

Explanatory Note for Understanding

“Economics of Biodiversity for Access and Benefit Sharing (ABS)”

Biodiversity Degradation and Management

Biodiversity represents the variety of life on earth; which includes species, genetic and ecosystem diversities. Biodiversity is crucial for the functioning of ecosystems and socio-economic development of a nation. Biological diversity is a global asset with tremendous economic values to the present and future generations. However, the species and ecosystem are under threat in recent years than ever before and their losses (45-250 species per day) have become a global concern. Population growth, unplanned economic development, unscientific land use changes, and consumerism are the major challenges that increase the pressures on biodiversity.

But biodiversity once lost is lost for ever and likely to cause serious consequences to the ecosystem and human life. Considering this fact, the Convention of Biological Diversity (CBD) was founded at the global level and 193 countries, including India, are its members. Subsequently the Government of India enacted the Biological Diversity Act (2002) and Rules (2004) and hallmarked the following objectives, which are similar to CBD mandates: (a) conservation of biological diversity, (b) sustainable use of its components, and (c) fair and equitable sharing of the benefits arising from the use of biological resources and the associated knowledge. Further, a decentralized ‘institutional setup’ (Biodiversity Management Committee, State Biodiversity Board, and National Biodiversity Authority) has been formulated for implementing this task.

Biodiversity Economics

Economics deals with the analysis of the use of limited and scarce natural resources to achieve various human needs. In this context ‘Biodiversity Economics’ addresses issues related to the use of biodiversity goods and services (which are getting scarce) for fulfilling various human requirements. The basic bio-economic challenge in recent decades is, how the scarce bio-resources (which are renewable) should be allocated to

various requirements to achieve human satisfaction. The subject matter of Biodiversity Economics includes: (a) valuation of biodiversity, (b) damage assessment of biodiversity and ecosystems, and (c) application of various economic instruments, both incentives (compensation and subsidies) and disincentives (taxes, fines, and penalties), for the effective management of biodiversity. In brief, Biodiversity Economics emphasizes the economic approaches to assess, understand and take effective policy decisions towards managing biodiversity for its sustainable utilization, and achieve the maximum economic and human development.

