Project Description:

National Biodiversity Authority (NBA) is currently implementing the first GEF national project on ABS with the support from United Nations Environment Programme (UNEP) and the Global Environment Facility (GEF), the Ministry of Environment and Forests (MoEF), Government of India. This project is being implemented in the states of Andhra Pradesh, Gujarat, West Bengal, Himachal Pradesh and Sikkim. The executing organizations includes NBA, the 5 State Biodiversity Boards, UNEP-Division of Environmental Law and Conventions (UNEP - DELC), United Nations University - Institute of Advanced Studies (UNU-IAS) and the United Nations Development Programme (UNDP).

This project deals with assessing and quantifying the economic value of biological diversity present at local, state and national levels using appropriate methodologies to determine benefit sharing which will help in better :

- Implementation of the Act and inform national decision makers on prioritizing conservation action;
- Development of tools, methodologies, guidelines and frameworks inter alia, on PIC, MAT, MTA;
- Benefit sharing agreements for realizing ABS provisions will help in developing ABS agreements.

The project facilitates and enhances efforts in stakeholder decision-making on the provisions of access and benefit sharing based on the economic valuation of bio-resources that will be carried out in the project.

Strengthening the Implementation of the Biological Diversity Act and Rules with focus on its Access and Benefit Sharing Provisions









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Strengthening the Implementation of the Biological Diversity Act & Rules with Focus on its Access and Benefit Sharing Provisions

Project Description

The National Biodiversity Authority (NBA) is currently implementing the first Global Environment Facility (GEF) national project on Access and Benefit Sharing (ABS) with the support from United Nations Environment Programme (UNEP) and the Ministry of Environment and Forests (MoEF), Government of India. This project is being implemented in the states of Andhra Pradesh, Gujarat, West Bengal, Himachal Pradesh and Sikkim in India. The executing organizations includes NBA. the 5 State Biodiversity Boards, UNEP-Division of Environmental Law and Conventions (UNEP-DELC), United Nations University - Institute of Advanced Studies (UNU-IAS) and the United Nations Development Programme (UNDP).

This project on "Strengthening the Implementation of the Biological Diversity Act and Rules with focus on its Access and Benefit Sharing Provisions" deals with assessing and quantifying the economic value of biological diversity present at local, state and national levels using appropriate methodologies to determine benefit sharing which will help in better implementation of the Act and inform national decision makers on prioritizing conservation action. The project also focuses on developing tools, methodologies, guidelines and frameworks *inter alia*, on Prior Informed Consent (PIC) Mutually Agreed Terms (MAT) Material Transfer Agreements (MTA) and benefit sharing agreements for realizing the ABS provisions. The project will facilitate and enhance efforts in decision making on the provisions of access and decide on benefit sharing components.

Establishing national, state and local level databases on biodiversity with ABS potential and developing ABS agreements as per the Act will help better use of country's biodiversity potential and facilitate better option for prospecting biological diversity. Establishing links to policy and regulatory frameworks on ABS provisions and promotion and strengthening of Biodiversity Funds at national, state and local levels; identifying and developing innovative financing mechanisms for implementation of the Act dealing with ABS applications and information management form the core of the project.

Carrying out public awareness activities on ABS and establishing state level platforms for local communities, NGOs and private sector stakeholder groups to partner and strengthen the ABS components of the Act is also a key part of the project. These activities will help in better coordination besides ensuring multi-stakeholder involvement in the implementation of ABS provisions of the Act. This process would help in contributing to the conservation and sustainable use of biological resources.

Project objective

Institutional, individual and systemic capacities of stakeholders are increased to effectively implement the Biological Diversity Act and the Rules to achieve biodiversity conservation through implementing ABS agreement in India.

Project Components and Planned Activities

Component 1: Identification of biodiversity with potential for ABS and their valuation in select ecosystems such as forest, agriculture and wetlands

Standard methodologies for valuing biodiversity would be developed for the forest, agriculture and wetland ecosystems with potential for ABS. Methodology and guidance on using the economic valuation would help in deciding the ABS permits. The expected outcome of the project will have enhanced understanding about the economic values of biological resources for improved policy making and implementation of conservation, sustainable use and determining the ABS provisions under the Act.

Component 2: Development of tools, methodologies, guidelines, frameworks for implementing ABS provisions of the Biological Diversity Act

Guidelines on PIC, MAT, MTAs and benefit sharing mechanisms at national, state and local levels are to be developed. Training module on negotiation skills, benefit sharing agreements, IPR and TK will be conducted for the benefit of BMCs and SBBs. Gap analysis on PIC, MAT, MTA and BS agreements will be carried out. Materials developed and lessons learned from this component will be used contributing to regional and international best practice examples and models for further developing ABS provisions.

Component 3:Piloting agreements on ABS

Guidance manual on Biological Diversity Act, 2002 and the Rules relevant to ABS will be published in english and respective regional languages. Sector specific guidelines on ABS issues and implementation options for benefit sharing at different levels will be developed. During the project period 25 ABS agreements will be negotiated and finalized and initiatives will be taken to establish state and local biodiversity funds.

Component 4: Implementation of Policy and regulatory framework(s) relating to ABS provisions at national level and thereby contribute to international ABS policy issues.

This exercise would involve gap analyses on policy and regulatory issues, creating awareness on implementation of ABS provisions within the BD Act. This component covers the inter-ministerial level dialogues which will facilitate the effective realization of ABS provisions within the BD Act.

An inter-sectoral task force will be developed to provide guidance on sectorial contributions and implications on ABS issues. A process documentation manual on ABS will be developed for use by countries in the region and globally for sharing of experiences and information with other countries at regional and International fora. Lessons learnt from this component will help strengthen national implementation of the Act at various levels besides supporting national actions on priorities identified under the national environmental policy and national biodiversity action plan.

Component 5: Capacity building for strengthening implementation of ABS provisions of the Biological Diversity Act

ABS related training and capacity building programmes will be organised for the SBBs and the BMCs on negotiation skills, linking the potential value of biological resources with ABS agreements. An online curriculum on ABS issues developed and orientation workshops involving ministries such as commerce, agriculture, trade and industries, science and technology, patent office, customs officials, PVP&FRA and tribal affairs would be organised. The outcomes of this component will help in accelerating implementation of the Act at national level besides providing capacity building opportunities at regional level.

