

## Categories of Protected areas

### Category Ia: Strict Nature Reserve

#### Primary objective

To conserve

- Regionally • Nationally • Globally outstanding ecosystems • Species (occurrences or aggregations) • Geo diversity features

### Category Ia: Strict Nature Reserve

Other Objectives • To preserve ecosystems. • To secure examples of the natural environment for scientific studies. • To minimize disturbance through careful planning. • To conserve cultural and spiritual values associated with nature.

### Category Ia: Strict Nature Reserve

#### Distinguishing features

The area should generally: • Have a largely complete set of expected native species. • Be capable of being managed to ensure minimal disturbance. • Be free of significant direct intervention by modern humans.

Category Ia: Strict Nature Reserve • Have a full set of expected native ecosystems, largely intact with intact ecological processes, or processes capable of being restored with minimal management intervention. • Be managed for relatively low visitation by humans.

### Category Ia: Strict Nature Reserve

#### Definition:

- Protected areas that are strictly set aside to protect biodiversity where human visitation, use and impacts are strictly controlled to ensure protection of the conservation values.

### Category Ia: Strict Nature Reserve

Role in the landscape/seascape • Protecting some of the earth's richness that will not survive outside. • Protecting additional ecosystem services. • Providing areas where ecosystems can be studied in as pristine an environment as possible.

Category Ia: Strict Nature Reserve • Protecting natural sites that are also of religious and cultural significance. Issues for consideration • There are few areas not under some kind of legal or at least traditional ownership, so that finding places that exclude human activity is often problematic.

Category Ia: Strict Nature Reserve • Most apparent problem is with climate and air pollution • New and emerging diseases. • In an increasingly modified ecology, it may become increasingly difficult to maintain pristine areas through non-intervention.

Thank you!

IUCN Categories of Protected Areas

Category II: Category II: National Park

Definition: • Large natural or near natural areas set aside to protect large-scale ecological processes, which also provide a foundation for environmentally scientific, educational, recreational and visitor opportunities.

Category II: Category II: National Park

Primary objective • To protect natural biodiversity along with its underlying ecological structure.

Other objectives • To manage the area in order to perpetuate, in as natural a state as possible.

Category II: Category II: National Park • To maintain viable and ecologically functional populations. • To contribute to local economies through tourism. • To manage visitor use for inspirational, educational recreational purposes.

Category II: Category II: National Park

Distinguishing features • The area should contain representative examples of major natural regions, and biological and environmental features or scenery. • It should be of sufficient size to maintain ecological processes.

Category II: Category II: National Park • The composition, structure and function of biodiversity should be to a great degree in a natural state. Role in the landscape/seascape • Protecting larger-scale ecological processes. • Protecting compatible ecosystem services.

Category II: Category II: National Park • Protecting particular species and communities that require relatively large areas of undisturbed habitat. • To inform and excite visitors about the need for and potential of conservation programmes.

To support compatible economic development, mostly through recreation and tourism, that can contribute to local and national economies and in particular to local communities.

Category II: Category II: National Park

Issues for consideration • Commercialization of land and water in category II is creating challenges in many parts of the world.

Category III: National Monument-Feature

Category III: National Monument-Feature

Definition:

• Protected areas set aside to protect a specific natural monument. • They are generally quite small protected areas and often have high visitor value.

### Category III: National Monument-Feature

#### Primary objective

- To protect specific outstanding natural features • Their associated biodiversity and habitats.

### Category III: National Monument-Feature

#### Other objectives

- To provide biodiversity protection in landscapes or seascapes that have otherwise undergone major changes • To conserve traditional spiritual and cultural values of the site.

### Category III: National Monument-Feature

#### Distinguishing features

- Category III protected areas are usually relatively small sites that focus on one or more prominent natural features and the associated ecology, rather than on a broader ecosystem.

#### Criteria

Natural geological and geomorphological features: • Waterfalls, cliffs, craters, caves etc.

Culturally-influenced natural features: • Cave dwellings

Natural-cultural sites:

Forms of sacred natural sites (sacred groves, springs, waterfalls, mountains, sea coves etc.) of importance to one or more faith groups

### Category III: National Monument-Feature

#### Cultural sites with associated ecology:

- Where protection of a cultural site also protects significant and important biodiversity, such as archaeological or historical sites that are inseparably linked to a natural area.

### Category III: National Monument-Feature

#### Role in the landscape/seascape

- Important natural monuments can sometimes provide an incentive for protection and an opportunity for environmental/cultural education even in areas where other forms of protection are resisted due to population or development pressure, such as important sacred or cultural sites and in these cases category III can preserve samples of natural habitat in otherwise cultural or fragmented landscapes.

Thank you!

### Category III: National Monument-Feature\_2

#### Supported by

Developed by the International Union for Conservation of Nature (IUCN) with support of the World Commission on Protected Areas (WCPA) and other international institutions such as the Convention on Biological Diversity (CBD), and assigned by national governments.

### Management

These areas are managed to maintain certain natural features, and this can be carried out by a range of actions depending on the governance type of the area

### Legal and compliance

The classification of a Category III protected area requires that such areas are managed for conservation by legal or other effective means, and therefore legal recognition and protection at the national or sub-national level is likely to be present in these sites. The level of legal protection will however vary between countries, and will depend on the governance type of the area, as they receive differing levels of recognition by government in different countries. Nonetheless a number of national laws are likely to apply to these sites that deter large-scale economic activities in order to maintain the conservation values of these areas.

