effects need to be monitored and guarded against. Bio-safety, bio-surveillance and bio-ethics will be given due consideration. The protection of Intellectual Property Rights will be an important objective. This Policy has been formulated after wide-ranging consultations with eminent scientists, pioneers in the biotech industry, entrepreneurs, NGO leaders, and representatives of user-groups and so on. Together they will work to convert the abundant bio-resources of the State into economic wealth and to sustain the position of Andhra Pradesh as the premier Biotech State in India.

([www.ableindia.org/html/resources/andhra.html](http://www.ableindia.org/html/resources/andhra.html))

### Himachal Pradesh:

Himachal Pradesh is an ideal destination to invest in biotechnology based industries because of the various advantages. These includes endowed with rich plant, animal and microbial biodiversity, having many rare plants, particularly in the upper reaches of Himalayas, which have immense potential for use in the pharmaceutical industry, having varied ecological conditions. Government Facilitates Biotechnology (BT) companies who refers to inter alia a company engaged in any of the activities like R&D/Manufacture of products/processes, which make use of specific living system and /or enzymes/biocatalysts derived from them, Genetic engineering/cell culture/microbiology/biochemistry and Bioinformatics. The State Government offers numerous concessions and incentives and undertakes to provide the following

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facilities/terms to the companies desirous of establishing BT units in the State.

To fulfill the objectives of 'Biotechnology Policy of Himachal Pradesh', the proposed institutional network is as under State Department of Biotechnology. This will be nodal Department to deal with matters concerning Biotechnology in the State. It will be responsible for implementing the Biotechnology Policy. Besides the department will Support R&D Institutions by providing funds through national and international funding. They execute and monitor commercial exploitation of biotechnological tools, Establish liaison among R&D Institutions, Industry, farming community and NGOs, Help in establishing 'Biotechnology Park' for promoting biotechnology based endeavors in the State, Help in managing intellectual property and patenting issues. A Task Force has already been constituted to advise the State Government on making biotechnology related policies and implementing them. The Task Force will also formulate norms for setting up biotechnology based industry. A Single Window Clearance Agency will be constituted to clear all the projects related to biotechnology.

([www.himachal.nic.in/biotech/missonobj.htm](http://www.himachal.nic.in/biotech/missonobj.htm))

### **Karnataka:**

The main objectives of the Millennium Biotech Policy of Karnataka are:

- To spread awareness about the investment opportunities in biotechnology, genomics, bioinformatics, biofuels, contract research, etc. to the entrepreneurial community.
- To sustain and maintain the present pre-eminent position of Karnataka and Bangalore in the field of biotechnology.
- To outline a set of incentives and concessions for the biotechnology industry to attract investments to the State.

- To provide specific infrastructure as well as enhance human resources for the development of biotechnology.
- To encourage the growth of bioinformatics in Karnataka.
- To provide an appropriate institutional framework to achieve all these objectives.

### **Kerala:**

The State's Biotechnology Policy, which will be implemented by the Biotechnology Commission, is designed to "Catalyse the development and application of biotechnology, taking advantage of the State's resources and emphasising its specific needs while meeting global requirements". The broad objectives of the policy include the rapid exploitation of pipeline technologies and opportunities available in the State to products and processes, creation of a knowledge cadre and a knowledge base by strengthening and creating educational and R&D institutions and putting in place the framework necessary for the growth of biotechnology enterprises in the State.

An important objective of the policy is to use biotechnology to enhance the value of Kerala's export-oriented resources such as spices, seafood, plantation crops and so on while ensuring that appropriate quality standards are maintained. The policy also looks at improving productivity and evolving new applications in crops such as rubber and coconut, while using biotechnology to develop novel products that are internationally competitive.

The policy emphasises the need to use biotechnology to promote Kerala's traditional tribal and ethnic knowledge, especially in medicine, by scientific validation and facilitating protection of intellectual property rights. In this context, the need to use biotechnology tools to leverage the State's traditional ayurvedic system of medicine comes in for special mention. Creation of an enabling environment for the healthy, efficient and competitive growth of the biotechnology

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knowledge base and the industry are also important objectives outlined in the biotechnology policy.

Another objective is the possibility of using biotechnology to enhance the quality of the environment and promoting sustainable development. In addition to these, the policy also touches on other areas such as the strategic administrative initiatives and institutional mechanisms to be adopted, the development of human resources for the biotechnology sector, creation of biotechnology parks and so on.

