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<u>Full Length Research Paper</u> Reflections on Ecological Sustainability: Assessing Development through Sustainable initiatives of Government and Non-Government Organizations in Himachal Pradesh, India.

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ARTICLE INFORMATION	ABSTRACT
Corresponding Author: Dr. Pankaj Gupta	Guided by the three-domain framework of sustainable development, sustainability is an essential idea behind the effective public administration, policy-formulation and governance. The ecological domain occurs at an intersection between the social and biological ambits of biosphere and emphases on the
Article history:	vital aspect of human engagement with and within nature. This paper probes into the
Received: 25-11-2023	multidimensional thought of ecological sustainability, covering its concept, principles, as well as the
Revised: 03-12-2023	diverse domains linked with realizing it. The objective of this work is to explore how the initiatives of
Accepted: 18-12-2023	government and non-governmental organizations in Himachal Pradesh represent a step toward a
Published: 20-12-2023	sustainable era. The sustainable initiatives of government and non-government bodies and accomplishments made by them have been exemplified in this paper with respect to land resource
Key words:	management, management of disasters, mineral resources, water resources, biodiversity and wildlife
Sustainable	management, farming and allied sectors, environmental pollution, solid waste management and
Development, Ecological	energy sector. The study involved collection of both primary and secondary data. Primary data was
Sustainability, Himachal	collected using a pre-designed questionnaire administered on the respondents by personally visiting
Pradesh, Rio Earth	the important institutions involved in environmental management. The secondary data was obtained
Summit, U.N. Conference	from relevant published or unpublished literature. The data was edited, categorized, tabulated and
of Human Environment,	analysed for making recommendations. In conclusion, this paper encapsulates the key points and
Rio Earth Summit,	accentuates the need for ecological sustainability in a wider sense.
Agenda 21	

Introduction and background

Sustainable Development: Evolution of the Concept

The environmental problems started with the developmental activities. People in the name of modernization started damaging the natural environment without analysing its consequences. This gave rise to the era of environmental activism. In the late 19th century, a need was felt to formulate regulations for preserving the environment for human welfare and sustainable development. India is the first country in the world to have made provision for the protection and conservation of the environment in its constitution. The concept of sustainability has been accepted widely since the prehistoric times, especially among the indigenous communities; but the environment was discussed for the first time in 1972, as an international agenda during the U.N. Conference of Human Environment at Stockholm. The origin of the word '*sustainability*' was observed in the field of hunting, wherein hunters and gatherers were keen to establish a stable means of survival. In German, '*sustenance*' refers to necessities kept as stock for crises. Today, the word '*sustainable*' still has the meaning of being '*eternally effectual*' in common usage [Boyer et al. 2016]. The aftereffects of anthropogenic activities and environmental damage are gradually being recognized. The initial dialogue was deep-seated and required restructuring, claiming that capitalist economic development cannot be unified with social and ecological development, which challenges the idea of a sustainable world [Redclift, 1992; Tulloch and Neilson, 2014]. Restating the necessity for Sustainable

Development, the World Commission on Environment and Development, brought out the Brundtland Report [Brundtland, 1987] entitled '*Our Common Future*' in 1987. The report defined Sustainable Development as:

"...the development that meets the demands of the current generation without compromising the ability of the future generation to meet their own needs..."

Later in 1992, the Rio Earth Summit was inspired by the Brundtland Report [Allen et al. 2018] where the conference document included Agenda 21 as one of the vital sustainable development outcomes. It asserted that national policies be formulated and executed to address the socio-economic and environmental constituents of sustainable development [Santander et al. 2022]. The World Summit on Sustainable Development (WSSD), also known as Rio+10, was organized at Johannesburg in 2002 to evaluate the status of putting into practice the suggestions of *Rio Earth Summit*. The World Summit on Sustainable Development (WSSD) presented several multi-stakeholder alliances for sustainable development and the Johannesburg Plan, an execution plan for the actions outlined in Agenda 21 [Sen 2020].

Ecological Sustainability

Nowadays, sustainability is an underlying idea behind the effective public administration, policy-formulation and governance, which is directed by the three-domain framework of sustainable development [Banon et al. 2011]. The framework believes that sustainability must be realized in terms of three domains, viz. economic, environment, and social related to each other as three independent spheres of life [James and Magee, 2017]. The ecological domain occurs at a juncture between the social and the natural realms of biosphere and focuses on the vital facet of human engagement with and within nature, including the built environment. The environment is everything that surrounds or affects an organism during its lifetime and consists of biotic and abiotic components. The environment comprises various types of forces, for instance, physical, intellectual, socioeconomic, political, cultural, moral, and emotional. It is the sum total of all the external forces, influences, and conditions, which affect life, nature, behaviour, growth and development, and maturing of living organisms.

Sustainable Development: Initiatives in Indian Context

Soon after the U.N. Conference of Human Environment at Stockholm, India took important legislative steps for environmental protection with passing of various acts. In 1998, National Forest Policy was framed to ensure environmental stability and maintaining ecological balance. The Biological Diversity Act 2002 was carved out of India's attempt to realize the goals treasured in the UN Convention on Biological Diversity (CBD) 1992. In 2006, the National Environment Policy (NEP) was revised by the Ministry of Environment, Forests & Climate Change (MoEF&CC) as a response to national commitment to a clean environment instructed in the Constitution in Articles 48 A and 51 A (g), reinforced by the judicial interpretation of Article 21. It describes the key environmental challenges, objectives, normative principles underlying the policy action, strategic themes for intervention, broad indications of legislative and institutional development required to accomplish the strategic themes and mechanisms for execution and review [NEP, 2006]. The principles of NEP are:

- Cost-effective measures to prevent environmental degradation;
- Decentralization-transfer of power from a Central Authority to state and local authorities;
- Economic efficiency;
- Environmental Protection as an integral part of the development process;
- Environmental Standard Setting;
- Equity in entitlements to, and participation of, the relevant publics, in the process of decision-making over use of environmental resources;
- Human beings at the core of sustainable development concerns;
- Integration, the inclusion of environmental considerations in sectoral policymaking;
- Prevention actions and environmental offsetting; and
- Right to development

Action plans have been evolved on identified themes by the concerned agencies at all levels of Government - Central, State/UT, and local, with the focus on:

- Capacity building, clean technologies and innovation;
- Enhancing and conserving environmental resources;
- Environmental awareness, education, and information;
- Environmental standards, management systems, certification, and indicators;
- International Cooperation, partnerships and stakeholder involvement;
- Regulatory reforms;
- Research and development and review and implementation of policy

Environmental laws are easy to draft but difficult to implement particularly in a country like India due to difference of opinion. India being a country of diversity in religion, caste, language, biogeographic areas, and diverse problems become even more complex in enforcing environmental laws. Later, the Ministry of Environment, Forests & Climate Change (MoEF&CC) notified the Wetlands (Conservation and Management) Rules 2010 to ensure that there is no degradation of wetlands. National Green Tribunal Act, 2010 came into being for the effective and expeditious disposal of matters related to environment protection, forests and natural resource conservation. These acts, laws and rules have been formulated to check the degrading environment and its management.

