Biodiversity Protection, Farmers and Breeders Right

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Lecture 04: Types of Bio-resources, Conservation Mechanisms

Welcome to the lecture 4 on Types of Bioresources and Conservation Mechanisms. In this lecture, we will cover certain concepts particularly the nature and scope of bioresources. Bioresources and the linkage with trade, we will discuss the aspects of UNCTAD. Then we will touch upon the aspects of bioresources and the convention on biological diversity. The emphasis on business and biodiversity and in the last segment, we will take up the aspect of conservation of biodiversity and what are the mechanisms available. Now, these are the keywords for the talk.

So, to begin with what are bioresources? Starting by the CBD definition which is laid down in article 2, biological resources include genetic resources, organisms or parts thereof, populations or any other biotic component of the ecosystem with actual or potential value or value for humanity. Please note the definition includes actual or potential value. So, if today the value of a bioresource is not known, but in future the potential use is discovered, then that use becomes important from the point of view of a benefit sharing mechanism. So, currently it may not have the perceived use may come up later, but nevertheless that potential use in future will certainly come under the ABS.

So, this is something you can remember. Of course, going forward you will take up these aspects of ABS and a finer understanding of that. So, we have in the earlier lectures dealt with the aspect of biodiversity and we are taking up the aspect of bioresource. So, the greater the biodiversity, the greater the potential for bioresources. Now, whenever we talk about bioresources, it is important to understand the categorization of bioresources in a general way.

So, based on the origin, characteristic and application, we have primary, secondary bioresources, tertiary bioresources and quaternary bioresources. So, if you look at primary bioresources are those which are from the place of where the major cultivation happens, be it food crops, ornamental crops, fruit crops. Then we talk about secondary bioresources where they derived out of the primary bioresources, which have value when it comes to industry, human consumption, fiber, feed. Then we have tertiary bioresources which are the byproducts or most often the products that are coming out of the processing of the secondary bioresources. Quaternary bioresources are bioresources which are typically dealing with waste material, animal excretions and then in some cases certain quaternary bioresources also for future value.

So, again you have quaternary bioresources also divided into short term, mid term and long term based on the utilization, based on the aspect of the bioresource in its time point. Now, one example of it would be as what is given in the illustration here. So, if you take up let us say paper industry, primary bioresources for instance for hardwood, birch is one example. The bark is the secondary bioresource, the unused paper forms the tertiary bioresource and then of course, waste paper is the quaternary bioresource. Now, when we discuss bioresources in the context of utilization, it is very important for us to keep in mind another definition under the CBD which is sustainable use.

We need to remind ourselves that today sustainability is core to the use of bioresources. Now, sustainable use means this use of components of biological diversity in a way that should not lead to the loss of biodiversity and maintaining it and its potential is imperative which is not only for the present generation, but also for the future generations. So, on one hand we have bioresources which have tremendous potential in terms of health benefits, economic benefits, social benefits and also environmental benefits, but when we need to look at balancing this in the context of sustainability. It is at that stage that we need to keep in mind that the property rights paradigm from what it was earlier to today where we are heading in the context of bioresources. So, here you see in this illustration wherever we talk about bioresources in the natural environment available for all non rivalries, public good character, then when you have bioresources in a human made environment and more and more appropriation of bioresources happening you are getting into this space of the determination of private rights.

And at that stage there are concerns about resource availability, how do you value biodiversity there are several approaches to valuation of resources by resources, the economic valuation of by resources and the need for incentivization of the mechanism has also become relevant internationally. So, bioresource form the base of industries which are dependent on biodiversity for their major developments. So, bioproduct industries typically depend on bioresources. There are several products for instance today bioenergy is a big area you have biothanol, biodiesel. The fiber industry is heavily dependent on bioresources, your biopolymers derived from biological resources, then we have the herbal industry, traditional medicine, the plant bioresources, animal bioresources, marine bioresources these have become the starting point for several bioproducts.

Now, here we come to the realm of the greater the appropriation of bioresources, the value is obviously greater. However, there have been concerns about the context of how do we protect communities who are directly dependent or whose livelihoods are intricately dependent on the immediate resources and particularly in this case bioresources. There are several local or indigenous communities worldwide who are

dependent on their immediate environment and the bioresources. So, here we need to take into consideration the context of traditional resource rights and hence the use of bioresources unchecked can mean not only a disturbance to the biodiversity, but also a disturbance to the livelihoods. So, when we look at the context of bioresources and property rights, we need to keep this paradigm in mind.

Of course, in the later weeks you will be going through the aspects of the international implementation and how the needs and expectations of local communities need to be taken into consideration whenever biodiversity related implementations are carried out. So, hence it is important for business also to keep this particular aspect in mind on the aspect of traditional resource rights. To that extent, one could extend the aspect of the rights to access biodiversity are intricate to local people. So, with that we come to the aspect of bioresources and trade. As you are aware in the earlier lecture we have dealt with the aspect of mega diverse countries.

