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Valuation of Bio-resources for Operationalizing "Access and Benefit Sharing" Mechanism: Search for Methodology

First National Level Discussion Meeting

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National Biodiversity Authority

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Access and Benefit Sharing (ABS)

- **Indiscriminate exploitation of** biodiversity …….
- Increasing **demand** for the bio-resources and **biopiracy**
- **Convention on Biological Diversity** (1992)
- 193 countries as parties
- Further legally binding **Nagoya Protocol** (2010) on ABS
- CBD → **indigenous and local communities role** in conserving the biological diversity and in protecting the traditional knowledge associated with the genetic resources.
- **India** is one of the leading countries advocating for its early enforcement.

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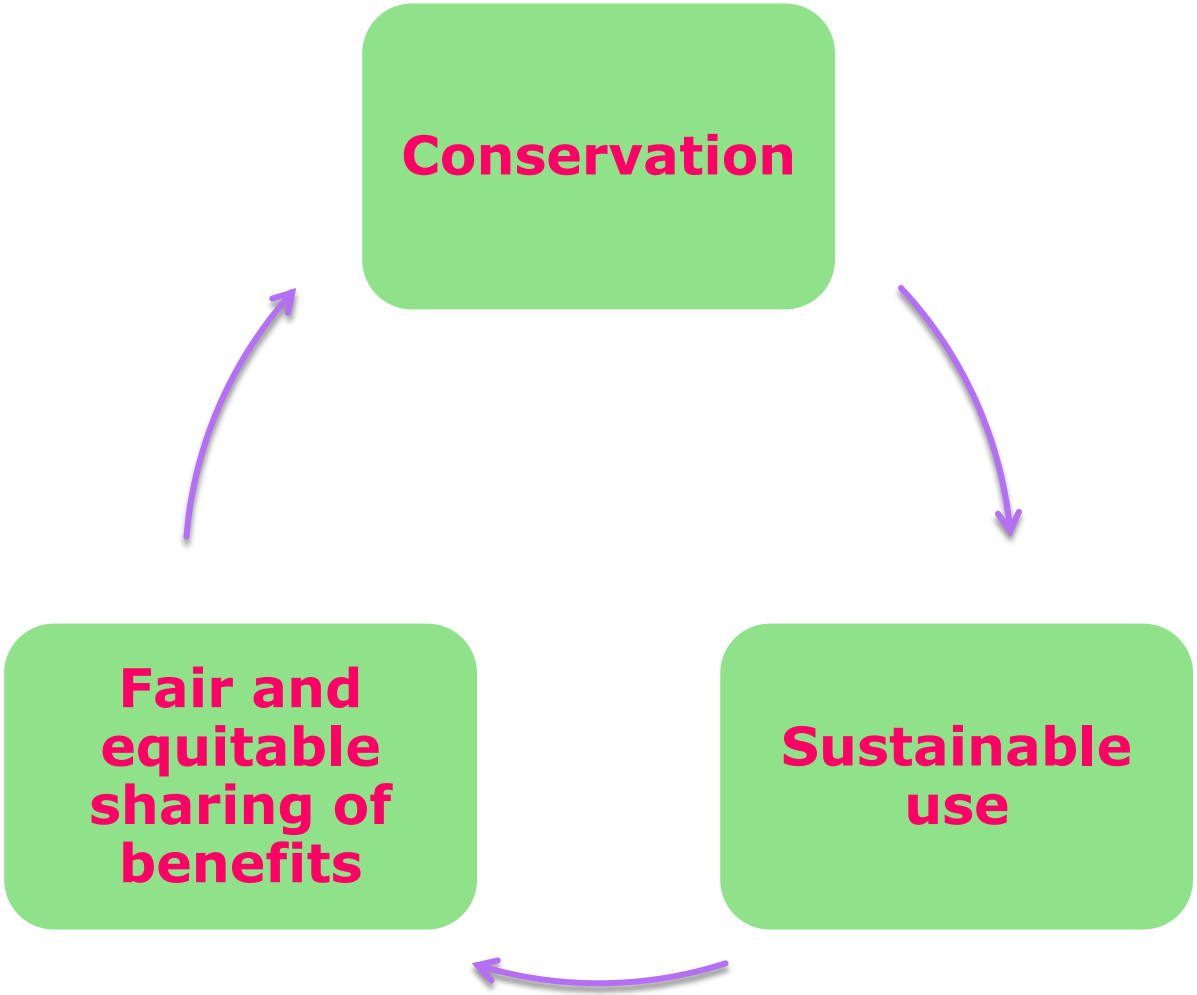
CBD Objectives



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ABS .....

