International Journal of Research in Economics and Social Sciences(IJRESS)
Available online at http://euroasiapub.org/journals.php
Vol. 6 Issue 12, December 2016
ISSN: 2249-7382 Impact Factor: 6.225 | Thomson Reuters ID: L-5236-2015

Biodiversity Information of India : Status and Scope

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Abstract:

Environmental services in species and ecosystems are needed globally, regionally and locally. India is a large nation and has about 10% of the world's species. It also has a rich cultural heritage of thousands of years ago. Much of Indian biodiversity is related to the socio-cultural practices of the land. Unfortunately, many species are in danger of extinction due to population explosion, climate change and poor implementation of environmental policies. Of the 35 biodiversity hotspots in the country, two are biodiversity hotspots: the Indo-Malayan, comprising the eastern Himalayas, north-eastern India and the Andaman Islands and the Western Ghats. These regions have some important gene-pools of medicinal plants, crops of wild varieties and other species of economic importance as well as numerous endemic and RET plant species. The conservation of this national wealth is of paramount importance at a time when increasing pressure on plant diversity in the form of land use and land cover changes, invasive species, global warming, nutrient accumulation and climate change.

Introduction:

Biodiversity is an important source for technological advancement in agriculture, medicine and other technological innovations. Loss of biodiversity reduces our ability to adapt to change. This loss is exacerbated by a lack of knowledge of biodiversity, especially among people with close ties to the natural ecosystem. Currently India has a special reference in all the biodiversity rich tropics and sub-tropics; the local representation environmental database almost does not exist. Existing databases of existing species with institutions like BSI and detailed ecological and edifice databases of selected study sites that exist with selected schools of environment in the country are not locally linked. In addition, due to the lack of dimensions of various ecosystems, it is not possible to up-scaling the database to the regional level. Population composition, population dynamics, lack of adequate and authentic

locally based databases on basic and finite factors, makes it difficult to characterize, monitor and conserve species. Recent improvements in remote sensing and GIS have enabled us to equip plant species based on the classification of species and local maps and environmental drivers.

Biodiversity certification is a major challenge in biodiversity conservation. Until recently, the local environmental database in India was almost non-existent. Existing databases on floristic and detailed environmental and edifice databases of selected study areas are not linked to space. In addition, up-scaling of databases at the regional level is not currently possible in the absence of parameters of different ecosystems. Nose came up with a new concept that no strong measure of biodiversity existed in the recent future, so an executive measure of biodiversity would be a "feature" of biodiversity. With the current technological capabilities, it is certain that the rate of extinction of existing species will lag behind biodiversity discovery and characterization. So it would be beneficial to identify the areas rich in biodiversity and evaluate them in depth in search of biodiversity. Recent improvements in remote sensing technology and geographic information systems have enabled us to classify plants based on environmental gradients and environmental drivers, create maps of endemic species, and equip plant types.

Today the landscape is shaped by the powerful-current forces for the origin of the human race that has evolved and budded the geographical changes. Landscape evolution in the pre-industrial era mainly influenced natural changes, but in recent years, especially in the last three centuries, the forces of human origin have brought about more profound changes in less time. In most cases anthropogenic forces were detrimental to the ecosystem process, commonly known as disruption, and are universally universal phenomena. There is rarely a habitable part of the earth that is not in some or other trouble. Landscape can be thought of as a controversial assembly or mosaic of interior similar elements or patches, such as forest, agricultural and urban / rural blocks. Factors leading to the development of landscape patterns include a combination of human and human-agents. The geography of the region, including the regional climate, is strongly linked to the geology of the region, the distribution of surface water, and the types of vegetation that exist on the site.

Indian Situation:

India is one of the twelve mega-biodiversity countries in the world. With only 3.3 per cent of the land area, India already has a per cent to cent per cent share of the world's recorded species. The Botanical Survey of India and the Indian Zoological Survey have recorded more than 47,000 species of plants and 1,000,000 species, respectively. India is also one of the twelve primary centres of origin of cultivated plants and is rich in agricultural biodiversity. India is equally rich in traditional and indigenous knowledge, coded and informal about the use and importance of biodiversity in both countries. For generations, thousands of human communities have been living in the midst of this rich biodiversity and have developed an everlasting lifestyle of coexistent nature with natural heights around them. Over the past two centuries, this equation has been fundamentally challenged and threatened by various elements. One of them is the social and political order that favours the maximum exploration of natural resources to achieve a certain pattern of 'development' and the top-down model of conservation that ignores and threatens the very existence of conservation's first allies. For their physical, social, emotional and moral life, truly for their livelihood, they are wholeheartedly involved in the environment around them.