Component 6: Increasing Public Awareness and education programmes

Local language resource materials would be developed comprising tools, methodologies, guidelines, frameworks of the activities outlined in the project along with relevant communication outreach materials. The exposure and exchange visits to the selected BMCs and SBBs would be organized to improve the knowledge base and sharing the experiences. Lessons learnt will help in better coordination of activities among the stakeholders in the implementation of the ABS provisions of the Act; it will also contribute to the conservation and sustainable use provisions under the Act.

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Project Implementing States

Andhra Pradesh

The state comprised of ecosystems ranging from coastal and marine, eastern-ghats, semi-arid and wetlands. With a coastline of 960 km, it offers rich marine and coastal biodiversity. The mainstay of local population remains agriculture and fisheries. The forest of Andhra Pradesh is largely of dry deciduous type with a mixture of teak, *Terminalia sps., Dalbergia sps., Pterocarpus sps. and Anogeissus sps.,*. The thick vegetation provides home to diverse wildlife which includes Tiger, Panther, Wolf, Wild Dog, Hyena, Sloth Bear, Gaur, Black Buck, Chinkara, Chowsingha, Nilgai, Cheetal, Sambar and a number of birds and reptiles. The long sea coast provides the nesting ground for sea turtles, the back waters of Pulicat Lake is serving as the feeding grounds for Flamingo and Grey Pelican. The estuaries of river Godavari and Krishna support rich mangrove forests with fishing cat and otters as keystone species. Rare plants like *Cycas beddomei, Pterocarpus santalinus, Terminalia pallida, Syzygium alternifolium, Shorea talura, Shorea tumburgia, Psilotum nudam, etc.* are also found in the State. Similarly, the rare and endangered species Jerdon's Courser, Golden Gecko, and Slender Loris are endemic to the State. The state has a total of 22 sanctuaries, 4 national parks and 3 established zoos.

Gujarat

It is characterized by arid conditions and the largest Thar Desert of India. The Rann of Kutch occupies 23,310 sq. km. and is located in extreme northwest part of the State. Even with aridity, 700 species of flowering plants have been recorded from Kutch district of which 345 species are indigenous. Vegetation of the desert is classified under 'Thorn Forest Type' with forests occupying 1.8% of the total desert area. The desert also acts as home to five endemic mammalian species, one bird species and five reptile species. Threats to this ecosystem can be attributed to population growth; and increase in livestock population leading to overgrazing of grasslands. Rann of Kutch is an established nesting and breeding ground of Flamingoes. The sub-species of wild ass are found only in the Rann. Some species of Rann of Kutch region are endangered. Mangroves of this region maintain the productivity along the coast. The State is also rich in medicinal plants. Local people are innovative and possess invaluable traditional knowledge on use of bio-resources. Gujarat has 22 sanctuaries and 4 national parks.

Himachal Pradesh

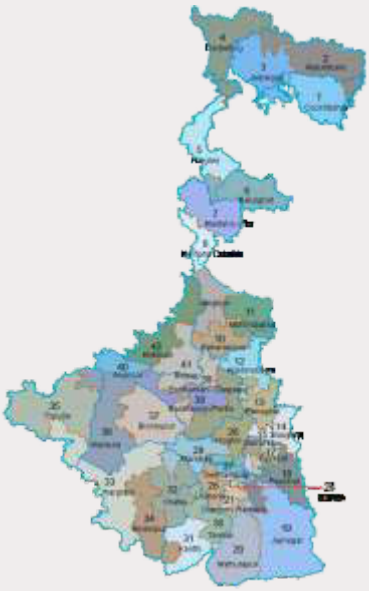
The forest types of Himachal Pradesh include tropical, sub-tropical and temperate forests. The tropical forests are confined to the foot hills and comprise of thorn, scrub and sal vegetations. Sub-tropical forests (500-1800 m) comprising dry evergreen area (below 1200 m) are dominated by Terminalia spp., Albizia spp., Oleaebo with subtropical chir pine forests extending up to 1800 m. The temperate forests (1500-3000 m) comprising Himalayan moist temperate sub-types (oak, fir, deodar, blue pine, horse chestnut) and Himalayan dry temperate forest (holm oak and edible pine at 2000-3000 m). Lakes are located in temperate as well as sub-tropical zone. Of these, Renuka and Pong are of national importance. Chandrabhaga, Ravi, Beas, Sutlej and Yamuna form the main river systems. Agro-ecosystem in the region has evolved out of forests and vegetation area. An estimated 17.5% of the state form agricultural landscape and 3.4% is used for horticulture. The region is rich in biodiversity. In the case of faunal diversity, pheasants and butterflies are well known as also the silk moths and golden mahasheer. Government of India has notified 8 species of plants and 10 species of animals as species which are on the verge of extinction. Many medicinal and ornamental plants are known to have been over exploited. The State still has two of the three species of Ovis from which all-domestic sheep breeds have been developed. It has vast area of cold deserts representing distinct biodiversity and. has two national parks and 32 wild life sanctuaries.

Sikkim

It is in the western part of North East Himalaya exhibits tropical, temperate to alpine forest types. It has 4,500 species of flowering plants, 362 species of ferns and fern allies and a rich biodiversity of orchids. More than 90% of the population depends on agriculture and horticulture. A rich endemic fauna of butterflies makes it of special biodiversity value. It has 422 species of birds and 697 species of butterflies which shows rich faunal diversity. Sikkim forms a part of Eastern Himalaya 'Hot Spot'. High altitude lakes and the river teesta provide the major freshwater sources in the state. Sikkim has witnessed significant reduction of habitats. Changes in the river flow through construction of dams are also believed to have serious impact on fishes and other aquatic fauna. Traditional agricultural practices called 'Jhum' (slash and burn) in 10 forest areas have also changed with shorter cycle, affecting both soil fauna and plant diversity. Tourism promotion in ecologically sensitive areas is slowly changing towards planned eco-tourism. There is one national park and six wild life sanctuaries, which together constitute over 30 % of the total geographical area of the state.

West Bengal

It is unique with regard to diversity of ecosystems, ranging from Darjeeling Himalayas to Terai forests and vast Gangetic plain with large tract under agriculture. Western part of the state is semi-arid offering less biodiversity. The largest mangrove forest in India (and largest mangrove in the world together with Bangladesh) is located in this state. A large number of rural and urban wetlands enrich the aquatic landscape. The rivers of West Bengal are dominated by Mahananda, Subarnarekha and Hugli – Matla system and offer the largest delta and 102 islands in the Sundarbans. The 220 km long coastline spread across three districts of the state, offers rich marine and coastal biodiversity. The state with its diverse ecosystem is known for its rich biodiversity which includes endangered royal bengal tiger, red panda, asian elephant, atleast 3 species of deer, wild boar, pangolin, etc. It also offers nesting ground for endangered marine turtle and horse-shoe crabs. The diversity of life, however, faced serious threats due to changes in habitat with ever increasing population pressure. Keystone species like royal bengal tiger and elephants have declined and more humanwildlife conflicts have been witnessed both in north and south Bengal in recent times.



