

Biodiversity Policy



Directorate of Research
CCS HARYANA AGRICULTURAL UNIVERSITY
HISAR-125004
HARYANA

Biodiversity Policy of CCS HAU

1. Biodiversity in Haryana

Haryana is one of the smallest States in India with 4.4 million hectares of land, forming 1.4 percent of the total geographical area of the country. Nearly 80 percent of the total geographical area of the State is under cultivation of which about 84 percent is irrigated with cropping intensity of 185 percent.

The State enjoys 1st position in the production of Basmati rice and productivity in pearl millet and rapeseed & mustard. The food grain production has increased to 16.35 million tons in 2012-13, as against only 2.59 million tons when the State came into existence in 1966-67. The State has the distinction of attaining food self-sufficiency in the shortest period. Currently, Haryana is one of the biggest contributors of foodgrains to the Central Pool. More than 60 percent export of Basmati Rice is taking place from Haryana alone. Progressive policies and programs, good Research & Development (R&D) system, required infrastructure and hard-working farmers have all contributed to the steady growth in the State. Krishi Karman has been awarded to Haryana State during 2010-11 and 2011-12 for better performance of Wheat production. During 2012-13, the GDP growth rate was 6.5 per cent in Haryana, as against 4.5 per cent at all India level. As regards sectoral growth, service sector recorded the highest growth of 9.3 per cent followed by industry (4.1%) and agriculture (3.2%). Haryana, with its rich cultural heritage, is a land of warriors and hardworking farmers. Mixed farming is a way of life. Climate of Haryana is uniquely favourable for cultivation of Basmati rice. About 2/3rd of the State has assured irrigation, most suited for rice-wheat production system, whereas rain fed lands (around 1/5th) are most suited for rapeseed & mustard, pearl millet, cluster bean cultivation, agro-forestry and arid-horticulture. The State is also ideally located nearer to National Capital Region (NCR) with access to a range of big markets and the international Airport. Rice, wheat, rapeseed & mustard, bajra, cotton and sugarcane are the major crops with considerable scope for agricultural diversification as well as off farm opportunities. Cauliflower, onion, potato, tomato, chillies, guava and kinnow are the important horticultural crops having good potential. Allied sectors like dairying, poultry, fishery, arid-horticulture, mushroom farming, bee keeping, agro-forestry have great potential. The land and water resources are indeed valuable and the State is fortunate to have very good cultivable land with high cropping intensity, proper farm mechanization and progressive farming community, especially very hard working women farmers. Rich traditional knowledge and modern farming practices adopted by the farmers place Haryana State in an enviable position. The Government policies are pro-farmer and State has an efficient governance system to support farmers.

Vast bio-resources like crop residues, sugarcane bagasse, vegetable wastes, fallen leaves from trees, etc. of the State offers unlimited opportunities for energy generation and organic recycling of soils. Currently, crop residue burning is a common practice with farmers. Considering its harmful effects, the State has already banned it. Strict enforcement of this order and promotion of organic recycling practices will be ensured. Since energy is a critical constraint, reasonable pricing of different forms of energy will be ensured. The energy consumption in agriculture needs to be reduced by about 10

percent in the next 5 years through efficient planning and utilization of bio-energy resources.

Alternative sources of energy like using animal power for farm operations like sowing, hoeing, etc, bio-gas, solar, wind and geothermal energy will be explored and new schemes will be put in place. The State will henceforth encourage the use of cow dung as manure and discourage its use as fuel, by taking steps to ensure alternative sources of fuel in rural

2. Haryana State Biodiversity Board

Notification of the 14h November, 2006 No S.O. 106/C. A. 18/2002/S. 22/2006- In exercise of the powers conferred by subsection (1) of section 22 of the Biological Diversity Act, 2002 (Act 18 of 2003) His Excellency Honourable Governor of Haryana hereby appoints the date of publication of this notification in the Official Gazette, to be the date from which Haryana State Biodiversity Board shall be established consisting of the following members namely:-

	Environment Minister, Government of Haryana	Chairperson
Ex-Officio Members		
1	Commissioner and Secretary to Government of Haryana, Environment Department	Member
2	Financial Commissioner and Principal Secretary to Government, Haryana, Forest /Wild Life Department	Member
3	Financial Commissioner and Principal Secretary to Government, Haryana, Agriculture Department	Member
4	Financial Commissioner and Principal Secretary to Government, Haryana, Animal Husbandry and Dairying Department.	Member