There are countries which are biodiverse rich, there are countries which are biodiverse poor. And since bioresources are the starting material for many of the industries, trade is a big component. And here it is important to discuss the United Nations conference on trade and development. In 1996 they came up with the initiative on biotrade in order to support the principles of CBD. Now, what is biotrade? The collection, the production, transformation and commercialization of biodiversity based goods and services and keeping in the sustainability criteria.

So, when we look at biotrade, we are looking at regional as well as national initiatives under the UNCTAD. While this program started very early on, today we have the announcement of the principles and criteria which have been revised, which take into account the specific species and ecosystems, the sustainable commercial use of it, keeping in mind the objectives of several conventions. So, when we look at the biotrade initiative, it is important for us to understand the conceptual framework in order to understand the activities under this. So, the biotrade principles as you can see in this illustration are, there are seven principles conservation of biodiversity, sustainable use of biodiversity, the fair and equitable benefit sharing, socio economic sustainability, the need for legal compliance, respect for actors rights who are involved in this, and the right to use and access natural resources. There are several approaches to carry forward the initiatives under the biotrade.

Four different approaches have been identified under the biotrade principles 2020. Value chain, adaptive management, ecosystem approach, sustainable livelihoods. Let us briefly understand what are these approaches based on. So, the value chain refers to the coordinated relationships established between actors involved directly and indirectly in a

productive activity, which takes into consideration the product which moves to the service from supplier to customer. Therefore, there are alliances between producers, processors, distributors, and together they work jointly in achieving the goals.

So, this is one aspect of the value chain approach that we see. Now, the biotrade initiative and the biotrade facilitation program are critical to the entire facilitation of this particular value chain approach. The second approach is the adaptive management approach. Here it takes into consideration measures on an ongoing basis which help in adapting in terms of bringing in changes, some corrective measures, how the management of biological resources can be taken up, and therefore, brings in continued monitoring in the context of the use of bio resources from the impact perspective on the ecosystems. So, sustainable practices, the identification of impact on species and ecosystems, and the monitoring form the core of this particular adaptive management.

Then we come to the ecosystem approach which integrates the ecological and social issues, understanding of the interaction processes involved in the productive process. And so, therefore, it is a very holistic approach when it comes to taking into consideration the factors as well as the local communities. So, we move on to the next aspect of what are the current perspectives in relation to biotrade. Now, there is a biotrade knowledge sharing self-assessment tool. This helps industry to understand who are all the different players in the network.

So, if one way to use a self-assessment tool which is available at the link provided here, it would help in actually submitting data in relation to the value chain. But eventually it will connect you to a network of people who are part of the value chain. This is a very important initiative which connects different actors together. And one component of this is the knowledge sharing platform which really coordinates and connects through the community cloud information on the sharing and the utilization of bio resources. Now, this initiative and the platform has the participation of governmental organizations, business associations, NGOs and companies.

We come to the context of the Convention on Biological Diversity which has specifically fostered agenda in relation to business and biodiversity. Now, under the global partnership, there are at this point of time, 21 national and regional initiatives to look into the business engagement and biodiversity matters. This provides information sharing and greater facilitation in relation to the contribution of business towards biodiversity conservation at two levels, the national and the regional levels. What you see in this illustration are specific decisions which lay out the guideline with respect to how initiatives and the engagement are considered with respect to the global partnership. So, the COP 10 decision and the COP 11 decision are relevant in this context.

So, in the context of business and biodiversity, we find an inclusive business platform where there is a general organization in terms of the basic motives and the aims. Then we have a mixed platform which has the business as the main component and also has several other non-business interests also taken into consideration. Now, this entire partnership is also in some way an umbrella organization which promotes the interest and initiative across business federations, individual companies and many stakeholders. And this is where we see since business is one of the major uses of bio resources, they have a critical role in addressing serious environmental problems and also addressing the loss of biodiversity. Now, with this understanding of bio resources and business, we also need to appreciate that the bio resource market also has a lot of challenges.

There continues to be over exploitation of bio resources. Bio resources are not valued in the same way at every place. There is also under valuation of bio resources. There have been pricing concerns.

The issues have been raised. The involvement of local communities into decision making, the benefit sharing mechanism have been the challenges. In most cases, it is also found that there is limited direct benefits. That means, there is a lot more that can be done in order to for the communities to get the direct benefit. So, keeping the fact that local communities and indigenous knowledge holders have a very important role in the understanding of the value of bio resources, this is one area which continues to be of importance nationally as well as internationally. The bio resource market has the raw material market, it has extractives and of course, there are finished products at the end of the supply chain.

Now, in the proximal part of the supply chain, the markets continue to be imperfect. Asymmetry of information is a major challenge at the domestic as well as at the international level. As more and more models come up in relation to the economic evaluation of bio resources and also the benefit sharing models and greater networking, we would see some of these challenges becoming minimal in the future. So, with that we come to the need for conservation. The greater the utilization of bio resources, the greater is the need to look at conservation of biological diversity, because biological diversity is the base for bio resources.