- **Innovative approach** and an **incentive mechanism** in biodiversity Conservation and Sustainable Use.

- 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).

- Philosophy proposes that providers of bio-resources are entitled to receive **fair benefits** from the users.

- Balances the rights of the users of BR with the rights of the providers
- Manage biodiversity as a **community asset**, and support biodiversity-based businesses in an effective and sustainable manner.

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ABS:

- 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 the equitable benefit sharing and signing of ABS agreements.

ABS Process in India

- India: Party to the CBD and as one of the mega-diverse countries
- India enacted the **Biological Diversity Act in 2002**, and notified the **Rules** thereunder in **2004.**
- The objectives of the Act are similar to those of the CBD (**ABS** key)
- **NBA, SBBs, BMCs**
- ABS agreements under the Act are: **Four categories**
- More than **100 agreements** have been signed so far
- Benefit sharing criterion: **2-3 % of the sale value of the final products derived from the bio-resources (royalty)**

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ABS: UNEP GEF MoEF Project

- "Strengthening the Implementation of the Biological Diversity Act and Rules with focus on its Access and Benefit Sharing provisions"
- Implemented in **5 states** in India (Andhra Pradesh, West Bengal, Sikkim, Himachal Pradesh and Gujarat)
- **Developing standardized economic valuation methods for valuing bio-resources from selected ecosystems** (Forests, wetlands and Agriculture) is the one of the objectives

- BRs are used as an **unavoidable input factor** for manufacturing **various value added products, having a huge market potential.**

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Timber and Non-timber Forest Products




Wetland / Marine Species and Products

Fish

Seaweeds

Agriculture Resources and Products

Wheat and Wheat Products

Milk and Milk Products

Poultry and Poultry Products

Valuation of Bio-resources

- 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 does not include human genetic material (The Biological Diversity Act, 2002)

- Bio-resources: **a subset of biodiversity**.

Biodiversity is a **'stock'** and bio-resources are **'flow'** (**renewability**)

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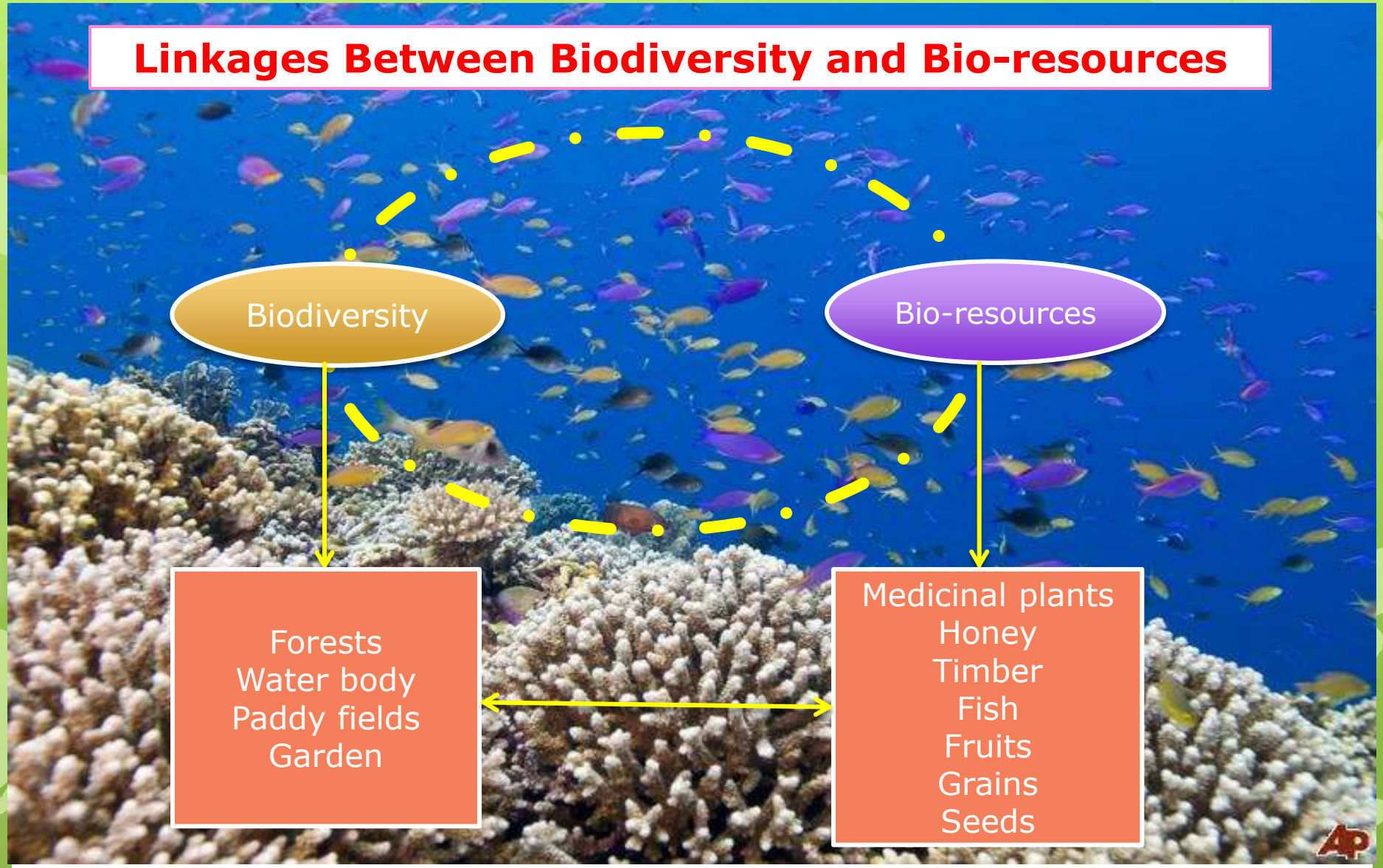
Linkages Between Biodiversity and Bio-resources