3. Biological Diversity Act 2002 and Rules 2004

Ministry of Environment and Forests, Govt. of India, New Delhi has enacted Biological Diversity Act, 2002 and Biological Diversity Rules, 2004 for the conservation and sustainable use of the biological resource on equity and gender basis and regulation and management of biodiversity in the country. Biological Diversity Act, 2002 envisages the formulation of various bodies for the regulation and management of biodiversity at three levels namely:

- i) National Biodiversity Authority at National Level.
- ii) State Biodiversity Board at the State Level.
- iii) Biodiversity Management Committees at every local body/panchayats level in the state.

Salient Features of Biological Diversity Act 2002 are:

- To regulate access to biological resources of the country with the purpose of securing equitable share in benefits arising out of the use of biological resources and associated knowledge relating to biological resources.
- To conserve and sustainably use biological diversity.

- To respect and protect knowledge of local communities related to biodiversity.
- To secure sharing of benefits with local people as conservers to biological resources and holders of knowledge and information relating to the use of biological resources.
- Conservation and development of areas of importance from the stand point of biological diversity by declaring them as biological diversity heritage sites.
- Protection and rehabilitation of threatened species.
- Involvement of institutions of State Governments in the broad scheme of the implementation of the Biological Diversity Act through constitution of committees.

What is covered by the Biological Diversity Act?

- The act covers conservations, use of biological resources and associated knowledge occurring in India for commercial or research purposes or for the purposes of bio-survey and bio-utilization. It provides a framework for access to biological resources and sharing the benefits arising out of such access and use. The Act also includes in its ambit the transfer of research results and application for intellectual property rights (IPRs) relating to Indian biological resources.

What is excluded by the Biological Diversity Act?

- The Act excludes Indian biological resources that are normally traded as commodities. Normally traded commodities (so far material is used only as commodity). Uses by cultivators and breeds e.g. farmers, livestock keepers and bee keepers and traditional healers e.g. vaid and hakims. Collaborative research between Indian and foreign institutions that conform to central government guidelines and has its approval subject to following the notified guidelines by the Ministry of Environment and Forests, Government of India. Such exemption holds only so far the biological resources are used as commodities and for no other purpose. The act also excludes traditional uses of Indian biological resources and associated knowledge and when they are used in collaborative research projects between Indian and foreign institutions with the approval of the central government.

4. What is Biodiversity

Biodiversity or biological diversity is the variability within and between all micro-organisms plants and animals both wild and domesticated and the ecological systems which they co-exist and inhabit. It is one of the greater wealth of the planet. It starts with genes and manifests itself as organisms, species, populations and communities which lead to the formation of ecosystems, landscape and ultimately biosphere. Biodiversity manifests at three levels.

- Species Diversity-diversity among species in an ecosystem.
- Genetic Diversity-Diversity of genes within a species. There is genetic variability among the populations and the individuals of the same species.
- Ecosystems diversity-diversity of higher level of organization, the ecosystem.

Importance of Biodiversity

Biodiversity has direct consumptive value in food, agriculture, medicine and industry. Approximately 80,000 plants have been used at one time and another in the human history of which only 150 have been cultivated on a large scale. Today 10 to 20 species provide 80-90% of food requirements of the world. At one time, nearly all medicines were derived from the biological resources. Even today, 67-70% of modern medicines are derived from natural products. In addition to food and medicines, biodiversity provide us with many other products without which life would be difficult. Wood, fuel, fodder, clothing and shelter, material for industries are some of the examples.

Biodiversity also has aesthetic and recreational values. Biodiversity maintains ecological balance and continues evolutionary process. The indirect ecosystem services provided through biodiversity are photosynthesis, pollination, transpiration, chemical cycling, nutrient cycling, soil maintenance, climate regulation, air water system management, waste treatment and pest control. Conservation and sustainable use of biodiversity are therefore, fundamental to ecological sustainable development. In fact the very survival of mankind is dependent on biological diversity i.e. plants, animals and microbes.