([www.kerala.gov.in/annualprofile/index.htm](http://www.kerala.gov.in/annualprofile/index.htm))

### **Madhya Pradesh:**

The Government of Madhya Pradesh has displayed a strong commitment for the socio-economic development of the citizens of the state. Conservation of the state's rich biodiversity, its sustainable use for expanding livelihood security and ensuring equitable sharing of its benefits have been part of this larger commitment. Development of biotechnology and the spread of benefits through widespread use of its applications have emerged as one of the leading intellectual enterprises of the scientific community the world over. It shall be the endeavor of the state government to create an environment conducive for the application of biotechnological tools to further its commitment for socio-economic development.

While the playing field transcends state and national boundaries and thereby necessarily involves the Government of India, this State Government shall make efforts at the community and state levels to harness the potential of biotechnology for value addition in agriculture, horticulture, animal husbandry, fisheries, forestry and use of bio-fuels; and to improve the quality of life of the citizens by promoting health and nutritional security and through pollution abatement. To achieve these larger goals the state government shall expand opportunities in biotechnological education and research and take steps to protect and expand

the flow of benefits from traditional knowledge and practices.

The broad objectives of the policy shall, inter-alia, include promotion of biotechnology applications for:

- Conservation of the state's biodiversity and the sustainable use of its biotic resources.
- Production of high-yielding, draught and pest - resistant seeds for agriculture and horticulture crops suited to different agro-climatic zones.
- Improvement of the quality of livestock and poultry, especially the breeds indigenous to the state.
- Enhancement of the productive potential of the aquatic eco-system.
- Promotion and cultivation of medicinal and aromatic plants, and the processing and value addition of their produce.
- Production of cost effective drugs that help counter diseases common in the tropical and sub-tropical regions of the country.
- Promote environmentally safe technologies for pollution abatement, especially treatment of urban waste and industrial effluents.
- Aforestation and especially in the quick revival of species which have shown a tendency to decline.
- Generation and use of different types of bio-energy.

### **Maharashtra:**

The State of Maharashtra has always played a leadership role in the national economic and social renaissance and looked at advances in science and technology as great opportunities for bringing about economic transformation and social change. Biotechnology has the potential to transform the lives of the people in the State by impacting hugely on agriculture, animal husbandry, health, environmental protection, material transformation, etc. Further, Maharashtra has the potential to become a leader in Biotechnology, not only in the country but also

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in the entire world. It is to realize this potential that the State is announcing this Biotechnology Policy 2001.

To develop the Biotechnology industry in the State in order to:

- Provide to the farmers of the State better, high-yielding, drought and pest-resistant crops suited to the agro-climatic conditions of the State;
- Help develop affordable and more cost-effective drugs and devices to counter diseases common to India and to tropical and sub-tropical areas, and to reduce the disease burden;
- Develop cheaper and effective technologies to purify water sources and to deal with industrial effluents and urban wastes, etc.;
- Improve the livestock in the State in order to increase the earning capacity in rural areas;
- Improve the marine stock to improve the productivity of the fishing industry;
- Enhance the value and utility of medicinal plants and traditional systems of medicine by developing new products with global potential;
- Develop and promote utilization of animal diagnostics and vaccines for preventing losses and increasing realization from livestock and poultry;
- Augment feed and fodder availability and processing;
- Improve the overall nutritional security in the State;
- Improve the quality of life through better health and better environment.

([www.b2bnagpur.com/maharashtra\\_policy/maharashtra\\_biotechnology\\_policy.htm#M](http://www.b2bnagpur.com/maharashtra_policy/maharashtra_biotechnology_policy.htm#M))

### **Orissa:**

The draft policy aims to take up a detailed inventory of bio-resources in the State with the help of universities, research institutions, non-governmental organisations and private agencies. The other objectives of the proposed policy are to promote

conservation of bio-diversity, and develop high quality infrastructure with the required support services for manufacturing units by setting up specialised biotech parks in various parts of the State.

