

Biotechnology Policy, 2063 (2006 A.D.)

1. Vision:

To increase production and productivity by means of research and development of biotechnology as well as transfer of technology, and improve the living standard of Nepali people by achieving a significant progress in the field of public health and environment.

2. Background:

Biotechnology accomplishes such a task that channelises the characteristics and property of any organism or their living cells/tissues etc. in the works of human welfare. With the help of this technology, the tasks – such as modifying the production technique of biomass, transforming their characteristics and property by various means, improving a breed of plants or animals as per necessity, channelising various micro-organisms in an assigned task and making human conducive change into genetic formation of various seeds, plants and animals – are being carried out. As the biomass is a focal point of this technology, our country, which is deemed to be rich in biological resources, is required to take a new step in the field of science and technology with the realization of her traditional knowledge and modern technology.

In order to face the existing challenges of a developing country like ours, the Biotechnology Policy, 2006 is formulated obtain the potentials opened up by biotechnology. The implementation of this policy may assist in increasing the production of food grains through biotechnology, developing a new technology of medical treatment,

controlling environmental pollution and promoting various industrial sectors.

3. Objectives:

The overall objective of this policy is to make contribution to the reduction of poverty by developing and expanding biotechnology with its use in the sectors of comparative benefit and its application as a basis of key substitute for the development of the country as well as environment protection and public welfare. Other objectives of this policy are as follows:

- 3.1 To fulfill a minimal need of food grains and nutritious food for growing population, thereby assisting in the reduction of poverty.
- 3.2 To use biotechnology in the areas comparatively providing benefit to Nepal.
- 3.3 To encourage research and development of biotechnology contributing for developing the forests, agriculture and food sectors in an internationally competitive and environmentally sustainable manner.
- 3.4 To promote a managerial skill in the field of biotechnology, attract the competent researchers and experts, promote an entrepreneurship and maintain a balance between demand and supply for the expert-skill.
- 3.5 To reduce environmental degradation and protect natural resources and means.
- 3.6 To develop simple and new programmes for ensuring the transformation of the results of research into professional

use subject to making contribution to the rural and national economic system.

4. Strategies:

The following strategies shall be adopted to fulfill the above-mentioned objectives:

- 4.1 The Government needs to as a promoter, facilitator and regulator.
- 4.2 To create a conducive environment by means of encouraging and regulatory working structure for the development and research of prerequisite infrastructure in biotechnology and the sector relating thereto.
- 4.3 To establish biotechnology-based industries on the basis of national requirement, market demand and regional characteristics, and encourage as well as provide concession to such industries.
- 4.4 To make necessary legal provisions for the development and commercialization of biotechnology.
- 4.5 To develop a cluster, incubator and network and prepare critical mass for the research, commercialization and use of biotechnology.
- 4.6 To facilitate a venture capital fund and flow of bank loan to be provided for the biotechnology-based industries.
- 4.7 To ensure such matters as intellectual property right, bio-safety, bio-surveillance and bio-ethics.
- 4.8 To encourage for making a research continuously with a view to using biotechnology in tissue culture, forest,

agriculture and food grains, herbs, mushroom production and processing system including animal and human health system.

- 4.9 To identify the needs of rural people involved in biotechnology-based activities by means of regular monitoring and public awareness, and make necessary provision accordingly.
- 4.10 To promote participation of private sector and give high priority to research, development and expansion of biotechnology.
- 4.11 To maintain and manage the records on the achievement of biotechnology.
- 4.12 To draft laws on the ownership of biotechnological resources of Nepal.
- 4.13 To develop indicators to measure public benefit as may be provided by biotechnology for sustainability, natural resource management, environment and biodiversity conservation, and make such benefits to the public.
- 4.14 To provide timely information about actual condition on size, trend and quality standard of the market of genetically modified and not modified products and consumer's feeling thereon.
- 4.15 To encourage the study of biotechnology in secondary schools and different levels of university.

5. Policies:

In order to provide a foundation for effective inter-governmental relation, promote partnership amongst stakeholders, establish open and transparent processes, increase awareness and public understanding; the following policies shall be adopted on the basis of above-mentioned strategies:

- 5.1 To recognize effective “enabling technology”, to be used in various sectors, and biotechnology as a sector of high priority.
- 5.2 To establish a ‘Biotechnology Coordination Committee’.
- 5.3 To establish a ‘National Biotechnology Research and Development Centre’.
- 5.4 To review existing laws that may effect on the use of biotechnology and make necessary provision.
- 5.5 To develop appropriate human resources and create an opportunities for biotechnology.
- 5.6 To encourage private entrepreneurs to set up a laboratory, green-houses and nurseries with a view to producing quality and disease free plants by means of biotechnology.
- 5.7 To create bilateral and multilateral working structures for research, development and commercialization of biotechnology.
- 5.8 To strengthen the institutions currently working in the filed of biotechnology and establish new institutions according to the requirements.
- 5.9 To establish one-window system for transportation, import and export of biotechnology-based production.