Developmental Activities and its Impacts in Himachal Pradesh

Himachal, one of the enthralling regions in the Northwestern Himalaya has varied climatic conditions that favor the thriving of floral, faunal, and cultural diversity. The state is home to numerous indigenous ethnic groups. Himachal is blessed with lush green forests rich in biodiversity which preserve the environment, fragile Himalayan ecosystem, support the economic growth of the state, and act as life-supporting systems. Situated in the heart of the western Himalaya, Himachal is bordered by the states of Jammu & Kashmir and Uttar Pradesh. Located between $30^{\circ}22'$ and $30^{\circ}12'$ North Latitudes and between $75^{\circ}47'$ and $79^{\circ}4'$? East Longitudes, the state has an altitude ranging from 350 to 7000 meters above the mean sea level. The total geographical area of the state is 55,673 km² which is 1.7 percent of the country's area and 10.54 percent of the Himalayan landmass. Administratively, Himachal is divided into twelve districts but, geographically, the state can be divided into three distinct regions. The mesmerizing beauty of nature, snowy landscapes, green cover, religion, and culture has fascinated the people from different parts of the world.

Due to the influx of people, the development of industrial sectors, increase in population and number of vehicles, urbanization, deforestation, unplanned land use pattern, solid waste management, use of chemical fertilizers for high crop production, Himachal is facing the challenges of environmental degradation, which manifests in the form of environmental pollution. In 1974, H.P. State Pollution Control Board was constituted to combat environmental pollution and perform regulatory functions as revealed in environmental legislations.

The population increase and developmental activities are posing pressure on natural resources and harming the fragile ecological strata of the state. In recent years, the state has witnessed the development of the industrial, tourism, and hydropower sector. Himachal Pradesh because of its scenic beauty is a perfect destination for tourists. In recent years, the tourism industry has increased in the State and has contributed to the economic development of the state, besides creating job opportunities. Himachal Pradesh is also known as a Water State with huge hydropower potential, though the development of hydropower projects has both positive and negative impacts. Development of the hydropower sector has provided job opportunities but also caused environmental degradation.

The state has the Hydropower potential of about 25,000 MW, including about 2300 MW of Small hydro capacities, categorized as a renewable source. About 10,000 MW Capacity has already been harnessed and an additional about 8000 MW capacities are at various stages of development. The hydropower projects in this region have posed threats to biodiversity. Many perennial rivers have become seasonal and seasonal rivers have become extinct due to the coming up of these hydropower projects. There has been a shift in the agriculture pattern in this region due to perishing water sources. The mountain ecosystem has adversely affected due to modernization and infrastructure development. Mountain ecosystems are becoming susceptible to accelerated soil erosion, landslides, the rapid loss of habitat, and genetic diversity. It is very important to maintain a balance between development and the environment. Environment degradation is going to affect the entire globe. It is said that the development of any nation is not possible without causing any damage to the environment but if we consider the present situation we really need to change this perception. The word development should be replaced with sustainable and eco-friendly development without compromising the environment. To control further environmental degradation existing laws and policies must be followed up strictly and if needed new amendments should be enacted to overcome the existing gaps.

Environmental policy and laws directed by the central law and policy guidelines are being followed in Himachal Pradesh. In recent years, the state has started thinking of evolving a policy document and identified a few environmental issues which are of concern for the state and are aimed to have an approach compatible with the mountain ecosystems and geophysical structure. The state government has attempted to maintain and endorse the improved living standards of people in the state. The government of Himachal Pradesh has established a number of institutions for managing the ecological domains of sustainable development. The key institutions involved in the sustainable management of environmental problems in Himachal Pradesh are- Department of Agriculture and Horticulture; Department of Fisheries; Department of Industries; Department of Tourism; Himachal Pradesh Council for Science Technology and Environment; Himachal Pradesh Department of Revenue and Land Records; Himachal Pradesh Forest Department; Himachal Pradesh Pollution Control Board; Himachal Pradesh State Biodiversity Board; Himachal Pradesh State Wetland Authority and Department of Irrigation & Public Health [Anonymous 2018; Gupta et al. 2020].

Methodological framework

The study involved collection of both primary and secondary data. Primary data was collected by personally visiting the important institutions involved in environmental management. A pre-designed questionnaire was administered on the respondents, which included the respective heads/officials of the concerned department. The questionnaire sought information on institutional

competencies of the department/ institution and the information was gathered with regard to mandate and objectives, programmes/ schemes and activities of the department and their role in sustainable environment management, which were supplemented with their success stories. The secondary data was obtained from relevant published or unpublished literature by visiting departmental libraries, web sources, reports, books and various international and national journals. The data gathered from different sources has been interpreted and duly acknowledged by citing its source. The data collected through various methods was edited, categorized, tabulated and analysed for making recommendations.

Results and Discussion

Managing Ecological Domains: Government's Initiatives

Land Resource Management: Legislation and policies for land management is governed by Indian Forest Act, 1927 and Forest Conservation Act, 1980 and Rules, 1981. In addition to this, the State Government has devised various acts, laws and regulations for the purpose (Box 1). A number of programmes for land management including afforestation, combating degradation and desertification have been evolved by the state government.

Box 1: Sustainable Initiatives of State Government

- H.P. Private Forest Act, 1954 and rules, 1969
- H.P. Forest (Settlement) Rules, 1965
- H.P. Utilization of Lands Act and Rules, 1973
- H.P. Forest Produce (Regulation of Trade) Act, 1982
- H.P. Land Preservation Act 1978, Rules 1983

Integrated Wastelands Development Projects have been implemented by the Rural Development Department H.P. in Chamba, Hamirpur, Kangra, Kinnaur, Kullu, Mandi, Shimla, Sirmaur and Solan districts. The Drought Prone Area Programme has been implemented in the districts of Bilaspur, Solan and Una through the Department of Rural Development and Panchayati Raj. Likewise, the Desert Development Programme has been implemented in Kinnaur and Lahaul-Spiti districts [Gupta et al. 2020].