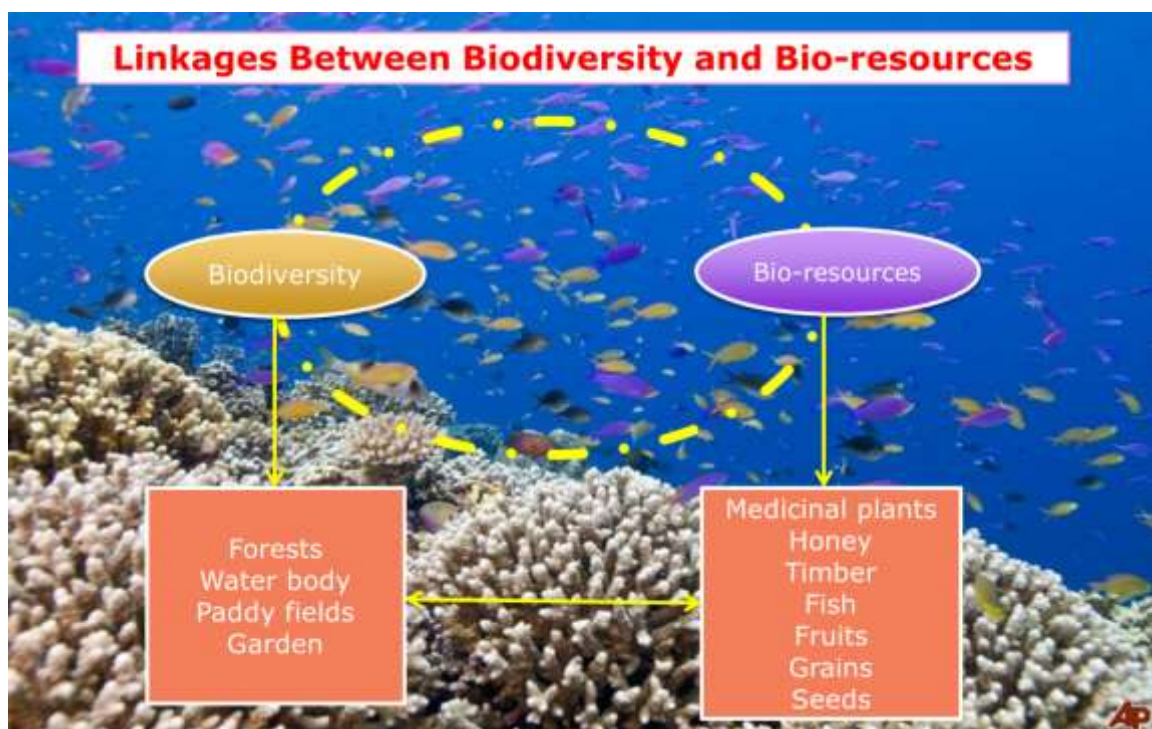
Valuation of Biodiversity

Biodiversity is has significant economic values, which are implicit, in general, rather than explicit. Most of these values are often not captured by the market; hence, their economic potential is underestimated, which is considered as one of the factors for the rapid depletion of biodiversity and extinction of species. Most of our biodiversity is on common land and its property rights are not clearly defined. Hence, the goods and services derived from biodiversity experiences market failure. Even if bio-resources (biodiversity goods) have a market, they are imperfect and experience market distortion. The demand, supply and price mechanisms do not function effectively as they do in the case of other commodities. Hence, the existing price of bio-resources at the collection point does not reveal its real value.

However, understanding the non-marketed benefits of biodiversity and the true value of bio-resources are critical for initiating effective policies towards the conservation and sustainable use of biodiversity. Methodology development, particularly for valuing the non-marketed services of the ecosystem/biodiversity has progressed substantially in the last two decades. Methodologies such as: market prices, replacement costs, avoidance of damage cost, production function, hedonic price, travel cost, contingent valuation, participatory environmental valuation and benefits transfer are well established, and widely used in valuing ecosystem services in different parts of the world. However, developing the standard methods/tools for finding out the true value of bio-resources (a pre-requisite for operationalizing ABS) is still in a preliminary stage.

Bio-resources and their Link with Biodiversity

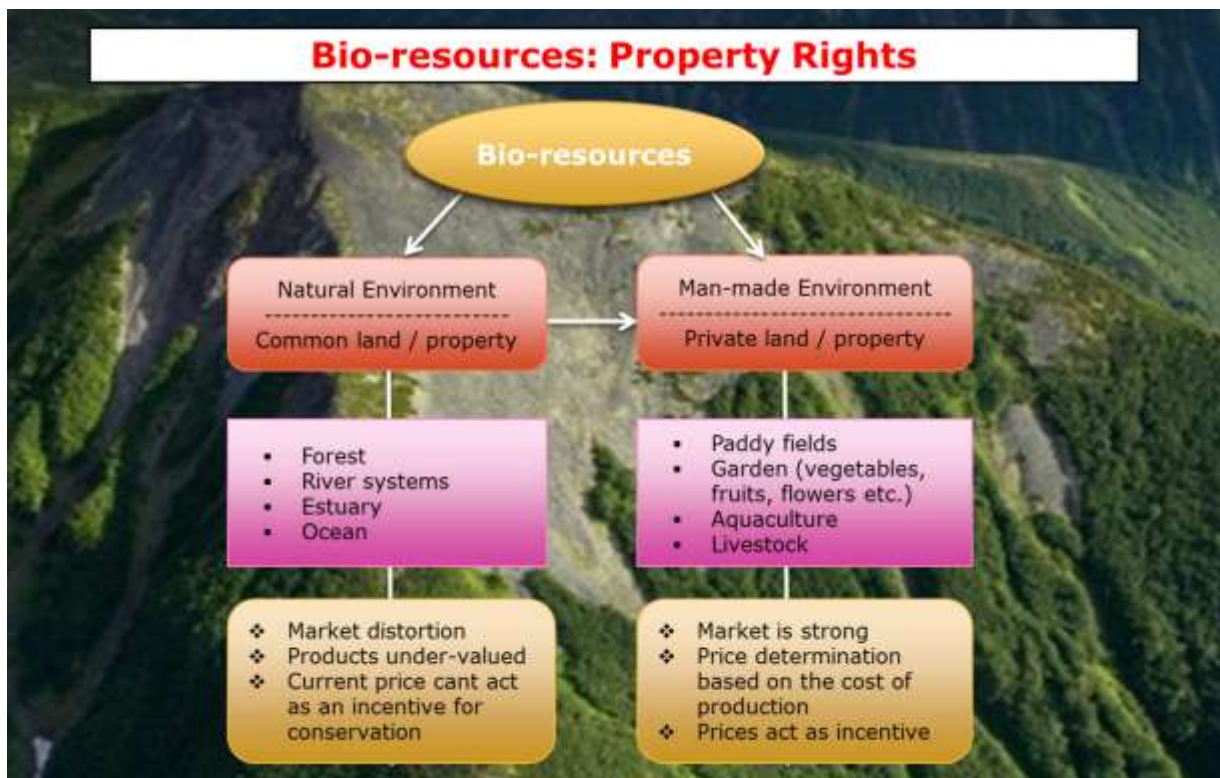
Bio-resources / biological resources means: plants, animals and micro-organisms or parts thereof, their genetic material and by-products (excluding value added products) with actual or potential use or value, but not human genetic material (The Biological Diversity Act, 2002). Bio-resources are renewable and can consider as a subset of biodiversity. Bio-resources and biodiversity are highly interlinked. One can interpret biodiversity as a stock and bio-resources as the flow from it; they are mutually interrelated in their existence and function as interpreted in the following **figure**. Hence, the earth's biodiversity stock should be maintained intact through its sustainable utilization (extraction should be less than or equal to its regeneration) for fulfilling various human requirements for ever.



