

**BIOTECHNOLOGY POLICY
– HARYANA**

**DEPARTMENT OF SCIENCE
& TECHNOLOGY
GOVERNMENT OF
HARYANA**

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1	INTRODUCTION
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Haryana was in the vanguard of the green revolution: It is an agrarian state deriving 33% (199-200 quick estimates), of its annual income from the agricultural sector with 71% (2001 census data), of its population in the rural areas. At the same time, it is pertinent to note that it borders the capital Delhi on three sides, has large cities, is urbanizing at a fast pace, is a leading industrial state with the number of large & medium industries continuously growing. Several reputed companies in the field of biotechnology have already set up their enterprises/manufacturing units. With just 1.37% of the total geographical area and less than 2% of the country's population, it today is one of the leading States in the country in terms of per capita income. It enjoys the unique distinction of being the first in India to provide electricity, metalled roads and portable drinking water to all its villages. With this basic infrastructure already in place, it is in an ideal position to take full advantage of the new biotechnological revolution.

Thus the objectives of the State's policy naturally flow from its existing infrastructural facilities and resources to which can be added those from which results can be realistically achieved within a meaningful time frame.

2	OBJECTIVES
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1. To create awareness and build capacity in human resources
2. To capitalize on and add to the existing base
3. To commercially exploit biotechnology for the benefit of the State and its people
4. To intensify yields, maximize productivity and ensure quality
5. To provide incentives to attract investments
6. To provide a nodal mechanism for continuous private sector-Government interaction
7. To develop, establish and enforce health and environmental safeguards
8. To satisfy the needs of the present without diminishing the prospects of future generations

Some major facts and figures about the State are given in the table below:

Area	:	44212 Sq. KM.
Population	:	21,082,909 (census- 2001)
Rural Population	:	71%
Urban Population	:	29%
Literacy	:	68.59%
Urban	:	79.89%
Rural	:	63.82%
Total Villages	:	6955
Total Towns	:	106

POWER

Total consumption -15.71 billion units

All villages connected

ROADS

Total metalled length – 22960 Km.

Connectivity – all villages and towns

INDUSTRIES

Total Registered Factories – 8631

Large and medium scale units - 1077

Total workers – 5.0 Lakhs (approx.)

Total large/medium units in agro processing, pharmaceuticals and related fields
190 (Approx.)

IRRIGATION

Gross Cropped Area – 60.45 Lakh Ha. (GCA)

Gross Irrigated Area	-	50.41 Lakh Ha.(GIA)
Net Area Irrigated (NAI)	-	2945000 Ha.
%GIA to GCA	-	83.4
Intensity	-	$\frac{(GIA \times 100)}{(NAI)} = 171.17$

PORTABLE WATER

Availability	-	All Villages
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HEALTH

Total Hospital/Dispensaries	-	3072
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FAMILY WELFARE

Population under age 6 years	-	15.48%
All India Average	-	19.16%

- Based on 2000-2001 Statistical Data

4	BIODIVERSITY
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Biodiversity is recognized as eco-system diversity, species diversity and genetic diversity. Because of its small size the State is poor in the quantum of biological resources, forest wealth etc. However, by virtue of its location it is rich in biodiversity since it comprises of A) Himalayan and Shivalik Regions, B) Gangetic Plains, C) Aravalli Hills and D) Semi Arid Zones adjoining Rajasthan. Thus in a small geographical space there is great variation in each region supporting its own type of biodiversity.

With this varied topography, Haryana presents both scientist and entrepreneur with a wide spectrum for research, development and commercial activity. The two major rivers in the State, The Yamuna and the Ghaggar flow from Himachal Pradesh and are a rich source of germ plasm coming from a State extremely well endowed in biodiversity. The short distances involved, access to facilities and markets, the availability of a sound and developed infrastructure and a large number of well developed research institutes are in themselves a great incentive.