- 5.10 To implement the concept of biotechnology-village to promote the applied technologies.
- 5.11 To set up a fund at national-level in order to promote research and development of biotechnology.
- 5.12 To obtain a membership of the International Centre for Genetic Engineering and Biotechnology and establish relation with related regional and international institutions/organizations.
- 5.13 To promote the transfer of economically viable technology developed in a laboratory for forest, agro-based and industrial productions.
- 5.14 To emphasise the development of such a biotechnology that may assist to environmental protection and the management of natural resources.
- 5.15 To make necessary provision to set up a venture capital in financial institutions and provide tax facility as well as financial support to efficient biotechnology-based industries.
- 5.16 To exchange facility and technology amongst neighbouring and other developing countries and striving to maximize a cordial relationship with development partners of Nepal for the development and expansion of biotechnology.
- 5.17 To provide financial facilities to the feasible biotechnology-based programmes.
- 5.18 To provide a various levels of trainings on biotechnology to researchers as well as development workers, farmers and industrial employees.

- 5.19 To encourage domestic and foreign investment for the development of biotechnology and necessary for it.
- 5.20 To formulate and implement a long-term, mid-term and short-term training for the research, development and expansion of biotechnology.
- 5.21 Nepal will, in consistent with this policy, review a various working procedures in order to turn a biotechnology-based patenting into reality and also review Cartagena Protocol on Biotechnology (C.P.B.), Trade Related Intellectual Property Rights (TRIPS), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and technical aspects of Biotech.

6. Implementation Strategies:

The following implementation strategies shall be adopted to implement the Biotechnology Policy and fulfill the objectives contained in the said policy:

6.1 Sectors of Priority-based Importance:

The following areas shall be of significance areas for priority-based sectors and the programmes of research and development on biotechnology shall, by developing the said sectors, be operated for making national contribution.

6.1.1 Forest, Agriculture and Food-grains:

The sectors of importance for giving emphasis for the use of biotechnology in the field of forest, agriculture and food-grains shall be as follows:

- Tissue Culture

- Bio-pesticides, Bio-fertilizer and other Biotech Aspects
- Natural Products in Healthcare
- Animal Feeds/Supplements for Agriculture Products
- Aquaculture
- Plant and Animal Improvement
- Decorative flowers/plants, herbs and mushrooms

6.1.2 Treatment of human health, animals and plants:

In order to cure normal and chronic diseases to be communicated through genetic impairment or external effect and to make timely identification of pathogen, the knowledge of modern biotech shall be utilized. The sectors of giving emphasis in this regard shall be as follows:

- Diagnostics
- Vaccines
- Veterinary Drugs, Diagnostics and Vaccines
- Immunology and Therapeutics
- Embryo Transfer
- Gene Therapy

6.1.3 Environment and Biodiversity:

The activities of biotechnology shall be carried out thereby making contribution in reducing environmental pollutions and protecting as well as preserving natural

resources and biodiversity. The important sectors under this shall be as follows:

- Development of Microbial Strain Cultures for Waste Management
- In-situ and Ex-situ Conservation and Utilization of Plant Resources
- Bioremediation and Industrial Effluent Treatment
- Monitoring Tools and Biosensor
- Pest Management through Natural Bio-agents and Botanies

6.1.4 Industry:

Programmes shall be operated to maximise development and competitiveness of the industries established in such areas of food processing, forest based-products including the area of chemical and accomplish a significant achievement through biotechnology-based research. The important sectors thereof shall be as follows:

- Food and Industrial Products
- Fermentation Products
- Bio-energy

6.1.5 Deoxyribonucleic Acid (DNA) Technology:

In order to take benefit form the DNA technology, the programmes shall be operated by giving focus on the following subjects:

- Identification and Isolation of Genes to use in Molecular Hybridization

- Studies on Polymorphism, Molecular Mapping of Endangered and Commercial Species
- Selection of Gene for Breeding Programme and Development of Diagnostic Kits
- DNA Profiling for Forensic
- Diagnostic of Genetic Disease
- Paternity Analysis, Immigration and Citizenship Record

6.2 Development of Human Resources:

- 6.2.1 It shall be encouraged to initiate the study of biotechnology and bio-information system in school leaving certificate, pre-bachelor, bachelor and master's levels of various secondary schools, universities and such institutions related thereto.
- 6.2.2 Measures of promoting a common inventory of human resources shall be adopted for biotechnology.
- 6.2.3 Necessary initiation shall be made to develop suitable human resources in the field of biotechnology and retain the existing human resources and attract the new-comers.
- 6.2.4 Scientist shall be imparted with a short-term and long-term necessary training on professional and innovative skills.
- 6.2.5 Efforts shall be made to establish cooperation on study and research amongst national and foreign universities/institutions in the field of biotechnology.

6.2.6 Scholarships for master and PhD in science and technology shall be made available in biotechnology and the area related sectors.

6.2.7 The programmes and systems for the promotion of entrepreneurship shall be developed by National Biotechnology Research and Development Centre, and Ministry of Environment, Science and Technology.