### Biodiversity importance

The main emphasis of protection in category III areas is on the natural features found in these sites. Their role in the conservation of species and habitats, hence, varies. In some cases their contribution to biodiversity conservation may be indirect result of protection of natural features. In other cases (e.g. natural cave system) they may play a key role in the wider conservation strategy of an area.

### Socio-cultural values

Category III areas are likely to hold socio-cultural values as they may have features such as sacred groves, springs, waterfalls, mountains, sea coves etc. of importance to one or more faith groups. These areas are often of significant tourism value and can be managed with the objective of promoting sustainable tourism.

### Issues for consideration

It will sometimes be difficult to ascertain the conservation attributes of category III sites, particularly in cases where there may be pressure to accept sites within a protected area system to help protect cultural or spiritual values.

Not all natural monuments are permanent

It is sometimes difficult to draw the boundaries between a natural monument and cultural site, particularly where archaeological remains are included within category III. Soe appaet ouets ay euie potectio of a lage ecosyste to suvive.

ategory III differs from the other categories in the following ways:

Category Ia Category III is not confined to natural and pristine landscapes but could be established in areas that are otherwise cultural or fragmented landscapes. Visitation and recreation is often encouraged and research and monitoring limited to the understanding and maintenance of a particular natural feature.

Category II The emphasis of category III management is not on protection of the whole ecosystem, but of particular natural features; otherwise category III is similar to category II and managed in much the same way but at a rather smaller scale in both size and complexity of management.

Category IV The emphasis of category III management is not on protection of the key species or habitats, but of particular natural features.

Category V Category III is not confined to cultural landscapes and management practices will probably focus more on stricter protection of the particular feature than in the case of category V.

Category VI Category III is not aimed at sustainable resource use.

Thank you!

Category IV: Habitat-Species Management Area

Habitat-Species Management Area

Definition:

IUCN Management Category IV (Habitat/Species Management Area) refers to areas that are managed to protect particular species or habitats. They are defined by IUCN as “protected areas aiming to protect particular species or habitats and management reflect this priority.

Habitat-Species Management Area

Primary objective • To maintain, conserve and restore species and habitats.

Other objectives

1. To protect vegetation patterns.
2. To protect fragments of habitats as components of landscape or seascape-scale conservation strategies.
3. To develop public education and appreciation of the species or habitat

Supported by

Developed by the International Union for Conservation of Nature (IUCN) with support of the World Commission on Protected Areas (WCPA) and other international institutions such as the Convention on Biological Diversity (CBD), and assigned by national governments.

Habitat-Species Management Area

Distinguishing features ☐ Protection of particular species ☐ Protection of habitats ☐ Active management to maintain target species ☐ Active management of culturally-defined ecosystems

Habitat-Species Management Area

Role in the landscape/seascape ☐ Protect critically endangered populations of species. ☐ Protect rare or threatened habitats. ☐ Provide flexible management strategies and options in buffer zones around, or connectivity conservation corridors between, more strictly protected areas that are more acceptable to local communities and other stakeholders; ☐ Maintain species that have become dependent on cultural landscapes where their original habitats have disappeared or been altered.

Thank You!

Category IV: habitat-species management area

Management

These areas are managed to maintain or restore certain species and/or habitats, and this can be carried out by a range of actors depending on the governance type of the area (see IUCN Protected Area Management Categories for information on governance types). These are often areas that have already undergone substantial modification, where a high degree of human pressure often exists, and significant management intervention is necessary. Category IV areas will generally be publically accessible.

Legal and compliance

The classification of a category IV protected area requires that such areas are managed for conservation by legal or other effective means, and therefore legal recognition and protection at the national or sub-national level is likely to be present in these sites. The level of legal protection will however vary between countries, and will depend on the governance type of the area, as they receive differing levels of recognition by government in different countries. Nonetheless a number of national laws are likely to apply to these sites that deter large-scale economic activities in order to maintain the conservation values of these areas.

Biodiversity importance

Category IV areas are important for their role in plugging the gaps in conservation strategies by protecting key species or habitats in ecosystems. It provides a management approach for areas that have already undergone substantial modification, necessitating protection of remaining fragments for identified target species with or without intervention.

Socio-cultural values

While Category IV areas are not necessarily associated with human presence and intervention, many exist in crowded landscapes and seascapes where human pressure is comparatively greater, both in terms of potential illegal use and visitor pressure.

Issues for consideration

Many category IV protected areas exist in crowded landscapes and seascapes.

The category IV protected areas that rely on regular management intervention need appropriate resources from the management authority.

Because they usually protect part of an ecosystem, successful long-term management of category IV protected areas necessitates careful monitoring and an even greater-than-usual emphasis on overall ecosystem approaches and compatible management in other parts of the landscape or seascape.

Category IV differs from the other categories in the following ways:

Category Ia Category IV protected areas are not strictly protected from human use; scientific research may take place but generally as a secondary objective.

Category II Category IV protected areas aim their conservation at particular species or habitats and may in consequence have to pay less attention to other elements of the ecosystem in consequence, whereas category II protected areas aim to conserve fully functional ecosystems.

Category III The objective of category IV areas is of a more biological nature whereas category III is site-specific and more morphologically or culturally oriented.

Category V Category IV protected areas aim to protect identified target species and habitats whereas category V aims to protect overall landscapes/seascapes with value for nature conservation

Category VI Management interventions in category IV protected areas are primarily aimed at maintaining species or habitats while in category VI protected areas they are aimed at linking nature conservation with the sustainable use of resources

Thank you!