Management of Mineral Resources: In addition to National level policy framework and regulations, being followed by the State government, the government has evolved HP Minor Minerals (Concession) Revised, Rules 1971.

Box 2: Sustainable Initiative Himachal Pradesh Mineral Policy, 2013

Legislation of Himachal Pradesh enacted the Mineral Policy 2013 for the regulation of mines and minerals in the state. It took into account the hilly the terrain of the state where mining considerations are different as compared to the plains. The policy was formulated keeping in view the ecological and environmental problems particular to the state, and to meet the growing demand of minerals. The objective of the Mineral Policy 2013 laid stress on exploration of the mineral wealth of the State by adopting modern exploration techniques. It focuses on harnessing mineral deposit by promoting the adoption of mechanized and scientific mining with due regard to the conservation of mineral, mine safety and environmental aspect; value addition through the promotion of processing units and mineral-based industries in the state.

These rules which were framed under Section-15 of Mines and Minerals (Development and Regulation), Act 1957 are applicable to all minor minerals, i.e., building material, in the State of H.P. These rules define a procedure for grant of mining leases, auction procedure, and issuance of short-term permits, the area and period of the lease, payment of royalties, dead rent, etc. The department has notified the Himachal Pradesh Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2004. These rules define a procedure for transportation and storage of minerals, and checking of illegal mining. Besides environmental concerns, the policy defines provisions for increasing the employability in the mining sector, mainly in the remote areas of the state. It adheres to the guidelines issued by the Ministry of Environment and Forest (MoEF&CC), Government of India, for utilization of minor minerals. In the year 2013, the state government evolved HP Mineral Policy, 2013.

Management of Water Resources: The department of Irrigation and Public Health (IPH) is concerned with the operation and sustainable maintenance of water resource management including drinking water-related infrastructure and related schemes, sewerage and irrigation systems, and disaster management plans. The IPH department executes projects and activities in the state for the conservation and maintenance of water resources. Besides taking into consideration the Water Supply Act, 1968 and Water Supply Rules 1989, the department has evolved few regulatory provisions for the management of water resources in the state and handling of the issues of concern [Gupta et al. 2020].

Himachal Pradesh Groundwater (Regulation and Control of Development and Management) Act 2005, was enacted by the legislative assembly of Himachal Pradesh to regulate and control the development and management of groundwater; maintain a database on

ground water; registration of existing users of groundwater; rainwater harvesting for conservation and groundwater recharge; royalty in respect of the use of groundwater; and offenses and penalties. Himachal Pradesh State Wetland Authority (HPSWA) was constituted in the year of 2017 by H.P. Council for Science, Technology & Environment (HIMCOSTE) for: conservation and restoration of wetlands for migratory & resident species of birds of the area. HPSWA is playing a key role in conserving the indigenous fish species and making fishery sustainable livelihood for the local fishermen; synchronizing the relation between fishermen, wildlife and farmers. It is enhancing the income of the local people by undertaking the income generation in potential areas, and the propagation of ecotourism in the area to create employment. It makes the tourists more sensitive towards the value of nature & wetlands. Various departments and agencies, for example forests, fisheries, tourism, industries, HP environment protection and pollution control board, universities, zoological survey of India, national & state level research institutes are involved in the wetland conservation programme. The sustainable initiatives of the government are listed in box 3 & 4 [HP Hydropower Policy, 2006 & 2009].

Box 3: Sustainable Initiative Himachal Pradesh Water Policy, 2013

The state has evolved its Water Policy in the year 2013 for sustainable water utilization and making the community aware of the significance of conserving water resources. The priorities areas of state water policy are- drinking water and sanitation; irrigation; ecology /afforestation /biodiversity/tourism; hydropower development; promotion of agro-industries and non-agro based industries, etc. The salient features of the Himachal Pradesh State Water Policy 2013 are:

- Scientific management, conservation, and regulatory mechanism for restoration of groundwater resources;
- Sewerage facilities in all urban as well as rural areas;
- Promotion of watershed management;
- Integration of agricultural strategies, cropping pattern and improved water application methods with all irrigation schemes to enhance the water use efficiency;
- Monitoring of water quality and mapping of water resources;
- Preparation of disaster management plan for each flood-prone basin for minimizing the erosion of lands by rivers through cost-effective measures.

State forest department is mainly concerned with the conservation of forests and wildlife. Forest management is done by implementation of laws and policies, besides organizing various activities. HP Forest Sector Policy & Strategy of 2005 sought to achieve sustainable management of forests, watersheds, wildlife, biodiversity, and habitats, for the maintenance and rehabilitation of its environment and livelihoods security of forest-dependent communities through the protection of forest goods and rights. In 2006, the Forest Department made an amendment to HP Forest Produce Transit (land routes) rules 1978 and added pine needles in the list of Minor Forest Produce and fixed the export permit fee for Chir Pine needles. The power to issue the export permit was given to Pradhans of the concerned Panchayat. The cement factories located in the State came forward to collect small quantities of pine needles from panchayats in response to this initiative. The policy motivated all stakeholders to work for the removal of Chir Pine needles from forest lands, which has proved to be beneficial as it has decreased the incidence of forest fire and encouraged the industries to use Chir pine needles as a fuel. Policy on Payment for Ecosystem Services (PES) in Himachal Pradesh came into being in the year 2013 to protect and manage natural resources for sustained production of ecosystem services; address the impacts of climate change; and generate additional economic incentives to the communities for conserving natural ecosystems. To strengthen Participatory Forest Management, the forest department gives emphasis on the Indian Forest Policy of 1988 and the subsequent government resolution on participatory forest management which ensures people's participation in natural forest management. The government has constituted Village Forest Development Committees (VFDCs), which are governed by HP Participatory Forest Management Rules 2001. Due to unlawful exploitation and trading, medicinal herbs are under great threat. For conservation & management of medicinal plants, the State Medicinal Plant Policy was adopted in the year 2006. The Forest Department is undertaking conservation & propagation of Medicinal Plants in Kullu District; strengthening the Medicinal Plant Resources in Chamba and Sirmaur Districts and undertaking conservation, development, and sustainable management of medicinal plant species in Himachal Pradesh. The department is strengthening the High-Altitude Medicinal Plant Resources in Trans-Himalayan Districts of Lahaul-Spiti and Kinnaur. H.P. Forestry Sector Medicinal Plant Policy, 2006 was a major regulatory milestone in the forestry sector evolved for judicious use of medicinal plants. This Policy also aimed at promoting the basic objectives of meeting the minor forest produce requirements of the rural and tribal populations as enshrined in the National Forest Policy, 1988. The scope of the policy, thus, covered the forest areas linked with conservation and/ or use of medicinal plants. Himachal Pradesh, known for its rich natural heritage, is amongst the top tourist destinations in the country, both for national as well as international visitors. Recent estimates have numbered the visitors to be 160 lakh which is more than twice the population of the state. Most of the tourist activity is concentrated at four major locations- Shimla, Manali, Dharamshala, and Dalhousie.