In spite of three national parks, one Biosphere Reserve, 17 Wildlife Sanctuaries, two tiger reserves, the biodiversity crisis continues in the State which harbor 50% of mammalian species, 44% of bird species, 25% of reptilian species recorded. Less forest cover, loss of water spread area, river water pollution, river valley projects and changes in agricultural land use are the major contributing factors.

Biodiversity Management Committees (BMCs) formed and People's Biodiversity Registers (PBRs) prepared at the Project States (2012)

Sl.No	States	Number of BMCs	Number of PBRs
1	Andhra Pradesh	104	02
2	Himachal Pradesh	09	01
3	Gujarat	11	To be completed
4	Sikkim	To be established	To be completed
5	West Bengal	33	17

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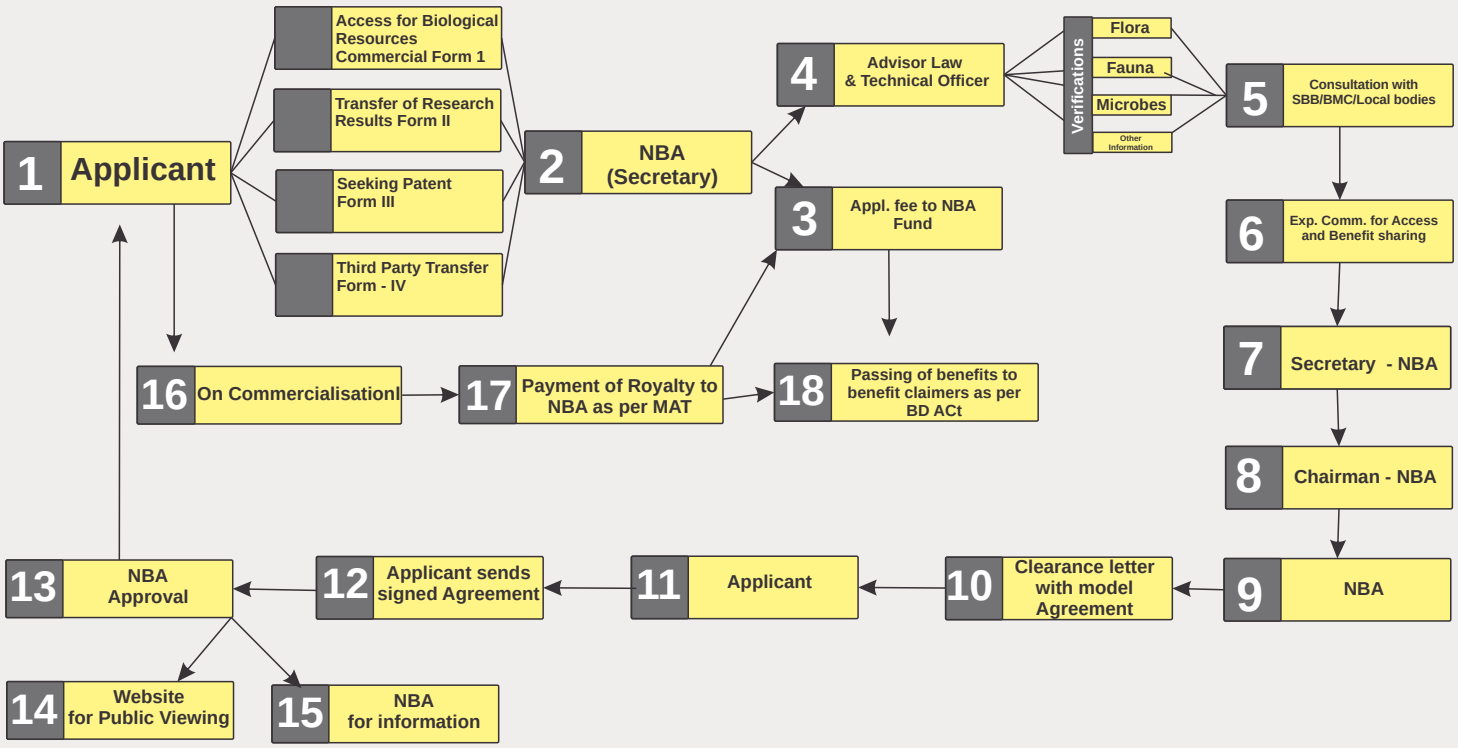
Access and Benefit Sharing and Biological Diversity Act of India

The ABS process in India

Using a 'learning by doing' approach, the NBA has put in place an ABS system in India in accordance with the provisions of the Act and Rules. The following figure presents the step-by-step, all inclusive process in dealing with ABS applications. Efforts are underway to further improve the efficiency of the system of processing applications and approvals, including attempts to reduce the timelines involved.

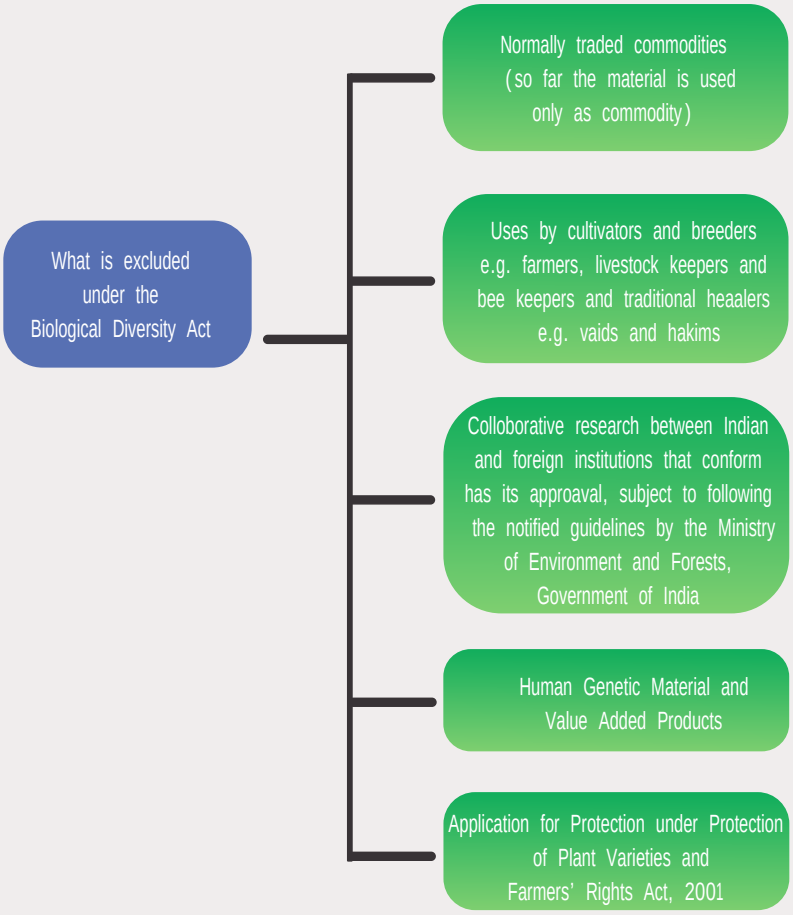
Sections 3, 4 & 6 of Biological Diversity Act 2002 and Rules 14-19 of the Biological Diversity Rules 2004 lays down a clear, predictable and transparent process for access to Indian biological resources and/or associated traditional knowledge.



