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## 1.1 LEARNING OUTCOMES

Students will be able to understand;

- ✓ Concept of Protected Area Network
- ✓ Importance of protected areas
- ✓ Categories of Protected areas by IUCN
- ✓ Protected areas of India and Jammu and Kashmir
- ✓ Important flora and fauna of J&K

## 1.2 PROTECTED AREA NETWORK (PAN)

*A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values* (IUCN, 2008).

Protected areas are a mainstay of biodiversity conservation, while also contributing to people's livelihoods, particularly at the local level. Protected areas are at the core of efforts towards conserving nature and the services it provides us – food, clean water supply, medicines and protection from the impacts of natural disasters. Their role in helping mitigate and adapt to climate change is also increasingly recognized; it has been estimated that the global network of protected areas stores at least 15% of terrestrial carbon.

There are several kinds of protected areas -national parks, wilderness areas, community conserved areas, nature reserves and so on – which vary by level of protection depending on the enabling laws of each country or the regulations of the international organizations involved. The total number of protected area records in the January 2018 release of the World Database on Protected Area (WDPA) is 236,204, covering 245 countries and territories, with more added daily, representing between 10 to 15 percent of the world's land surface area.

### Goals of Protected areas

- Protect particular species
- Preserve biodiversity: focus on areas of high species richness/endemism
- Preserve large and functioning ecosystems and their services

## 1.3 SIGNIFICANCE OF PROTECTED AREA NETWORK (PANS)

**PROTECTED AREA SERVICES:** The various ecosystem services we might expect from protected areas and lists the benefits associated with these services.

1. **SUPPORTING SERVICES** (i.e. services necessary for the provision of all other ecosystem services): Supporting processes and functions' refer to the basic running of an ecosystem: soil formation and nutrient cycling; life-cycle maintenance for species by provision of services like fish nursery habitats, means of seed dispersal and continued species interactions; along with conservation of the full range of biodiversity.
2. **PROVISIONING SERVICES** (i.e. ecosystem's ability to provide resources): Of more immediate interest to people are the various tangible resources that protected areas either provide directly or support.
3. **REGULATING SERVICES** (i.e. ecosystems' beneficial regulatory processes): Well-managed natural ecosystems also maintain a range of beneficial processes and functions with direct relevance to human wellbeing. These so-called regulating services refer mainly to the role of natural ecosystems in helping to control aspects of climate, hydrology and the

water cycle, weather events and key natural systems that impact on agriculture, such as pollination.

4. **CULTURAL SERVICES** (i.e. ecosystems' non-material benefits): Clearly not all the benefits we derive from natural ecosystems are narrowly utilitarian: humans enjoy a wealth of complicated cultural, psychological and spiritual links with the natural world. Because protected areas tend to be established in particularly beautiful and pristine parts of nature, these cultural services are particularly strongly represented