As most of the visitors do not get an opportunity to experience the rich bio-cultural heritage of the state, the Forest department of Himachal Pradesh framed an Eco-tourism policy in the year 2005 to enable tourists to experience the national heritage. The policy needed revision mainly due to the procedural requirements of obtaining clearance of eco-tourism sites under the Forest Conservation

Act, 1980 as per the guidelines of the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India. Some changes in the existing policy document have been necessitated in the context of evolving understanding of ecotourism concepts and principles. Later, the policy was reviewed and the revised eco-tourism policy of 2016 aims at bringing the wilderness and virgin ecosystems of Himachal Pradesh closer to the visitors and at the same time ensures adequate safeguards and systems for the protection and conservation of natural resources. The policy aims at involving local communities, as they would be provided with livelihood opportunities and help in awareness building, protection, and conservation. It envisages the generation of financial returns which can be ploughed back into proper up keeping and maintenance of the environment. It shall also promote a greater understanding and appreciation for natural and cultural heritage. '*Ecotourism*', as defined in HP Ecotourism Policy means venturing into and enjoying nature in such a way so as to assure that negative impacts on the cultural and natural environment are minimized and mitigated.

It is, therefore, a '*responsible*' tourism which besides being ecologically and culturally sensitive helps the local communities in realising the socio-economic benefits in a sustainable manner. This policy is based on the understanding that involvement of local communities in ecotourism would support their livelihood needs and consequently create a stake for them in the conservation of local culture, ecology and environment. The policy envisions preserving and protecting the biodiversity (both flora and fauna) and cultural heritage of Himachal Pradesh and providing opportunities to enhance livelihood of local people. The ecotourism policy thus encourages a partnership between the civil society involving the local communities, NGOs, eco-clubs and academic institutions as well as private enterprises/businesses and the state Government Departments of Forest, Tourism, Fisheries, IPH, Power and PWD. The mission statement of policy is to make Himachal Pradesh a leading ecotourism destination, with ecotourism attracting at least 10 percent of overall tourists visiting the state by the year 2030. Ecotourism is thus, one of the most viable options for conservation of natural resources and sustainable development in a mountain state like Himachal Pradesh. It is being executed mindfully, with the minimum impact to inspire cultural awareness, tolerance and commitment to natural resource conservation [HP Tourism Policy, 2005].

Box 4: Sustainable Initiative Himachal Pradesh Ecotourism Policy, 2017

Himachal Pradesh Ecotourism Policy, 2017 has been formulated to preserve and protect the natural (both flora and fauna) and cultural heritage of Himachal Pradesh, provide opportunities to enhance the livelihood of local people generate resources for sustainable development and promote greater understanding and appreciation for this heritage through authentic ecotourism initiatives. The underlying principles which form the basis of H.P. Ecotourism Policy 2017 are to:

- Provide a positive experience for both visitors and hosts;
- Build environmental and cultural awareness and respect;
- Minimize physical, social, and behavioral impacts;
- Provide direct financial benefits for conservation and livelihood opportunities to local communities;
- Deliver memorable interpretative experience to visitors; and
- Recognize the rights and spiritual beliefs of the local people

Forest department has created a *Special Purpose Vehicle* in the form of 'Himachal Pradesh Ecotourism Society' (HP ECOSOC), under the registration of Societies Act 1860 to assist in delivering the mission and objective of the policy. HP ECOSOC is created to cover the entire state and work with ecotourism societies at DIVISION/CIRCLE level to facilitate PPP (Public Private Partnership) initiatives at identical locations and provide guidance in furtherance of the principles mentioned in the policy. An appropriate strategy for pursuing the principles as mentioned in the policy has following components:

- 1. Creating awareness and capacity building of the principal stakeholders
- 2. Community involvement
- 3. Coordination with partner departments
- 4. Marketing
- 5. Development and management of ecotourism assets
- 6. Development and management of new ecotourism sites through departmental mode and Public Private Partnership (PPP).

The department has started innovative schemes, like '*Ek Buta Beti Ke Naam*' to sensitize people about the importance of daughters and forest conservation. Under this scheme, five tree saplings are presented to the families of newly born girl child along with another kit comprising 20 kg vermicompost, five tree guards, and the nameplate of the girl child. *Vidyarthi Van Mittar Yojna* has been designed to sensitize the students about the importance of forests and to inculcate a sense of belongingness for nature. The scheme is motivating students to sensitize communities for conservation and protection of forests and to create forest groves & increase forest cover. *Smriti Van Yojana* is being implemented to create awareness amongst the people about tree planting. The scheme involves tree plantation by people in specially designated areas on the occasion of their birthday, marriage anniversary, or on the death anniversary of their parents/ relatives/ elders.

Biodiversity and Wildlife Management: According to the directions of the Central Government, the Govt. of Himachal Pradesh established the Himachal Pradesh State Biodiversity Board under the State Council for Science, Technology and Environment. The board has been constituted under Section 22 of the Biological Diversity Act, 2002, for the conservation of diversity, sustainable use of its components, and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters linked with and related thereto in the state. The HP State Biodiversity Board works with the help of Biodiversity Management Committees in which local people are involved for the purpose of promoting conservation, sustainable use, and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties, and cultivars, domesticated stocks and breeds of animals and microorganisms and chronicling of knowledge relating to biological diversity Management Committee helps in the identification of conservation of local practices such as protection of sacred groves. In exercise of the powers conferred under section 63 of the Biological Diversity Act, 2002, the Government of Himachal Pradesh made the Himachal Pradesh Biological Diversity Rules, 2019. The Board in consultation with local bodies or Biodiversity Management Committees and other stakeholders, take necessary steps to facilitate the setting up of areas of biological significance [Gupta et al. 2020].