Who is required to make an ABS application?

Following the principle of common but differentiated responsibility, the Act covers foreigners, non-resident Indians, and any-body corporate, association or organization that is either not incorporated in India or incorporated in India with non-Indian participation in its share capital or management.

All individuals other than Indian citizens require the approval of the National Biodiversity Authority when they access/ use biological resources and associated knowledge occurring in India or obtained from the country for commercial or research purposes or for the purposes or for the purposes of bio-survey or bio-utilization.



Indians and Indian institutions do not require the approval of the National Biodiversity Authority when they engage in the above mentioned activities. However they would need to inform the State Biodiversity Boards prior to undertaking any research with the intent of commercialization. Any application for intellectual property rights based on Indian biological resources irrespective of whether such applications are filed by Indians or non-Indians requires the prior approval of the NBA.

Relevant definitions for the purposes of ABS within the Biological Diversity Act:

In this Act, unless the context otherwise requires,-

"Benefit claimers" means the conservers of biological resources, their by-products, creators and holders of knowledge and information relating to the use of such biological resources, innovations and practices associated with such use and application;

"Biological diversity" means the variability among living organisms from all sources and the ecological complexes of which they are part, and includes diversity within species or between species and of eco systems.

"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 does not include human genetic material.

"Bio-survey and bio utilization" means survey or collection of species, subspecies, genes, components and extracts of biological resource for any purpose and includes characterization, inventorisation and bioassay;

"Commercial utilization" means end uses of biological resources for commercial utilization such as drugs, industrial enzymes, food flavours, fragrance, cosmetics, emulsifiers, oleoresins, colours, extracts and genes used for improving crops and livestock through genetic intervention, but does not include conventional breeding or traditional practices in use in any agriculture, horticulture, poultry, dairy farming, animal husbandry or bee keeping;

"Fair and equitable benefit sharing" means sharing of benefits as determined by the National Biodiversity Authority under section 21;

"Local bodies" means Panchayats and Municipalities, by whatever name called, within the meaning of clause (1) of article 243B and clause (1) of article 243Q of the Constitution and in the absence of any Panchayats or Municipalities, institutions of self-government constituted under any other provision of the Constitution or any Central Act or State Act;

"Prescribed" means prescribed by rules made under this Act;

"Regulations" means regulations made under this Act;

"Research" means study or systematic investigation of any biological resource or technological application, that uses biological systems, living organisms or derivatives thereof to make or modify products or processes for any use;

"Sustainable use" means the use of components of biological diversity in such manner and at such rate that does not lead to the long term decline of the biological diversity thereby maintaining its potential to meet the needs and aspirations of present and future generations;

"Value added products" means products which may contain portions or extracts of plants and animals in unrecognizable and physically inseparable form.

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Economic Valuation Component in the ABS Project

Background

The project on *"Strengthening the Implementation of the Biological Diversity Act and Rules with focus on its Access and Benefit Sharing provisions"* deals with assessing and quantifying the economic value of biological diversity present at local, state and national levels using appropriate methodologies to determine benefit sharing which will help in better implementation of the Biological Diversity Act and inform national decision makers on prioritizing conservation action. Developing tools, methodologies, guidelines and frameworks inter alia, on PIC, MAT, MTA, Benefit Sharing agreements for realizing ABS provisions will help in developing better ABS agreements.

Project Component

Identification of biodiversity or genetic resources with potential for ABS and their valuation in selected ecosystems such as: forests, wetlands and agriculture.

Major Activities

- Develop standardized economic valuation methods for valuing biodiversity in forest, agriculture and wetland ecosystems with potential for ABS
- Organize three national workshops and five state level workshops on understanding the valuation methodology and using the same in decision making
- Develop methodology and guidance on using the economic valuation in deciding on ABS permits
- Develop a data base covering the economic valuation information in finalizing ABS agreements

Expected Outcomes/results

Enhanced understanding of economic values of biological diversity for improved policy making and implementation of conservation, sustainable use and determining the ABS provisions under the Act enhanced.

Expected Outputs

- Economic value of biological diversity present at village or districts, state and national levels assessed and quantified using standard valuation methodologies in at least 5 states and 40 Biodiversity Management Committees;
- Discussion on provision of access and benefit sharing based on the economic valuation and methods.

Approaches

- Standard economic valuation methods developed for forests, agriculture and wetland ecosystems in 5 project states.
- Use of standard economic valuation methods to develop ABS agreements that capture appropriate benefit sharing principles.
- Surveys/reports of SBBs and BMCs use of the economic valuation methods to realize the ABS potential of the select ecosystems present in their states.
- Manuals on Standard Economic Valuation for forests, agriculture and wetland ecosystems.
- Interviews/surveys, and others on how provider of biological resources can use economic value for ABS purpose.

ABS and Valuation Linkage

Access and benefit-sharing (ABS) framework provides guidance for the way in which 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). Providers of genetic resources can be governments or civil society bodies, which can include private land owners and communities within a country, who are entitled to provide access, negotiate the benefits resulting from their use.

The rapid development of modern biotechnology over the past decades has enabled us to use genetic resources in more scientific manner for improving human well-being. It has also improved conservation methods that help safeguard global biodiversity. ABS principles ensures that the physical access to genetic resources is facilitated and that the benefits obtained from their use are shared equitably with the providers. Such ABS regimes also need to consider valuable traditional knowledge associated with the resources.

