Plant resources, Concept, Status and Concern

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Resource

- Resource is a substance present in the environment that is useful for people, is economically and technologically feasible to access and socially acceptable to use.

- Resource include soil, water, food, plants, minerals and animals.

- A resource is a supply, from which benefits are produced. Typically resources are materials or other assets that are transformed to produce benefits and the process may be consumed or made unavailable.

- Resources or natural resource are naturally occurring material that a human population at any given state of economic development or technological awareness, perceives to be necessary and useful to its economic and material-wellbeing.

Classification of resources

- Resources can be classified in the following ways
- -on the basis of origin
- -on the basis of exhaustibility
- -on the basis of ownership
- -on the basis of status of development

On the basis of origin

- Biotic resources-These are obtained from biosphere and they have life such as human beings, flora and fauna, fisheries livestock

- Abiotic resources- These include all those things composed of non living things such as soil, minerals

On the basis of exhaustibility

► Resources that can be either renewable or non-renewable on the basis of whether they can be renewed or reproduced by physical or chemical or mechanical processes For example solar, wind, forest, wild-life etc.

► Renewable resources can further be of two types-

► Continuous or flow resources – wind, water, solar energy etc.

► Biological resources- forest, wildlife, natural vegetation

► Non renewable resources-These are formed over a long geological time scale. For example mineral and fossil fuels

► Non renewable resources can be of two types

► Recyclable resource- Metal

► Non recyclable resource-which get exhausted on utilization on usage and cannot be recycled – For e.g.. Fossil fuels

On the basis of ownership

- Private/Individual resource- These are the resources owned by individual privately For example- Land owned by farmers (allotted by government against payment of revenue), plantations, ponds (if in individual land), plots, houses in cities etc.

- Community resource-Resources accessible to all members of a community. For example public parks, grazing ground, playgrounds etc.

- National resource-Resources that belong to a nation- For example, roads, canals, minerals, wildlife, land within political boundary, territorial water (ocean area up to 19.2 kms)

- International Resource- International resources where no individual country can utilize these without the consensus of international organizations.

On the basis of state development

► Potential resources-Resources which may exist in a region and may be used in the future. For example mineral oil which may be present in different parts of the country may be considered a potential resource which may be used on drilling

► Developed resource-Resources which have been surveyed and the actual quantity and quality has been determined and are used in the present state For example Petroleum and natural gas obtained for Bombay High Fields.

► Stock-Material in the environment which have potential to satisfy human need but human beings do not have technology to access these. For example Water is a compound of two inflammable gases hydrogen and oxygen but we do not have the technology to separate these from the oceanic water

► Reserve-These are subset of stock which are yet to put into use by the existing technical know-hows. These can be used for meeting future requirements For example River water used for generating hydroelectric power, but presently it is only used only to a limited extent. Thus, the water in the dam is a reserve that can be used in future

Development of resource

- It is the process of developing a resource to make them useful for human use and needs.

- Some resources can be used directly.

- Other resources cannot be used directly. For example land has to be cleared before ploughing or growing crops.

- Water has be taken to fields to irrigate the crops

Problems created by indiscriminate use of resources

- Many resources got depleted. Fro ex forests

- Resources get accumulated in the hands of few people. This divides the people into rich and poor

- Global warming, ozone depletion, environmental degradation and other problems (flood, desertification)

Sustainable economic development

- The economic development that does not damage the environment and at the same time takes care of the needs of the future generations is called sustainable development.

- Sustainable development is important because:

- Many of the resources are non-renewable and exhaustible. Over exploitation of these sources will affect the needs of our future generations

- Environment pollution has become a major threat to the survival of human beings

Resource Planning

- Resource planning is a technique or skill of proper utilization of resources

- STAGES OF RESOURCE PLANNING

- A) Identification and listing of resources- Surveying, mapping and the measurement of the qualities and the quantities of the resources are the activities undertaken in this stage.

- B) Planning of exploitation-develop a planning structure with suitable technology, skill and institutional setup.

- C) Match resource development plans with national development plants.

Importance of resource planning

- It is necessary for balanced development in India

- Some regions of our country are rich in certain resources and poor in some other resources. For E.g. Rajasthan is poor in water resource but rich in solar and wind energy

- Some regions are self sufficient while others are very poor in resources For E.g.. Madhya Pradesh is rich in many resources but Ladakh is poor in resources

- Wastage of resource can be avoided by planning

- Environmental pollution can be reduced

- Over exploitation of resources can be avoided.