Property Rights and Markets for Bio-resources

Bio-resources exist in a natural environment (common lands) as well as manmade environment (private land). For example, forest, river, estuary, ocean, etc. are common properties. Hence, the bio-resources from these sources experience market failure or distortions and the current market price at its collection point does not represent its real or true value. In other words, due to the market imperfections bio-

resources are under-priced. Therefore, the existing price for bio-resources received by the local communities cannot act as an incentive for their conservation. On the other hand, bio-resources such as grains, cereals, vegetables, fruits, fishes from aquaculture ponds and life stocks, that exist in private lands (fields and gardens) are controlled by private entrepreneurs and priced in better manner. These cultured or cultivated products' market prices reveal their cost of production and act as an incentive to flourishing agri-business (see figure).



Bio-resources: Extraction and Challenges

Bio-resources are free gifts of nature. Earlier, bio-resources extraction and use were limited in volume, and does in an environmentally sustainable manner. Bio-resources related economic activities were then at a subsistence level, and mainly confined to certain regions. Since the providers and users are not divergent, benefit sharing was not a serious concern. But over time, population growth, rapid economic development, progress in trade, globalization and the emergence of Multi-National Companies (MNCs) changed the scenario. Bio-resources are extensively extracted and used for divergent purposes, and have become emerging commercial products for entrepreneurial development. Bio-resources are the base for several industries (such as

pharmaceuticals, agro-processing, cotton textiles, fisheries, cosmetics, bio-technology etc.) contributing to the global economy and human welfare. In this context global food and health securities depend on biodiversity. Further biodiversity or bio-resources is the source of employment and livelihood for millions of poor in developing countries like India.

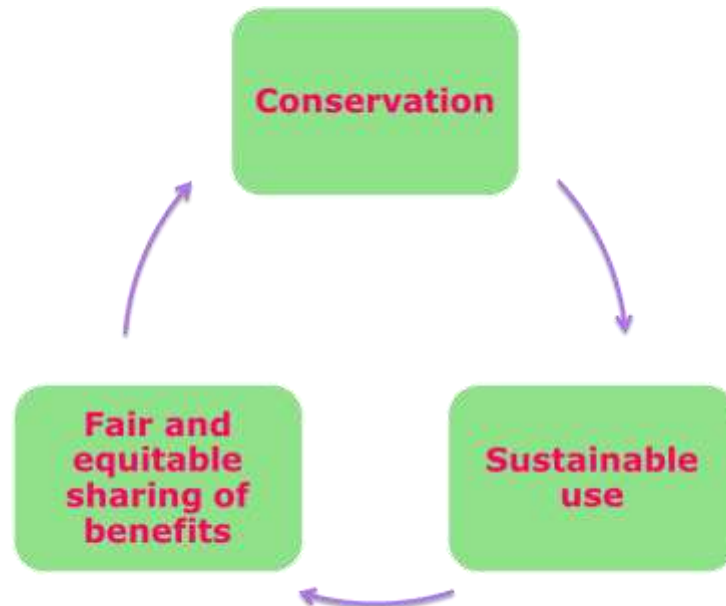
A large part of the world's biodiversity is in the developing world, or poorer nations known as mega-biodiverse countries. Huge quantities of bio-resources from these parts of the world are being collected for meeting the global requirements. Local and indigenous communities are involved in the collection with their hard work and unique knowledge. However, the transaction of bio-resources at the collection point is done in the traditional fashion. Provider/sellers and buyers have limited knowledge and information about the product. Normally information is disclosed by both the parties (sellers and buyers). In the exchange, the users of bio-resources (the companies or their representatives) have better knowledge about their significance and value than the providers. However, the local communities are being exploited (obtaining only a meagre price), by the traders and companies, who make substantial profits from the business. At this stage, the current price represents only an exchange rate and not the real value of the resources, and does not act as an incentive in its conservation. Consequently, it leads to over-extraction and extinction of species, becoming a threat to biodiversity. But local communities may be the only stakeholder in the bio-resources conservation, management and sustainable use.