Due to the current trend of globalization and intellectual property rights (IPR) regimes, there is an urgent need for proper and scientific assessment and documentation of the basis of biodiversity and related knowledge, especially in developing countries in the tropics. Traditional knowledge sharing methods are not always open and are limited based on hierarchy, community, caste and class. Because most of the information is undocumented, information on the use of various utilities and biodiversity in tropical developing countries may be destroyed or privatized by some multinational companies in order to extract resources and nutrition from the poor. The challenge of the 21st century is, for the first time, developing knowledge of the nation's biodiversity in all its complexities in order to sustainably conserve and utilize these resources. This knowledge is important for science and society to sustain the nation's natural resources, to grow their economy, to sustain human health and agriculture, and to improve the quality of human life. We urgently need this knowledge as the rapid transformation of biodiversity and its habitats increases as we transform natural systems into changing systems in human life on a daily basis.

Community of Plants in Assessment of Biodiversity:

Biodiversity is collectively related to the plant community. The plant community or organization determines the biodiversity of the environment. The plant community improves the functioning of the ecosystem necessary for the survival of the species. An important component of the assessment of the biodiversity covered by the large number is the diversity of the plant community. So community characteristics should be analysed for rapid and effective biodiversity assessment. In addition plant species usually exist in association with selected species and any change in the structure of the species can bring about changes in the plant community and therefore changes in the biodiversity or environment of the area. Changes in ecological biodiversity are caused by three basic environmental processes: 1) invasion of exotic plants; 2) Progressive legacy as part of the environmental process and 3) Regressive evolution due to natural and anthropological pressures on the environment. Assessment of changes in biodiversity or biodiversity conditions is indicated by the presence of indicator species and the distribution and abundance of keystone species.

Indicator Species of Keystone and Assessment of Biodiversity:

Indicative species can play a major role in the rapid assessment of the biodiversity status of a region. Inadequate richness in soil and plant waste, for example, is a good indicator of rich diversity in the presence of ecosystems. Recent studies have shown that identifying and analysing the behaviour of some of the indicative species in a community can predict% %% species differences in that community. Keystone species, on the other hand, are responsible for the subsistence of the existing community, and changes in the abundance and distribution of keystone species will result in irreversible changes in the ecological structure in terms of ecological structure that will affect biodiversity. It is also important to assess keystone species and keystone species in the community and to preserve and maintain biodiversity in the environment as their removal will cause permanent damage to the environment. One possible way to characterize keystone species in forest ecosystems is to focus on the competitiveness of species with gradients, respectively, and their role in helping or contributing to the conservation of existing plants.

1. **Biodiversity Assessment:** The spatial organization of Earth's biodiversity develops with the physical environment of the region, in general and with local biological influences in particular. It is also understood that ecosystems do not exist as separate

units but are constantly represented on environmental gradients with different land cover patches in the form of landscapes. The landscape represents a mosaic of interactive interactions in relatively large to very large areas including a variety of land use and land cover. Patch dynamics in landscape, an important environmental process, is well understood and explained by analyzing the size, shape and arrangement of patches in time and space. These patches are repositories of past and present environmental events and situations with social interaction. The landscape process has a significant impact on the diversity of the landscape level and makes it an important characteristic parameter of the landscape. Tax collection can make an accurate representation of some biological distribution where surveys designed to facilitate data collection and easy resume have been used. Tax collection can also be used with some reliability on rough scales but generally becomes less reliable than individual stocks. Museum and herbarium data on taxa locations, on the other hand, is biased, compiled for a different purpose, and often in an opportunistic way, allowing collectors to find the location they were looking for or easily accessible.

2. **Assessment of Biodiversity and its Hierarchy:** At the landscape level, observable properties include the identification, distribution and proportion of each type of habitat, and the distribution of species in those settlements. At the ecosystem level, prosperity, equality and diversity of species, societies and communities are important. At the species level, each population may have an interest in abundance, density, and biomass. And, at the genetic level, the genetic diversity of individual organisms in a population is important. At all these levels of the organization, it is better to evaluate the biodiversity and use different approaches at different local and global levels. For these reasons, understanding the priorities of biodiversity conservation and management led to a shift in policy from habitat conservation to individual settlements through an interactive network of species at the landscape level. In this 'top-down' method, biodiversity can be first characterized at the landscape level and then a comprehensive list can be created for the area to be prioritized. This ‘top-down’ approach allows extrapolation to large landscapes and involves the development and systematic maintenance of a local environmental database. Due to the complexity of biodiversity, surrogates such as species subgroups, species

assemblies and habitat types have to be used as biodiversity solutions and locations of these surrogates in these areas have to be designed so that similarities or differences between areas can be estimated. . In most parts of the world, only local information is available on high-order surrogates, such as plant types and environmental classes. Maps of plant types and / or ecological classes provide spatial coherence over a wide area. High levels in the biological hierarchy such as species assemblies, habitat types and ecosystems lose biological precision, but they have other advantages.