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Paradox in Valuation

- Most of the ecosystem/Biodiversity values: **not captured by market**
- **Total Economic Value** (TEV) Approach (**Goods + Services**)
- Methodology development: valuing the non-marketed services of the ecosystem has progressed

- **Goods Value**: Based on their current exchange rate or price **(quantity of goods X price)** at their collection point

- **Services Value**: **Actual valuation takes place with the help of an appropriate methodology**.

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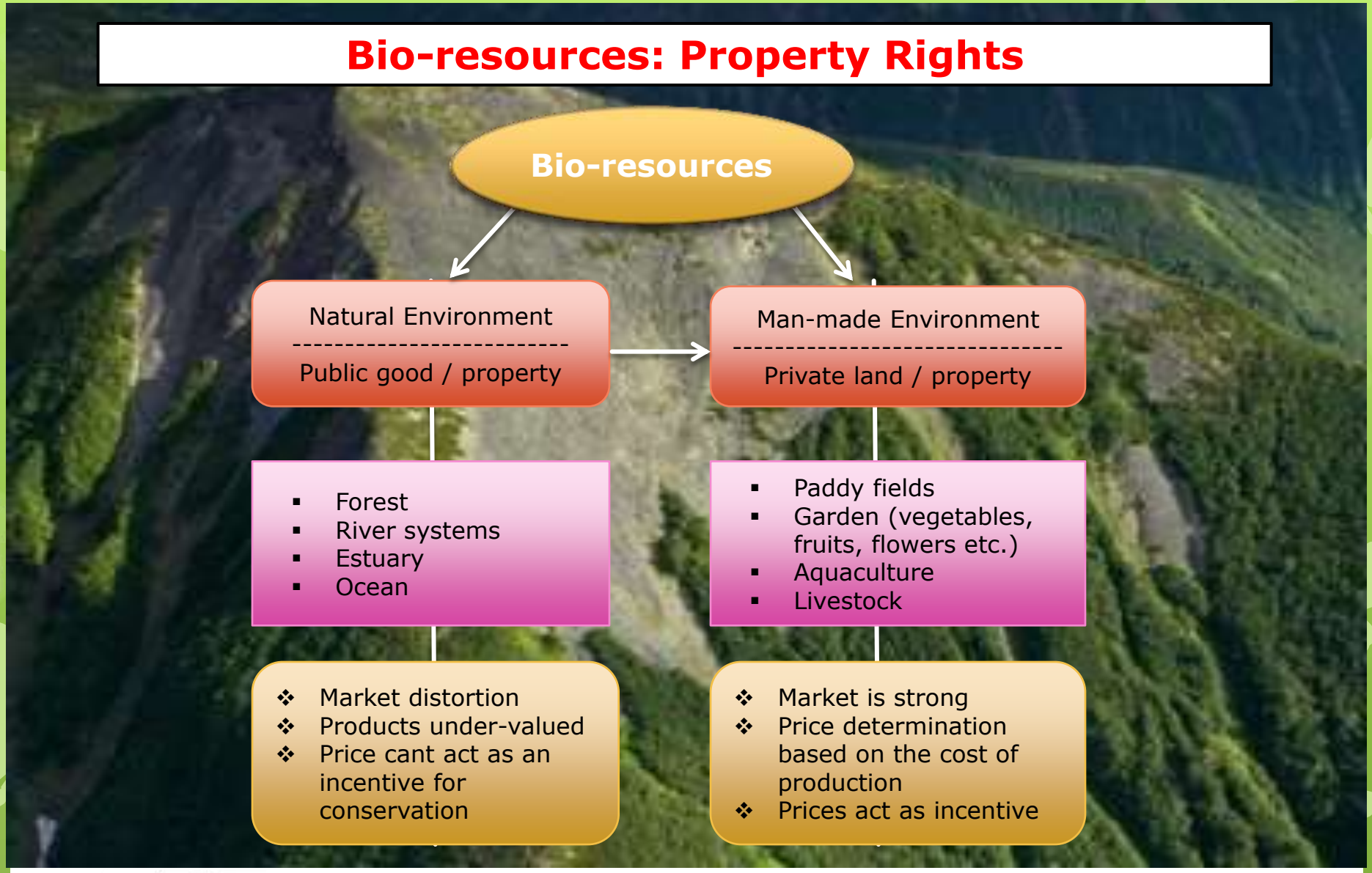
Why the Real Value Estimation of Bio-resources is Significant?