Resource conservation

- Planned use of resources in order to meet the present needs and to store a part for future generations is called resource conservation

- It is necessary because-Many resources are non-renewable and exhaustible. If we conserve tem we can use the for a longer period of time

- Conservation of resources helps us to reduce wastage. It will help in economic progress

- Resource conservation helps us to protect the environment

Importance of plant resource

- ► Ecological benefits/services- They provide the buffering capacity and stability to life on planet and maintain interactive dynamics of the ecosystems of the world

- ► Economic benefit

- ► Food value- provide food to the human population on earth

- ► Commercial value- In the form of product like timber (which provides material used for providing shelter to man) Natural fibers like cotton and silk (still used for clothing by human population)

- ► Medicinal value- Medicines, drugs and pharmaceutical. Many genetic resources are used from a derivation of basic drugs (Traditional knowledge of indigenous plants provide scientific knowledge in this field)

- ► Aesthetic value-Natural beauty has inspired human beings resulting in development of his thinking process used for economic and commercial progress.

- ► Cultural value- Plants are deeply associated with culture.

Principles for conserving biodiversity

- Each form of life is unique and warrants respect from humanity. Every life form have right to live in their habitat

- Biodiversity conservation is an investment that yields substile local, national and global benefits in terms of medicines, genetic resources

- As part of larger effort to achieve sustainable development biodiversity conservation require fundamental changes in patterns and practice of economic, social and cultural development

- Increased funding or biodiversity conservation will not by itself slow biodiversity loss. Policy and institutional reforms, peoples participation networking of efforts are needed to created the conditions under which increased funding can percolate to the desired locations.

- Biodiversity conservation can be sustained only if people's involvement, awareness and concern are substantially heightened and addressed.

- Priorities for biodiversity conservation differ when viewed from local, national and global prescptives; All communities have vested interest and old traditions in conserving their biodiversity. The focus should not be exclusively on a few species rich ecosystem or areas. It should be logical and realistic with broader vision

Principles of conserving biodiversity

► Action to conserve biodiversity must be planned and implemented at a scale determined and implemented at scale determined ecological and social criterial. The focus of activity must be in the vicinity where people live and work as well as in wild land areas.

► Cultural diversity is closely linked to biodiversity. Humanity's collective knowledge of biodiversity and its use and managements rests in cultural diversity, conversely conserving biodiversity often helps strengthen cultural integrity and value

► Respect, preserve and maintain knowledge innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for conservation and sustainable use of biodiversity and promote their wider application

► Caring biodiversity before introducing any technological development. Protocol to care for this should be a part of new initiatives.

► Identification of keystone species, edge (evolutionarily distinct and globally endangered) species, flagship (species chosen to raise support for biodiversity conservation in a given place or social context) species and looking into causes of their threat and measures to check it

Flagship and Umbrella species

► Flagship- species chosen to represent an environmental cause, such as an ecosystem in need of conservation.

► Species are chosen for their vulnerability, attractiveness or distinctiveness in order to generate support and acknowledgment from the public at large.

► It gives publicity to few key species, the support given to those species will successfully leverage conservation of entire ecosystem

► Umbrella species are species selected for making conservation related decisions, typically because protecting these species indirectly protects many other species that make up the ecological community of its habitat.

Protected areas of India

- Areas in which human occupation or at least the exploitation of resources is limited.   It is defined as a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated eco-system services and cultural values.

- Several kinds of protected areas, which vary by level of protection depending on the enabling laws of each country or regulations of the international organizations involved.

- "Protected area" also includes marine protected area, the boundaries of which will include some area of ocean, transboundary protected areas that overlap multiple countries that remove the borders inside the area for conservation and economic purposes

- India has the following protected areas-National parks, Wildlife Sanctuaries, Conservation reserves, community reserves, marine protected areas

National Parks

- Protected areas, declared and owned by the central government.

- India first national park was established in 1936, Jim Corbett National Park.

- At present there are 103 national park with 1.2% geographical area

Wildlife Sanctuary

► Any area other than area comprised with any reserve forest or territorial waters can be notified by state government to constitute as a sanctuary if such area is of adequate ecological, faunal, floral, geomorphological, natural or zoological significance, for the purpose of protecting, propagating or developing wildlife or its environment.

► Some restricted human activity is allowed inside the sanctuary area

Conservation reserves and community reserves

- These are protected areas of India which typically act as buffer zones or connectors and migration corridors between established national parks, wildlife sanctuaries and reserved and protected forest of India.