As far as the wildlife legislation is concerned, the state is governed by the Wildlife Protection Act, which was enacted by Govt. of India in 1972 to conserve and protect the plant as well as animal species and their natural habitat. The state government is running projects and programs under wildlife conservation. Secure Himalaya Himachal Pradesh is being implemented by the Ministry of Environment, Forest, and Climate Change from 2017- 2024. The project is implemented for conserving biodiversity, promoting livelihoods, preventing illegal trade in wildlife and improved knowledge and communication. Under the Cheer Pheasant Release Programme, the Forest Department has set-up an exclusive breeding Centre for Cheer Pheasant in 2019. Project Snow Leopard was developed by MOEF and Government of India in Spiti valley. The Wildlife Wing of Himachal Pradesh Forest Department and Nature Conservation Foundation, Mysore (NCF) is making efforts for research and conservation in the Snow Leopard range in Spiti. Under Western Tragopan Conservation Programme, there are 24 captive birds in Saharan Peasantry which is the only place in the world to hold Western Tragopan in captivity. Department of Fisheries Himachal Pradesh was established independently in 1966, before that it was under forest department from 1950 till February 1966 and then shifted to the agriculture department. Himachal became the first state to popularize trout farming in the private sector. To safeguard the aquatic biodiversity, the Government of Himachal Pradesh took a historic decision by making the release of at least 15 percent water downstream dams & weirs of hydropower projects mandatory besides declaring Tirthan River as free from hydropower projects. Endeavoring efforts have been made by the department for an increase in fish seed production and stocking of seed by expanding the rearing space at the existing farms and purchase of seed from outside. Himachal Pradesh Government notified HP Fisheries Act-16-1976 and later to implement this act, HP Fisheries Rules were framed to achieve sustained yield from these water bodies. Thus, the government has been making efforts with regard to the Protected Area Network and ensuring the participation of the people and stakeholders in the planning and management of forests, wildlife, and biological diversity, through its activities and programs.

Disaster Management: The State Disaster Management Authority Himachal Pradesh under the chairmanship of the Chief Minister has the responsibility of formulating policies, plans, and guidelines for disaster management and coordinating their execution for safeguarding well-timed, effective, and coordinated response to disasters at state level. National as well as State level legislations are executed for the regulation of disasters. National Disaster Management Policy 2009 has been prepared as per the provision of Clause (a) of Sub-Section (2) of Section 18 of the Disaster Management Act, 2005 that aims at providing guiding principles for reducing, preventing, mitigating disaster risk, and creating a system for effective disaster response. Section 18 and 19 of the Disaster Management Authority (SDMA) with certain powers and functions. The District Disaster Management Authorities (DDMA) ensure that the guidelines for prevention, mitigation, preparedness and response measures prescribed by NDMA and SDMA are followed by all the departments of the state government at the district level and the local authorities.

Box 5: Sustainable Initiative

Himachal Pradesh Disaster Management Policy 2011 was formulated with a vision to build a safe and disaster-resilient Himachal Pradesh by developing a holistic, proactive, technological driven and community-based strategy through a culture of prevention, mitigation, preparedness, and response.

Farming and Allied Sectors: The regulatory framework for management of environmental concerns with regard to farming and allied sectors includes the implementation of Fertilizer Control Order, 1973; Fertilizer Control Order, 1985; Insecticide Act, 1968; Insecticides Rules, 1971; Insecticide Order, 1986; Seed Act, 1966; Seed Rules, 1968 and Seed Control Order, 1983. To handle the ecological issues linked with farming, the state has evolved the Organic Farming Policy of Himachal Pradesh. This policy works on the vision of "*Organic Himachal Pradesh*" and gives recognition and reassurance to the organic sector in the state. The agriculture department has made tremendous achievements in the last fifty years in production. A major increase has been noticed in maize, rice, ginger, and potato production. Moreover, the department is running various centrally and state-sponsored schemes for promoting eco-friendly agriculture in the state [Sharma and Gupta, 2013].

Box 6: Sustainable Initiative

Organic Farming Policy of Himachal envisions an enabling environment for organic farming in the state, by developing appropriate policies, plans, and support services for activities, such as organic production of lead cash crops- fruits and vegetables of the state, increasing yields in low-input areas, conserving biodiversity and natural resources. Organic Farming Policy Himachal Pradesh strengthens the crop-livestock linkages of the farming sector and makes the state an organic compost rich state. It lays emphasis on undertaking steps to facilitate organic grazing areas, organic fodder supply for livestock and organic non-timber forest products. The policy framework creates investment environment for organic agribusiness and organic villages /valleys based organic agro-tourism, to develop an important sector for self-employment and value-added on-farm & off-farm activities in rural development sector.

The use of chemical fertilizers and chemical pesticides is being discouraged. The budget provided for pesticides/ insecticides is used for providing bio-pesticides and bio- insecticides. The Department of Horticulture takes care of every vital issue linked with horticulture, for instance, around 6000-7000 ha of the area is annually brought under fruit plantation all over the state for which 15 to 20 lakhs fruit plants of different species are provided to the farmers. This also comprises replantation of old orchards. The production and supply of plants of different fruits are undertaken through progeny-cum-demonstration orchards and nurseries. Two plant tissue culture laboratories, one each in the public and private sector, have been established for the rapid propagation of planting material. To handle the ecological impacts of chemical fertilizers, three plant tissue analysis laboratories have been established at Shimla, Kullu, and Dharamshala, where plant tissue samples are analyzed for the diagnosis of nutritional disorders. To decrease the chemical use in pests' control, a Biological Control Laboratory has also been established at Shimla.

Box 7: Sustainable Initiative

In the existing scenario of the horticulture industry in the state, the horticulture development in the state is envisioned with the assistance of World Bank-funded Himachal Pradesh Horticulture Development Project (HPHDP). The project has been executed over a period of seven years. The project covers the entire state, with major interventions in Shimla, Kullu, Kinnaur, Chamba, and Mandi districts. The project is aimed at supporting small farmers and agro-entrepreneurs to increase the productivity, quality, and market access of selected horticulture commodities in the state. It is addressing the key gaps and shortages in the horticulture sector and transforming the sector to be more productive, efficient, and profitable.

The activities related to the awareness, training, demonstration, fruit shows, exhibitions, seminars, and workshops for farmers are organized for the propagation of technical know-how to the farmers. Ancillary horticulture activities include beekeeping, floriculture, mushroom cultivation, micro-irrigation, protected cover cultivation, use of bio-fertilizers in horticulture, improved horticultural tools, implements and machinery, field diagnostic facilities for pathological and nutritional disorders. The eco-friendly aspects of various programs and schemes include:

- Confirming spray schedules for control of pest and diseases of fruits;
- Multiplication, mass rearing, and release of bio-agents for controlling insect-pests of fruit crops;
- Plant protection inputs on subsidized rates for control of major/minor pests of fruit crops and provision of technical knowhow regarding beekeeping in the state;
- Technical control of plant protection activities.

