STRATEGY & ACTION PLAN
FOR
CONSERVATION OF BIODIVERSITY
IN PUNJAB

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EXECUTIVE SUMMARY

The variety of genes, species and ecosystems which encompass populations, communities & habitats constitute biological diversity. Increasing human population, industrialization, intensive agricultural & animal husbandry practices and over-exploitation of natural resources are, however, threatening our bioresources. The Convention on Biological Diversity, which came into force in 1993, makes it mandatory for all signatory countries to conserve their biodiversity and prepare strategies & action plans for its conservation at the national level. In this context, the process of preparation of National Biodiversity Strategy & Action Plan was initiated by the Government of India in 2000. A unique mechanism has been adopted for the same, which envisages preparation & merger of Strategies & Action Plans for all States & Union Territories, Eco-regions, Sub-state sites & several Thematic documents.

The present document defines the Biodiversity Strategy & Action Plan (BSAP) for Punjab. It establishes a general frame work for the State’s Policy on conservation & sustainable use of its biological resources, defines their current status, identifies processes leading to its deterioration and sets out guidelines and specific programmes for future action. It should, therefore, be regarded as a bridge between the National Biodiversity Strategy & Action Plan (NBSAP) and role of the State government for application of measures & actions at the ground level.

The document covers, both, natural & agricultural systems and attempts to collect & collate available data on wild & domesticated species/varieties of flora & fauna. It attempts to promote conservation & sustainable use of the State’s biological resources by promoting awareness amongst the masses, cooperation between stakeholders and creating mechanisms required to plan for natural resource management and its long-term conservation. The strategy is guided by the cross sectoral concepts of conservation & sustainable use, public participation & coordination, gender & equity, planning, education, training & research and economic, legal, ethical & cultural issues.

A multi pronged approach was adopted for preparation of this document. This included notifying a state level steering committee, collection of primary data through questionnaire & six public hearings, discussions & interviews with representatives from various departments, academic institutions, NGOs, village Panchayats and knowledgeable local persons & experts and collection & collation of secondary data from universities, R&D bodies, Government departments & research institutions as well as published journals & reports.

The document presents, both, the geographical & ecological profile of Punjab. The state is one of the smaller states of India with an area of 50,362 sq km located in the northwestern part of the country. The climate is typically sub-tropical. Land is shared by activities like agriculture, water resources, wetlands, forests, living spaces, industrial & commercial use, transportation network, etc. Eighty four percent of the state’s area is under agriculture with a cropping intensity of 183%. About 5.7% of the area is under forests. Sutlej & Beas are the two important rivers traversing the state, whereas Ravi touches it at its northern border and Ghaggar passes through the south. The state is however, traversed by a large network of canals, distributaries & canals. It is also well known for its large dams and several barrages, which have resulted in the formation of 9 manmade wetlands. Out of these the Harike, Kanjli and Ropar wetlands are among the Ramsar sites of India. Several natural wetlands also exist. The natural forests in the state are found in the Shivalik area in the districts of Ropar, Hoshiarpur & Gurdaspur, and in form of Bir forests in district Patiala and Mand forests around wetlands. These are the areas of high biodiversity in the state. To protect the existing biodiversity 10 protected areas have been identified covering a total area of 317.79 sq. km. The important sanctuaries include the Abohar wildlife sanctuary, the Harike
wildlife sanctuary & sanctuaries in the Shivaliks. Some community-conserved areas also exist, out of which the most important is the Aboltar wildlife sanctuary which exists on private land of 13 villages & 3 closed areas belonging to the Bishnoi community. For ex-situ conservation of biodiversity, one zoological garden, one tiger safari & 3 deer parks have been set up. Several botanical gardens (some of which date back to the time of the Moghuls) also exist, important being Aam Khas Bagh, Fategharh Sahib; Rambagh, Amritsar; Baradari Gardens, Patiala, etc.

A review of the various components of the state’s physical environment indicates that intensive & extensive agriculture, high human population density and increased urbanization & industrialization has adversely affected the natural habitats and thus, the biodiversity in the state. Diverse historical events, frequent reorganizations, over exploitation of soil & water resources and consolidation of land holdings have also contributed to habitat and biodiversity loss. Palaeontological records of the area indicate that it was floristically and faunistically rich in the geographical past. Available data indicates the presence of 371 species of algae, 448 species of fungi, 10 species of bryophytes, 26 species of pteridophytes, 21 species of gymnosperms & 1939 species angiosperms in the state. Five angiospermic taxa recorded from the state are new taxa to science whereas 8 species are new reports from India. Although no systematic studies have been carried out to identify the rare or endangered flora of the state, however, a reference to Red data book of Indian plants indicates one species as endangered and one as rare. Faunal studies indicate the presence of 112 species of fishes, 15 species of amphibians, 35 species of reptiles, 442 species of birds & 43 species of mammals besides a large number of invertebrate species.