The benefits to be shared can be monetary, or non-monetary. It is vital that both users and providers understand and respect legal, administrative and policy frameworks at national and local levels as well as in those outlined in the Convention of Biological Diversity (CBD) and the Nagoya Protocol on ABS.

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) including provision for fair and equitable benefit sharing.

The process of prospecting biological and / or genetic resources involves a large number of actors and stakeholders ranging from local communities to multi-national companies. Thus there is a need to establish appropriate user provider chain when dealing into ABS issues.

The negotiation between a provider and a user of resources can never be entirely based on the nature and quality of resources to be used. Both user and provider need to know the value of the resources that is in discussion to meaningfully arrive at a conclusion on the quantum of benefits that can be generated and subsequently shared.

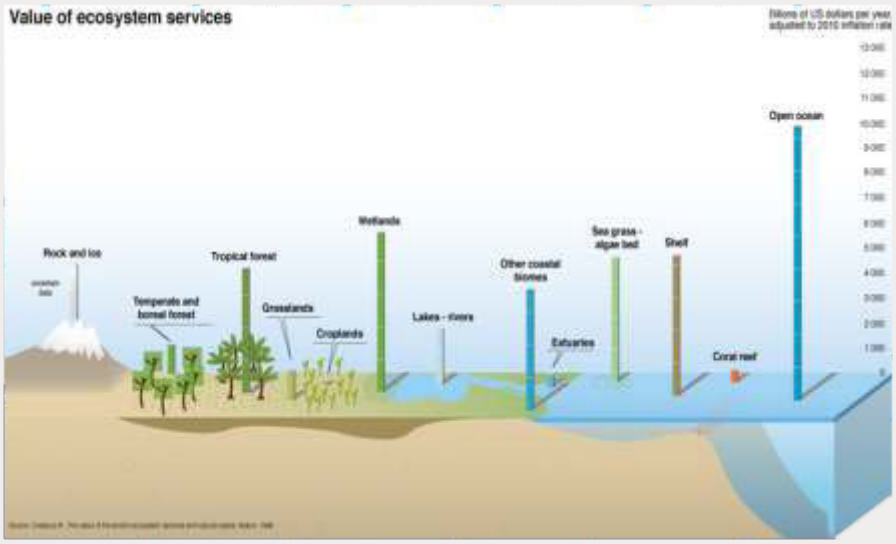
However, many times, the economic potential of biological resources is hardly understood by the providers as well as users in exact economic terms. This becomes a fundamental problem in arriving at suitable ABS agreements.

In general, the provider (either the local community and indigenous group or the country) believe that they obtain a meagre share of the real resource value since they don't have a proper base value to bargain or negotiate the benefits.

The valuation exercise, currently undertaken in India with the framework of UNEP-GEF-ABS project is an attempt to understand or measure the real value of biological resources (goods), which enable appropriate fixation of benefit sharing components.

Economic Valuation of Biodiversity and Ecosystems

Unlike marketable goods, many ecosystem good and services are not traded at markets and therefore their value is not reflected in fixing prices. Consequently, private and public decision making on conservation of biological resources are not appropriate, particularly for its conservation and sustainable management. Further allocation of appropriate share of funds, including application of incentive mechanisms, are not considered effectively. This distortion is an important underlying cause of biodiversity loss/decline.



Source: http://www.grida.no/graphicslib/detail/value-of-ecosystem-services_defb

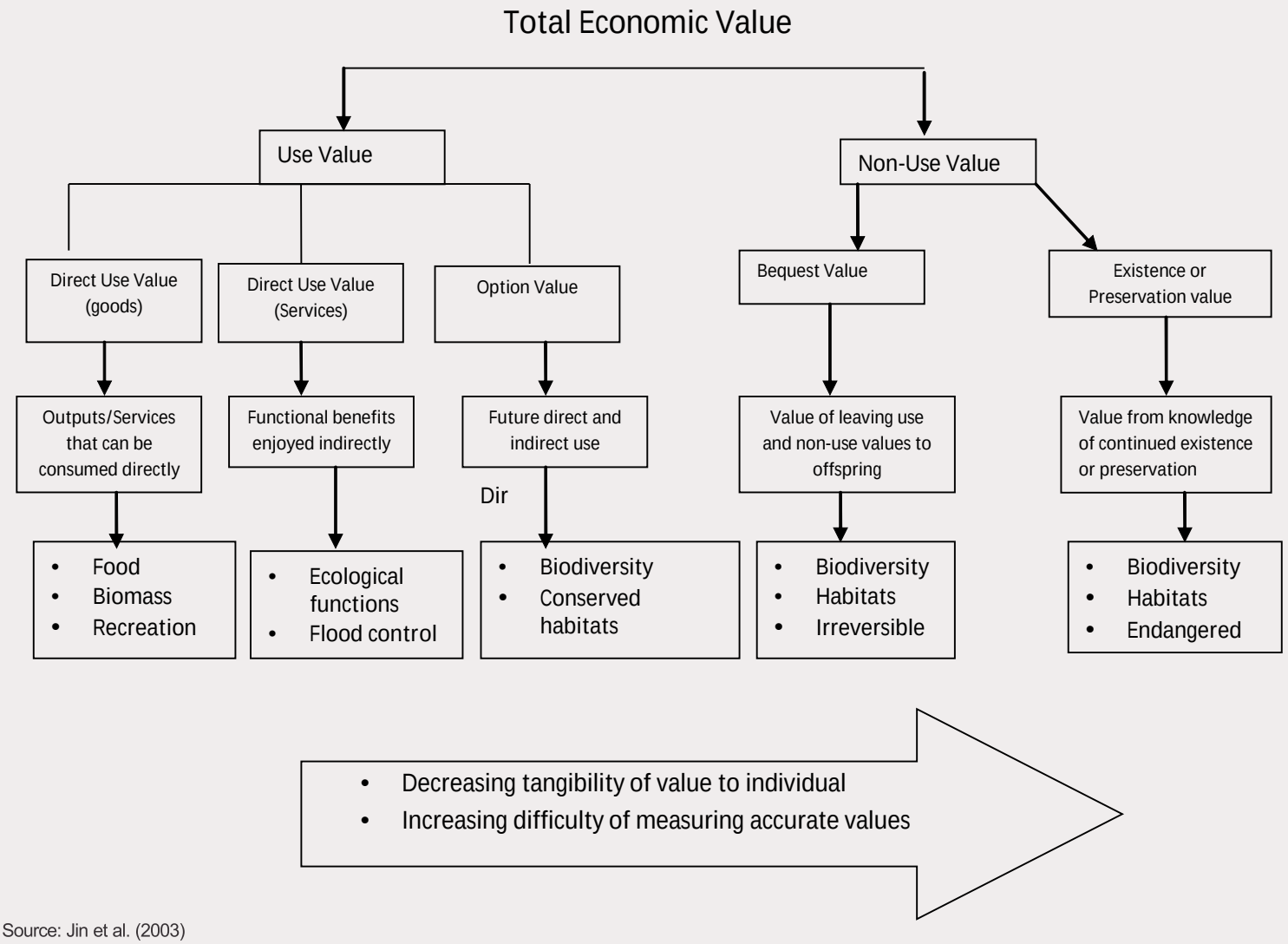
According to experts if the full economic value of ecosystem services was taken into account in decision-making, the degradation of biodiversity and ecosystems services could be significantly reduced or even reversed. In this context, The Economics of Ecosystems and Biodiversity (TEEB) report aims at developing mechanisms to assess the value of nature, drawing attention to the global economic benefits of biodiversity and highlighting the growing costs of its loss and provides some conclusive evidence on why biodiversity and ecosystem need to be properly valued and accounted for.