6.3 Basic Structure:

6.3.1 The infrastructure of existing biotechnology-based research shall gradually be strengthened.

6.3.2 It shall be encouraged to develop necessary infrastructure in governmental, semi-governmental, private and academic institutions for the development of biotech capacity.

6.3.3 National Biotechnology Central Laboratory shall be established to conduct research and training as per national priority.

6.3.4 Bio-villages with a new progress made in biotechnology and best traditional techniques shall be established.

6.3.5 Instrumentation centres shall be established and developed to provide the researchers involved in biotechnology with necessary equipments.

7. Facilities:

7.1 Chemical and Equipment Purchase Tax: Necessary provisions shall be made for giving exemption on custom duty to be imposed while purchasing chemical materials and equipments on

the recommendation of Biotechnology Coordination Committee for a biotech industry or research institution.

“Biotech industry” means an industry involved in any of the following activities:

- To make research and development on the use of living systems and/or enzymes or bio-catalysts and produce goods through the use thereof.
- To use the technologies relating, among other things, to genetic engineering or cell culture, microbiology, bio-chemistry, molecular biology and tissue culture.

7.2 The necessity of electricity service is inevitable for the development of biotechnology; therefore, a provision of providing subsidy on the price of electricity shall be made.

7.3 The Government shall provide land to establish a bio-village.

7.4 A Venture Capital Fund shall, by utilizing the capital market, be set up with the investment of Nepal Government and private sector.

7.5 As the Nepali citizens working in abroad may play a significant role on technology transfer and market promotion in this sector, the foreign currencies that they have generated shall be encouraged to invest in this sector.

7.6 A provision of reward and admiration shall be made to encourage bio-technicians and the concerned industries.

8. Institutional Provisions:

8.1 Biotechnology Coordination Committee shall be constituted for making research and development relating to biotechnology and

developing necessary human resources for this sector as well as a curriculum on biotechnology subject. This Committee shall encourage the private-sector entrepreneurs to adopt biotechnology for increasing their production and perform a task of raising public awareness.

The formation of Biotechnology Coordination Committee shall be as follows:

1. Honourable Minister/State Minister, Ministry of Environment, Science and Technology	Chairperson
2. Honourable Member, National Planning Commission (Looking Biotechnology)	Member
3. Secretary, Ministry of Environment, Science and Technology	Member
4. Secretary, Ministry of Law, Justice and Parliamentary Affairs	Member
5. Secretary, Ministry of Forest and Soil Conservation	Member
6. Secretary, Ministry of Industry, Commerce and Supplies	Member
7. Secretary, Ministry of Finance	Member
8. Secretary, Ministry of Agriculture and Cooperatives	Member
9. Secretary, Ministry of Education and Sports	Member
10. Secretary, Ministry of Health and Population	Member

11. Secretary, Ministry of Information and Communication	Member
12. Chairperson, Concerned Biotechnology Association (one person)	Member
13. Reactor, Tribhuvan University	Member
14. Reactor, any related University (one person)	Member
15. Secretary, Nepal Academy of Science and Technology	Member
16. Chairperson, Agriculture Enterprise Centre	Member
17. Biotechnology Expert (four person)	Member
18. Representative of Consumer Group (two person)	Member
19. Executive Director, Nepal Agriculture Research Council	Member
20. Executive Director, National Biotechnology Research and Development Centre	Member-Secretary

8.2 National Biotechnology Research and Development Centre:

The National Biotechnology Research and Development Centre shall be constituted under the Ministry of Environment, Science and Technology. It shall perform the following functions:

8.2.1 The National Biotechnology Research and Development Centre will identify the priorities relating to national biotechnology and promote cooperation amongst various components of the implementation and system of this national strategy.

- 8.2.2 To act as a secretariat of the National Biotechnology Coordination Committee, implement and cause to be implemented the policy and planning relating to biotechnology, supervise and inspect such policy and planning and provide support thereto and regulate the activities carried out by private entrepreneurs.
- 8.2.3 To coordinate with the concerned ministries to open a Biotechnology Division for the promotion of research and development with regard to biotechnology and set up research laboratories in the National Biotechnology Research and Development Centre
- 8.2.4 To explore about a matter of economic resource, international relation, commercial development and public concern including moral matter. Promoting the finding of investment of venture capital and industrial partners in biotechnology.
- 8.2.5 To prepare a list of groups of international and national advisors.
- 8.3 A Biotechnology Scientific Committee shall be constituted under the National Biotechnology Research and Development Centre and the Committee shall comprise of scientists representing from various sectors of biotechnology.

9. Legal Provisions:

Necessary laws shall be enacted to regulate a transaction to be made by means of biotechnology and other necessary provisions related with this technology and protect the rights relating to intellectual property.

10. Amendment to Policy:

Due to a rapid development being made in the field of biotech, this policy may be reviewed and amended as required in an interval of every two years as per the necessity of technology development and service expansion. Provided that this may, on the suggestions of various sectors, be reviewed and amended as required even prior to the said time period.