

## Commentary

### Protected areas and conservation of biodiversity

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#### Abstract

Conservation of our biodiversity needs protected areas which are included among the largest types of land use allocation. These cover more than 10% of the global land area and nearly 2% of the oceans. Some of these are regarded as sacred places as well as sources for food and other natural resources. Many are now known as spots of recreation and scenery. All these areas have been selected on a scientific basis followed by well-organized management practices. The area of these has increased much lately but we still need to fill the gaps. These are expected to serve humanity by safeguarding nature, particularly our biodiversity. If we succeed in making humans understand the economic and social values of biodiversity and role of protected areas, we may succeed in bringing down the threats not only in the protected areas but also our surrounding environment.

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Biodiversity is a basic need for human well-being as well as for an economically prosperous healthy planet. Living in peace and balance on Mother Earth is essential. Food, medicine, energy, clean water and air, disaster prevention, leisure, and cultural values are all dependent upon it. As per the IPBES global assessment report, nearly 25% of the species of plants and animals are considered threatened. This means that approximately 1 million species are already in danger of extinction, many of those within a few decades. Therefore, action must be taken to reduce our biodiversity loss. Because of changes in land and sea use, direct exploitation of organisms, pollution, climate change, and the invasion of alien species, the biosphere which supports human life is changing at a

rate that has never been seen before. The rate of change differs among regions and countries. There is an urgent need for changes in our societies concerning the relationship with biodiversity by sharing the vision of living in harmony with nature. The population of the world is currently estimated to be 8.1 billion, and it is predicted to expand to 10 billion in 2050, with 24 of the world's poorest countries contributing to the increase. The planet is going through its hottest time of year; around 7.3 billion people are experiencing extreme heat because of global warming, which is having an impact on both terrestrial and aquatic plants and animals.

We are coming across zoonotic diseases,

impacts on soil microbes and viruses, all of which can pose a disastrous situation for the health of living beings. The temperature rise above 1.5°C is expected to reduce food production by 20-50 percent by 2050. The population outburst is compelling us to produce more food, while reducing the environmental footprint of food systems, particularly agriculture. Lately, biotechnological approaches have been developed in Climate Smart Agriculture by developing tolerant crops. All through history, we have tried to set aside the areas of significant value including burial grounds and old sacred places. The first records in this connection are found in the Artha Shastra texts from 4th century BC from India. In 252 BC, the Emperor Ashoka issued the first legal decree for the protection of wildlife and forests [1]. One of these oldest sites with continuous record of conservation is probably the New Forest in Southern England set aside in 1079 as a royal hunting reserve, a national park now. In 1761, Main Ridge Reserve in Tobago was established under the status of a watershed protection, and in 1864 in California Yosemite Grant by USA was established to protect natural areas against commercial developments. The first national park - the Yellowstone National Park, was established in 1872. We do find the laws made for preservation and protection of such sites from all encroachments. This area was declared as a public park and the action was followed in other areas such as Australia's Royal National Park (1879), New Zealand's Tongariro National Park (1894), Sweden's Laponia (1909), and Kruger National Park in South Africa (1925) [2]. In this way, societies have tried to protect the species as well as natural systems around them. The protected areas are a need of the day to bring down the loss of endangered species and threatened wild nature. The aim should be to help humanity protect the species diversity together with their ecosystems, but the locals should not bear the cost for such areas. Some of the protected areas are too

small to allow continuation of species existence together with ecological processes, as well as cultural identities over long periods. The protected areas serve as the lasting manuals for nature conservation and their protection is a must. While planning the protected areas, our governments must collaborate with the local community. Indigenous people play a critical role in managing protected areas and securing UN World Heritage status for them, which will enable locals and national agencies to defend these areas against strong economic forces.

Sports hunters have recently been interested in the preservation of animals as a food source. The maintenance of forest ecosystem services, the use of agro-water resources, and other human uses have raised the value of biodiversity for its maintenance, all of which are impacted by the exploitation of tree stands for timber. One key motivator is the recreational tool. In the 19th century, idea of protected areas was to keep these free from human presence. The concern for loss of species arose in 19th century followed by the protected area theory in the 20th century. The preservation of a limited number of plant and animal species in zoos and botanical gardens has shown that the preservation of a species' natural habitats is essential to its true existence. Many protected area designations nowadays are based on the preservation of species and their ecosystems, which has led to the development of unbiased scientific methods for choosing specific locations and protection networks. According to [3, 4] the aesthetic values have started to play a role, as such utilitarian needs are rearranged, with a desire to use natural systems to secure benefits such as freshwater supplies, coastal protection, and carbon storage and sequestration. The international listing of protected areas (national parks) started around the 1960s, the first list included around 1000 sites; in 2003 the number rose to more than 100,000 sites [5]. The developments in the

aquatic ecosystems lagged behind, although only 0.45 percent of the oceans were designated as marine protected areas in 2003, this figure went up to 1.31 percent in 2010. The Great Barrier Reef Marine Park, the Serengeti National Park, and the Grand Canyon National Park are three iconic examples of global protected areas that are principally set aside for the conservation of wildlife. The most often used definition of a protected area was given by IUCN in 2008 [4]. The long-term preservation of nature, along with the ecosystem services and cultural values that go along with it, is accomplished by the definition, acknowledgement, dedication, and management of geographic space through legislation or other workable ways.