- These area are designated as conservation reserves if they are uninhabited or completely owned by Government of India but used fro subsistence (livelihood) by communities

- Community reserves-If part of the land is privately owned

Marine protected areas(MPA)

- ► Areas of seas, oceans or estuaries.

- ► It is a space in ocean where human activities are more strictly regulated than the surrounding water for the conservation purpose.

- ► These places are given special protections for natural or historic marine resources by local, state, territorial, native, regional or national authorities

Biosphere reserves

► These are special category of protected areas of land and or coastal environment where people are an integral components of the system

► These are representative examples of natural biomes and contain unique biological communities.

► Concept of biosphere was a part of Man and Biosphere (MAB) programme 1971, which is an inter-governmental Scientific programme that aims to establish a scientific basis for improvement of relationships between people and their environments. It predicts the consequences of today's action on tomorrow's world and thereby increases people's ability to efficiently manage natural resources for the well-being of both human populations and the environment.

► First biosphere reserve was in 1979, and now we have 18 biosphere reserves

► The reserves are rich in biological and cultural diversity and encompass unique features of exceptionally pristine nature.

Biosphere reserves

- The goal is to facilitate conservation of representative landscapes and their immense biological diversity and cultural heritage-(Conservation function), foster economic and human development which is culturally and ecologically sustainable (developmental function) and to provide support for research monitoring, education and information exchange (logistic function).

- Structure of biosphere reserved includes

- Core zone- undisturbed or least disturbed area of representative ecosystem

- Buffer Zone- Surrounds the core zone and is managed for research, education and training activities. Traditional activities including timber production, hunting fishing, grazing are permitted

- Transition zone-Outermost part of the biosphere reserve with active cooperation between reserve management and the local people, wherein activities like settlements, cropping, forestry and recreation and other economic uses continue in harmony with conservation goals

Sacred groves

- Patches of forests of varying sizes that are protected by local communities because of their religious beliefs and traditional rituals that run through generations. The degree of sanctity of sacred forests varies from one place to other. People believe that ant kind of disturbance will offend the local deity causing diseases, natural calamity or failure of crops.

- For example Garo and Khasi tribes prohibit human interference in sacred groves

Uttar Pradesh

- The state has a geographical area of 240,927 Km2 (7% of area of India). The diversity of habitat has diverse plains, which spreads across the region of Terai, the Gangetic plains, and the Bundelkhand

- Terai region has moist deciduous forest, forests near the river banks, and grasslands.

- Gangetic plains have scattered sal dominated and mixed forest, and dry thorny forests.

- Bundelkhand regions has the dry deciduous forests

- There are scattered wetlands which attract the water birds and migratory birds. The gangetic stretches also home Gangetic dolphin and two crocodile species- Gharial (Gavialis gangeticus) and Muggar (Crocodylus palustris). f

Region	Habitat Type	Vegetation
Terai Region	Moist deciduous fores (sal dominated/ Mixed)	Shorea robusta, Adina cordifolia, Syzygium cumini, Mallotus philippensis, Callicarpa macrophylla, Murraya koenigii, Clerodendrum viscosum, Helecteres isora, Mitragyna parviflora, Maghania macrophylla, Grewia asiatica, Zizyphus mauritiana, Carissa spinarum, Aegle marmelos, Tectona grandis, Ficus semicordata, Acacia catechu, Terminalia bellerica, T. arjuna
	Forests along the river banks	Acacia catechu and Dalbergia sissoo and associates like Trewia nudiflora, Mallotus philippensis
	Grasslands	Saccharum benghalensis, Phragmites karka, Vetiveria zizanoides, Cymbopogon flexuosus, Desmostachya bipinnata, Themeda arundinacea, Dichanthium annulatum,

Vegetation

Gangetic planes	**Sal and mixed forest (scattered)**	**Lagerstroemia parviflora, Miliusa velutina, Cassia fistula, Buchanania latifolia, Diospyros tomentosa, Dillenia entagyna, Bauhina vahlii, Milletia extensa, Clerodendurm viscosum,**
	Dry Thorny forest	Ziziphus xylocarpus, Z. mauritiana, Z. mummularia, Butea monosperma, Calotropis procera, Prosopis spicigera,
Bundelkh and	**Dry deciduous froest/ Mixed thorny**	**Terminalia bellerica, T. elliptica, Tectona grandis, Bombaxceiba, Cochlospermum religiosum, Diospyros melanoxylon, Lagerstroemia parviflora, Acacia catehu, Calotropisprocera, Rhynchosia minima, Mucuna pruriens, Tinsopora cordifolia, Dioscorea hispida, Ziziphus xylocarpus, Prosopis spicigera, Butea monosperma, Acacia nilotica,etc**

