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Bio-resources Valuation for Access and Benefit Sharing: Methodology

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Development Process of the Valuation Methodology of Bio-resources

(a) Discussions with Experts

○ **Experts:**

Environmental Economists, Ecologists, Forest Officials, Agriculture Scientists, Bio-Technologists, Statistician, Wetland Specialists, SBB Officials and BMC members, NGOs and Local Communities

○ **Issues:**

Valuation Exercises in ABS Project

Biodiversity and its Degradation

ABS as an Innovative Option for Biodiversity Conservation

Valuation of Ecosystem / Biodiversity vs Valuation of Bio-resources

Valuation Approach / Methodology

Limitations in Biodiversity Valuation



(b) Literature Review and Evidences:

- ❖ Ecosystem/Biodiversity (Services and Goods)
- ❖ **Bio-resources specific valuation studies**
- ❖ 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.**



(c) Industrial Visits and Discussions: LESSONS

- Since Bio-Prospecting industries role is significant in ABS.....
- 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 biodiversity'**, (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.



- 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 benefit**)
- 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).



Possible 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 opinion**, certain methodologies or approaches have been drafted.



Valuation of Bio-resources: Possible Approaches

- Value Chain Analysis
- The “Maximum Willingness to Pay” Approach (users)
- Application of the Appropriate Economic Instruments: (tax, cess, charges, royalty etc.)
- Minimum Support Price for Bio-resources
- Collectors’ Willingness to Accept and Minimum Livelihood.



Value Chain Analysis: (A Broader Framework)

- 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*



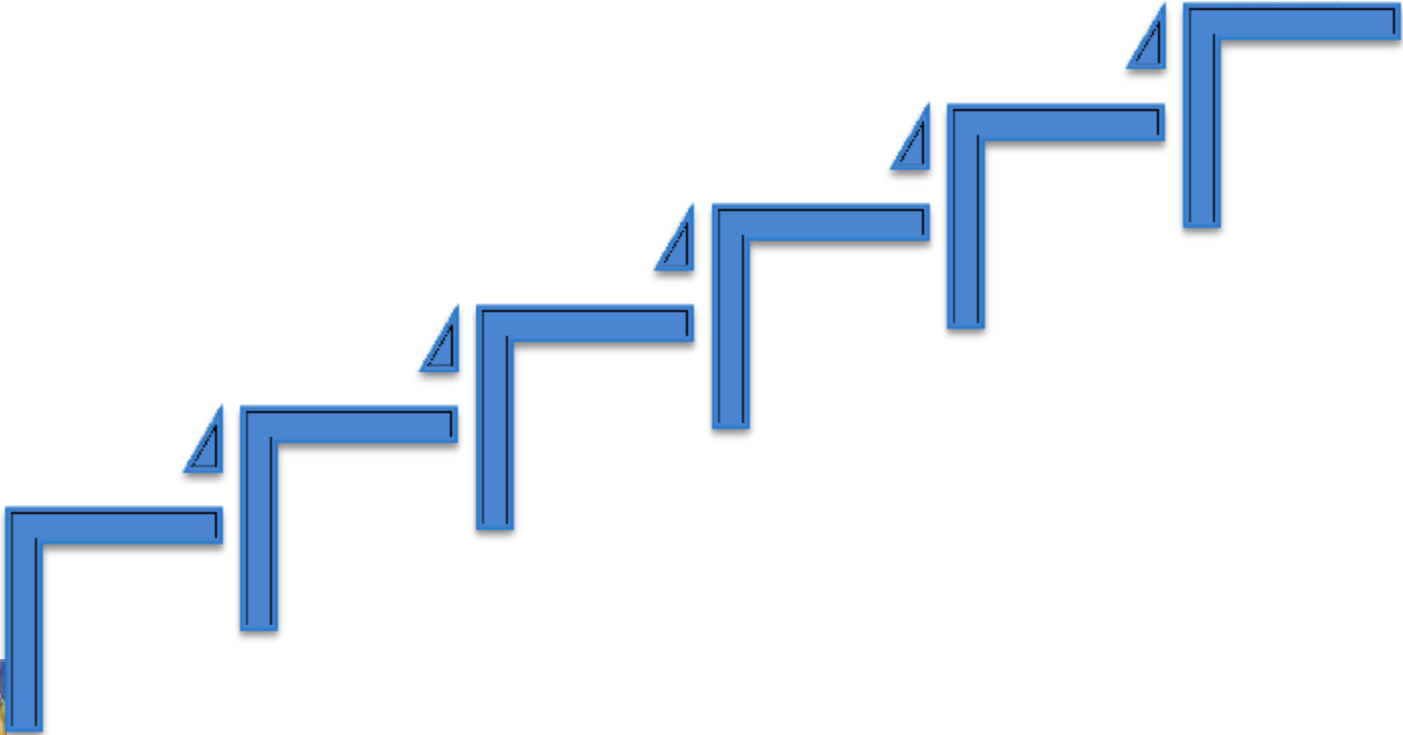
- *Arogyapacha* is an **unavoidable input**, but not an **exclusive one**
- Many other products and knowledge/skill (research and development) also attribute to such development
- **Amortised (Remunerated)** pricing technique is relevant to estimate the real price of bio-resources.