#### Category V: Protected Landscape-Seascape

##### Protected Landscape-Seascape

###### Definition:

- 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.

###### Supported by

Developed by the International Union for Conservation of Nature (IUCN) with support of the World Commission on Protected Areas (WCPA) and other international institutions such as the Convention on Biological Diversity (CBD), and assigned by national governments.

##### Protected Landscape-Seascape

- Where safeguarding the integrity of this interaction is vital to protect and sustain the area and its associated nature conservation and other values.

Primary objective • To protect and sustain important landscapes/seascapes and the associated nature conservation.

##### Protected Landscape-Seascape

Other objectives ☐ To maintain a balanced interaction of nature and culture. ☐ To contribute to broad-scale conservation by maintaining species associated with cultural landscapes and/or by providing conservation opportunities in heavily used landscapes; ☐ To provide opportunities for enjoyment, well-being and socio-economic activity through recreation and tourism; ☐ To provide natural products and environmental services; ☐ To provide a framework to underpin active involvement by the community in the management of valued landscapes or seascapes and the natural and cultural heritage that they contain; ☐ To encourage the conservation of

agro biodiversity and aquatic biodiversity; □ To act as models of sustainability so that lessons can be learnt for wider application.

#### Protected Landscape-Seascape

Distinguishing features □ Landscape and/or coastal and island seascape of high and/or distinct scenic quality and with significant associated habitats, flora and fauna and associated cultural features □ A balanced interaction between people and nature □ Unique or traditional land-use patterns

#### Desirable characteristics:

- Opportunities for recreation and tourism consistent with life style and economic activities;
- Unique or traditional social organizations, as evidenced in local customs, livelihoods and beliefs;
- Recognition by artists of all kinds and in cultural traditions (now and in the past);
- Potential for ecological and/or landscape restoration.

#### Protected Landscape-Seascape

Role in the landscape/seascape □ Some category V protected areas act as a buffer around a core of one or more strictly protected areas □ Category V protected areas may also act as linking habitat between several other protected areas. □ Category V offers unique contributions to conservation of biological diversity. In particular: □ Species or habitats that have evolved in association with cultural management systems and can only survive if those management systems are maintained □ To provide a framework when conservation objectives need to be met over a large

Thank you!

#### Category V: Protected Landscape-Seascape\_2

##### Management

Management of these areas can be carried out by a range of actors depending on the governance type of the area. A high degree of human intervention is to be expected within these areas, including agriculture and forestry, although these practices should be traditional and sustainable systems of land-use.

##### Legal and compliance

The classification of a category V protected area requires that such areas are managed for conservation by legal or other effective means, and therefore legal recognition and protection at the national or sub-national level is likely to be present in these sites. The level of legal protection will however vary between countries, and will depend on the governance type of the area, as they receive differing levels of recognition by government in different countries.

As designated protected areas, these sites receive international attention and have been incorporated into a number of environmental safeguard standards.

##### Biodiversity importance

The biodiversity importance of category V areas is due to the important role



they play in conservation at the landscape/seascape scale, particularly as part of a mosaic of management patterns, protected area designations and other conservation mechanisms.

#### Socio-cultural values

Evidence of traditional land use patterns is a key criterion for category V areas, and therefore these areas will hold certain socio-cultural values, largely that of resource use by local people such as sustainable forestry and agriculture. Human settlements are very likely to be present as a key characteristic of these areas is a long-history of interaction between people and their environment.

#### Issues for consideration

□ Being a relatively flexible model, category V may sometimes offer conservation options where more strictly protected areas are not feasible. □ Category V protected areas can seek to maintain current practices, restore historical management systems or, perhaps most commonly, maintain key landscape values whilst accommodating contemporary development and change: decisions about this need to be made in management plans. □ The emphasis on interactions of people and nature over time raises the conceptual question for any individual category V protected area: at what point on the temporal continuum should management focus? □ Since social, economic and conservation considerations are all integral to the category V concept, defining measures of performance for all of these values is important in measuring success.

Category V differs from the other categories in the following ways:

Category Ia Human intervention is expected. Category V does not prioritize research, though it can offer opportunities to study interactions between people and nature. Category Ib Category V protected areas are of lesser interest as defined by IUCN. May still be subject to management intervention inimical to the concept of category Ib. Category II Category II seeks to minimize human activity in order to allow for as natural a state as possible. Category V includes an option of continuous human interaction.

Category III Category III focuses on specific features and single values and emphasises the monumentality, uniqueness and/or rarity of individual features, whereas these are not required for category V protected areas, which encompasses broader landscapes and multiple values.

Category IV Category V aims to protect overall landscapes and seascapes that have value to biodiversity, whereas category IV aims often quite specifically to protect identified target species and habitats. Category V protected areas will often be larger than category IV. Category VI

Category VI emphasises the need to link nature conservation in natural areas whilst supporting sustainable livelihoods: conversely category V emphasises values from long-term interactions of people and nature in modified conditions. In category VI the emphasis is on sustainable use of environmental products and services (typically hunting, grazing, management of natural resources), whereas in category V the emphasis is on other uses typically agriculture, forestry, tourism. Category VI will usually be more natural than category V.

Thank you!

Protected Area with Sustainable Use of Natural Resources

Category VI

Protected Area with Sustainable Use of Natural Resources

## Definition:

Protected areas that conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems.