The policy promises special incentives to the biotech industry and related sectors and creates an enabling environment for the growth of the biotech industry, especially the simplification of procedures for getting clearances for the commercialisation of new biotech products. The thrust areas that have been identified by the State Government include medical research and application; food and nutrition security; disaster management with biotechnology intervention; and environmental biotechnology and biodiversity conservation. The national workshop on "Biotechnology Potentials for Development in Orissa," has been organised by the State Government with the cooperation of the Central Government's Department of Biotechnology and other agencies. The final policy on biotechnology will be formulated on the basis of the inputs of this conference and an investors' meet on biotechnology that will be organised here shortly.

### **Tamil Nadu:**

In order to consolidate with gains and carry the State forward in the path of economic development, the Government of Tamil Nadu has decided to focus on another knowledge-based industry, i.e. Biotechnology. There is growing realisation world over that Biotechnology is going to be the major thrust area in the new millennium. With the announcement of the Human Genome sequence and the progress made in genetic engineering in the last two decades, Biotechnology as an industrial activity is set to increase exponentially in the future.

Tamil Nadu needs to pursue opportunities in all the four segments of Biotechnology like Medical/Human & Animal Healthcare, Agriculture-food, Environment and Industrial Products.

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Though medical and Agriculture-food areas are more relevant from the international market point of view, environment and industrial products are also likely to present immense opportunities in the short term both for traditional and modern Biotechnology products. Tamil Nadu would present an attractive market for Medical Biotechnology products as it accounts for about 11% of the pharmaceutical market in the country. Hence Biotechnology presents an ideal opportunity for the State to reverse this trend.

The focus on Environmental Biotechnology products within the State will be in important sectors like leather and textiles. Collaborations with reputed institutes like Central Leather Research Institute (CLRI) will be encouraged to develop appropriate products like Methods / Apparatus / Techniques for Biosensors, Microbial strain development of Cultures for waste management, Food and Industrial enzymes (Papain, Phytase, Lipase, Enzyme Cocktails, etc.), Classical Fermentation Products (antibiotics, immuno modulators, etc.) for yield improvements, Bioenergy, Surface and additives, Biopolymers.

To sum up, there are a number of opportunities in the above segments of Biotechnology, which can be commercially exploited to create new jobs and economic wealth in the State. Many of the opportunities are based on the bioresources available within Tamil Nadu. The Government will take steps to create appropriate mechanisms and implementation structures as stated below to derive benefit from these opportunities.

### **Uttar Pradesh:**

Uttar Pradesh is becoming more prosperous state through utilizing modern tools of biotechnology bringing prosperity to farmers, generating employment in rural areas, food for all, Good health and clean environment. The mission is to develop knowledge based economy, assure benefit of biotechnology to all section of the State and

promote entrepreneurship in biotechnology based industries.

Main objectives are-

- To establish pre-eminent position of the State in the field of biotechnology.
- To create awareness about the entrepreneurial and job opportunities in the field of biotechnology.
- To attract bio-technology based industrial investment.
- To develop and conserve bioresource for sustainable commercial use.
- To harness existing R&D capabilities for industrial/ commercial developments in the State and to promote corporate funding and developing such knowledge.
- To develop adequate institutional and related infrastructure for development, acquisition and dissemination of biotechnology through out the State.
- To promote research and development and to establish centers of excellence in frontier area of biotechnology.

### **Uttaranchal:**

Vision of the biotech policy of this state:

- To be the leading state in Agro-Biotechnology in India by 2014.
- To be the knowledge powerhouse in commercialization of medicinal & aromatic plants and promote the State as the capital of alternative medicine,
- Develop infrastructure for housing the best of the human resources with emphasis on commercialization.

They have some initiatives and achievements in this regard.

State Biotechnology Programme (SBP) was formally started in Feb. 2003. Centre of Excellence on Mountain Biology (CEMB) has been established at Haldi. State Biotechnology Policy is drafted and a Directory of Experts and Institutions in Biotech and related areas in Uttaranchal have also been released. A DBT sponsored three year "Network Programme for the establishment of Bamboo plantations Uttaranchal" was started in 2004-05 under the

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overall coordination of SBP, in partnership with Uttaranchal Bamboo and Fibre Development Board and the State Forest Department. For initiating plantations of elite bamboo species yet another programme has been launched in the State under the National Bamboo Mission by Uttaranchal Bamboo and Fibre Development Board. The Management Council of Pantnagar University had approved the proposal of providing 1000 acres of land for the establishment of Biotech Park at Haldi, Pantnagar; part payment ( Rs. 2.75 crores) in lieu of land has also been made to the University in March, 2004. The State Biotechnology Program participated in Bangalore BIO-2005 held in April, 2005, Biotech Programme of Uttaranchal State also participated in 4<sup>th</sup> CII Biotech. Mission to U.S.A. in June, 2005.