Need for Conservation of Biodiversity

- Conserving biological diversity is an ethical imperative because all life has a right to exist
- Biological diversity provides many benefits to humans, supporting the systems that store and cycle nutrients essential for life, absorbing and breaking down pollutants, recharging groundwater, producing soil and protecting it from excessive erosion, providing the basis for all improvements to domesticated plants and animals, and providing numerous raw materials for industry and medicine.
- Biological resources and related traditional knowledge are often of great commercial value to business corporations in developing commercial products. Traditional knowledge transforms biodiversity into Bioresources. Biodiversity and associated traditional knowledge are an integral strength of today's developing countries particularly in the areas of agriculture and Horticulture. It holds great potential all over the world that is increasingly being sensitized to Traditional knowledge.
- Indigenous farming communities have also identified and managed a series of genes through selection and cross breeding. These genes have potential traits of pest(s) and disease(s) resistance, drought tolerance, high salt tolerance, cold tolerance, tolerance to water logging etc. To develop a crop that can withstand global warming and climate changes across agricultural zones, International scientists visit tropical regions for crop varieties that are drought tolerant / resistance and for this purpose they depend largely on traditional knowledge and local farmers.
- Breeding and selection process with local varieties, they will be able to develop a potential and high yielding crop variety with combinations traits for tolerance to drought or salinity or resistance to pest(s) and disease(s).
- Commercial value: Oil, Fertilizers etc. extracted from species of plants and animals.
- Biological value: Pollination, Soil formation and Nutrient enrichment.
- Recreational Value: cannot be measured in terms of money.
- Aesthetic Value: Art, Poetry, Literature.

- Scientific Value: Gene Pool, Evolution, Human Welfare, etc.

5. Status of Biodiversity in CCS HAU

CCS Haryana Agricultural University is playing leading role for sustainable development of Haryana state. CCS Haryana Agricultural University is already following the provisions of Protection of Plant Varieties & Farmers' Rights (PVP&FR) Act (2001) and will also give due attention to the Biological Diversity Act 2002 for the promotion of sustainable development. Keeping in view the interest of small holder farmers, the university will frame an appropriate policy on Genetically Modified (GM) crops to harness the benefits of biotechnology ensuring required biosafety measures. Bio-prospecting of valuable germplasm for Intellectual Property Rights (IPR) requirement including Geographical Indicator (GI) (ex. Basmati rice) shall be given priority. University will plan for establishment of Agro biodiversity gardens at university campus and regional stations to conserve valuable germplasm of the State. University Agro biodiversity Committee will be constituted for conservation of biodiversity. In this context, the university will establish Agro biodiversity Innovation Fund (AIF) and the University Agro biodiversity Committee be made fully functional for protecting valuable biodiversity keeping in view the provisions of relevant international conventions.

Agro biodiversity

Agro biodiversity occupies a unique place within biodiversity. It recognises that agriculture evolved from bio prospecting, selection and development of a few species from plant and animal kingdoms, to meet human needs of food, fibre and fuel. All biotic factors related to agriculture, such as, plants, animals, fish, reptiles, insects, birds and microbes are components of agro biodiversity. The conservation, management and sustainable use of these organisms (and their wild progenitors/relatives) require specific attention. The Biodiversity Act, 2002, is now the most important act that regulates all aspects related to all biodiversity. In order to provide for the establishment of an effective system for protection of plant varieties the rights of farmers and plant breeders and to encourage the development of new varieties of plants it has been considered necessary to recognize and protect the rights of the farmers in respect of their contribution made at any time in conserving improving and making available plant genetic resources for the development of new varieties. Moreover to accelerate agricultural development, it is necessary to protect plants breeder's rights to stimulate investment for research and development for the development of new plant varieties. Such protection is likely to facilitate the growth of the seed industry which will ensure the availability of high quality seeds and planting material to the farmers. India having ratified the agreement on trade related aspects of the intellectual property rights has to make provision for giving effect to agreement. To give effect to the aforesaid objectives the protection of plant varieties and Farmers' Rights Act, 2001 has been enacted in India. For agro-biodiversity, the Seeds Act (1966), Protection of Plant Varieties and Farmers' Rights Act (2001) and Plant Quarantine (Regulation of Import into India) Order (2003) are the most important ones. The various central Acts are supported by a number of state laws and statutes concerning forests and other natural resources as well. Overall, agricultural biodiversity management efforts should focus on conservation, sustainable use and equitable sharing of benefits.