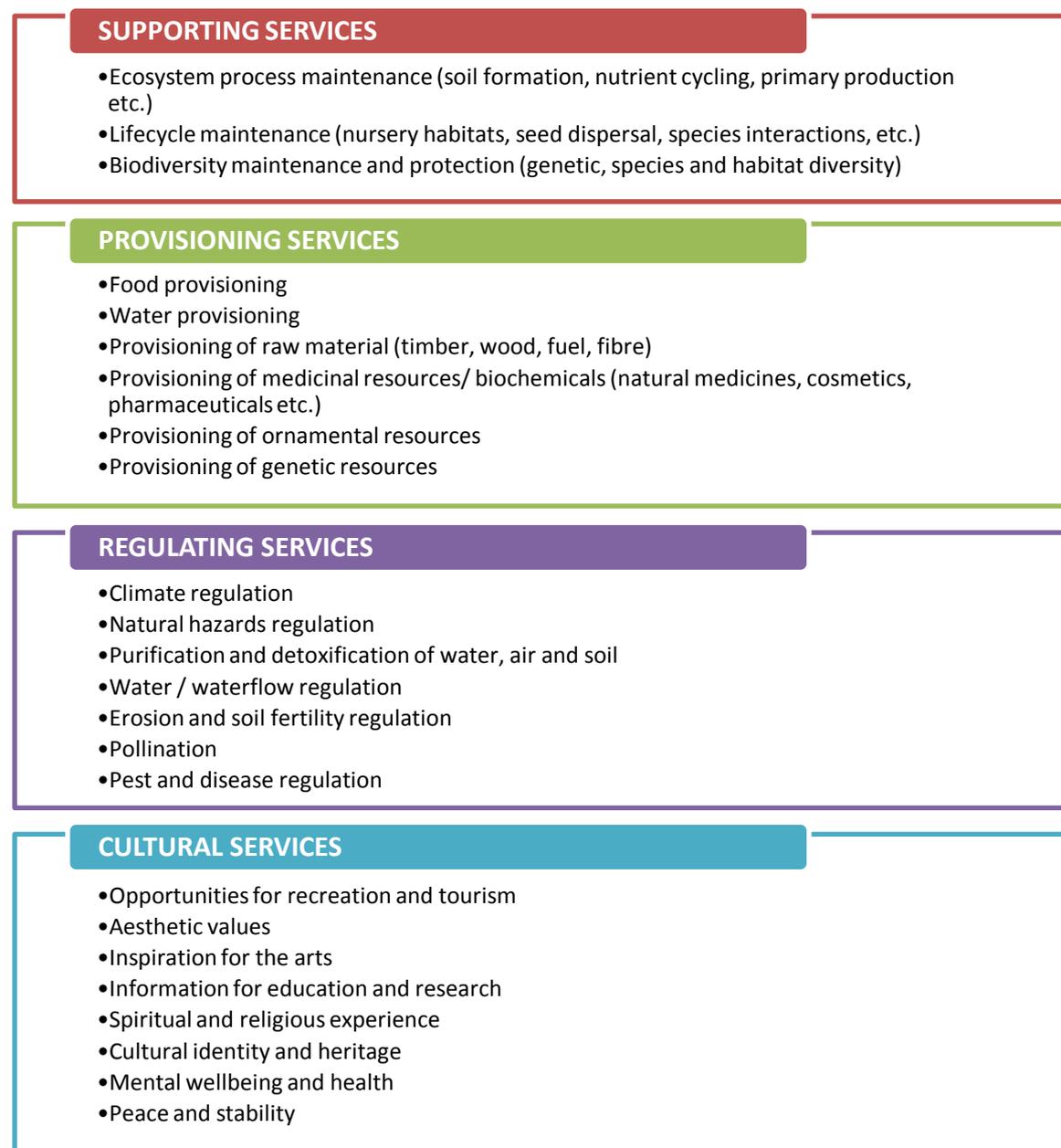


Figure 1: Protected Area Services [Sources: Kettunen and ten Brink (2013); adapted from MEA (2003); de Groot *et al.* (2010); and UK NEA (2011)]

## 1.4 IUCN Protected Area Categories System:

IUCN protected area management categories classify protected areas according to their management objectives. The categories are recognised by international bodies such as the United Nations and by many national governments as the global standard for defining and recording protected areas and as such are increasingly being incorporated into government legislation (Dudley, 2008).

**1a- Strict Nature Reserve:** Category 1a are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphical features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring.

**1b Wilderness Area:** Category 1b protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.

**II National Park:** Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.

**III Natural Monument or Feature:** Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.

**IV Habitat/Species Management Area:** Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.

**V Protected Landscape/ Seascape:** A protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.

**VI Protected area with sustainable use of natural resources:** Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

## 1.5 PROTECTED AREAS NETWORK IN INDIA

India is one of the 17 mega diverse countries of the world. With only 2.4% of the world's land area, is home to 7-8% of the recorded species of the world, which includes 46,000 plant species and 91,000 animal species. India is home to world's largest wild tigers population and has got unique assemblage of globally important endangered species like Asiatic lion, Asian Elephant, One-horned Rhinoceros, Gangetic River Dolphin, Snow Leopard, Kashmir Stag, Dugong, Gharial, Great Indian Bustard, Lion Tailed Macaque, etc. In India the PAs are constituted and governed under the provisions of the Wild Life (Protection) Act, 1972, which has been amended from time to time, with the changing ground realities concerning wildlife crime control and PAs management.

There are 4 categories of the Protected Areas viz,

- National Parks,
- Sanctuaries,
- Conservation Reserves and
- Community Reserves.