Generally large, with most of the area in a natural condition

Where a proportion is under sustainable natural resource management

## Supported by

Developed by the International Union for Conservation of Nature (IUCN) with support of the World Commission on Protected Areas (WCPA) and other international institutions such as the Convention on Biological Diversity (CBD), and assigned by national governments.

## Category VI

Primary objective • To protect natural ecosystems • Use natural resources sustainably, when conservation and sustainable use can be mutually beneficial.

## Category VI

Other objectives ☐ To promote sustainable use of natural resources, considering ecological, economic and social dimensions; ☐ To promote social and economic benefits to local communities where relevant; ☐ To facilitate inter-generational security for local communities' livelihoods – therefore ensuring that such livelihoods are sustainable; ☐ To integrate other cultural approaches, belief systems and world-views within a range of social and economic approaches to nature conservation; ☐ To contribute to developing and/or maintaining a more balanced relationship between humans and the rest of nature;

Criteria ☐ These areas aim to conserve ecosystems and habitats, together with associated cultural values and natural resource management systems ☐ They are unique in that they have the sustainable use of natural resources as a means to achieve nature conservation, together and in synergy with other actions more common to the other categories, such as protection. ☐ The category is not designed to accommodate large-scale industrial harvest. ☐ In general, IUCN recommends that a proportion of the area is retained in a natural condition, which in some cases might imply its definition as a no-take management zone.

## Category VI

Role in the landscape/seascape • Protected areas are particularly adapted to the application of landscape approaches. • This is an appropriate category for large natural areas. • It is particularly appropriate to the conservation of natural ecosystems when there are few or no areas without use or occupation.

Thank you !

Protected Area with Sustainable Use of Natural Resources  
Management

Management of these areas can be carried out by a range of actions depending on the governance type of the area. Human occupation and intervention is to be expected in these areas, although most practices will be traditional and low-impact as sustainable use is actively promoted.

#### Legal and compliance

The classification of a category VI protected area requires that such areas are managed for conservation by legal or other effective means, and therefore legal recognition and protection at the national or sub-national level is likely to be present for these sites. The level of legal protection will however vary between countries, and will depend on the governance type of the area, as they receive differing levels of recognition by government in different countries. Nonetheless a number of national laws are likely to apply to these sites that restrict large-scale economic activities in order to maintain the conservation values of these areas.

As designated protected areas, these sites receive international attention and have been incorporated into a number of environmental safeguard standards. These include those of multilateral financial institutions such as but not limited to the World Bank and the International Finance Corporation.

#### Biodiversity importance

Category VI areas are unique among the IUCN Categories as they seek to achieve biodiversity conservation through a synergy between the sustainable uses of natural resources together with protection. These areas tend to be relatively large and are particularly relevant for the application of landscape approaches to conservation. As intervention within these areas is aimed at maintaining or restoring natural ecosystems, they can be anticipated to have high biodiversity values, and may include no-take areas as an integral part of maintaining these values.

#### Socio-cultural values

These areas can be expected to hold significant socio-cultural value. While industrial use is not expected, sustainable use by local and traditional communities is a key criterion, and the maintenance of these sustainable practices is as important as the maintenance of the natural resources on which people rely.

#### Issues for consideration

- ☐ Protection of natural ecosystems and promotion of sustainable use must be integrated and mutually beneficial.
- ☐ New skills and tools need to be developed by management authorities to address the new challenges that emerge from planning, monitoring and managing sustainable use areas.
- ☐ There is also need for development of appropriate forms of governance suitable for category VI protected areas and the multiple stakeholders that are often involved.

Category VI differs from the other categories in the following ways:

Category Ia Category VI protected areas do conserve biodiversity, particularly at ecosystem and landscape scale, but the aim would not be to protect them strictly from human interference. Although scientific research may be important, it would be considered a priority only when applied to sustainable uses of natural resources, either in order to improve them, or to understand how to minimize the risks to ecological sustainability.

Category II Category VI protected areas aim to conserve ecosystems, as complete and functional as possible, and their species and genetic diversity and associated environmental services, but differ from category II in the role they play in the promotion of sustainable use of natural resources. Tourism can be developed in category VI protected areas, but only as a very secondary activity or when they are part of the local communities' socio-economic strategies (e.g., in relation to ecotourism development).

Category III Category VI protected areas might include the protection of specific natural or cultural features, including species and genetic diversity, among their objectives, whenever the sustainable use of natural resources is also part of the objectives, but they are more oriented to the protection of ecosystems, ecological processes, and maintenance of environmental services through nature protection and promotion of management approaches that lead to the sustainable use of natural resources.

Category IV Category VI protected areas are more oriented to the protection of ecosystems, ecological processes, and maintenance of environmental services through nature protection and promotion of the sustainable use of natural resources. While category IV protected areas tend to prioritize active management, category VI promotes the sustainable use of natural resources.

Category V Category V applies to areas where landscapes have been transformed as a result of long-term interactions with humans; category VI areas remain as predominantly natural ecosystems. The emphasis in category VI is therefore more on the protection of natural ecosystems and ecological processes, through nature protection and promotion of the sustainable use of natural resources.

Thank you!

Thank you!

National Parks of Pakistan

Learning Objectives

□ What are National Parks? □ Important National Parks of Pakistan

National Parks of Pakistan

National Park

National park is an area which is strictly reserved for the betterment of the wildlife & biodiversity, and where activities like developmental, forestry, poaching, hunting and grazing or utilization are not permitted □

In these parks private ownership rights are not allowed. □ Their boundaries are well marked and circumscribed. □ They are usually small reserves spreading in an area of 100 sq. km. to 500 sq. km. □ In national parks, the emphasis is on the preservation of a single floral or faunal species.