In order to promote HRD in the area of Biotechnology in Uttaranchal, a consultative meeting was organized on 3.6.2005 under the chair of Additional Chief Secretary; a total of 21 experts from twelve institutions from the State participated in this meeting. As per the recommendations of this meeting, a task force of experts is being constituted for guiding the growth of Biotechnology sector in the State. For providing further impetus to HRD in Biotechnology in the State, a decision has been taken to award merit based 10 Ph.D. level scholarships and 50 M.Sc. level scholarships in the area of Biotechnology; the proposal would be implemented following concurrence of the Finance Division. The process of constituting Uttaranchal Bio-technology Vision Group has been started.

([http://gov.ua.nic.in/biotech/Ini\\_achi.htm](http://gov.ua.nic.in/biotech/Ini_achi.htm))

### **West Bengal:**

Over the past 25 years implementation of rural land reform programme has unleashed an economic resurgence in West Bengal, which is expected to prompt its rapid stride into a highly industrialized state. Hence the need of the hour is to harness the available resources for developmental activity through a visionary policy in the area of biotechnology. It

should be emphasized that the strengths and visionary policy in the area of biotechnology of West Bengal lie in its highly successful agriculture sector. It also has untapped unique resources in the mangroves unlike any other states in the country. Focusing on these strengths, a biotechnology vision statement for West Bengal has been developed which will further enhance and organize the existing strengths and strengthen the weaker but potentially important development programme.

The mission is to ensure scientific and technological empowerment of West Bengal's human resources. The aim is to create a strong infrastructure both for research and commercialization. They intend to launch a major well directed effort for generation of products, processes and technologies to enhance the cost effectiveness and productivity of agriculture, modern medicine, pollution control, biodiversity conservation and bio-industrial development.

In totality, aims have been given to generate skilled manpower, enhance the knowledge base, strengthen existing infrastructure and create new infrastructure, map the bio resources of West Bengal, develop entrepreneurship programme in the rural sector, special programmes for women's development, SC/ST and enhance industrialization at the cutting edge of science. The salient features include introduction to Biotechnology at the grass roots level, Mapping of Bio-resources of West Bengal, Developmental Infrastructure, Human Resource Development.

### **Chandigarh:**

The vision of the Chandigarh Administration is to give an impetus to the economy and human resources of the Union Territory of Chandigarh by realizing the potential of Biotechnology. The goal is to spread awareness among the public about the benefits of Biotechnology to create a large pool of personnel with skills in different aspects of Biotechnology, and to develop processes, designs, compounds, equipments and solutions

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which have applications in the field of Agriculture, Industry, Food & Nutrition, Medicine, Pharmaceuticals, Health Services and Environmental sciences.

Chandigarh Administration has following objectives:

- To make Chandigarh a preferred Biotechnology destination.
- To promote the Biotechnology industry in Chandigarh and in the region.
- To provide facilities to Biotech, Companies by the development of Biotech Laboratories.
- To enhance the growth of the biotechnology sector by utilizing the services of Biotech professionals.
- To create employment for trained Biotech professionals and other qualified personnel in Chandigarh and the region.
- To invite technology leaders worldwide to avail of Chandigarh's Biotech facilities.
- To actively facilitate networking amongst Biotech organizations and universities and colleges offering Biotechnology, Bio-physics, Bio-Chemistry, Nanotechnology and Bio Informatics.
- To encourage education and training of skilled professionals in biotechnology and related fields.
- To facilitate investment in biotechnology, health services, pharmaceutical research, medical education and related sectors by providing the required infrastructure and policy framework.

([www.spicindia.com/itchandigarh/biotech-policy.asp](http://www.spicindia.com/itchandigarh/biotech-policy.asp))

### **National Biotech Strategy**

The Indian Biotechnology sector is gaining global visibility and is being tracked for emerging investment opportunities. For a country like India, biotechnology is a powerful enabling technology that can revolutionize

agriculture, healthcare, industrial processing and environmental sustainability. The time is now ripe to integrate these efforts through a pragmatic National Biotechnology Development Strategy.