5**BIOTECHNOLOGY – THE NEED**

The broad geographic, demographic, economic and ecological status given above makes apparent that since its creation in 1966-67 the State has actively and progressively capitalized on green revolution and related technologies. Basic infrastructural needs such as roads, electricity and drinking water have been met. Since land is a constant factor for which there are competing uses, rapid urbanization and industrialization are competing uses, rapid urbanization and industrialization are inevitable, it may safely be assumed that the existing technologies have more or less been exploited to the full. For its future needs therefore, the State will have to necessarily turn to the high tech areas which emerged during the last quarter of the 20th century and biotechnology which is the emerging revolution of the 21st century. To this end Haryana will have to derive maximum benefit from the existing State and National level institutions (Annexure –I) and also create new facilities in such areas as are necessary.

6**SECTORAL REQUIREMENTS**

Sectoral requirements are specified for the major activities which essentially sustain the State, provide income and employment to the bulk of its population. The overall policy objectives provide sufficient scope to identify several Sectoral objectives. However, in order that resources are utilized optimally and efforts not diluted the departments and organizations involved will initially concentrate on a select few priorities or “thrust areas”. This does not preclude future initiatives as and when considered opportune and appropriate.

6.1**AGRICULTURE & HORTICULTURE**

Thrust Areas To extend micropropagation technology to the maximum possible extent for the benefit of farmers and the State and therefore:

- to ensure the availability of quality planting material
- to create all conditions necessary for its acceptance and successful adoption

To promote organic farming and therefore:

- To reduce the use of chemicals
- To bring about crop diversification
- To use biological tools for pest and crop management

To move from the Green to the Ever-Green Revolution

MAJOR STATISTICS

AGRICULTURE

Total cropped area-60.45 Lakh Ha.

Total food grain production 132.50 Lakh Mt.

Total-Rice 2559 Kg./Ha

Wheat-4109 Kg./Ha.

Contribution to Central Pool-

Rice-60-65% of production

Wheat-50% of production

HORTICULTURE

Area under fruit & vegetable-

1999-2000-163659 Ha

Production 1999-2000-22.12 Lakh Mt.

2000-2001-163715 Ha.

Production 23.22 Lakh Mt.

Population increase, urban and industrial expansion would over time provide smaller land mass for agriculture from which more is expected. Plant tissue culture technology will be promoted on a large scale for in-vitro mass multiplication of plants with desired traits for quality, yield and disease resistance. Such benefits as can be safely had from genetically modified crops will also be exploited and necessary investment made in biotechnological research to evolve location specific varieties best suited to conditions in the State.

Soil health has suffered to a great extent on account of intensive agriculture, large-scale adoption of the rice-wheat cycle, cultivation of marginal lands and inadequate use of compost/farmyard manure. For example, the rice-wheat sequence results in a total nutrient withdrawal from the soil exceeding nutrients added by chemical fertilizers. Thus there has been a constant decline in the organic matter content of soils with the result that the efficiency of chemical fertilizer use has also declined. If the agriculture production system is to be sustainable, soil health needs to be restored and therefore, organic farming will be encouraged. In so doing farmers can be expected to benefit from both an increasing market for organic produce and a more balanced diet. Integrated soil management will have to be practiced and the use of bio-fertilizers/herbicides, progressively increased.

The popularization of the cheapest and most established form of biotechnology; tissue culture, restoring the health of degraded soils, organic farming and integrated

soil management can only be achieved through diversification of crop cycles: This means agricultural and horticultural cropping patterns will be integrated.

6.2	ANIMAL HUSBANDRY
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THRUST AREA To encourage in-vitro fertilization and embryo transplanting to improve the live stock productivity.

To develop recombinant diagnostics and vaccines for major diseases in livestock and establishment of required cell lines.

To map and conserve livestock genetic material.

MAJOR STATISTICS Total Buffaloes - 57 Lakhs (25 Lakhs breedable)

Total Cows - 13 Lakhs (3.5 Lakhs breedable)

Total Milk - 48.45 Lakhs Mt.

Per capita per day availability - 637 gms. ,
(all India average 210 gm.)

Total Poultry - 96.00 Lakhs (Approx.)

Total Goats/Sheep - 19.5 Lakhs

The State ranks amongst the top in cattle, buffalo and goat population density in the world. It presents level of milk production stems from an 80% increase in animal population since its formation in 1966. There is no scope to further increase animal population to cater to the increasing human population and demand for milk. Yields will therefore have to be increased. Relatively cheap and efficient technology in the form of in-vitro fertilization and embryo transfer exists. This will initially be carried out with the Murrah buffalo, a native bred famous for high milk yield. It also commands a high national demand. However, it has been found that both fertility and yield tend to decrease when it is bred outside the State. Thus further improvements will serve both internal and national requirements.