3. **Landscape Level and Assessment of Biodiversity:** An ecosystem is a unit of space composed of a group of different organizations with different divisions depending on their structure and function, including the exchange of energy and individuals in the system as well as other neighbouring ecosystems. Studying ecosystem dynamics and biodiversity changes at the patch level seems to be an attractive ecological basis for understanding this process, but landscape ecology assumes the localization of ecosystems, habitats, or communities that have an environmental impact on a large area of ecological functions and biodiversity. Delivery. Landscape ecology is considered an integral part of the broader concept of landscape heterogeneity for biodiversity management and conservation. Therefore, in order to characterize the landscape, diversity plays an important role; they act as insurance by increasing the ability to resist change. In an effort to conserve biodiversity, many protected areas have been identified. Although these areas are protected, they are not free from various levels of human intervention. It is therefore necessary to study the position, interaction and importance of landscape elements. In order to fully understand the complex mechanisms that control biodiversity, as well as their spatial and temporal dynamics, it is necessary to adopt a synchronous approach to measurement methods, pattern design and technology. Data requirements include data of both spatial and non-spatial types and of different time ratios. From this perspective, the combination of satellite remote sensing, Global Positioning System (GPS), and Integrative Tools is an important complimentary system for land-based studies.

Biodiversity and its Scale:

The concept of scale is important for the study of the environment, especially when talking about multi-dimensional and hierarchical concepts such as biodiversity. Different levels of biodiversity have to be addressed at different levels as information tools that summarize the status and trends of biodiversity as a biodiversity indicator. Genes, species and ecosystems can be measured differently in time and space. The local level is critical for the sample design of the monitoring program required for indicator construction. Biodiversity assessment is sensitive to sample size and the area surveyed. Whitaker proposed three aspects of biodiversity to measure diversity in scales. Alpha diversity is the diversity of a particular region or ecosystem and is usually expressed by the number of species in that environment; Beta diversity is used to monitor changes in species diversity between ecosystems and gamma diversity, which is a measure of the overall diversity of different ecosystems in the region. Landscape composition can be measured according to the size of the species composition. The simplest approach is Landscape Richness i.e. the number of different patch types in the landscape. The second approach involves having a relative quantity or abundance of different patch types with richness. The measurement of landscape diversity is identical to the general measurement of species diversity. Different patch types provide a combination of different habitats and species, thus it can be expected that the total number of species in the landscape will increase while the prosperity in the landscape increases.

Quantification of Biodiversity Assessment with Indian Situation:

An ecosystem is a unit of space composed of a group of different organizations with different divisions depending on their structure and function, including the exchange of energy and individuals in the system as well as other neighbouring ecosystems. Landscape ecology is considered an integral part of the broader concept of landscape heterogeneity for biodiversity management and conservation. Therefore, in order to characterize the landscape, diversity plays an important role; they act as insurance by increasing the ability to resist change. In an effort to conserve biodiversity, many protected areas have been identified. Although these areas are protected, they are not free from various levels of human intervention. It is therefore necessary to study the position, interaction and importance of landscape elements. The impact of biodiversity on the dispersal of environmental units has been documented by landscape-level patch numbers, shapes, sizes, abundance, and forest

matrix characteristics. Ecosystem degradation and patch characteristics are related to the degree of dispersion. Apart from creating niches for invasive species, fragmentation also isolates local gene ponds which destroys genetic diversity and degrades the species over a long period of time.