The ushering in of green revolution has led to a considerable change in the area and varieties of crops under cultivation. Data indicates that whereas area under wheat has increased by 2.42 times, area under rice has increased by 11.5 times from 1960-61 to 1999-2000. At the same time, however, area under bajra has decreased by 24.6 times, under barley by about half and under jowar it is less than 500 ha now. Further considerable varietal changes have also taken place. Prior to the green revolution 31 varieties of wheat, 31 of rice, 4 of maize, 3 of bajra, 11 of sugarcane, 18 of pulses, 8 of oil seeds & 17 of cotton were reported to be in use and propagated through pure line selection by various workers. Since the advent of green revolution the traditional varieties have been replaced by high yielding varieties introduced by PAU and the Department of Agriculture. Though 37 varieties of wheat, 18 of rice, 34 of pulses, 10 of sugarcane, 18 of maize, 9 of bajra, 28 of oilseeds & 14 of cotton have been released since 1964 but only a few of them are actually in use by the farmers. Further, the population of domesticated fauna in the state has also increased by 8.7% in the past two decades. Though two desi breeds of cow have been reported but the pure breed has been cross bred with Jersey and Holstein & is now usually not available. Further, 3 native breeds of buffaloes, 3 local breeds of sheep, 2 of goat, one of horse and two of poultry are being reared in the state.

The major processes which have affected wild & domesticated biodiversity in the state include intensive & extensive agriculture, promotion of monoculture plantation, urbanization, industry, transport, trade, etc. Unsustainable development models, lack of administrative coordination amongst Development departments and peoples participation in planning & implementation of developmental projects are also important causative agents of biodiversity loss.

The Departments of Forests & Wildlife, Agriculture, Animal Husbandry, Fisheries, Horticulture, Industry, Irrigation & Power, Science, Agriculture & Environment, etc. are the key departments which can play a major role in biodiversity conservation in the state besides academic institutions, local communities, NGOs, industry & corporate sector, as well as, religious & cultural groups. The initiatives taken up by some of these departments include promotion of social instruments to protect biodiversity (e.g. projects which promote peoples’ participation), enactment of specific laws and promotion of
scientific studies. However, economic instruments need to be strengthened for the purpose.

Based on available data, gaps in information, vision, policy & legal structure and institutional & human capacities have also been identified for both wild & domesticated biodiversity. These include inadequacies in information on baseline data, absence of review mechanisms to assess impact of developmental activities on biodiversity, poor information dissemination, emphasis on short term benefits, poor implementation of existing legal systems and lack of understanding of importance of biodiversity issues in developmental projects, cross sectoral research studies and trained personnel, etc. There is also a distinct gap in linkages amongst various departments and in awareness & education.

The strategies identified to fill these gaps include an assessment of status of existing wild & domesticated biological resources, defining of criteria for economic evaluation of resources, promotion of policies & schemes linking wild & domesticated biodiversity elements, developing resource efficient technologies, optimizing application of environmental impact assessment and fostering public participation in biodiversity conservation. Efforts need to be made to restore original ecosystems and improve canopy density in existing forests for conservation of wild biodiversity. Critically endangered and threatened species need to be actively preserved and local communities need to be involved in management of areas rich in biodiversity including protected areas. For conservation of domesticated biodiversity the state needs to promote diversity in agricultural crops besides revival of traditional species based on collective wisdom of the Punjabi farmers in addition to the opinion of experts. A social security system for farmers needs to be put in place by extending insurance to several crops and increasing demand of diverse crops (like jowar, bajra, pulses, etc.) through diversity in food grains supplied through the public distribution systems. The problem of excessive production of certain crops (like wheat, rice & potato) also needs to be tackled besides improvement of storage capacities especially at the village level. Further, Integrated Pest Management, traditional farming systems, biofertilizers & biopesticides need to be promoted.

In response to the need to implement the strategies outlined above appropriate actions for key government departments and other stakeholders need to be identified. The State Department of Science, Technology & Environment needs to take up the responsibility of promoting inter-departmental coordination and establishing liaison with the State Planning Board & Department of Finance to ensure adequate funding of biodiversity conservation programmes. A state level data base of existing wild & domesticated biodiversity and traditional knowledge systems needs to be prepared and awareness, education & training on biodiversity issues needs to be promoted. Further, guidelines for use & management of natural resources including habitat restoration and in-situ & ex-situ conservation of species, assessment of unsustainable farming methods, ways of conserving relatively less grown crops, reduction in excessive use of water & farm chemicals, incentives for conservation & promotion of sustainability in agriculture and animal husbandry practices need to be developed. Institutional, legislative & economic reforms also need to be taken up and education, awareness, training & research need to be promoted. A State Biodiversity Authority could also be set up to promote interdepartmental coordination within the government as well as between GOs, NGOs, industries, academicians & R&D scientists. Further, suggestive actions to be taken up by key participating departments and stakeholders have also been specified.

For operational implementation of the action plan, it is proposed that each participating agency may set up a technical unit/cell for drawing up and implementation of sectoral plans related to biodiversity and the state government may ensure sufficient human, material & economic resources to achieve these objectives.