Recent developments in vaccine production are on the forefront of biotechnology and many of the shortcomings of the traditional vaccines can be removed through newer bio-techniques. Therefore the existing Haryana Veterinary Institute, Hisar will be strengthened and modernized for production of various biological products/vaccines. New generation vaccines against important livestock and poultry diseases using biotechnological innovations will be developed and produced at this institution.

6.3 FOOD & AGRO PROCESSING

Thrust Areas

To boost the storage, processing and marketing of perishable food products.

To develop and encourage the processing of fish, meat, dairy and poultry products.

Biotechnology can significantly increase the production, storage and processing of fruits and vegetables. Similarly dairy, fish, poultry and meat products require longer preservation so that safety and quality are ensured to consumers at lesser cost. Biotech industry will be given all encouragement to fulfill these requirements. The CCS Haryana Agricultural University, Hisar and Central Food Technology and Research Institute, Mysore will be associated in these efforts.

6.4 HEALTH

Thrust Areas

To set up a Research and Development Centre to study and introduce new techniques.

To develop and strengthen infrastructure for testing of biotechnological drugs/vaccines.

A faculty of biotechnology will be set up in Post Graduate Institute of Medical Sciences (PGIMS) Rohtak to undertake various research and developmental activities with special focus on developing application of biotechnology in diagnostics. This faculty would also cater to the requirements of the educational sector in health and medicine.

Several diseases for which license to produce Polymerase Chain Reaction (PCR) bases drugs/diagnostic kits have been given to industries by Govt. of India. Production of these drugs and kits is likely to start in 2002-2003 and these will be introduced in the State. Similarly, new vaccines for rabies, cholera, hepatitis-c and malaria will be ready by 2004-2005. Doctors, paramedical staff and hospitals will be familiarized and oriented towards these developments so that the public is able to benefit without delay.

6.5 EDUCATION & INDUSTRIAL TRAINING

Thrust Areas To introduce and augment biotechnology in the academic curriculum

To provide exposure and training at all levels

The Education Department and Universities will introduce and augment biotechnology at schools and institutions of higher learning with the two fold objective of offering students a new career opportunity and fulfilling the perceived needs of the State in coming years both in the private sector and Government.

The State has a good number of Industrial Training Institutes (ITI;s) which provide profession oriented certificate and diploma courses of varying durations. They form a valuable existing educational resource. Therefore within their overall functional framework they will be required to provide area specific fields of study and impart training in biotechnology.

6.6 HUMAN RESOURCE DEVELOPMENT

Thrust Area To develop skilled manpower, create awareness and impart knowledge.

Although formal education will be provided institutionally, its larger application and constant need requires that it be met sectorally by the concerned sector/department. Focus will be on the twin objectives of training and skill upgradation of existing manpower on one hand and creating awareness on the other.

Therefore each sector will be required to develop packages relevant to all concerned levels and ensure that the benefits of training are such that the innovations flowing from biotechnology are exploited.

The extension machinery of the concerned department, with such strengthening as may be necessary and with the help of conversant institutions will be utilized to create awareness about biotechnology among all its potential users and beneficiaries. This will be a continuing activity so that lack of knowledge about the new technology is not an impediment to its adoption. To this end impetus will be given to constant interaction between students, teachers, technicians, researchers, industrialists, farmers and consumers so that the flow of information from "lab to field and field to lab" is swift.

6.7 BIO-INFORMATICS

Thrust Areas

To create a common platform with Information Technology.

To devise software needed to handle and manage the database.

To network databases for mining National & International data available.

Optimal use of Biotechnology demands use of Bio-informatics. The State has made swift progress in IT and the base is continuously being strengthened. Upgradation is a dynamic process. Therefore, it is logical for Haryana to avail of its existing strength and add a new dimension, the provision of advanced bio-information services. This will entail developing data warehouses, data design, data mining from single and multiple databases to decipher the national and international data available and to correlate the function of individual sequences.