Managing Environmental Pollution: State Pollution Control Board is a nodal agency in the administrative structure of state government for planning, coordination, prevention and control of pollution and protection of the environment in the framework of environmental regulations. The Board has eleven Regional Offices, a Central Laboratory, and three Regional Laboratories, which cater to the diverse requirements in terms of environmental monitoring, surveillance and analysis of complex environmental parameters.

Monitoring of Ambient Air Quality: There are eleven stations for monitoring of Ambient Air Quality Standard in Himachal Pradesh for monitoring the status of Air Quality in Himachal Pradesh,. The monitoring stations in Himachal Pradesh are located at Shimla, Parwanoo, Damtal, Paonta Sahib, Kala Amb, Baddi, Nalagarh, Sunder Nagar, Manali, Una and Dharamshala.

Monitoring of Water Quality: With increasing population, industrialization, and urbanization, supply of sufficient water to the people of the state is becoming difficult. Climate change and changing rainfall patterns are resulting in water pollution. The water level in the rivers is decreasing and causing water scarcity in the state. Water quantity has become more important than water quality. In recent years, the number of water-borne diseases has increased due to contamination of water by human activities, industrialization, mixing of sewage water and domestic waste into the river systems. HP State Pollution Control Board has been reviewing hydel projects and making required interventions in the management of muck. The board has initiated the process to get the real-time on-line Continuous

Flow Measurement & Data logging device for measuring the flow to monitor the mandatory 15 percent release of water in the operational hydel projects.

Solid Waste Management: The state also takes into account the Solid Waste Management Rules, 2016, according to which, the municipal authorities are responsible for the execution of these rules, for collection, storage, segregation, transportation, processing, and disposal of municipal solid wastes. The state government has banned plastic carry bags altogether in the entire state since 2009. The government has also banned single-use plastic cutlery from 2018.

Box 8: Sustainable Initiative

Himachal Pradesh is the first State in the country to have enacted H.P. Non-Biodegradable Garbage [Control] Act 1995 and Rules 1996, an Act for dealing with solid waste management and the menace of colored recycled plastic carry bags.

Energy Sector: In order to consider the utilization of energy, the state government has established the Directorate of Energy Himachal Pradesh, which is providing a conducive policy framework and directions to promote, develop and optimally harness, the huge hydro potential of the State and coordinate/facilitate the programs /policies which leads to energy conservation and its efficiency. Legislations have been evolved for sustainable development of the energy sector. This includes the Hydropower Policy 2006; whose main objective is the development of Himachal Pradesh as a *"Hydro Power State"* of the country. It provides affordable, reliable, and quality power to the consumers round the clock, creates avenues for employment to residents in the power projects and at the same time mitigates the social, economic, and environmental impact. The policy takes care of the Electricity Act, 2003 which seeks to promote competition, safeguard the interest of the consumers, tariff validation, removal of subsidies, reinforcement of the regulatory institutions, and provide haphazard open access to different users. The main objectives of the Hydropower Policy are to:

- Attain financial turnaround and commercial viability of the power sector;
- Address the problem of ecological imbalance and environmental degradation caused by implementation of the projects;
- Develop the local area by creation of Local Area Development Committee financed through power projects;
- Establish and promote power trading entity in the state;
- Generate and provide employment opportunities to the people of the state;
- Make available reliable, regular, and quality power on demand at affordable rates in the immediate near future;
- Make power sector a major source of revenue to the state;
- Promote & provide continued support for the development of renewable energy sources like SHPs, solar, biomass, water mills, etc.;
- Protect the rights of the local inhabitants for irrigation and drinking water requirement;
- Secure long-term financial interests of the state;
- Speed-up power development in the state and achieve capacity addition.

Besides this, there is H.P. Solar Power Policy, 2016, which aims at:

- Contributing to national objective of increasing the share of renewable energy in total energy consumption, in agreement with climate, environment and macro-economic concerns;
- Creating awareness about the potentials of renewable energy, especially solar energy;
- Encouraging investment, mostly private, to derive the benefits of jobs, incomes, revenues and growth;
- Promoting generation of electricity from solar energy for energy security for sustainable development;

Landmarks Accomplishments of different government departments

A few initiatives of different government departments which have set benchmark were gathered from different departments are discussed as:

Climate Smart Way outs for Sustainable Livelihoods: Around 70 percent of the state's population relies on agriculture for their livelihood but the impacts of climate change often make the sector and people more vulnerable. District Sirmaur is mainly water-stressed with recurring droughts, the decline in winter precipitation and snowfall, warmer and shorter winters, and extreme weather events. Hence, to ensure a sustainable and resilient livelihood, a project was initiated wherein a drought-related vulnerability assessment was done to evolve climate-smart solutions for drought management. The project undertook training of farmers on climate-smart agriculture practices with at least 25 percent of women participation. Additionally, inter-cropping of maize and pulses, micro-irrigation practices, and risk-transfer instruments such as weather insurances were promoted. The project was funded under the National Adaptation Fund for Climate Change.

Gender Responsive Acclimatization & Valuation of Climate Vulnerability: Villages of Dhamoon panchayat of district Shimla were highly vulnerable to varying climate and diversified livelihood activities. To climate-proof these villages, the first-ever fully

automated Hi-Tech Green House has been piloted. Moreover, through integrated climate-resilient actions and scientific management practices, ecosystem services have also been strengthened. Furthermore, the importance of gender-responsive climate adaptation is evident. Through the process of gender-focused review, training, and capacity building, women farmers have successfully restored their abandoned farmlands via cash-crop farming, the community-based revival of traditional *kuhls* for irrigation, and conservation of traditional crops. The shift in farming practices from traditional crops to cash crop intensive production is driven by variations in climate and socio-ecological evolution in agriculture-horticulture practices. The initiative has restored few traditional crops, motivated the women to collect, store and propagate traditional crop seeds, and mainstreamed adaptation in their day-to-day life.