Most public and private resource management and investment decisions are strongly influenced by considerations of the monetary costs and benefits of alternative policy choices. Undertaking valuation should seek to address the relevant components of the Total Economic value (TEV) of non-marketed ecosystem services. The TEV includes both the direct and indirect use value as well as non-use value of ecosystem services (Fig) and hence goes beyond the immediate benefits of commercial exploitations of biodiversity resources. Decisions can be improved if they are informed by the economic value of alternative management options and involve mechanisms that bring to bear non-economic considerations as well.

From an ABS perspective, use value - particularly direct use values - in the forms of goods / products which are tangible or visible is significant. Majority of these products are currently marketed in different local or traditional manner, where the real value of the product is not reflected in the form of medium of exchange or price. Hence products are under-priced. The basic reasons are:

- Bio-products are generally considered the free gifts of nature (manufactured by nature with its unique and intrinsic ability).
- Bio-products are public goods (either pure or in-pure public goods) hence non-excludable and non-rivalry in character. In most of the core biodiversity spots (such as: forests, wetlands, marine and coastal zones) the property rights are not well defined.
- The non-excludability character of open access resources like biodiversity (bio-products) will often make a market price close to zero, when the actual value is quite large.
- Since the bio-products are non-rivalry in character, there is no (not much) competition of these resources, hence the market price will be inaccurate.
- Non-excludable and non-rivalry characters of biodiversity reflects the “off-site effects” and the resources often flow to wider communities to different provinces and countries skewing the well below market prices than the actual value.

Total Economic Value of Biodiversity



Source: Jin et al. (2003)

With this in mind, the UNEP – GEF – ABS project focuses on economic valuation of ecosystem goods from three ecosystems viz. forests, wetlands and agriculture.

Economic Value of Different Ecosystems

The on-going ABS Project attempts to value selected ecosystems such as: forests, wetlands and agriculture in the project implementing states in India (Andhra Pradesh, West Bengal, Sikkim, Himachal Pradesh and Gujarat).

Forests

Forests are important renewable ecosystems capable of providing a wide range of benefits (environmental, economic, social and cultural) to the society. Forests provide raw-materials for food, fuel and shelter. In forests, ecosystem components such as micro-organisms, soil and vegetative cover interact to purify air and water, regulate climate and recycle nutrients and wastes. Hence forest attributes significantly in global life support system, economic growth and the environmental conditions of the country. The values associated with conventional forest products such as timber, pulp, paper etc. pass directly through to markets. On the other hand, many other services of forests (regulating weather patterns, recreational services, controlling soil erosion and hydrological cycle etc.) are not marketable. Therefore, it is becoming increasingly important to identify and evaluate these non-market benefits of forests with the help of appropriate methodology for deriving the total economic value of the forest. See the following examples.

Price of some NTFP (Rs. per Kg.) from a Protected Area from Kerala

NTFP items	Collection price at forest gate	Sales price of the Federation	Final consumer price	Price spread	% of Collection price
Honey	119	133	200	81	59.5
Honeywax	80	135	203	123	39.4
Kalpasam	51	85	128	77	39.8
Cheevakkai	9	11	16	7	56.3
Gooseberry	5	5	8	3	62.5
Kakkumkai	5	7	10	5	50.0
Atthithippali	10	16	24	14	41.7
Kunthirikkam	30	39	58	28	51.7
Kudampuli	74	110	165	91	44.8
Pachottitholi	11	13	19	8	57.9

Source: Shylajan and Mythili (2007)

Annual Economic Value of Forest Stock of Himachal Pradesh (as per 2000 prices)

Catogary	Goods and Services	Physical Value	Monerary value (Rs. Crore)
Direct Consumptive benefits	1.Salvage	3.50 lakhs m3	32.00
	2.Timber for right holders	1.06 lakhs m3	60.00
	3. Fuel-wood	27.60 lakh tons	276.00
	4.Fodder	92.0 lakh tons	690.00
	5.Minor forest produce	1161.56 tons	25.00
			1083.00
Direct Non-consumptive benefits	6.Ecotourism	66.56 lakh - Tourists	6657.00
Total Direct Benefits(A+B)			7740.00
Indirect Benefits	7.Watershed	6.77crore m3 - Growing stock in river Basin Forest Circle and 36986 km2 - entire forest area	73972.00
	8.Microclimatic Factors	969018 Households	145.00
	9.Carbon Sink	14346 km2 - Area under tree cover and scrub forest	17645.00
	10.Biodiversity / Endangered Species	8966- Total no. of species found in Himanchal Pradesh & 125 – Endangered species	7137.00
	11.Employment Generation	48.40 Man days	25.00
Total Indirect Benefits			98924.00
Total Economic Value			106664.00

Source: Madhuverma (2000)

Economic Value of Different Ecosystems

Wetlands

Wetlands are one of the most productive ecosystems in the earth. Wetland includes: (a) estuaries – where rivers meet the sea and salinity is intermediate between salt and freshwater (e.g., deltas, mudflats, salt marshes), (b) marine – not influenced by river flows (e.g., shorelines and coral reefs), (c) riverine – land periodically inundated by river overtopping (e.g., water meadows, flooded forests, oxbow lakes), (d) palustrine – where there is more or less permanent water (e.g., papyrus swamp, marshes, fen) and (e) lacustrine – areas of permanent water with little flow (e.g., ponds, kettle lakes, volcanic crater lakes)

The major components of a wetland includes biotic (plants and animals) and non-biotic (soil and water). The interactions between the components make wetland as functions, including nutrient cycling and exchange of water between the surface and the groundwater and the surface and the atmosphere (hydrological cycle). The system also has attributes, such as the diversity of species.