Vegetation composition

► There are about 3987 species flora of the state (Srivastava, 2001)

Angiosperms	2711
Pteridophytes	33
Bryophytes	19
Lichens	26
Fungi	500
Algae	698

Endemic Plants (Sristava, 2001)
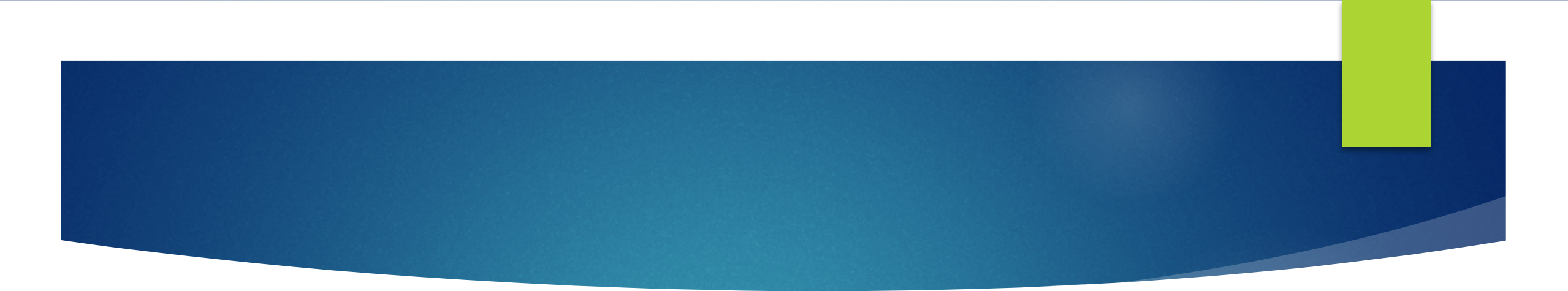
Name of the species	Place of occurance
Rorippa pseudoislandica (Brassicaceae)	Hamirpur
Derris kanifillalii (Fabaceae)	Pilibit
Derris scandens(Fabaceae)	Saharanpur
Indigofera thotharthrii (Fabaceae	Bahraich
Diospyros holeana (Ebenaceae)	Gonda
Brachystelma'laevigatum(Asclepiadaceae)	Gorakpur
Brachystelma'pauciflorum(Asclepiadaceae)	Bahraich
Alectra chitrakutensis (Scrophulariaceae)	Banda
Hemarthria hamiltoniana (Poaceae)	Upper Ganga Plains
Cymbopogon flexuosus (Poaceae)	Sahranpur

Usage of plants as food and medicine

- ► Some plants found in local diversity are used as food Bauhinia variegate, Cordia oblique, Madhuca ilikendica, Emblica officinalis, Grewia tiliaefolia, Schleicher trijuga,etc.

- ► Some plants found in the local diversity are used as medicine Aristolochia indica, Casearia tomentosa, Acacia catechu, Colebrookia oppositifolia,

Local biodiversity

- Refers to the diversity present in the locality

- Refers to the plants that grow in that area naturally/alpha diversity. This is the diversity in species, i.e. the number of species within a community. This depends on the interaction between the biotic and abiotic factors and also takes into account immigration from other locations.

- Local plant diversity depends on the species richness and soil pH 9

- Local biodiversity provides direct, indirect benefits and option value

- Direct benefit can be of commercial value or consumptive value (non market value) consumptive value include firewood, fodder, meat, fruits vegetables for human consumption. Consumptive value include formation of habitats, providing conditions necessary for human survival

- Indirect values deal with functions of ecosystem. It includes non consumptive value,social, ethical and aesthetic value

- Non consumptive value-Photosynthesis, regulation of climate, production of soil, removal of pollution Eg. Plants functioning as air purifiers

- Social Value- religious, spiritual and cultural value. Ritual significance of many plants and animals. Eg. Hibiscus offered to goddess, Datura to lord Shiva, Sacred groves

- Ethical value- Ethical values claim that humans have a duty to protect species. People must learn to minimize environmental damage and learn to take responsibility of their action and maintain the earth. Eg. Maintenance of wetlands (ponds) etc

- Aesthetic value- Enlightened self interest, creativeness , happiness resulting in development of human beings. Eg. Hiking, Mountain climbing

- Option Value- Providing options for future, in form of genes. They provide genes for future. Eg. Pharmaceutical vlaue

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► Thank You