### **Vision & Mission:**

Biotechnology as a business segment for India has the potential of generating revenues to the tune of US\$ 5 Billion and creating one million jobs by 2010 through products and services. India has many assets in its strong pool of scientist and engineers, vast institutional network and cost effective manufacturing. There are over a hundred National Research Laboratories employing thousands of scientists, educational and training institutes across the country offering degrees and diplomas in biotechnology, bio-informatics and the biological sciences, producing students , practitioners, researchers in biosciences and engineering each year. These resources need to be effectively marshaled, championed and synergized to create a productive enterprise.

India is reorganized as a mega bio-diversity country and biotechnology offers opportunities to convert our biological resources into economic wealth and employment opportunities. Innovative products and services that draw on renewable resources bring greater efficiency into industrial processes, check environmental degradation and deliver a more bio-based economy. Indian agriculture faces the formidable challenge of having to produce more farm commodities for our growing human and livestock population from diminishing per capita arable land and water resources. Biotechnology has the potential to overcome this challenge to ensure the livelihood security of 110 million farming families in our country.

The advancement of biotech as a successful industry confronts many challenges related to research and development, creation of investment capital, technology transfer and technology absorption, patentability and intellectual property, affordability in pricing,

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regulatory issues and public confidence. There are several social concerns that need to be addressed in order to propel the emergence of biotechnology innovation in our country such as conserving bioresources and ensuring safety of products and processes. Government and industry have to play a dual role to advance the benefits of modern biotechnology while at the same time educate and protect the interests of the public. Wide utilization of new technologies would require clear demonstration of the new added value to all stakeholders.

The issue arising from biotechnology research in both medicine and agriculture is of paramount importance. The policy also aims to chalk out the path of progress in sectors such as agriculture and food biotechnology, industrial biotechnology, therapeutic and medical biotechnology, regenerative and genomic medicine, diagnostic biotechnology, bio-engineering, nano-biotechnology, bio-informatics and IT enabled biotechnology, clinical biotechnology, manufacturing & bio-processing, research services, bio-resources, environment and intellectual property & patent law.

This is the time for investment in frontier technologies such as biotechnology. It is envisaged that clearly thought-out strategies will provide direction and enable action by various stakeholders to achieve the full potential of this exciting field for the social and economic well being of the nation.

### **Recent issues on Agricultural Biotechnology**

This describes major emerging issues relating to the 'Agricultural Biotechnology'. The main issues are food security vs. Genetically Modified Food, Genetically Modified Organisms, Genetic Modification of Plants and Food Crops, Organic farming etc. These are gradually opening up opportunities in the area of agriculture, food and medicine etc for the development of human society in a sustained way.

### **Food security vs. genetically modified food-**

Genetically modified crops recently opening up opportunities in agriculture, food and medicine. In principle genetically modified foods are as unacceptable intervention in God's creation, violating barriers in the natural world. Such basic changes in genes and food require due precaution on food safety and environmental risk, but not out of proportion.

GM soya and maize imports used to make soya oil and maize flour used for many processed foods. The companies refused to segregate supplies or label products as GM, being more concerned with winning markets than public attitudes. When people realized they were eating GM foodstuffs whether they liked it or not, with perceived risks but no tangible benefits, and with no say in the decisions, a consumer backlash wasn't surprising.

### **Will genetic engineering really 'feed the world'?**

Many are concerned that the driving forces of biotechnology create products for western indulgences, neglecting real food shortages else where in the world. The causes of hunger are more about poverty, war, and political and social issues than inefficient production. Yet GM might help in some situations. GM vitamin A rice might help malnourished communities with no access to fresh vegetables. If genes could be altered to enable staple crops to grow in marginal conditions, it might make differences to countries which struggle to feed themselves. But useful applications are often hard to engineer and offer no profits to private industry. GM has so far mostly been rich man's technology. To be serious about 'feeding the world' means radically reorienting research investment to put top priority on meeting the specific needs of marginal agriculture, using diversity of old and new technologies.

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## Potential Risk-

For some it's a threat to something basic about us and the natural world – harmful, unnecessary and benefiting big business at others expense. Questions were also raised about potential risks to health, gene flow to non-GM crops, and a loss of biodiversity.