7 BIOTECH INDUSTRY – INCENTIVES

INCENTIVES

Biotech Industry will mean and include inter-alia units engaged in the following:-

- i)** Research and development and/or manufacture of products or processes through methods which use or are derived by using specific living systems, and/or enzymes/biocatalysts derived there from but does not include any traditional activity or method of production relying on age old natural processes.
- ii)** Genetic Engineering or cell culture or microbiology or biochemistry
- iii)** Bio-informatics

Bio-tech Industries will receive special incentives from the State. These could take the form of a total package or be given separately and will depend on the emerging trends, national scenario and the changing needs over time. As has been stated at the very outset one of the main objectives of the State will be to provide a nodal mechanism for continuous private sector-Govt. interaction. Through this mechanism the felt needs of industry, the requirements and obligations of the State will be taken into account for purposes of incentives, though this will not be the exclusive area of concern. In short, the approach will be dynamic rather than static. Thus, since policy should stand the test of time for several years, it has been considered

appropriate to place at **Annexure-II** the incentives being offered presently.

8	REGULATION
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REGULATION

All such sectors to which the science is directly applicable have found mention above. The largest single question hanging over the future of biotechnology is the possible long term environmental and human health effects of using genetically modified crops. Currently there is no single legal framework which covers biotechnology in its totality. The present status is that there are National and State laws governing the activities of agriculture, animal husbandry, food, health etc. Where ever necessary, States have brought about amendments to national acts to suit their specific requirements. Several such acts and rules there under provide for standing committees charged with specific responsibilities.

To some extent the existing laws and structure, with or without modifications may suffice. However, biotechnology is a relatively new science and its field applications even more recent. Several controversies have risen and will continue with regard to its benefits and risks. While there is little doubt about the immense gains to be had from its safe, strictly monitored and legally regulated use there is also awareness about the possibly irreversible damage which can be caused by haphazard, ill informed application or exploitation for short term gains. The coming years will witness that the biotechnology revolution will essentially be brought about by the private sector with Govt. providing the necessary support.

It will continue to be the direct responsibility of individual departments in Govt. to implement rules and regulations pertaining to their respective sphere and to update these, as also to initiate new laws. However, the sheer complexity of biotechnology in its wide spread application can eventually result in a large number of laws and regulations covering several fields which may not be independent of each other, Resultant inter-Sectoral effects make the need for linkages inevitable.

In order that the progress of biotechnology is both harmonious and holistic a statutory State Environment and Health Board will be created and all regulations, existing or intended, subjected to its scrutiny.

Having been a pioneering Green Revolution State, Haryana has progressed rapidly and the welfare of its people has increased manifold. In the process it has been one of the largest contributors of food to the Nation. This strength lies in its agrarian economy. The continued uplift of its citizens and obligations to the country both present and future can only be met through a change in paradigm from the Green to the Ever-Green Revolution. Which in turn can only be sustained with the help of biotechnology.

**ANNEXURE- I
(EXISTING INSTITUTIONAL INFRASTRUCTURE)****EXISTING INSTITUTIONAL INFRASTRUCTURE****HARYANA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY (HSCST)**

HSCST has set up a Centre for Research and Application in Plant Tissue Culture, (CRAPTC) at Hisar, a project jointly undertaken by the Department of Biotechnology, (DBT), GOI and the State Govt. The Centre is currently producing tissue cultured material of various plants with an annual capacity of ten lakhs plants which will be increased to fifty lakhs plants per annum over the next three years. The Haryana State Remote Sensing Applications Centre, (HARSAC) is a well established sister organization which has state of the art facilities for processing satellite remote data and digital mapping using Geospatial Information Systems, (GIS). Projects undertaken and in hand with HARSAC include those on biomass studies, wasteland mapping, forest cover mapping and crop estimation. These will provide a valuable input in the overall field of biotechnology in general and bio-informatics in particular.