Refining Adaptive Capacity: Kandraur panchayat in Bilaspur district was water-stressed with warmer winters, erratic rainfall, depleting groundwater table and inadequate irrigation infrastructure. The majority of the population is dependent on rain-fed agriculture for their livelihood and grows only food crops like wheat and maize. As part of the climate change adaptation in rural areas of India, the project has been implemented by GIZ in partnership with the Department of Environment, Science and Technology, Himachal Pradesh. Few progressive farmers undertook crop diversification. A farmer of Miyan Bandla village cultivates vegetables like colocasia, onion, spinach, garlic; spice crops like ginger, turmeric; essential oil crops like red and white sandalwood; and horticultural crops like mango, lemon and pomegranate. He has also introduced new crops like yam, kiwi that are suitable for the regional climatic conditions. Another farmer has increased his poly-house using a drip irrigation system. With this demonstration, the project aims to benefit more farmers in four villages of the panchayat by developing adaptive capacity with additional irrigation infrastructure, watershed structures, introducing micro-irrigation techniques for water-use efficiency and knowledge management and capacity building.

Reinstating Traditional Irrigation Systems: The government has taken several initiatives and programs to restore and protect *kuhls*, the community-managed traditional irrigation systems in Himachal Pradesh. These surface channels divert water from natural flowing streams, on an average serving around 6 to 30 farmers and irrigating around 20 Hectares of land. *Kuhls* consists of informally constructed outlets channelling water for irrigating nearby terraced fields, where the water flows from one field to the next. Many *kuhls* have been repaired and hectares of the area have been created for irrigation. Farmers were provided irrigation pipes and encouraged to adopt micro-irrigation systems. Water user's association and watershed committees were established to maintain the restored *Kuhls* and farmers were trained on sustainable irrigation and the latest agriculture technology.

Model Eco-Village Scheme: The eco-village is an emerging concept in India. To demonstrate villages as models of sustainable development, the Government of H.P. has launched Eco-Village Scheme through the Department of Environment, Science & Technology with the involvement of local communities. In the first phase, five villages have been identified to be developed as eco-villages, key elements of which include environmental sustainability through responsible natural resource management practices, community participation, use of modern and clean technology & practices, the convergence of resources available to promote sustainable development with interventions in the areas of water management, waste management, irrigation, sustainable agriculture /horticulture, energy conservation, spring-shed, natural resources management and climate change adaptation.

On-Grid Rooftop Solar Power Plant: The Department of Environment, Science and Technology has installed 35 KW roof-top solar systems on the roof of Paryavaran Bhawan in Shimla. A total of 112 photovoltaic panels have been installed with each panel having wattage of 315 watts. The total project budget is around 19.23 lakh. One bi-directional meter has also been installed which is essential for energy inflow and outflow from the solar plant to the main electricity grid. A grid-tied inverter/power conditioning unit of 40 kW has also been installed. The plant reduces the use of electricity generated through fossil fuels and eventually helps in offsetting carbon dioxide in the atmosphere. It has been estimated that the return on the investment made on the installation and connection of the rooftop solar power plant will be made in approximately 5 years which will lead to revenue saving as per estimation, about 97 lakhs would be saved in the next 25 years.

Electronic Display Screens (EDS): There is a dire need to create environmental awareness and to monitor and maintain the fragile environment and to take preventive measures against the odds. The state continues to monitor pollution and manage the same. The government of Himachal Pradesh has installed 12 Electronic Display Screens (EDS), which details water and noise pollution, civil and bio-medical waste management, water management, and temperature of selected sites.

Solid Waste Disposal: The State Pollution Control Board has installed Rapid Mixed Waste Disposal Machine at Karsog, which disposes-off unsegregated mixed solid waste (wet and dry) without any human intervention. The machine converts unsegregated waste into dark brown coloured solid, which is used for making organic fertilizer. The non-biodegradable/plastic material is converted into solid fuel or coal, which can be used in cement factories as fuel. Another Rapid Composting microorganism-based machine has been installed which converts organic waste into compost in 24 Hours. The SPCB has also installed a plastic shredding machine for disposal of plastic waste. It reduces the volume of plastic, which can then be used as fuel in cement factories.

Bio-Monitoring of Natural Aquatic Resources: Bio-monitoring is important to assess the health of an ecosystem. In recent years the use of bio-indicators has increased to monitor the quality of environment and health of organisms inhabiting the ecosystems. Himachal

Pradesh State Pollution Control Board has introduced bio-monitoring programs for rapid assessment of water quality of the aquatic system, under which water quality assessment of major rivers is being carried out.

Vidyarthi Van Mitra Yojna: Students are the building blocks of a society and endowing them to become future stakeholders with a vision of safeguarding the environment is the duty of the present generation. *Vidyarthi Van Mitra Yojna* was launched by the Government of Himachal Pradesh in the year 2018 for creating awareness among the school children for the protection of forests by involving them in plantation initiatives. This is one of the most promising schemes of the Forest Department. Such initiatives not only make the present day's generation the responsible citizens of tomorrow but also help in spreading the message of protecting the environment and forests. A plantation drive under H.P. State Legal Services Authority has planted lakhs of plants with the help of school students. The main objective of this scheme is to make the students the ambassadors of environment conservation through awareness programs together with large-scale plantation drives. The students are encouraged not only to plant the trees but to maintain the green cover so that a sense of ownership is developed in them. More than 3000 eco-clubs have been established in schools across the state under the National Green Corps Programme.

Van Samridhi, Jan Samridhi Yojna: This scheme is one of the most ambitious projects of the Government of Himachal Pradesh and was launched in September 2018. Its aim is to enhance the employment opportunities of the local people living in rural areas through the collection and selling of Non-Timber Forest Products (NTFP) including medicinal plants. The scheme envisions strengthening the wild NTFP natural resource including the post-handling of the produce and its marketing. In Himachal Pradesh almost 1489 plant species have been recorded to be used as NTFP. These include fuelwood, fodder, roofing material, fiber for ropes, etc. The main aim of the scheme is to strengthen the NTFP resource base through active participation of the local community and capacity building of these communities to harvest the resources along with value addition to the post-harvest for earning benefits. The scheme enables the allocation of forest lands to Community User Groups (CUGs) and the cultivation of multilayered native NTFP and medicinal plants. The produce is likely to be available for both household use and selling purposes. The *jadi-buti* cell plays a major role in the capacity building of the local communities. It will create a brand for the local medicinal plants and necessary promotional activities will be undertaken by the requisite stakeholders. 90 percent of the benefits earned will be in the hands of the members of the communities involved.