- Spread of genes from GM crops that are resistant to a herbicide could create weeds that are resistant to it
- GM crops might grow as weeds
- GM crops that are resistant to insect pests might deplete pest populations and so damage the natural food chain.
- GM crops that are resistant to insect pests might accelerate the evolution of pests to overcome this resistance.
- GM crops that are resistant to insect pests might be harmful to other species.
- GM crops will reduce biodiversity
- For the consumer- GM foods might result in unexpected health hazards such as I novel allergens, or transfer of antibiotic resistance from marker genes in GM crops to bacteria that live in the human gut.
- For the farmer- GM crops might show unexpected properties and might not breed true.

## Genetic modification of Plants and Food Crops-

The use of GM in plant breeding aims to:

- Increase crop yields beyond the maximum for existing varieties
- Reduce post-harvest losses
- Make crops more tolerant of stresses (crops, drought, salt, heat)
- Make crops that do not exhaust soil fertility (make more better use of nitrogen, phosphorous etc.)
- Improve nutritional value of foods
- Reduce reliance on chemical pesticides by producing pest resistant crops
- Develop alternatives for industry such

as starches, fuels, and Pharmaceuticals

Some of these aims involve transferring genes across species in a way that cannot be done by plant breeding. Whether it is safe to do this depends on which genes are being transferred, and this is addressed by safety assessments and regulations whether it is ethical to do so raises a different set of questions.

Therefore the widespread adoption of GM crops seems likely to exacerbate the underlying causes of food insecurity, leading to more hungry people, not fewer. To have a lasting impact on poverty, Action Aid believes policy makers must address the real constraints facing poor communities lack of access to land, credit, resources and markets- instead of focusing on risky technologies that have no track record in addressing hunger.

Some recommendations as follows-

- Donors and governments should address the wider causes of food insecurity - land, credit, agricultural training and infrastructure - before putting resources into GM crops.
- They should introduce a moratorium on the further commercialisation of GM crops until more research has been carried out into the socio-economic, environmental and biodiversity impacts of GM crops, particularly in developing countries.
- Poorer farmers and communities should be enabled to participate more in national GM debates and policy-making.
- Genetic resources for food and agriculture should be exempt from intellectual property requirements.
- Farmers' rights to save and exchange seeds should be recognised under the intellectual property rules of the World Trade Organisation (WTO) and should be protected in developing country intellectual property rights legislation.
- Governments should introduce competition rules to prevent private sector monopolies and effective

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- institutions to enforce them.
  - The potential impact of GM crops on food security, poor farmers and biodiversity should guide the development and implementation of national biosafety frameworks.
  - Funding for public sector agricultural research should be increased and should specialise in support for sustainable, farmer-led agriculture.

## News & Views

### Grass created in lab escapes to wild

An unapproved type of genetically engineered grass has been found growing in the wild in what scientists say could be the first instance in the United States in which a biotechnology plant has established itself outside a farm. Ecologists at the Environmental Protection Agency said they had found a small number of the grass plants growing in central Oregon near the site of field tests that took place a few years ago. The EPA scientists and others said the grass would probably not pose an ecological threat. Still, it could provide fodder for critics who say that agricultural biotechnology cannot be adequately controlled. "It is a cautionary tale that you have to think about the possibility of plants escaping into populations where there are wild relatives present," said Jay Reichman, an agency ecologist who is the lead author of a study to be published in the journal *Molecular Ecology*. The genetically engineered grass, called creeping bentgrass, is being developed by the Scotts Miracle-Gro Company and Monsanto for use on golf courses. It contains bacterial gene that makes the grass resistant to the herbicide Roundup, known generically as glyphosate. The goal is to create a product to allow groundskeepers to spray the herbicide on greens and fairways to kill weeds without hurting the grass. The Department of Agriculture is evaluating whether to approve the grass. A department spokeswoman said that no timetable had been set for making a

decision, but that the new information would be assessed.

*(17 Aug, 2006, The Times of India)*

### Regional centre for biotechnology

The Govt's Dept of Biotechnology is all set to establish a regional centre for education and training in biotechnology, in association with UNESCO. Realising the need for high quality education and training in the area of biotechnology, the government's Department of Biotechnology is all set to establish a regional centre for education and training in biotechnology, in association with UNESCO. A memorandum of understanding (MoU) was signed in the Capital last week. The mandate of the proposed centre includes capacity building through education and training, and research and development in biotechnology through regional and international cooperation. Calling it an endeavour towards developing research capacity, M K Bhan, Secretary, Department of Biotechnology said that the establishment of the regional centre reflects the government's concern to link education with research.