Access and Benefit Sharing (ABS): An Incentive Mechanism for Biodiversity or Bio-resources Management

ABS is emerging as an innovative approach and an incentive mechanism in biodiversity conservation and its sustainable utilization. The ABS framework provides a formal guidance for the way in which biological or genetic resources are accessed, and the way benefits are shared between people or countries using the resources (users) and the people or countries that provide them (providers). The ABS philosophy proposes that providers of bio-resources are entitled to receive fair benefits from the users. In this context ABS balances the rights of the users of bio-resources

with the rights of the providers of such resources. Further, the ABS can manage biodiversity as a community asset and support biodiversity-based businesses in an effective and sustainable manner (see figure).

CBD and Biological Diversity Act: Objectives



It is vital that both users and providers understand and respect the legal, administrative and policy frameworks at the national and local levels, as well as those outlined in the Convention of Biological Diversity (CBD) and the Nagoya Protocol on ABS. The ABS is based on prior informed consent (PIC) being granted by a provider to a user, and negotiations between both parties that result in mutually agreed terms (MAT). The negotiation between a provider and a user of resources should be based on the true/actual value of the resources. Hence, understanding the real value of bio-resources is a pre-requisite for equitable benefit sharing and signing of ABS agreements.

Bio-resources Valuation for ABS

The Total Economic Value (TEV) of biodiversity consists of use values and non-use values. Use value (direct or indirect uses) is associated with trade and commerce or cultural and spiritual aspects. Non-use value is derived from the inherent nature of biodiversity and aims to maintain flora and fauna and ecological balances. From the

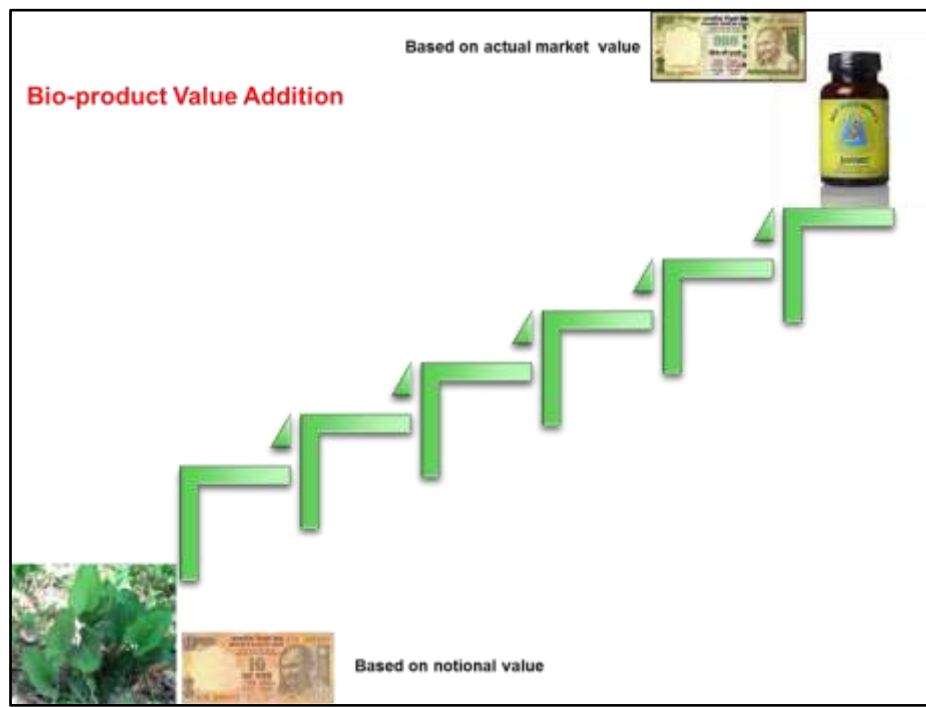
ABS perspective, the use value of tangible and visible bio-resources is significant, since it is directly involved in trade and acts as the basic raw-material or input factor in manufacturing. Currently, the benefit sharing arrangements on these products are based on a fixed percentage of gross sales of a commercial product as the minimum requirement, and do not fully reflect the economic potential of the resources. The estimation of the real value of bio-resources will help in determining the realistic benefits, which should be shared by the providers or local communities. Generally, different actors – including ‘direct actors’ such as local communities (who share the knowledge and resources) and researchers, institutions and government - are involved in the bio-resources based production process. Further, in the production process, different factors of productions are involved. Hence the income / benefits derived from the commercial use of bio-resources should be distributed as ‘returns’ to the various factors of production, where a considerable amount should be given to the local communities. This is the fundamental principle behind the implementation of the ABS.