Disintegration leads to processes such as fragmentation, migration, local and regional extinction. At the landscape level, the discomfort is related to the patch structure and local arrangement and determines the fate of the patches, their size and duration. Severe discomfort usually has a depressing effect on biodiversity, but intermittent discomfort has been reported to increase diversity in the system. But disturbance of any severity will always have a detrimental effect on the biodiversity of an area. Human activities have a wide-ranging impact on biodiversity, affecting ecological existence from species to entire communities and environmental factors, however heterogeneity in the landscape can be caused by moderate distress. Disintegration mechanisms can be measured using different indices i.e., degree of fragmentation, fractal dimension, infection, justification, similarity and patchiness. Identifying areas with high biological richness or endangered biological richness has a profound effect on preference and also helps in the search for endangered and endangered species. An approach to landscape-to-species biodiversity traits can also use landscape modelling techniques to identify potential sites for endangered and endangered species. In addition, this technique is also useful for identifying potential biodiversity-rich areas for in-depth exploration to improve the list of plant biodiversity. The study was conducted in India in three phases.

Characterisation of Biodiversity:

A total of 175 plant and land use classes have been mapped using visual illustration techniques. Forest 86 Forest Department is further described, out of which there are 20 mixed types of natural structure, 2 grey greenery structures, 21 local specific structures, 1 forest plantation class, deg degraded class, 2 woodland classes, 1 scrub class, and 1 grass class. 17 categories of orchards have been fixed in the land use categories. Other land use and land cover classes include agriculture, fallow / barren land, river beds, body of water, wetlands, settlement and ice. In some areas due to permanent cloud cover the ground cover could not be realized, it has been placed below the rejected class. Different plant types and land uses are

distributed across the country and according to their bio-geographical preferences. Forests include mixed natural textures, greenery textures, locally specific textures, forest plantations and inferior classes, and woodlands, Covers about 19% of the country's geographical area (TGA). The calculated fraction as the number of forest and non-forest patches in the 300 X 300 m grid is categorized into classes with values ranging from 1-39 for the whole country. Pixels with a fragmentation index value of 1 are classified as low fragmentation, while pixels with a value of 2 are defined as medium fragmentation. Analysis of fragmentation conditions in the Indian landscape has proved that about 50% of the forests are under low-lying pieces. This suggests that most of the forests are under some protection, as indicated by the fewer pieces, despite some oppression.

Of the most populous regions in the world, the whole country has high levels of anthropogenic oppression, but the degree of pressure varies from region to region. The country's distress index shows that distress among the country's plants is highest in the western Himalayas, followed by the north-eastern region where the displacement is cultivated, yet the distress is greater in the Western Ghats despite the high rate of anthropogenic oppression, due to the outbreak of various plantations of coffee, arachnids, etc. in only a few pockets.

The mixed form has the highest area under low turbidity and the maximum area under scrub / shrub land is high and very troublesome. A good amount of deviation is shown in the degradation formations as expected. Analysis of decomposition indicators in Indian vegetation regions proves that this decomposition is mainly concentrated in deciduous areas and scrubs / shrubs, but most of the natural structures are relatively unaffected. Since natural mixed compositions mainly contribute to the biodiversity of India, a detailed analysis has been done on the wide distribution of different plants in terms of decomposition and governance of mixed natural compositions. India has rich biodiversity due to its unique location and diverse biodiversity. Due to the high pressure of population, exploitation of resources, agricultural land and the need for development, there is a huge pressure on most of the natural areas of India. Despite the pressure, India is the centre of attraction for two of the world's biodiversity. The biological prosperity values calculated on the biological prosperity map are in the range of 27-112.

Using remote sensing and GIS-based analysis, the project has developed plant type maps, local barriers and other biological richness maps. About six thousand field sample points with different levels were explored for plant species and used for biological enrichment modelling. Locations of more than 8000 species and abundant local databases have been developed. The Digital Database on Vegetable Type Distribution is the first database of its kind developed in India, which is a basic input for identifying species habitat and will serve as a benchmark for environmental studies related to biodiversity. Disturbances remittances that crossed the landscape flagged the 'stress' ecosystem and shed light on the causal factors. Biological enrichment maps (BRs) emphasize the areas that should be given priority when formulating biodiversity conservation strategies.

Conclusion:

Distributed information on biodiversity on the Zoological Survey of India, Distribution Database of Historical Plant Species and Botanical Survey of India, other databases related to biodiversity of various universities and institutes, traditional knowledge mostly unwritten medicinal properties and other economic uses of plants and animals on a common platform. For this purpose a web portal has been created for data-institutions, services and dissemination in which each data source of the parent organization will act as a node for the web portal in the form of Indian Bio-Resource Information Network (IBIN). The created database will serve as a surrogate for the conservation and sustainable management of biological resources. The database will allow the identification of distance areas, species / habitat relationships, and help in biodiversity conservation planning by identifying priority areas.

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