National Parks of Pakistan

Major National parks in Pakistan are as follows;

□ Hingol National Park □ Hazarganji Chiltan National Park □ Kirthar National Park □ Lal Suhanra National Park □ Margalla Hills National Park

□ Ayubia National Park □ Deosai National Park □ Chitral Gol National Park □ Khunjerab National Park □ Machiara National Park

National Parks of Pakistan

1) Hingol National Park

□ Hingol National Park spread over an area of about 1,650 square km along the Makran Coast, Balochistan □ It is the largest of National Parks of Pakistan □ The area was for the first time declared reserved in 1988. □ Hingol is known to support threatened invertebrates in addition to a variety of bird species □ The park is an excellent habitat to wild animals including over 3000 ibexes, and 1500 Urals and more than 1200 Chinkara □ A number of resident and migratory birds are supported by this park

Hingol National Park

2) Kirthar National Park

□ Kirthar National Park is the the second largest national park of Pakistan spread over an area of 3000 square kilometres. □ Kirthar was designated a national park by the Sindh Wildlife Department in 1974, □ This is the first of Pakistan's parks to be included in the UN's listing of National Parks of 1975 □ This is natural haven for Urial sheep, Ibex, Chinkara gazelle, □ Jungle cats, desert cats, occasional leopard, desert wolf also prowl the park.

Kirthar National Park

Thank You!

National parks-2

National parks-2

Learning objectives

□Lal Suhanra National Park □Hazarganji Chiltan National Park □5) Margalla Hills National Park

4) Lal Suhanra National Park

□ Blackbuck became virtually extinct in the Cholistan Desert but the species has been re-introduced in Lal Suhanra □ There is big lake in the center of the park called Patisar Lake, which is ideal for bird watching. □ Patisar Lake regularly holds between 10,000 and 30,000 ducks and common coot in mid-winter. □The park supports a large population of birds of prey. □ Nilgai antelope is also being bred in the Park

Lal Suhanra National Park

□

Hazarganji Chiltan National Park

5) Margalla Hills National Park

□Margalla hills national park, is located in the foothills of the himalayan range. □Area is drained by the river kurang and its tributaries, which flow into the river soan □ Park is the most accessible park in pakistan due to its close proximity to the national capital, islamabad. □ Asiatic leopard, wild boar, golden jackal, rhesus macaque, leopard cat, are some of the mammals found in the park. □ Birds in the park include Himalayan Griffon vulture, Laggar falcon

Margalla Hills National Park

Thank you!

Zoological Parks in Pakistan

Learning Objectives

□ What are zoological parks? □ Importance of Zoological parks □ Pakista's faous zoological parks

#### Zoological Parks in Pakistan

A zoological park is a locatio here aials are kept i captiity for study ad ieig. □ The zoo originally evolved from the menageries of the ancient world, in which royalty would exhibit their collection of exotic pets. □ Unfortunately not all zoos are scientific in nature, and extreme controversy has arisen regarding how the animals are treated. □ Suffice to say, regulation is necessary to ensure proper care. □ Conservation (not exploitation) should always be the central goal behind any legitimate zoo.

#### Zoological Parks in Pakistan

□ Zoos provide the opportunity for people to see a glimpse of this side of nature. □ Zoo plays important role in conservation of many threatened/endangered species □ Wild animals in captivity help us manage and conserve them in the wild. □ Zoos raise money for conservation efforts. □ Zoo provides area for recreational purposes

#### Importance of Zoological Parks in Pakistan

Some of famous zoological parks in Pakistan are listed bellow; □ Bahawalpur Zoo □ Changa Manga Wildlife Park □ Clifton Fish Aquarium □Hyderabad Zoo □Islamabad Zoo □Jallo Wildlife Park □Jungle World

#### List of Zoological Parks in Pakistan

□ Karachi Municipal Aquarium □Karachi Safari Park □Karachi Zoo □ Lahore Walkthrough Aviary □Lahore Zoo □Lahore Zoo Safari □Landhi Korangi Aquarium □Landhi Korangi Zoo

#### Zoological Parks in Pakistan

Thank you!

#### Zoological Parks in Pakistan

##### Learning Objectives

□Pakista's faous zoological parks

#### Zoological Parks in Pakistan

□ Nawab of former state Bahawalpur, Sir Sadiq Muhammad Khan Abbasi, established Bahawalpur Zoo in 1942 □ It covers an area of 25 acres . □ The Bahawalpur Zoo came under administration of Wildlife Department in 1982. □ The lion, black tiger, fish, watch, crocodile and many other animals which were mummified during 1942 and 1974 are kept in museum □ Domestic cats, jackals, an Indian civet cat, Crocodiles, lions, tigers and hyenas etc are present in zoo

#### Bahawalpur Zoo

#### Bahawalpur Zoo

#### Lahore Safari Zoo

□ A Safari Zoo is established since 1996-2001 for public recreation within the suitable environmental location, □ It is just 13 KM away from motorway link Thokar Niazbaig, Multan Road, Lahore. □The Safari Zoo is offering stunning display of the animals and birds unique in this region. □ In 2004, the largest walkthrough aviary of Pakistan was constructed in the facility and was opened for visitors □ Amazing fact is that In July 2016, a record 34,340 tourists visited

Lahore's Safari Zoo and an income of Rs0.93 million was generated by wildlife and parks department

Lahore Safari Zoo

Thank you!