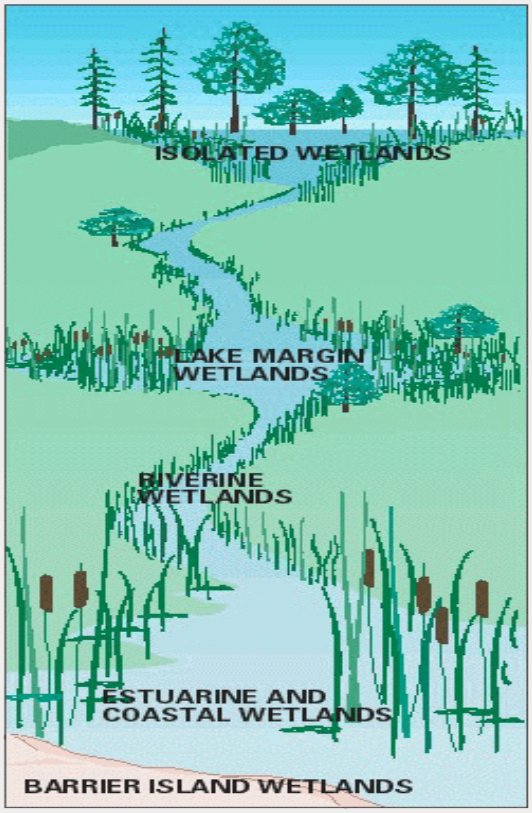


Figure:Wetland functions depend upon the location of the wetland within a watershed. (Source: Modified from J.A, Kusler, Our Nationlal Heritage: A Protection Guidebook. Copyright © 1983 by the Environmental Law Institute. Reprinted by permission)

Characteristics and functions of wetlands

Isolated Wetlands Waterfowl feeding and nesting habitat 2. Habitat for both upland and wetland species of wildlife 3. Floodwater retention area 4. Sediment and nutrient retention area 5.Area of special scenic beauty
Lake Margin Wetlands 1. See "isolated Wetlands" beside 2. Removal of sediment and nutrients from inflowing waters Fish spawning area
Riverine Wetlands 1. See "isolated Wetlands" above 2. Sediment Control, Stabilization of river banks 3. Flood conveyance area
Estuarine and Coastal Wetlands 1. See "isolated wetlands" above 2. Fish and shelfish habitat and spawning areas 3. Nutrient source for marine fisheries Protection from erosion and storm surges
Barrier island Wetlands 1. Habitat for dune-associated plant and animal species 2. Protection of backlying lands from high-energy waves 3. Scenic beauty

Loss of Wetland Wealth Per Capita over 1991-2001

State	loss over 1991-2001 (in Million USD 1999-2000 price)	Population in 2001 (Million)	loss Per Captita over 1991-2001 (in USD 1999-2000 Price)
Gujarat	387.68	50.67	7.65
Jammu and Kashmir	2,148.75	10.14	211.83
Kerala	13.82	31.84	0.43
Rajasthan	103.51	56.51	1.83
West Bengal	0.34	80.18	0.004
Total	2,654.11	229.34	11.57

Source: Pushpamkumar (2012)

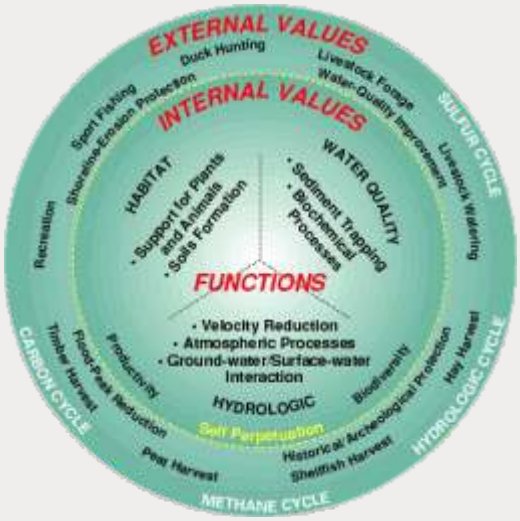


Figure : Wetland functions and internal and external values.
Source: http://water.usgs.gov/nwsum/WSP2425/functions.html

Wetland ecosystem provides direct as well as indirect services to the humanity. People use wetland soils for agriculture, they catch wetland fish to eat, they cut wetland trees for timber, fuel-wood, to make mats and to thatch roofs, collect plants for manufacturing medicines and other commercial products. Further wetlands also used for recreation (bird watching or sailing) and scientific research purpose. The indirect services of wetlands includes: flood control, regulating the atmospheric conditions and climate and protect the communities from natural calamities (as mangrove wetlands protect coastal communities).

Economic Value of Bhoj Wetland (located in Bhopal) in Selected Use

Use	Stakeholder	Valuation Technique	Annual Value (Rs.)
Drinking Water	Water supplying agencies	Supply Cost	9,54,13,962
Fish Production	Fishermen	Market Price of Existing Production	80,00,000
Boating	Boatmen	Income Estimation	24,37,880
Trapa cultivation	*Trapa* (water chest nut) Cultivators	Market Price of Existing Production	50,00,000
Washing of clothes	Washer men	Income Estimation	36,00,000
Boating	MP Tourism Dev. Corporation	Revenue Generation	6,74,635
Recreation	Entire population of the city	Contingent Valuation Method	4,84,68,956
Increase in property prices	Lake front property owners	Hedonic pricing	50% difference in property prices