Sanctuary	National Park	Conservation Reserves	Community Reserves
<p><b>Sanctuary</b> is an area which is of adequate ecological, faunal, floral, geomorphological, natural or zoological significance.</p> <ul style="list-style-type: none"> <li>• The Sanctuary is declared for the purpose of protecting, propagating or developing wildlife or its environment.</li> <li>• Certain rights of people living inside the Sanctuary could be permitted.</li> <li>• Further, during the settlement of claims, before finally notifying the Sanctuary, the Collector may, in consultation with the Chief Wildlife Warden, allow the continuation of any right of any person in or over any land within the limits of the Sanctuary.</li> <li>• In addition, while any removal or exploitation of wildlife or forest produce from a Sanctuary requires the recommendation of the State Board for Wildlife, removal etc.,</li> </ul>	<p><b>NP</b> is an area having adequate ecological, faunal, floral, geomorphological, natural or zoological significance.</p> <ul style="list-style-type: none"> <li>•The National Park is declared for the purpose of protecting, propagating or developing wildlife or its environment, like that of a Sanctuary.</li> <li>•Unlike a Sanctuary, where certain rights can be allowed, in a National Park, no rights are allowed.</li> <li>•No grazing of any livestock shall also be permitted inside a National Park while in a Sanctuary, the Chief Wildlife Warden may regulate, control or prohibit it.</li> <li>•National Park requires recommendation of the National Board for Wildlife</li> </ul>	<p><b>Conservation Reserves</b> can be declared by the State Governments in any area owned by the Government, particularly the areas adjacent to National Parks and Sanctuaries and those areas which link one Protected Area with another.</p> <ul style="list-style-type: none"> <li>• Such Conservation Reserves are declared for the purpose of protecting landscapes, seascapes, flora and fauna and their habitat. The rights of people living inside a Conservation Reserve are not affected.</li> </ul>	<p><b>Community Reserves</b> can be declared by the State Government in any private or community land, not comprised within a National Park, Sanctuary or a Conservation Reserve, where an individual or a community has volunteered to conserve wildlife and its habitat.</p> <ul style="list-style-type: none"> <li>• Community Reserves are declared for the purpose of protecting fauna, flora and traditional or cultural conservation values and practices.</li> <li>• As in the case of a Conservation Reserve, the rights of people living inside a Community Reserve are not affected.</li> </ul>

India has a network of 868 *Protected Areas (PAs)* established, extending over 1,65,088.57 sq. kms. (5.02% of total geographic area), comprising 104 *National Parks*, 550 *Wildlife Sanctuaries*, 87 *Conservation Reserves* and 127 *Community Reserves*.

	<ul style="list-style-type: none"> <li>India's <b>First National Park</b> was established in 1936 as Hailey National Park, now known as <b>Jim Corbett National Park</b>, Uttarakhand.</li> <li>The <b>Biggest National Park</b> in India is the <b>Hemis National Park</b>, located in Jammu and Kashmir State followed by Desert National Park, 1,220 square miles in the state of Rajasthan. The third largest national park is the Gangotri National Park which is 922 square miles located within Uttarakhand and 4th is the Namdapha National Park which lies within Arunachal Pradesh and extends over 766 square miles.</li> </ul>
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Category	Numbers	Total Area (km <sup>2</sup> )	Coverage % of country
<b>National Parks (NPs)</b>	101*	40,564.03	1.23
<b>Wildlife Sanctuaries (WLSs)</b>	553	119,756.97	3.64
<b>Conservation Reserves (CRs)</b>	86	3,858.25	0.12
<b>Community Reserves</b>	163	833.34	0.03
<b>Protected Areas (PAs)</b>	903	165,012.59	5.02

\*Three Button Islands National Parks (North Button Island, Middle Button Island & South Button Island) of Andaman & Nicobar Islands have been merged with Rani Jhansi Marine National Park.

**Protected Areas of India (As on December, 2019)**

	<b>Geographical Area of India</b> ( <a href="http://knowindia.gov.in/">http://knowindia.gov.in/</a> )	32,87,263 km <sup>2</sup>
	<b>Forest cover of India (FSI, 2017)</b>	<b>7,08,273 km<sup>2</sup></b>
	<b>Percentage Area under Forest cover</b>	<b>21.54 %</b> of Geographical Area of India

## 1.6 PROTECTED AREA NETWORK IN THE STATE OF JAMMU AND KASHMIR

The State Government has notified more than 17000 sq km as Protected Area Network comprising of **5 National Parks**, **14 Wildlife Sanctuaries** and **33 Conservation Reserves** and **14 Wetland Reserves**. These areas are being managed through habitat improvement and management, plantation, soil and water conservation, protection from fire, anti-poaching activities, development of infrastructure, providing supplemental feed to rescued captive wild animals etc. The rare and endangered species found in the state include *Kashmir stag (hangul)*, *Snow leopard*, *Tibetan antelope (chiru)*, *Tibetan gazelle*, *Markhor*, *Musk deer*, *Brown bear*, *Black-necked crane* and *Western Tragopan* etc.