Botanical Garden

What is a botanical gardens?

It is a garden dedicated to the collection, cultivation and display of a wide range of plants labeled with their botanical names. It may contain specialist plant collections such as tropical plants, or other species of plants.

Types of plants in botanical gardens

- 1- cacti and succulent plants.
- 2- herb gardens.
- 3- greenhouses, shade houses.
- 4- tropical plants.
- 5-Medicinal Plants.
- 6- aromatic or textile plants
- 7- other exotic plants.

who is responsible for a botanical gardens?

Botanical gardens are often run by universities or other scientific research organizations, and often have associated herbaria and research programmers in plant taxonomy or some other aspect of botanical science.

Importance of Botanical garden

- 1- Enjoyment
- 2-Economic
- 3- Scientific research

Botanic gardens contain collections of plants for education, scientific purposes and display; they can be: taxonomically-based - collections of a particular family, genus or group of cultivars; or collections of native plants; or useful species such as medicinal, aromatic or textile plants.

4- conservation

conservation of rare and threatened plants. The conservation of plant diversity is critical for sustainable development and botanic gardens are playing a key role as centers of conservation action. \* Botanical gardens can promote diversity. Because they include many species of plant.



5- Climate Change plants can alter the temperature of the Earth's atmosphere. Through the process of photosynthesis, plants use energy from the sun to draw down carbon dioxide from the atmosphere and then use it to create the carbohydrates they need to grow. Since carbon dioxide is one of the most abundant greenhouse gases, the removal of the gas from the atmosphere may temper the warming of our planet as a whole. \*transpiration in plants can increase water vapor in the atmosphere, causing more precipitation and cloud cover in an area. The additional cloud cover often reinforces the cooling by blocking sunlight. \*Contribute to soil fertility and prevent soil erosion

#### Botanical Garden in Pakistan

##### List of botanical garden in Pakistan

Research botanical gardens □ Abdul Wali Khan University Botanical Garden, Mardan  
 □ Botanical Garden, Governor's House, Lahore □ Botanical Garden, Govt Zamindar College, Gujrat  
 □ Danishmandan Botanic Garden, Lahore □ Botanical Garden, University of the Punjab, Quaid-e-Azam Campus, Lahore  
 □ Faisalabad Botanical Gardens (part of Gatwala Wildlife Park), Faisalabad □ Forman Christian College Botanic Garden, Lahore □ Government College University Botanic Garden of GCU, Lahore  
 □ Karachi University Botanic Garden of Karachi University, Karachi  
 □ Lahore Botanical Gardens, Lahore □ National Herbarium, Islamabad □ Pakistan Forest Institute Botanical Garden of Pakistan Forest Institute, Peshawar  
 □ Quaid-i-Azam University Botanical Garden, Islamabad □ Shah Abdul Latif Herbarium and Botanical Garden of Shah Abdul Latif University, Khairpur  
 □ University of Peshawar Botanical Garden of University of Peshawar, Peshawar □ living plants museum of medicinal plants, Pakistan Forest Institute, Peshawar  
 Public botanical gardens  
 □ Bagh-e-Jinnah, Lahore □ Rani Bagh Arboretum, Hyderabad □ Sukh Chayn Gardens, Lahore

#### Ramsar Convention

##### History & Concept

History • Ramsar is one of the global inter-governmental environmental agreements. • The treaty was negotiated in 1960s by countries and NGOs

##### History & Concept

History • To avoid the increasing loss and degradation of wetland habitat for migratory water birds • In a 18 nations meeting it was adopted in the Iranian city of Ramsar On 2nd February 1971 • Came into force in 21st December 1975

##### History & Concept

Mission The Convention's objective is the wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world

##### History & Concept

The Convention uses a broad definition of wetlands which includes

• All lakes and rivers • Underground Aquifers • Swamps and Marshes • Wet Grasslands • Peatlands • Oases • Estuaries • Deltas • Tidal flats • Mangroves etc.

##### History & Concept



Concept • Wetlands are among the most diverse and productive ecosystems. • They provide essential services and supply all our fresh water. • Wetlands continue to be degraded and converted to other uses.

## History & Concept

The “three pillars” of the convention

The Contracting Parties(160)commit to: • Work towards the wise use of all their wetlands. • Designate suitable wetlands for the list of Wetlands of International Importance. • Cooperate internationally on transboundary wetlands, shared wetland systems and shared species

Significant Ramsar sites of Pakistan

Significant Ramsar sites of Pakistan

In 2013, 19 (nineteen) Ramsar sites has been declared in Pakistan.

Area • Covering an area of 1,343,627 hectares (3,320,170 acres)

Significant Ramsar sites of Pakistan

Religion wise significant ramsar sites of Pakistan

Baluchistan • Astola Island • Hub Dam • Jiwani Costal Wetland • Miani Hor • Ormara Turtle beach

Significant Ramsar sites of Pakistan

Sindh • Keenjhar (Kalri) Lake • Haleji Lake • Drigh Lake • Indus Dolphin reserve • Jubho lagoon • Nurri Lagoon • Deh Akro-II • Indus Delta • Runn of Kutch

Significant Ramsar sites of Pakistan

Punjab • Uchhali Complex • Taunsa Barrage • Chashma Barrage

Khyber Pakhtunkhwa • Tanda Dam • Thanedar Wala

Threats to Wetlands

Threats to Wetlands

Half of the orld’s etland hae disappeared since long.

