

Biodiversity Protection, Farmers and Breeders Right

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Lecture 03: Biodiversity Mapping

Welcome to the lecture 3 on Biodiversity Mapping and the methods involved in biodiversity mapping and how biodiversity mapping can be utilized. So, biodiversity mapping is a very important area. Today, we see several maps created for biodiversity. Generally, there are two methods, one is the taxon based approach, where you collect individual data in relation to each taxon and then there is an overlay of it. Another is what we call the inventory based approach. Here we are looking at the geographical region itself and then combining the data of several regions.

So, these are the generally two methods of biodiversity mapping. Now, when we look at internationally from the context of CBD, the global taxonomy initiative is very important. Announced in 1998, this became a very important initiative to overcome what is called the taxonomic impediment. That is, there are gaps when it comes to the understanding of what are the total number of species or what are the identification of those species and therefore, here the GTI covers the total species at the different levels.

One is at the species level, then at the diversity at the genetic level and also at the ecosystem level. And this is formally been adopted in one of the conference of party meetings at the CBD. This forms a very important part of the strategic plan of CBD when it comes to preparing the taxonomy map of the larger regions of the world. And this is an important initiative and just not concerns only plants, but it also includes animals and microorganisms as well. So, you can see that there are several efforts and today because of the availability of digital technologies, we have several resources, digital resources which give you the data mapped in relation to biodiversity either on an individual species basis or you have several data collections of different regions.

What you see on this slide is some examples of those databases which will give you an idea of how they have been catalogued and how these can be used by researchers in the area of biodiversity to carry out further studies. This can also be used by policymakers to understand how to go about with implementing certain schemes. Conservation scientists can look at the changes to biodiversity that have happened over a period of time. So, this is a very important repository to be utilized for further studies on biodiversity. Some examples are as follows, global inventory for floras and traits where you can find a lot of checklists available with respect to different plant resources and the traits.

The encyclopedia on life provides a documentation of the species in different parts of the world. Now, the global biodiversity information facility is a very important international

network which provides a lot of open access information on different type of resources by resource the diversity in the organisms. And also those data collections can be utilized to understand not only just the quantitative information, but also the qualitative information that is provided. We also have libraries at different places in the world. One example is the Biodiversity Heritage Library which provides a lot of literature in relation to studies in relation to biodiversity.

We would encourage the participants of the course to go through some of these and there is a very good interface if you want to understand the morphology of that particular organism, its role in the ecosystem, its value in the ecosystem and what are the emerging aspects of that particular biodiversity. So, today these are very important resources that can be a very good starting point for scientists, policymakers and those implementing the laws. We now come to another aspect of understanding certain fundamental concepts in relation to biodiversity, which is the country of origin and the country providing genetic resources. When we look at the objectives of the Convention on Biological Diversity, there are three key objectives one being conservation, second being sustainable utilization of resources and third access and benefit sharing. It is to be noted that these are not just individual objectives, they are interlinked objectives.

The context of the country of origin has become very important from the point of view of access of by resources and therefore, it is important for us to understand from the definitional perspective what is the country of origin. The country of origin of genetic resources means the country which possesses those genetic resources in in situ conditions. And then we come to the second aspect of it on country providing genetic resources. In this case, this means country which is supplying genetic resources collected from in situ sources or taken from ex situ sources. In this case, such sources may or may not have been originating from that country.

Now, this context assumes importance from the point of view of the third objective of the CBD where we look at access and benefit sharing. So, here you have user countries and then you have provider countries. So, from the context of access to genetic resources, this paradigm is important. And here we look at the principles of prior informed consent and mutually agreed terms. Today, by resources are a wealth and wherever by resources are accessed, it is important that benefit sharing is a integral component of such access.

So, the international ABS regime builds that particular framework and that is where we look at the Nagoya protocol. While I will not deal with the extended aspects in this lecture, you will be going through some of it in the later weeks. So, we come to the context of mega diverse countries. And at this point, I would like to mention the fact that

endemism becomes a very important context to look at conservation efforts. The World Conservation Monitoring Center of the United Nations Environment Program or the UNEP has identified several mega diverse countries, what you see in this illustration.

And these countries are the ones that harbor a lot of endemic species. While the concept was proposed by Russell Mittermeier of the Conservation International, to be a mega diverse country two criteria need to be fulfilled. At least 5000 endemic plants also such regions would have borders with marine ecosystems. From the point of view of the implementation of the conventional biological diversity as well as Nagoya protocol, we do see the relevance of these countries and their implementation and submissions at the individual meetings of the conference of parties. So, while the listing of the mega diverse countries is available, we find that Brazil is one of the is the most mega diverse country.

And efforts to preserve biodiversity have become paramount in the implementation in Brazil. Then we have Colombia, the second largest followed by the United States, which again has a whole lot of diversity in the different types of biodiversity whether it is desert or forest or the tundra regions. Taking into the facet of prioritizing conservation in the mega diverse countries, it is also become important to raise the pitch internationally. And that is where 14 out of the 17 mega diverse countries met at Cancun, Mexico in 2002 to form a group which is called the like minded mega diverse countries. Notable achievement of this group was in the adoption of the CARTA to achieve the Aichi Biodiversity Target 11.

This like minded mega diverse country group continues to engage into policy discussions and moving the mandate with respect to conservation. These countries share 60 to 70 percent of the earth species. Some of the important timelines have been the 2002 Cusco declaration on access to genetic resources, traditional knowledge and intellectual property rights. Another declaration in New Delhi 2005 declaration, the ministerial declaration of Like Minded Megadiverse countries on access and benefit sharing are two important developments which have helped in moving the mandate when it comes to the goals of CBD. So, what are the main measures that they have taken up? First important thing is to coordinate efforts, promote the context of biodiversity conservation, the need to invest in development.