## 1.7 KISHTWAR HIGH ALTITUDE NATIONAL PARK

Kishtwar High altitude National Park is located in the northern side of Kishtwar town of Jammu and Kashmir and draws thousands of tourists in the charm of distinctive topography and vegetation along with more than 200 species of birds and about 25 mammal species. It is 230 Kms from Jammu to Kishtwar and 40 kms from Kishtwar to Dangduru.

**Location:** 33°27'N to 33°59'N ; 75°40'E to 76°17'E

**District:** Kishtwar,

**Year of Establishment:** 1981

**Area:** 2191.50 km<sup>2</sup>.

**Altitudinal Range:** 2300m-6000m asl.

**CLIMATE:** the climate of National Park is of temperate type with severe and prolonged winters and short summers. The temperature varies between 23° C to -7° C during winters and 11° C to 30° C during summers. The average rainfall is about 920mm.

**Major Flora:** *Pinus gerardiana, Cedrus deodara, Pinus wallichiana, Quercus baloot, Daphne paniculata, Juglans regia, Parrotiopsis Jacquemontiana, Desmodium elegans, Dipsacus innermis, Artemisia Vulgaris Ulmus spp., Brachypodium spp etc.*

**Major Fauna:** The Park is a renowned snow leopard reserve. The rich wildlife includes Brown Bear, Himalayan Black bear, Musk Deer, Ibex, Markhor, Snow Leopard, Wild boar, Bharal, Indian Muntjac, Serow, and Rhesus macaque. Hangul or Kashmiri stag migrates in winters from Dachigam National Park.

**Major Aifauna:** Bird species like Himalayan monal, Koklass, Himalayan snowcock, western Tragopan Himalayan Jungle crow, Bearded vulture, Griffon vulture, Paradise flycatcher, Golden oriole, White cheeked bulbul and Black bulbul are seen.

## 1.8 DACHIGAM NATIONAL PARK

Dachigam National Park is located 22 kilometers from Srinagar, Jammu and Kashmir. The name of the park literally stands for "ten villages" which could be in memory of the ten villages that were relocated for its formation.

**Location:** 34°05' N and 75°.10'E

**District:** Srinagar,

**Year of Establishment:** 1981

**Area:** 141 km<sup>2</sup>

**Altitudinal Range:** 1676m (5,499 ft) to 4267m (14,000 ft) asl.

**Topography:** Dachigam National park is located in the Zabarwan Range of the western Himalayas. The variation in altitude is vast, ranging from 5500 ft to 14000 ft above mean sea level. Due to this vast variation, the park is demarcated into an uneven region. The terrain ranges from gently sloping grasslands to sharp rocky outcrops and cliffs. Most of the grasslands and meadows, except in the harsh winters, are covered with coloured flowers. Located high among its interiors is the Marsar lake from which flows the Dagwan river. This river flows all the way down to, and past, the lower region where it runs along the only proper road in the park and is also known for its fish population, the trout.

**Major Flora:** *Fir, spruce, Blue pine, Parrotiopsis jacquemontiana, Indigofera, Rhus succedanea, Quercus robur, Prunus tomentosa, Rosa webbiana, Arneibia benthamii, Rheum emodi, Dipsacus innermis, Jasminum humile, Aesculus indica, Dioscorea deltoidea, Rhododendron campanulatum,*

*Ulmus wallichiana, Berberis lycium, Picrorhiza kurrooa, Artemisia absinthium, Aconitum heterophyllum, Podophyllum hexandrum etc.*

**Major Fauna:** The main animal species that Dachigam is known for is the hangul, or the Kashmir stag which is critically endangered. Other faunal species include

Himalayan, Brown bear, Himalayan Black bear, long tailed Marmot, Musk deer, Himalayan Weasel, Yellow throated Marten, Serow, Leopard Cat, Common leopard, Grey Langur, Otter

**Avifauna:** Commonly found avifauna are Cinnamon sparrow, Black bulbul, Himalayan monal, Golden oriole, Minivet, Pygmy owlet, Woodpecker, Babbler, Redstart, Wagtail, Koklass pheasant, Chough, Orange bullfinch, Kashmir flycatcher, Tytler's leaf warbler, Streaked laughing thrush, Himalayan rubythroat, Wallcreeper, Black-and-yellow grosbeak, Himalayan griffon vulture, Bearded vulture, Red-billed blue magpie and Titmouse.