• Continued development in all aspects is the need of hour with proper management • Unmanaged activities pose major threats to wetlands, despite their value and importance.

Threats to Wetlands

Industrial Development:

The rapid industrial development at the beginning of 19th century led to presentday situation of wetland being affected by human activities.

Invasive species

Alien invasive species have had severe impacts on local aquatic flora and fauna, and can upset the natural balance of an ecosystem. For example, the introduction of Nile perch to Lake Victoria has pushed many of the lake's native cichlid species to extinction.

Pollution

Pollution in wetlands is a growing concern, affecting drinking water sources and biological diversity. Drainage and run-off from fertilized crops and pesticides

used in industry introduce nitrogen and phosphorous nutrients and other toxins like mercury to water sources. These chemicals can affect the health and reproduction of species, posing a serious threat to biological diversity.

#### Climate change

Climate change is also taking its toll. Increases in temperature are causing polar ice to melt and sea levels to rise. This in turn is leading to shallow wetlands being swamped and some species of mangrove trees being submerged and drowned.

#### Dams

Worldwide there are now over 40,000 dams which alter the natural flow of water and impact on existing ecosystems.

Thank You!

#### Wildlife Sanctuaries in Pakistan

##### Learning Objectives

□ What is Wildlife Sanctuary? □ Importance of wildlife sanctuary. □ list of wildlife sanctuaries in Pakistan

#### Wildlife Sanctuaries in Pakistan

Sanctuary is an area which is of adequate ecological, faunal, floral, Geographical, and zoological significance. □ The Sanctuary is declared for the purpose of protecting, propagating or developing wildlife or its environment □ A sanctuary is a protected area which is reserved for the conservation of only animal and human activities like harvesting of timber, collecting minor forest products and private ownership rights are allowed as long as they do not interfere with well-being of animals □ Boundaries of sanctuaries are not well defined and controlled biotic interference is permitted

#### Wildlife Sanctuaries in Pakistan

##### Importance of Wildlife Sanctuaries

□ Sanctuary is created for the purpose of protecting endangered species with a limited territorial range □ Endangered species in wildlife sanctuaries are typically closely monitored □ Wildlife sanctuaries offer wildlife rehabilitation □ Wildlife sanctuaries help to preserve and bring back endangered species by giving them a natural environment to live in while they are in no danger of predators or humans. □ Wildlife sanctuaries also educate people about the creatures so that they can maybe help in preserving them

Wildlife Sanctuaries of Pakistan are;

- 1) Astor Wildlife Sanctuary
- 2) Baltistan Wildlife Sanctuary
- 3) Chasma and Taunsa Barrage Dolphin Sanctuary
- 4) Cholistan Wildlife Sanctuary
- 5) Hab Dam Wildlife Sanctuary
- 6) Kargah Wildlife Sanctuary

#### Wildlife Sanctuaries in Pakistan

7) Mahal Kohistan Wildlife Sanctuary

8) Naltar Wildlife Sanctuary

9) Nara Desert wildlife Sanctuary

10) Rann of Kutch Wildlife Sanctuary

Wildlife Sanctuaries in Pakistan

Thank you!

Wildlife Sanctuaries in Pakistan

Learning Objectives

□ list of wildlife sanctuaries in Pakistan

Wildlife Sanctuaries in Pakistan

Wildlife Sanctuaries of Pakistan are;

1) Baltistan Wildlife Sanctuary

2) Chasma and Taunsa Barrage Dolphin Sanctuary

3) Cholistan Wildlife Sanctuary

4) Hab Dam Wildlife Sanctuary

5) Kargah Wildlife Sanctuary

Wildlife Sanctuaries in Pakistan

7) Mahal Kohistan Wildlife Sanctuary

8) Naltar Wildlife Sanctuary

9) Nara Desert wildlife Sanctuary

10) Rann of Kutch Wildlife Sanctuary

Wildlife Sanctuaries in Pakistan

Rann of Kutch Wildlife Sanctuary

□ Rann of Kutch Wildlife Sanctuary, spread over 566,375 ha is part of the great Thar desert and comprises □ Rann of Kutch across the frontier with India, which includes permanent saline marshes, coastal brackish lagoons, tidal mudflats, and estuarine habitats. □ The site supports many locally and globally threatened species, □ Threatened species include the Great Indian bustard, Houbara bustard, Sarus crane □ This area used to have the only population of the Indian Wild Ass or Onager in Pakistan.

Rann of Kutch Wildlife Sanctuary

Chasma and Taunsa Barrage Dolphin Sanctuary

□ Chashma and Taunsa Barrage are declared Wildlife Sanctuaries by the Punjab government. □ A very important breeding, staging and wintering area for a wide variety of waterfowl, including at least one threatened species (*Marmaronetta angustirostris*). □ Mid-winter waterfowl counts in recent years have regularly exceeded 20,000 birds. □ The endangered Indus Dolphin (*Platanista indi*) occurs in the river both upstream and downstream of the barrage. □ Since the 1970s, the population of the Indus Dolphin has significantly increased here

Chasma and Taunsa Barrage Dolphin Sanctuary

□ Cholistan Wildlife Sanctuary is part of the Cholistan desert in the south eastern portion of the province of Punjab

- It contains some of the most rare and interesting wildlife in Pakistan.
- Some of the rare animals of this region are Desert wolf (rare), Indian fox, Red fox, Jackal, Small Indian civet, Small Indian mongoose, Indian grey mongoose, Indian desert cat, Jungle cat, Caracal cat, Saker falcon, Black backed vulture, Indian cobra, Monitor lizard, Saw scaled viper and Russells viper

Cholistan Wildlife Sanctuary

Cholistan Wildlife Sanctuary

Concept of Game Reserve

Concept of Game Reserve

Definition: A game reserve is a area herei otrolled hutig ad shootig is peritted o perit asis

A game reserve (wildlife preserve) is a large area of land where wild animals live safely or are hunted in a controlled way for sport.