- The status of components of agro-biodiversity is being monitored by university regularly in the context of adopting of high yielding varieties in place of locally adopted varieties, changing nature of cropping systems and infrastructural development. On-farm conservation of genetic resources and diversified farming practices are being promoted to overcome some of these challenges. The negative impacts of agriculture on biodiversity, productivity and sustaining on livelihoods are now getting attention and, thus management practices, technologies and policies are being identified to mitigate the same. These include promotion of integrated crop and livestock farming, revival of traditional watershed management practices and discouraging the indiscriminate use of chemical fertilizers and pesticides. Sustainable agricultural practices are now receiving greater attention with a renewed focus on integrated crop farming and livestock production systems for generating additional income to farm families. On-farm *in situ* conservation approach, with *ex situ* conservation providing a safety back-up, is being explored under different ecosystems with a view to develop workable models.
- Rich crop landraces and traditional farmers' varieties are prevalent in several pockets and areas. These constitute an invaluable reservoir of genes that are needed by plant breeders for development of superior crop varieties. However, the diversity is being lost from the "natural" habitats due to the expansions of agricultural production to frontier areas and also from the agricultural fields due to the adoption of improved varieties and other technology by the farmers. The university has already initiated scientific management of these invaluable resources has assumed greater significance over time. Also, the wild species and relatives of crop plants contain valuable genes that are of immense value as genetic resource for further use in crop breeding programmes. These resources are likely to play a unique role in the development of new cultivars and also in restructuring the existing ones which lack one or the other attribute. The most important inheritance factor obtained from the wild has been that for disease(s) or pest(s) resistance or drought tolerance.
- Agrobiodiversity and the available indigenous knowledge will be documented urgently through a well-organised approach. Both the formal and informal knowledge available with the farming communities deserves this documentation.
- High priority will be accorded to various researchable issues relating to agro biodiversity.
- Modern technologies, such as *in vitro* and cryopreservation, are needed for conservation of non-orthodox seed species, vegetatively propagated crop plants, medicinal and aromatic plants and other high value crops. The required support will be provided for research to develop the needed technologies. Responsibilities will be assigned to working scientists for standardising protocols for specific plant species.
- Agroforestry trees like *Salvadora oleiodes* and *Salvadora persica* are at the verge of extinction. Therefore, efforts will be made for conservation of biodiversity of *Salvadora oleiodes* and *Salvadora persica* using biotechnology.
- Wild species of bitter gourd/karela (*Momordica charanita* var. *abbreviate* (L) *seringe*) and cultivated species of Arya (*Cucumis melo* var. *Flexuous*) are disappearing from Haryana. So the exploration of these vegetables will be strengthened at Vegetable Research Farm of University for utilization in breeding programme for development of varieties and creation of variability for future use.

- Research work on organic farming will be strengthened to reduce the environmental pollution and chemical hazard to living being.
- Genetic variability of native, under-utilised species of food crops, fruits, medicinal, aromatic and other economic plants and also arthropods will be documented on priority. It will be supplemented through need-based introduction of useful species. Selected, hitherto unexploited, species having future potential should be researched on and adopted.
- Characterisation, evaluation and documentation of PGR shall receive a high priority. Relevant improved tools and technologies, such as biotechnology, should be deployed in future.
- Registration of plant germplasm should be encouraged and availed of by all concerned. Registration should be based on properly characterised, documented and researched PGR information.
- Mechanisms will be evolved for the legal protection of landraces/traditional varieties while recognising the ownership of the farming communities, private or public breeders.

Biodiversity is essential for sustainable Development and human well being. Important benefits of biodiversity are given below.

- Increase productivity, food security, and economic returns
- Reduce the pressure of agriculture on fragile areas, forests and endangered species
- Make farming systems more stable, robust, and sustainable
- Contribute to sound pest and disease management
- Conserve soil and increase natural soil fertility and health
- Contribute to sustainable intensification
- Diversify products and income opportunities
- Reduce the spread of risks to individuals and nations
- Help maximize effective use of resources and the environment
- Reduce dependency on external inputs
- Improve human nutrition and provide sources of medicines and vitamins, and
- Conserve ecosystem structure and stability of species diversity.