Value Addition for Bio-resources

Many value added products are derived from bio-resources. Generally, value addition for bio-resources (raw) and bio-resources based products occurs either through transaction costs or / and processing / manufacturing costs. Transaction costs are the costs on particular bio-resources from their collection point to the company gate, and occur through transportation and brokers or dealers’ profits. For example: in the case of honey, the collection price at the forest gate may be Rs. 50.00 per kg, and its final consumer price at a distant city may be Rs. 200.00, transacted through different agencies such as federations, wholesalers, and retailers at different locations. Hence, the price spread is Rs. 150.00 (Rs. 200 - 50). The ABS concern is whether the price spread is reasonable or not, and if not, what are the abnormalities in and how will it bounce back to the communities or providers of the honey?



Further, certain bio-resources are basic raw-materials for manufacturing final consumer products. For example: *Jeevani* an immuno-modulatory product (ayurvedic medicine) is manufactured from the plant known as *Arogyapacha*. Here the *Arogyapacha* (required for manufacturing one bottle of medicine) may be provided by an indigenous community for Rs. 10.00 and a bottle of *Jeevani* may cost Rs. 500.00. In this production process, *Arogyapacha* is an unavoidable input factor, but not an exclusive one. Many other products (inputs) and knowledge/skill (research and development) also contribute to *Jeevani* development. Hence, the processing / manufacturing costs at different stages are significant. Through an amortised (remunerated) pricing technique, one can estimate the real price of *Arogyapacha*.



Bio-resources Real Price Estimation: Major Steps

From the ABS perspective, the estimation of the real price of bio-resources is important. The value chain or amortized pricing technique has been identified as a tool for estimation, and the following steps (general as well as specific) are proposed with reliable information sources (see the tables). However, substantial support from various stakeholders, who are part of this exercise, is required for the successful estimation of the value of bio-resources.

Bio-resources real price estimation: **basic/general** steps

Steps	Tasks	Sources of Information
First	Identification of the key bio-resources (having economic and ABS potential) extracted from a geographical area / ecosystem	BMC, PBR, local community, indigenous group, forest department
Second	Understand its potential / purpose / usage	BMC, traders, research organizations, government departments, industries
Third	Identify its leverage / movements : local → regional → state → national → international	BMC, traders, industrial association, companies, exporters, customs department
Fourth	Prioritize the promising uses based on value addition (ranking)	Industries, traders, research organizations.

Bio-resources real price estimation: **specific** steps

Steps	Tasks	Sources of Information
First	Select any manufacturing or bio-resources processing company	Appropriate industry
Second	Estimate the transaction cost of bio-resources: from forest gate to company gate. (Price at company gate – price at forest gate)	Forest dwellers, traders, industries
Third	Identify the major production steps	Company management and production manager
Fourth	Identify the different factors of production involved in each stage and its cost / remuneration (Factor cost method)	Company management, production manager and labourers
Fifth	Identify the abnormal benefit claimers and rates (differences between company rate with general market rate)	Company management, production manager, labourers, industrial/govt. departments.
Sixth	Fix the optimum benefit and share the surplus to local communities who preserve the bio-resources (Royalty; institutional mechanism for distribution)	Company management, production manager, labourers, industrial/govt. departments and BMC