Concept of Game Reserve • In the game reserves the major focus is specifically the animals. • If hunting is prohibited, a game reserve may be considered a Nature Reserve • Wherein all aspects of naturally-occurring life in the area are considered.

Concept of Game Reserve

- Most of the areas in game reserves have created to provide habitat protection for animal species commonly referred to as game (hunnable species for sport or meat)

Concept of Game Reserve

- Game Count: • Game count to be conducted as it provides an estimation of the game population
- It is to ascertain the number of female animals, as this indicates the production potential. ◦

Concept of Game Reserve

- It is a estimate that alkgig 6k to ater is't uatural for a aial. • Soe of the Reserve's ater poits ill e doe aay or oed to ore suitable locations.

Critically Endangered Animals

Bulmer's Fruit Bat

The Bulmer's Fruit bat is elisted as Critically Endangered (CR) Facing an extremely high risk of extinction in the wild, on the IUCN red list of threatened species.

Major threats:

This is the large bat that has been hunted for meat at the known sites.

Great Indian Bustard

The 2011 Red List of birds, released by the International Union for Conservation of Nature (IUCN), has enlisted the bird in the critically Endangered category, the highest level of threat. The population of the species is estimated to be just 250.

Hunting, habitat loss and fragmentation have reduced the number of this species, which was found in large numbers in the grasslands of India and Pakistan. But their population is now restricted to small and isolated fragments of remaining habitats, says the Birdlife International, which prepared the list.

#### Madagascar Pochard

The Madagascan Pochard is endemic to the island. It is very rare and was known only from a single location in the northern central plateau, at Lake Alaotra basin. In spite of several breeding attempts between 2006 and 2012, only 21 adults were counted in 2012. The young die by starvation due to absence of adequate food items and too deep water. Hunting and trapping, and increase of human population involving degradation of the habitat are important threats. Introduction of exotic plants, mammals (Rats) and fish have destroyed the food supplies. Nest predation by rats and raptors also occurs regularly.

#### Pygmy Three-Toed Sloth

Classified as critically endangered and believed to have a rapidly declining population and habitat area, pygmy three-toed sloths (*Bradypus pygmaeus*) are entirely native to the island of Escudo De Veragua, off the Caribbean coast of Panama. The most recent data on these sloths is disheartening, indicating there may be only 48 left, a significant decrease from the last estimate of 79 in 2013. Threats: ☐ Illegal logging of mangrove forests for firewood and ☐ Hunting

In Vitro Germplasm Conservation

In Vitro Germplasm Conservation

In 1972, conservation of habitats rich in genetic diversity was recommended in the UN conference. Then an International Board for Plant Genetic Resource (IBPGR) was established.

This board has objectives to provide necessary support for collection, conservation and utilization of plant genetic resources from anywhere in the world.

#### Modes of Conservation

##### (a) In situ Conservation:

Since 1980, in situ conservation has received high priority in the world conservation strategy. The method of conservation is to preserve land races with wild relatives in which genetic diversity exists.

##### 1. Modes of Conservation

##### (b) Ex situ Conservation

It is the chief mode of conservation of genetic resources including both cultivated and wild ones. Under suitable conditions genetic resources are conserved for a long term as gene bank. Such gene bank is of two types:

##### (i) In vivo Gene Bank

##### (ii) In vitro Gene Bank

#### Modes of Conservation

(i) In vivo Gene Bank:

Generally plant seeds, vegetative propagules are used for storage for long time. The whole plants are preserved. This type of conservation strategy is called in vivo gene bank. In this approach, conservation method of storage is used for preservation of plant genetic resources

Modes of Conservation

(ii) In vitro Gene Bank:

This approach includes the conservation of genetic resources by non conventional methods. In this approach explants are grown on medium.

In vitro Germplasm conservation

Methods of Preservation

Free Preservation or Cryopreservation:

Cryopreservation (Latin Kuos means frost) means storage of materials at very low temperature. Plant cells and tissue cultures are brought to zero state of metabolism by subjecting them to ultra-low temperature i.e.  $-196^{\circ}\text{C}$ .

It is done by using liquid nitrogen which provides approximately  $-496^{\circ}\text{C}$ . Cryoprotectants (e.g. glycerol, proline, mannitol, dimethylsulfoxide, sorbitol) are also used to protect the viable cells from the damage during freezing and thawing (to become unfrozen or warm).

Cold Storage

Germplasm of some plants (in the form of shoot tips, nodal or meristem explant culture) are stored at low and non-freezing temperature ( $1-9^{\circ}\text{C}$ ). At low temperature, growth of plant material is slow down but not completely stopped as in cryo-preservation. In cold storage there is no risk of cold injuries.

Low-pressure and Low-oxygen Storage:

For conservation of cultured plant materials low-pressure storage (LPS) and low oxygen storage (LOS) have been developed. These are alternative methods of cryopreservation and cold storage.