In order to preserve genes, species, communities, and even habitats, high conservation value natural or seminatural areas are set aside under the protected area concept. IUCN, however, has divided these into a number of groupings. The protection of biodiversity has prompted increased international effort, and protected areas are now essential components of any global conservation strategy. As per [4] IUCN protected area management categories are classified as: **strict nature reserves** which serve as essential reference points for scientific study and observation; **the wilderness areas** as generally large unmodified areas, maintaining their natural identity and effect; **the national parks** as large natural areas set aside to protect large-scale ecological processes, providing a foundation for environmentally and culturally compatible spiritual, scientific, and visitors' opportunities; **habitat/species management areas** protecting particular species or habitats, and management reflects the priority; **protected landscapes/seascapes** - places where human involvement has created a distinctive area with major ecological, biological, cultural, and scenic value; **Protected areas** preserve ecosystems,

habitats, related cultural values, and conventional methods of managing natural resources while utilizing natural resources sustainably.

The traditional protected areas have often been written off as useless for preserving freshwater resources whereas the unconventional protected zones, included into coordinated management initiatives for the entire basin, are receiving increased attention. The vital flora that lines streams and lakes, filters pollutants, adds organic matter, and lowers water temperatures, can be preserved by riparian buffer zones. Wider than other riparian buffer zones, floodplain reserves are made specifically to safeguard the extremely productive transitional zones that serve as home to a variety of freshwater and terrestrial animals. Many of the world's first protected areas were established in mountainous locations, as evident by the association between mountains and protected areas, according to [6, 7]. Currently, there are almost 21,400 protected areas in the mountains, which make up 17% of all mountain areas outside of Antarctica and approximately 32% of all protected areas worldwide. Biosphere reserves are a unique kind of protected region with the ability to allow humans to coexist with nature [8]. Protected areas are viewed as the cornerstone of efforts to withstand the biodiversity and natural ecosystem processes on Mother Earth in light of the current global environmental problems. Growing land-use and population density have resulted in hostile, altered landscapes surrounding protected areas; illicit gold mining has increased, casting doubt on the sustainability of these regions and their biodiversity. As per the AZE "Alliance for Zero Extinction", a consortium of conservation organizations has analyzed the extinction threat covering birds, amphibians, mammals, reptiles, and coniferous plants and the extent to which the species' ranges were protected. Only 43% of the recordings were completely confined within protected areas, while

another 15% were only partially so [9]. Most of the sites lie in tropics, with over 350 sites in Tropical Moist Forests. In the Americas, out of the 329 sites only 45% have some degree of protection. In Central and South America plus Caribbean, out of 250 sites covering 334 species, 40 percent have some degree of protection. Almost 40 trees that are classified as severely endangered are only found in protected areas worldwide. In the same way, the last remaining populations of white rhinoceroses are present in the Garamba National Park of the Democratic Republic of the Congo and the Gir National Park of Gujarat, India, respectively; these animals are extinct.

Political boundaries are rarely observed in nature; in many instances, habitats, species, and even populations cannot be adequately safeguarded in a single country. Examples of this include bilateral funding and co-management agreements such as transboundary protected areas (TBPAs). To improve global patterns and trends in conservation and preservation, international agreements must be developed and put into effect. The sites support complementary human use and are frequently divided into core, buffer, and transitional zones with varying levels of human use and access. The Ramsar sites are protected areas recognized under the Convention on Wetlands of International Importance. The 563 Biosphere Reserves in 110 countries are sites recognized under UNESCO's MAB Program. These are just a few of the reasons why these sites are included in the list of sites that countries nominate for international recognition on a voluntary basis. Because 187 nations that have ratified the World Heritage Convention have nominated these sites, they have universal significance. Of these, 923 sites are chosen, 183 for their natural qualities and 28 for their natural and cultural qualities, after which the member countries take legal action to conserve them. The member nations employ a variety of standards and criteria to

recognize and preserve significant wetlands. There were around 2000 approved locations totaling 1.9 million square kilometers in 2011. Their recognition leads to associated benefits from tourism, particularly for World Heritage Sites. There are 227 TBPAs, comprising 3043 distinct protected areas, covering more than 4.6 million km<sup>2</sup>, according to the most recent inventory. Globally, there are 9869 protected areas (>1000 ha) covering an area of about 9317874 km<sup>2</sup>, which equals to 6.29 percent of the earth's land surface area. Asia has the least global protected area. In the 25 biodiversity hotspots in the world, harboring 30-40 percent of all earth's biodiversity, less than 10 percent of the land area is protected. Since protected regions are impervious to all environmental changes caused by humans, we can better study the effects and synergies of human activity. Integrating most of the protected area portfolio is necessary for a protected area project to be effective. In the last thirty years, there has been a significant shift that has elevated protected places to the top of the human agenda. We need to understand the importance of our ecosystems together with their interaction with water, energy and food. The interdependence among these is profound because water is indispensable for our living, energy for our daily life as well as food production/processing. The ecosystems provide essential services for these activities; as such an interconnection among these is critical for resource efficiency, sustainability and resilience. Protecting our ecosystems is vital as these help in water purification, flood control, and biodiversity.

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