OTHER INSTITUTIONS WITH IN HARYANA

1. CCS Haryana Agriculture University, Hisar
2. Guru Jambheshwar University, Hisar
3. Maharishi Dayanand University, Rohtak
4. Kurukshetra University, Kurukshetra
5. Post Graduate Institute of Medical Sciences (PGIMS), Rohtak
6. State Energy Research Institute, Gurgaon

7. International Federation of Organic Agriculture Movement (IFOAM), Gurgaon
8. National Oil, Seeds & Research Centre, Gurgaon
9. National Horticulture Board, Gurgaon
10. Central Soil & Salinity Research Institute, Panchkula
11. National Bureau of Animal Genetic Resources, Karnal
12. Central Insecticide Board, Faridabad
13. Directorate of Wheat Research, Karnal
14. National Brain Research Centre, Gurgaon
15. National Dairy Research Institute, Karnal

INSTITUTIONS IN CHANDIGARH (STATE CAPITAL)

1. Post Graduate Institute of Medical Education and Research
2. International Depository Authority
3. National Facility for Biochemical Engineering Research and Process Development Centre
4. Institute of Microbial Technology
5. Panjab University

INSTITUTIONS IN DELHI

1. All India Institute of Medical Sciences
2. Indian Institute of Technology
3. Jawaharlal Nehru University
4. University of Delhi, Delhi
5. Blue Green Algae Collection (National Biotech Facility/Repository)
6. Micro Propagation Technology Park (National Biotech Facility/Repository)
7. National Facility for Plant Tissue Repository
8. National Containment/Quarantine Facility for Transgenic Planting Material

9. National Facility for Virus Diagnosis and Quality Control of Tissue Culture Raised Plants
10. Apex Bio- informatics Centre
11. Indian Agricultural Research Institute
12. National Institute of Immunology
13. Biotech Consortium India Limited

ANNEXURE – II (PACKAGE OF INCENTIVES)
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PACKAGE OF INCENTIVES

Special incentives will be given to biotech industries and are detailed below

PREFERENTIAL ALLOTMENT OF LAND

The State Government shall give preferential treatment for the allotment of land to the Biotech industry on an ongoing basis in all industrial areas developed by State agencies

CONTINUOUS UNINTERRUPTED POWER SUPPLY

The state Government shall endeavor to provide continuous and uninterrupted power supply for Biotech industry and to exempt them from scheduled power cuts. Encouragement shall be given to captive power generation in Biotech Parks/ Biotech locations.

CUSTOMIZED PACKAGE OF INCENTIVES TO MEGA PROJECTS

Mega projects having investments of Rs. 30 crore and above will be offered customized packages of concessions by the High Powered Committee Constituted under the Industrial Policy 1999

CAPTIVE GENERATION

Captive generation sets installed by biotech industry will be eligible for exemption of electricity Duty for five years.

VENTURE CAPITAL

Govt. will encourage setting up of venture capital funds with private participation to provide active monetary support to biotech industry.

REGISTRATION CHARGES AND STAMP DUTY

- Rebate on registration and transfer of property charges and exemption from stamp duty on a tapering scale shall be given for sale/lease of built up space to the Biotech industry.
From the date of notification to 31.12.2003, 90%.

- First January 2004 and up to 30th June 2005, 75%.
- First July 2005 and up to 31st December 2006, 60%.
- First January 2007 and up to 30th June 2008, 45%
- The rebate would be applicable on the combined levy of registration fee, stamp duty and transfer of property duty and transfer of property duty and no total exemption of stamp duty would be extended. This concession would be available only for the first transaction, when the first sale by the infrastructure company is made to Biotech industry.

Rebate on Industrial Plots

Rebate equivalent to 20% of the land cost shall be given if the industrial unit starts commercial production within 3 years of offer of possession of industrial plots allotted by Haryana State Industrial Development Corporation Ltd. And Haryana Urban Development Authority.

Exemption in Labour Laws

Labour laws shall be amended so that the Biotech industrial units shall be able to operate in night shift also.

Clearances and Support

Single Desk Clearance for obtaining easy clearances and approval of various Government Departments shall be facilitated for biotech industries. On-line clearances and Support Network will be established linking all the related Departments/ Organizations. The Industrial Assistance Group shall coordinate approvals and facilitation.

Time schedule for Sanctions/ approvals

A time schedule will be fixed for various departments for giving necessary sanctions/ approvals to reduce time frames for project completion.