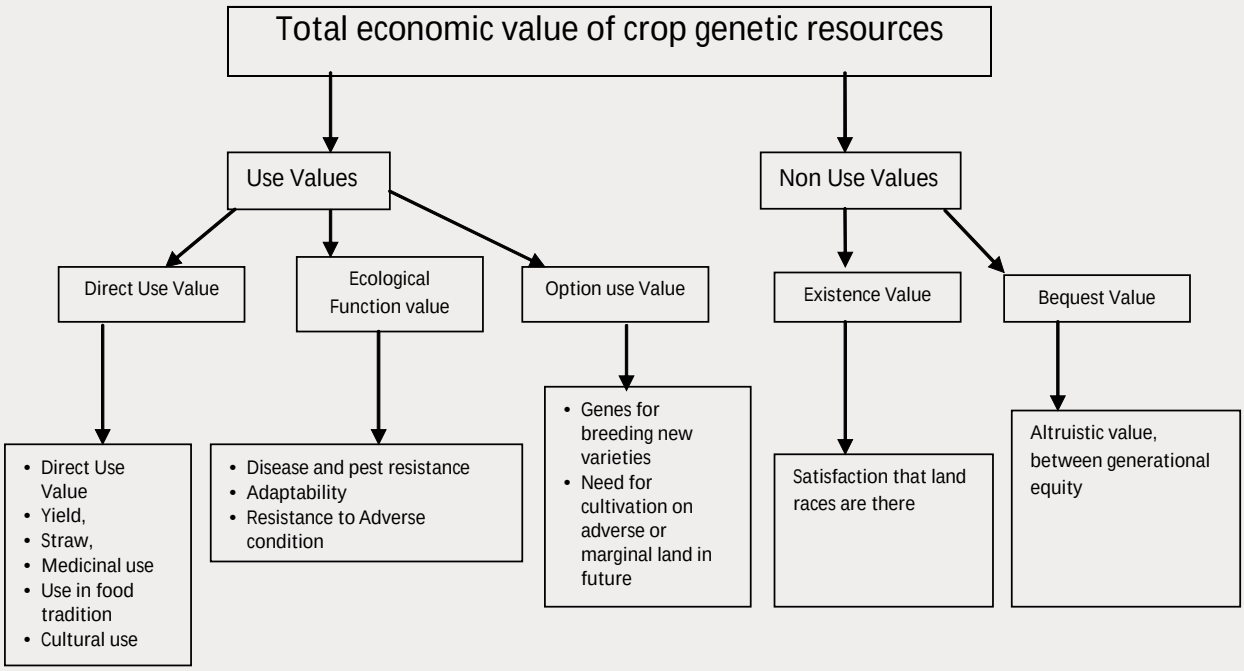
Source: Madhuverma et al. (2001)

Total Economic Value of Crop Genetic Resources

Agriculture

Agricultural biodiversity is an essential component for global food production, livelihood security and sustainable agricultural development. The plant, animal and microbial organisms influenced on food and agriculture must be conserved and used sustainably for universal food security. Agricultural biodiversity of all food species is highly threatened during globalisation induced unsustainable industrial food production. It is the first link in the food chain, developed and safeguarded by farmers, herders and fishers throughout the world. Agricultural biodiversity includes: (a) harvested crop varieties, livestock breeds, fish species and nondomesticated ('wild') resources within field, forest, rangeland and in aquatic ecosystems; (b) non-harvested species within production ecosystems that support food provision, including soil micro-biota, pollinators and so on; and (c) non-harvested species in the wider environment that support food production ecosystems (agricultural, pastoral, forest and aquatic ecosystems).

Agricultural biodiversity emerged from the interaction between the environment, genetic resources and the management systems and practices used by culturally diverse peoples resulting in the different ways land and water resources are used for production. It thus encompasses the variety and variability of animals, plants and micro-organisms which are necessary to sustain key functions of the agro-ecosystem. In brief, agricultural biodiversity is essentially the interaction of knowledge and genetic resources used for food, biological support or ecological services. Therefore valuing agricultural biodiversity and incorporating into decision making is important (see the Figure).



Source: Poudel and Johnsen (2007)

Under the UNEP – GEF – ABS project, valuation of these three ecosystems will be undertaken with specific focus on goods being provided by them from an ABS view point. Based on the results, it is expected that few model ABS agreements can be finalized through bio-prospecting where the benefit sharing components will be more clearly captured based on actual value than potential value.

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Process Documentation for the ABS Project

The process is as important as the product in any project of this nature. Process documentation (PD) is a method of concisely capturing and sharing critical project concepts, plans and information as they are developed, so that impacted parties can share this information, make informed decisions, and keep the project moving forward without having to revisit old discussions. The basic aim of process documentation is to learn from the implementation experience and in the light of this modify the strategy and ultimately, policy of a program, project or organization.

Documentation of processes helps in creating systematic information to articulate the intervention strategies and develop the flow chart of a program. This helps the project or organization to find out more about the needed field intervention methods, coordination, management requirements, financial management and human resource development policies. Not only the project conducting process documentation is benefited from this, but also other similar projects and agencies can use the outcome as a model in their formulation and implementation methods. Under the UNEP ABS Project on Access and Benefit sharing the following planned methods will be followed to document the process, which includes:

- Chronological accomplishments and short comings if any as a lessons learning during the implementation of the project.
- Design and establish a database based on economic values developed for biodiversity that can be used by NBA, SBBs and BMCs for ABS.
- Collection of documents related to best practices on ABS provisions to facilitate decision making.
- Identifying biodiversity potential related to ABS provisions and sustainable use practices.

Methods of Process Documentation:

The documentation process includes the creation of repository of the following:

- Minutes of the meeting, scope document,
- Records, Case studies,
- Reconstruction of events,
- Field diaries,
- Video and audio recoding
- Newspaper clippings,
- Internet sources and Publication,
- Peoples Biodiversity Register, Conducting Interviews / survey

Under the UNEP-GEF MoEF ABS Project, the Process Documentation will be prepared on the following themes:

Background of the Project on ABS

1 Context

- Institutional arrangements
- Time Frame

2. The Institutional Framework

- Steering Committee
- National Project Director (NPD) and team
- Project Technical Committee (PTC)
- Project Management Unit (PMU)
- State Project Unit (SPU)
- Biodiversity Management Committee
- Institutional Structure (Fig.)

3. Level of the Implementation Process

- Identification of biodiversity with potential for ABS and their valuation in selected ecosystems.
- Development of tools, methodologies, guidelines, frameworks for implementing ABS provisions.
- Piloting Agreements on ABS.
- Implementation of Policy and regulatory framework (s)relating to ABS
- Capacity building.
- Awareness creation and education.

4. Orientation and Review workshops

- Project Inception meeting
- State Project Launch meeting
- Workshop on valuation methodology
- Training on negotiation skills, benefit sharing agreements, IPR protection and TK documentation
- Dialogues at Inter ministerial level on ABS
- Online curriculum on ABS
- Awareness products, materials and communication and outreach materials

5. Methodologies

6. Monitoring and Evaluation

7. Facilitating ABS agreements

- National Agreements
- International Agreements

8. Strengthening of the Implementation of the BD Act with focus on ABS and its implementation

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