The benefits derived out of biodiversity should be having a overall positive impact on the objectives of the convention. The need to recognize traditional knowledge of indigenous and local communities in the different legislative frameworks. This group also looks at developing better scientific technical cooperation in several areas. So, while each individual country has taken up measures, the local action of these countries provides a very important indicator for the total global impact. And some of the work done in these

regions provides an understanding of how they have transformed several ecosystems and have mitigated loss of biodiversity.

While there are several mega diverse countries, a few illustrations are provided. For instance, we are looking at Mexico. Mexico has a larger implementation when it comes to not only the specific species and species monitoring programs, there are several programs in relation to protected areas, overall land development and how biodiversity is an integral component. Then we look at how information systems are also being generated for the overall resource to be used in the national context, and also strategy on invasive species and how to prevent and control such species. We come to the context of Brazil, where there are several programs that have been undertaken with institutes in Brazil dealing specifically with the areas of biodiversity conservation.

The context of Green VAT, very relevant and also building the engagement when it comes to the dialogue on biodiversity. While we look at individual country based commitments, Brazil is also a member of the Amazon cooperative treaty organization, which is a very important organization to look at the overall conservation when it comes to the Amazon basin and the adjacent areas. India also one of the mega diverse countries has several national programs from the point of view of international mandates. It has laws particularly the biological diversity act 2002, which becomes the special legislation for implementation of biodiversity programs in coordination with existing national frameworks and laws. The implementation of biodiversity is also important from the point of view of the overall environmental law implementation.

So, the Green India mission, several national schemes, national missions when it comes to animal species and their preservation have also become important to take care of the endangered species, restoration of habitats and also conservation initiatives. We now move to the context of Australia, which has several initiatives taken. Some of them which are important are the plan with respect to salinity and water quality. The caring for our country is a very important initiative to develop a framework for managing, monitoring, evaluating, reporting framework with respect to national resource management. So, every year these mega diverse countries report their conservation initiatives as part of the national reports submission to the CBD.

Philippines is yet another country which has unique biodiversity. It has a like any other member country to the CBD, National Biodiversity Strategy and Action Plan. When it comes to the network for nature is one important initiative taken. And again Philippines has some very interesting species that are very unique and several indigenous people. So, there are separate programs for many of these.

So, when we take up the understanding of these individual countries, we do understand somewhere that their integrated efforts of with when it comes to biodiversity and the environment itself in many of these countries. South Africa is one of the very important biodiverse countries, which also has different biodiversity programs, several programs with respect to climate change and also institutions which are moving the mandate of biodiversity. So, if you were to look up the Convention on Biological Diversity website www.cbd.int and go through the implementation of these different mega diverse countries, that would give you a clear understanding of what are the efforts that are taken with respect to each of these countries and what is the evolving mandate internationally.

So, therefore, what we begin to realize is that in the context of biodiversity, there is a lot of international cooperation and coordination as a necessity. The United Nations has been a very important backdrop, and its United Nations environment program has actually fueled the entire context of today what we see as the Convention on Biological Diversity and its implementation. The global environment facilities support several projects across the world. Now, the context of international cooperation coordination needs to be understood from the intergovernmental organizations working together to look at the interrelated aspects of biodiversity. For instance, biodiversity ecosystem functions, biodiversity and migratory species, biodiversity and wetland conservations.

And then we look at biodiversity and climate change. So, biodiversity is also a reflection on the cultural identity. You have UNESCO joining several activities, and the very important context of the IUCN and its creation itself is a very significant development. And today we see a lot of activities that have been very significant from the point of view of the overall efforts that have been recognized world over. In the context of international cooperation, it is worth to mention the Millennium Ecosystem Assessment initiated by in the year 2001, and went on to several years where many organizations came together to come up with the assessment with respect to biodiversity and ecosystem services.

With four working groups, the Millennium Ecosystem Assessment forms a very important documentation that helps us understand the condition and trends, what are the scenarios which emerge, and how the responses are understood. And the sub-global assessments which were also part of the working group activity give us a finer understanding of how we need to look at key policy decisions with respect to individual regions. So, conceptual framework is what you see on this illustration, where we look at the context of human well-being on one end, what are the direct drivers of change in terms of land use, climate change, external inputs, technology adaptation and use, indirect drivers of change in terms of the demography, economic, socio-political aspects, cultural and religious beliefs, and the ecosystem services. So, what you see as the assessment

report is an integration of all of this together at the local, at the regional, and at the global level. So, while there are several organizations involved, in the context of biodiversity, it is noteworthy to mention the Convention on Biological Diversity also being a very important facilitator, the Convention to Combat Desertification, Convention on Wetlands, the Ramsar Convention, the Convention on Migratory Species.

So, this points out to a very important aspect that we need to keep in mind that today when we look at biodiversity assessment, we need to look at it from the point of view of an interface of science, policy, and law. The solutions are not in any one of them, but the solutions are in the combined understanding of them. So, these assessments provide us a very rich source of looking at forward measures for implementation. So, we come to the summary of today's lecture, where we have understood the types of diversity from the point of view of species diversity, genetic diversity, ecosystem diversity, and how we measure biodiversity. Today, there are several digital sources for measuring and mapping biodiversity, and they form a very important starting point for researchers to take up efforts on biodiversity.

Mega-biodiverse countries are very important, because it is these countries which have been prioritizing conservation efforts, and will and have continued to take this up as a very important mandate internationally. And yes, from the point of view of overall goals of biodiversity, it is but imperative for us to keep in mind that any biodiversity implementation needs an cooperation and coordination of efforts from several groups, countries, international organizations, non-governmental organizations, and many other stakeholders in order to fulfill the goals of biological diversity. Thank you.