Based on actual market value



Bio-product Value Addition



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 the status of the bio-resources (<i>Rare Endangered and Threatening – RET, Abundant, Endemic</i>). For providing a weightage in valuation process (rent)	BMC, PBR, local community, indigenous group, village taxonomists, forest department
Third	Understand its potential / purpose / usage	BMC, traders, research organizations, government departments, industries
Fourth	Identify its leverage / movements : local → regional → state → national → international	BMC, traders, industrial association, companies, exporters, customs department
Fifth	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



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.



- 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.



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**.



In Brief

- **It is significant to develop case specific and separate formulas for valuing bio-resources.**
- **In this context bio-resources are categorised under 6 heads.**



Methods Derived from the Expert Committee Meeting (13th July 2013)

	Category of Bio-resources	Possible Methodological Approach	Payment Detail
A	Bio Pharmaceuticals (modern drugs)	Scarcity Rent (SR)+ Information Rent (IR): share a proportion attributable to the product.	Initial payment + payment at the time of product development + payment at marketing stage.
A1	(Population status, Rare Endangered and Threatening (RET), Abundant, Endemic)	Endemic Rent (ER)	Monetary + Non- Monetary (for endemic and RET)
B	Bio-technology (Seed / Agriculture Related), Land races, Microbes,	Information Rent (IR): share a proportion attributable to the product.	Initial payment + payment at the time of product development + payment at marketing stage Monetary + Non- Monetary (for endemic and RET)
C	Crop protection products	Information Rent (IR) :share a proportion attributable to the product.	One time
D	Botanicals (AYUSH)	Based on the proportion of Net Present Value (NPV) of the profit x the contribution of input to the out put	One time
E	Nutraceuticals / Personal Products cosmetics	Based on the proportion of NPV of the profit x the contribution of input to the out put	One time
F	Academia / R&D (non-commercial scientific research)	Onetime fee + renegotiation change in intent	One time

Aspects to Consider

Aim: *Identify the proportion of bio-resources (value) in the NPV of the product*

Population status

- *Rare Endangered and Threatening (RET) Species*
- *Abundant*
- *Endemic*

Rent

- Scarcity Rent
- Information Rent
- Endemic Rent



RENT:

- Rent for the Resources is the difference between the value (to the users) and the costs of obtaining/exploiting the resources.

$$\text{Rent} = \text{Value} - \text{Cost}$$

Scarcity Rent(S.R)

- S R is the value derived from the limited stock of resources.
- If resources stock is not available for a company, No production !



Information Rent(IR)

- Information is a valuable economic resources.
- Any research (for bio-prospecting) starts with prior information.
- For Eg: A particular plant has medicinal value (remedy for a specific health problem).
- These kind of information is important for drug manufacturing companies.
- Discovery will be made easily (time and cost saving)
- Therefore, **the value/profit acquired through relevant prior information (high probability leads) command information rent.**
- Information are with local communities (traditional knowledge)
- It can attributes in the entire stage of product manufacturing (origin to the final stage of production)



Endemic Rent(ER)

- ER is the value derived from an endemic species, they are unique and regional Specific.





Thank You