## 1.9 HEMIS NATIONAL PARK

Hemis National Park (or Hemis High Altitude National Park) is located in the eastern Ladakh Union Territory of the Republic of India and is globally famous for its snow leopards having the highest density of them in any protected area in the world. It is the largest National park in India and is the second largest protected area after the Nanda Devi Biosphere Reserve. This national park comprises Alpine Meadow, Alpine Tundra, pine forests and Alpine Shrublands as part of its varied ecosystem. These different types of vegetation flourish under drier conditions as the park lies within the rain shadow of the Himalayan Mountains. These diverse and abundant environments create the ideal habitats for a number of different animal species. In addition to its wildlife and flora, the park has also been home to Tibetan monks, and one of its most popular tourist attractions is the Hemis Monastery, which dates back some 400+ years. Today, local tribes remain within the park's borders, living off the land and implementing their deeply-entrenched cultures and customs into their daily lives. This is also a frequented area for pilgrims, who visit during the festival of Hemis Tsechu.

**Location:** 33° 59' 00" N and 77° 26' 00"E

**District:** Leh,

**Year of Establishment:** 1981

**Area:** 3350 km<sup>2</sup>

**Altitudinal Range:** 3000 to 6000 m asl

**Major Flora:** Dry forests of juniper, Populus - Salix forests are present at lower altitudes. The upper mountain slopes are moist, this area is characterized by alpine vegetation including *Anemone*, *Gentiana*, *Thalictrocn*, *Lloydia*, *Veronica*, *Delphinium*, *Carex* and *Kobresia*. The other parts of the park support steppe vegetation which is dominated by *Caragana*, *Artemisia*, *Stachys*, and *Ephedra*, present along the lower river courses.

15 rare and endangered medicinal plants which include *Acantholimon lycopodiodes*, *Arnebia euchroma*, *Artimisia maritima*, *Bergenia stracheyi*, *Ephedra gerardiana*, *Ferula jaeschkeana*, and *Hyoscyamus niger* are reported.

**Major Fauna:** The park is home to a viable breeding population of about 200 snow leopards, especially in the Rumbak catchment area.

Other species are Argali (Great Tibetan Sheep), Bharal (Blue Sheep), Shapu (Ladakhi Urial), Asiatic Ibex, etc. The Tibetan wolf, the Eurasian brown bear (endangered in India), and the red fox are also present in Hemis. Small mammals include the Himalayan marmot, mountain weasel, Woolly hare and the Himalayan mouse hare.

**Avifauna:** Golden Eagle, Himalayan Griffon Vulture, Tibetan Snow Finch, Red-billed Chough, Tibetan Snow cock, Himalayan Snow cock, brown accentor, robin accentor, Tickell's leaf warbler, streaked rosefinch, black-winged snowfinch, chukar, Blyth's swift, red-billed chough and the fire-fronted serin.

## 1.10 IMPORTANT ANIMAL SPECIES OF PAs IN JAMMU AND KASHMIR



Snow leopard



Kiang –Wild Ass



Kashmir Stag



Himalayan Black Bear



Shapu -Ladakhi Urial  
(*Ovis orientalis vignei*)



Himalayan Ibex  
(*Capra sibirica*) (*Equus kiang*)



Himalayan Brown Bear



Himalayan Serow



Spotted Deer (*Axis axis*)



Yellow-throated marten



Himalayan Goral



Markhor  
(*Capra falconeri*)



Black Necked Crane



Himalayan Monal



Western Tragopan

## 1.11 SUMMARY

Protected areas are places where conscious efforts are made to preserve not only wild species, but also the ecosystems in which species live. In parts of the world where most of the landscape has already been transformed by agriculture or industry, protected areas may be the only natural or near natural ecosystems remaining for large areas. The wider socioeconomic and cultural values of these natural ecosystems are increasingly being recognised, as are the important ecosystem services they provide. Until recently these services have often been taken so much for granted that their values have been underestimated, forgotten or simply never noticed.

## 1.12 SELF ASSIGNMENTS QUESTIONS

1. Define Protected area network and give its importance.
2. Enlist various categories of PAs given by IUCN.
3. Describe briefly different types of protected areas in India which special reference to Kishtwar High Altitude National Park.
4. Enlist some indigenous plant and animal species found in Jammu and Kashmir.

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