Non-Recyclable Polythene Buy Back Scheme: On the occasion of World Environment Day celebrated on June 5, 2019, the Himachal Government decided to introduce a scheme for buying back non-recyclable polythene to reduce the amount of plastic being generated. Prior to this, Himachal Pradesh had been applauded for becoming the state to completely ban the use of any kind of plastic bag including single-use plastic on October 2, 2009. Through judicial intervention, the ban on the plastic used for packaging material had been uplifted but not on the single-use plastic bags. The government decided to buy back plastic bags in a similar way as newspapers are bought. The collected plastic shall be used in the construction of roads or in the cement plants as fuel. Over 32,000 kilos of plastic waste had been collected and from which, 6000 kilos were used in road construction. In the last five years, ACC Cement has used 300 Tons of plastic in kilns for cement production. These are some of the inspiring stories and initiatives of conservation which have surely improved the environment and are likely to contribute in the future also. Such approaches will not only help those stakeholders who are working to implement sustainable community development programs but will set benchmarks for others to adopt and bring a radical change in the thinking process of the communities at large, especially in instilling environmentally responsible behaviour.

Managing Ecological Domains: Initiatives of Non-Governmental Organizations

NGOs can play a vital role in helping to plug gaps by conducting research to enable policy development, building institutional capacity, and enabling independent dialogue with civil society to help people live more sustainable lifestyles. Numerous NGOs are working in Himachal to save the environment by conducting campaigns to create awareness among people about the depleting natural resources. NGOs have helped reduce deforestation, soil erosion, and educate the rural people on the significance of separating waste material into biodegradable waste. Some of the NGOs are disseminating information through newsletters, brochures, articles, audio-visuals, etc. and by organizing seminars, lectures, and group discussions for the promotion of environmental conservation. Their main role in Himachal is institutional capacity building; providing science-based policy advice and enabling independent and open discussion with civil society. A few instances have been enlisted to elucidate the role of NGOs in ensuring ecological sustainability.

Incredible Himachal, the Society for Social Welfare & Environment founded in 2010 in Shimla is spreading awareness about the environment, global warming, pollution and also creating efforts for the promotion of cultural preservation, science, literature, tribal heritage, and rural development. The chief functionary of the NGO represented India at Korea & China for Indian Social Activities strongly and got praise from different NGO's and social activists of China & Korea. This organization is working on various projects such as *One Tree One Life, Give Blood Give Life, Arogya Himachal, Rural Development*, etc.

Collective Efforts for Voluntary Action (CEVA), is working for sustainable development of the most isolated and backward regions of the Himalay. The chief functionary himself belongs to the tribal community of Pangi Valley. The vision of the organization is the overall development of tribal areas and their people in all spheres without disturbing the traditional ethos and the fragile ecosystem of the valley. Interventions of the CEVA are tribal development, environment, tribal mart, health service, financial inclusion, women

empowerment, agriculture promotion & tribal tourism. Presently, the organization is executing various projects to fulfil its vision. For environment conservation, they are working on different projects like spreading awareness on forest fire prevention, forest conservation, etc. CEVA is working in association with communities of the Himalayan region for improved access to basic health, education, employment, agriculture, food security, and the environment.

WWF Himachal is a science-based organization which addresses issues such as the conservation of species and their habitats, climate change, water, and environmental education, among many others. It is working on adapting old technology for a greener tomorrow and renewal of waterwheels in Kullu district.

Centre for Environment Education (CEE) Himachal Pradesh was established in 1984 as a Centre of Excellence of the Ministry of Environment and Forests, Government of India. As a national institution, CEE's mandate is to encourage environmental awareness. It develops innovative programs, learning material and builds capacity in the field of Education for Sustainable Development. It is dedicated to ensure that Environmental Education leads to action for sustainable development. It undertakes field projects that demonstrate and validate the role education can play in sustainable development. CEE works with local, state, national, and international agencies, organizations, and governments to help create a sustainable future. It undertook capacity building training for the members of DIET and SCERT. It is generating awareness on local environmental issues and conservation measures through observing days like World Environment Day etc. and offering consultancy on training and awareness programs for the Himachal Pradesh Forest Department functionaries.

Likewise, the Society for Development Alternatives (SDA), Shimla; Himachal Manav Seva, Shimla; Society for Technology Development, Mandi; Organization for Social, Environmental and Rural Development, Kangra; Manav Seva Sansthan, Bilaspur; Himachal Pradesh Eco Development Society, Palampur, Kangra; Education Society Vidya Niketan (ESVN), Sirmaur, etc. are playing a challenging role in the current scenario. Government, NGOs, and people participation are the looming need of the hour. With multi-sectoral coordination and holistic approach, sustainable development can be realized with the help of people and NGOs.

Thus, institutions both government and non-government with their schemes and programs focussing on environment provides an effective answer to any changes that are taking place in environment by refining the existing policies or evolving management strategies to cope-up ecological degradation. Himachal Pradesh has institutions that work with the mandate of protecting the environment. While analysing the information gathered from different institutions, it was found that the extent of implementation, state of environment and strategic planning keeps on changing and closer assessment has to be done from time to time. The findings of the present study are in harmony with the Al-Saqri and Sulaiman (2014) who recommended the institutionalization in GCC states to cover major framework of sustainable development strategies, ensure the use-effectiveness of polices and environmental management tools meant for sustainable development. In general, majority of the institutions have supported sustainable practices, ensured environment management and use of renewable resources. This finding is in agreement with El-Fadl and El-Fadel (2004), who reported that majority of GCC countries have enabled EIA legislation while others have specific localized legislations. Hence, institutional coordination must be encouraged to cover the framework of sustainable development goals, which will ensure the usefulness of those polices and other environmental management tools and confirm the sustainable utilization of natural resources.

Conclusion

Hence, all initiatives of state government and NGOs are taking into consideration, the strategies for realizing the goals of sustainable development by:

- Adopting action- and result-oriented approach;
- Emphasizing the significance of inter-linkages among key issues and challenges and the need for a systematic approach to them at all relevant levels;
- Encouraging complete participation of concerned departments in decision-making processes;
- Enhancing effective engagement and participation of civil society and other stakeholders;
- Giving due consideration of all appropriate cross-cutting issues to contribute to the execution of sustainable development goals;
- Providing policy direction and recognizing specific actions to promote efficiently execution of sustainable development, together with voluntary sharing of experiences and lessons learned.

Thus, Himachal Pradesh has recognized the significance of green growth and has been at the front of environmental stewardship schemes which include the programmes on climate change and disaster management, energy conservation, enactment of ban on plastic bags, compulsory rainwater harvesting in all newly constructed buildings, organic farming policy, payment for ecosystem services policy, ecotourism policy, state tourism policy, solar power policy, and environment master plans.

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