- **Huge quantity of collection**: food, medicines or biomass.
- Also involved in **research and development** (which lead to the innovation of new consumer products) **and trade, and act as the basic raw-material/input factor** in manufacturing many products.

- Most of our ecosystems (forests, rivers, estuaries, oceans, etc) are **common properties**.
- Hence, the goods from these sources experience **market failure or distortion**
- Current **market price at their collection point does not represent their real or true value or but only an exchange rate**
- Too **arbitrarily assessed or fixed**.

- Due to the market imperfections: ecosystem goods **'under-priced'.**
- This might be the reason for the less percentage (negligible share) of goods' value in the TEV of ecosystems, in empirical studies.
- The providers (**local communities) are being exploited** (obtaining only a meagre price), by the traders and companies, who make substantial profits from the business.
- In this context, **the valuation of biodiversity/ecosystem goods is a fundamental step towards determining the real value of bio-resources, and operationalizing the ABS**

Bio-resources: Property Rights



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Development Process of the Valuation Methodology of Bio-resources

***Evidences from Literature*:**

- Considered the bio-resources (such as medicinal plants, microbes, genetic resources), **bio-prospecting, and the products'** (drugs, cosmetics, food items etc.) **manufacturing capacity** in valuation
- All the studies used **sophisticated statistical models**.
- Different studies followed **different methodologies** and arrived at **different values**.
- Indicated the **diminishing values of the marginal species, and the issues of redundancy in bio-prospecting**.
- Advocated that the income derived from bio-prospecting is an ideal source of **revenue for the conservation** of biodiversity.

- None of the studies approached/discussed the **ABS type of valuation**
- Broadly the values assigned by these studies to bio-resources are **low**
- These are primarily the '**gap filling**' type with academic and research interests, rather than the "**valuation for commercial purpose**" like the ABS. Hence, according to the studies, whatever the final figure (**value**) arrived at is **not a big concern**, since it is not directly used for any **policy decisions**.
- However, **some of the methods or approaches used by certain studies are very promising, and can be considered for the valuation we are seeking for ABS, with the required modifications based on the field level realities.**

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Lessons from Industrial Visits and Discussions

- The use of bio-resources by companies **varies substantially**, (purpose: R&D and raw-material for production)

- Some of the companies collect bio-resources, such as strains from the **authorized culture centres**, and propagate them as per their requirements.

- According to these companies they are **not 'destroying the bio-diversity'**, (initial collection by parent institutions is negligible).

- In bio-prospecting, the role of R&D is crucial, where the human brain and technology are the key factors.

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- R&D companies: even if they fail in their research, this could be a lesson for avoiding further failures.
- In R&D, a company may target some objective/product but may achieve some other things. In these circumstances, the **correct judgement of success and failure is a challenge**.
- In certain companies, the success rate of R&D is only **10%.** But in bio-prospecting, the general success rate is indicated as **50%**.
- Bio-prospecting industries' R&D cost should cover only **20 to 30% of the total production cost**. (a lower cost might be a big gain).
- The detailed cost information of companies can be obtained through a **questionnaire survey**. However, the **willingness to share** information from the company's side is important.
- Companies do not think or anticipate **resource crises or scarcity** in future; (priority for biodiversity conservation is insignificant).