At this stage, I would like you to see this illustration from the overall implementation of the context of conservation in relation to bio resources. So, we will be taking up some of these aspects. One on the end of what are the conservation objectives, how do we see the linkage of conservation objectives with the sustainable utilization and access and benefit sharing, and how the process can be incentivized as well. Article 6 of the CBD spells

out the general measures marked in color the need for development of national strategies, plans and programs for the conservation and sustainable use of and adapting them to the objectives and measures of the convention. The need to integrate as much as possible into sectoral and cross-sectoral plans, programs and policies.

So, this is the general measure. Then we move on to the understanding under Article 7, the identification and monitoring of bio resources. Every member to the CBD need to take into consideration the identification of the components of biological diversity, the need for monitoring through different sampling techniques and other techniques, categorization of activities which are based on conservation, maintenance and organization. So, what you see on the right panel, the identification of ecosystems and habitats, monitoring of those species and communities, and then we are looking at the context of described genomes as well as genes for social, scientific and economic importance. The two major conservation mechanisms in situ and ex situ conservation. In situ conservation is defined as the means to conserve ecosystems and natural habitats and the maintenance of recovery of viable population of species in the natural surroundings.

As opposed to the ex situ conservation is the offsite conservation which is outside the natural habitat. By all means, in situ conservation is more efficient from the point of view of the measures to protect biodiversity as well as from the point of view of the financial requirements. Ex situ conservation also has benefits when it comes to the need to take care of endangered species and then introduce them into the natural environment. So, taking these two aspects of in situ and ex situ conservation, we also need to keep in mind the components of article 8 of the CBD which are also linked with respect to the conservation objectives. From the need to establish guidelines for protected areas, areas of special measures, sustainable utilization of biodiversity and its components, the management of biological resources, the need to involve environmentally sound measures, restoration of degraded lands and ecosystems, the role of the risks associated with living modified organisms, then the understanding of how indigenous and local communities have been conserving biodiversity and how alien invasive alien species affect a particular ecosystem.

The development of legislation or regulations with respect to protection of biodiversity becomes very necessary to look at from the point of view of threatened species and populations. There are several in situ conservation modes as you can see on this particular illustration. The greater and greater the protection of large areas protected areas and natural reserves, as we see internationally the number is increasing which is very heartening, but we need to do more in terms of in situ conservation. Genetic reserves, on farm conservation, home garden conservation are some of the aspects of in situ conservation which have value from the point of view of genetic diversity on one

end, taking into consideration the conservation of land resources, when it comes to indigenous and local communities as well as certain groups. Cultivation of crops for livelihood purposes, for medicine, all in all in situ conservation is a very important mode of conservation when it comes to biological diversity.

Specific attention may be drawn to biosphere reserves. They support a lot of diversity in terms of faunal and floral diversity, microbial diversity as well. The biosphere program under the UNESCO has been a very important program to promote sustainable development and has several achievements. So, looking at the conservation, integrating it with the context of economic development and also it being utilized for several purposes. The integration of these become very relevant in the context of the goals of conservation.

Article 9 of the CBD is relevant from the point of view of looking at the measures, ex situ conservation measures, the relevance of country of origin, rehabilitation of threaten species and also the collection of how the mechanisms should be taken up in terms of the collection of biological resources for ex situ conservation. In this illustration, you can see the several ex situ conservation modes of particular interest and growth as we see is the growth of seed banks, tissue banks, biorepositories. So, there is an expansion of the ex situ conservation also based on new technological developments and this again has its own relevance when it comes to protection of endangered species, and so on. As you can see, the conservation of biodiversity is not only the fort of scientists. Policy makers, the implementation of law, all of them are equally important.

So, if one needs to understand conservation from a very holistic view, biological diversity conservation, one should understand the interface of science, policy and law. And it is at this stage, we need to appreciate the work of several international organizations beginning with the IUCN, the several international conventions along with CBD, UNESCO, the UN environmental program which is the background or the backdrop of the entire effort on conserving the environment. One its expanded programs of particular relevance is also the decade of ecosystems restoration 2021 to 2030. The aim being to look at how can we bring back the ecosystem to its original place. Several partnering organizations have their own role with respect to this interface.

And so, today when we look at conservation, conservation has a meaning for all, women based conservation, how women groups can participate in conservation, how scientists can participate, how policy makers can participate. And the emphasis of local communities, how local communities can share conservation practices all of them are equally important. So, with that we need to intricately understand the sustainable development and biodiversity relation. And therefore, the 2030 agenda on sustainable

development and its goal 14 and 15 become relevant in the context of conservation. So, in the earlier lectures we mentioned about the objectives of the Convention on Biological Diversity are interlinked and it is in that interlinking that the understanding should be and the implementation should be.

We come to the conclusion and in summary we have understood the aspect of the value of bio resources, categorization of different types of bio resources, why bio trade is an important component and how different actors and how business can contribute to conservation and in the achievement of sustainability. What are the international mandates coming out on the conservation of biological diversity from a CBD perspective and the relevance of ex situ and in situ conservation. These are a few references that you may utilize for the lecture. Thank you.