The proposed centre, which will be ready in two years, will offer postgraduate, doctoral and post-doctoral education in diverse areas of biotechnology as well as conduct short-term programmes in socially relevant subjects like IPR/technology transfer, bioethics, bio-enterprise/ management in biotechnology, biosafety and so on. "Biotechnology is a driving force for innovation and development. The biotechnology centre would essentially focus on areas like nano-biotechnology, agriculture biotechnology, stem cell research, environmental biotechnology and so on," said Maciej Nalecz, director, division of basic and engineering sciences, UNESCO.

*(16 Jul, 2006, Times News Network)*

### Farmers use as much pesticide with GM crops, US study finds

One of the major arguments in favour of growing GM crops has been undermined by a study showing that the benefits are short-lived because farmers quickly resort to spraying their

fields with harmful pesticides. Supporters of genetically modified crops claim the technique saves money and provides environmental benefits because farmers need to spray their fields fewer times with chemicals.

*(The Independent, UK - 26 Jul 2006)*

### Genetic code of a tree gets unlocked

Researchers have deciphered for the first time the genetic code of a tree, which could lead to new varieties better at producing wood, paper and fuel. The work could vastly increase cultivation of the black cottonwood, a fast-growing poplar already used by the timber and paper industries. Details of the analysis of the tree's DNA, performed by dozens of researchers in eight countries, appear this week in the journal *Science*. Today, the black cottonwood is still considered "wild," even though it's grown for lumber and pulp. Fifteen years from now, fully domesticated varieties of the tree, optimally tuned to grow faster and longer, better resist insects and disease and require less water and nutrients, could be growing like any other crop on tree farms spread across large regions of the US researchers said. To create such poplars, researchers first must hunt among the tree's more than 45,500 genes to understand how they control its growth. Doing so can allow later tinkering, including selective breeding and genetic manipulation to bring out desirable traits. Already, they have found 93 genes associated with the production of cellulose and lignin, which form the walls of plant cells. One goal is to create a poplar variety that can be used as a source of ethanol, which can be burned as fuel. Currently ethanol is more expensive and difficult to produce from wood than it is from crops like corn. Researchers also would like to create poplar varieties to soak up even more carbon dioxide from the atmosphere and lessen the impact of the gas on global warming.

*(19<sup>th</sup> Sep. 2006, Times of India)*

### Upcoming Events

Events	Place	Date
Asia Biofuels Conference & Expo IV	Beijing, China	October 10, 2006
ICGS-2006	Ghaziabad India	October 23, 2006
Nano Biotech World Congress	Boston, USA	November 16, 2006
First International Conference on Management of Natural Resources, Sustainable Development and Ecological Hazards	Bariloche, Argentina	December 12, 2006
Global Sustainable 2 <sup>nd</sup> Biotech Congress (2006AD)	Nagpur, India	December 18, 2006

### Important Links

- Biotechnology Information System Network ([www.btisnet.nic.in/](http://www.btisnet.nic.in/))
- National Biotech Strategy ([www.dbtindia.nic.in/biotechstrategy/BiotechStrategy.pdf](http://www.dbtindia.nic.in/biotechstrategy/BiotechStrategy.pdf))
- Biotechnology in Food and Agriculture ([www.fao.org/biotech/stat.asp](http://www.fao.org/biotech/stat.asp))
- Biotechnology Regulatory Services ([www.aphis.usda.gov/brs/](http://www.aphis.usda.gov/brs/))
- Biotechnology Dictionary ([www.cato.com/biotech/](http://www.cato.com/biotech/))
- Industrial Biotechnology in Sustainable Development ([www.bio.org/ind/background/wsummit.asp](http://www.bio.org/ind/background/wsummit.asp))
- Sustainable Development Network ([www.sdnetwork.net/](http://www.sdnetwork.net/))
- Sustainable Development Partnership ([www.sdp.gov/sdp/initiative/chai/](http://www.sdp.gov/sdp/initiative/chai/))
- Biotechnology for Sustainable Agriculture ([www.agnet.org/library/article/bc44009.html](http://www.agnet.org/library/article/bc44009.html))

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