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Possible / Draft Methodologies for Valuation of Bio-resources

- Since the **existing literature** on environmental economics has not debated much on this issue, we do not have any standard reference for framing the methodology.

- However, based on the **rough insights from selected literature** and **experts**' (environmental economists, ABS specialists, statisticians, industrial consultants, NGOs, community representatives etc.) **opinion**, certain methodologies or approaches have been drafted for discussion.

Value Chain Analysis:

- Many value added products are derived from bio-resources.
- Value addition: through **transaction costs or and processing / manufacturing costs**

→ **Transaction costs**

→ Processing / Manufacturing Costs

- Certain bio-resources may act as basic raw-material for manufacturing final products
- Eg: *Jeevani* an immuno-modulatory product (ayurvedic medicine) is manufactured from the plant known as *Arogyapacha*

- *Arogyapacha* is an **unavoidable input**, but not an **exclusive one**
- Many other products and knowledge/skill (research and development) also attribute to such development
- **Amortised (Remunerated)** pricing technique is relevant to estimate the real price of bio-resources.

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Bio-product Value Addition

Based on actual market value

Based on notional value

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.

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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

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In brief:

- The value chain analysis is applicable where bio-resources are used **an input factor in production**, or considered as a commercial product.

- Here, the **input output process** and the **value additions** at different stages of production with cost accounting is the key to value chain assessment.

The "Maximum Willingness to Pay" Approach:

- In bio-resources based economic activities and exchange:

The provider or **community may not know the actual value**
But the **buyers** (industries and R&D companies) are **fully aware**

- Hence, the **maximum willingness to pay** for bio-resources by the user at their **collection point will reveal their 'real value**'

Pre-conditions and assumptions

- The final users of the bio-resources need to **directly procure the resources** from the community (not be through traders).
- The **community's empowerment** in bio-resources should be sensitized (active involvement in the exchange process like auction)
- Role of local institutions like **panchayats and BMCs** is significant.

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- The community (as a custodian of resources) can **demand a higher price** for each bio-resource it exchanges at its collection point.
- Automatically, the **industries will come forward for negotiation**, (unavoidable input factor in their production).
- The **negotiated value** will act as the "**real value" for BR**.
- Through this method one can **confine the value of the resources at their source**, rather than targeting the final products percentage share, which is becoming more controversial.

Application of the Appropriate Economic Instruments: (tax, cess, charges, royalty etc.)

- The bio-resources which come under the purview of the ABS are predominantly the **public owned resources or state property**.
- Here, communities obtain the privilege of the users' right. Since it is a state property, **any resource-based management issues** (such as scarcity, extension and unsustainability) should **come under the purview of the Government**.
- BR have **multiple uses and diverse product manufacturing capacity and value generation** (not a uniform resource like water).
- With this consideration the government authority concerned, can **fix a 'tax' or apply any other appropriate instrument for the extraction** of the particular resources.

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Criteria need to be considered, before **selecting the appropriate economic instruments and fixing the tax rate**.

- An inventory of Bio-resources with species current stocks, volume of extraction, sustainability rate, extinction level
- Anticipated changes in the resources in future

- It can also act as an **economic disincentive** in the extraction of bio-resources, and in saving the biodiversity.

- However, as the money derived through tax goes as **public revenue**, (direct application for conservation of biodiversity may be an issue).

Minimum Support Price for Bio-resources

- The authority concerned (BMC) can fix a **support price** (with the consultation of experts) for the bio-resources prevailing in their jurisdiction.

- **The availability of the resources, demand, purpose of collection, usage in industries, value generation capacity** etc., may be considered as the criteria for fixing the support prices.

Collectors' Willingness to Accept and Minimum Livelihood

- Generally, the local communities put in their **hard work and unique knowledge** in collecting the bio-resources from the wild.
- But in most cases, they are compelled to exchange the resources at **negligible prices**.
- **Market imperfection, lack of ownership rights of the resources, and the least bargaining ability** contribute to lowering of the prices.
- Hence, the communities' **willingness to accept** should be considered.
- **Further, a minimum or standard amount for rural livelihood or wage** can be considered in the bio-resources collectors' case, and that amount **fixed as the value of the bio-resources that he/she collected per day.**

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In Brief

- **Developing an appropriate methodology for valuing bio-resources, which are used for commercial purposes, is extremely important for signing the ABS agreements, and charging the 'real value' for bio-resources from the users.**
- **The possibilities in considering the above draft methods and / or identifying new methods should the main task**
- **Simple methods, more practical and easy to value ……..**

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Thank You

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