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# ECONOMICS OF BIODIVERSITY FOR ACCESS AND BENEFIT SHARING (ABS)

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# Challenges

- Population growth
- Development → Land use Change
- Consumerism
- Increasing pressures on Ecosystem/Biodiversity
- Loss of species and ecosystem (**45-250 species loss per day !**).



- Biodiversity/ecosystem protection: major environmental policy agenda.



- Current market and legal systems unable to provide clear answers.



- Need for **clear policy**

- **Future lies in innovative approach and agenda setting.**



## Changing Trends

- Environmental concerns overriding development concerns
- Abilities to translate **potential** of biodiversity and ecosystem services to **real**
- **Science-policy interface being revisited.**



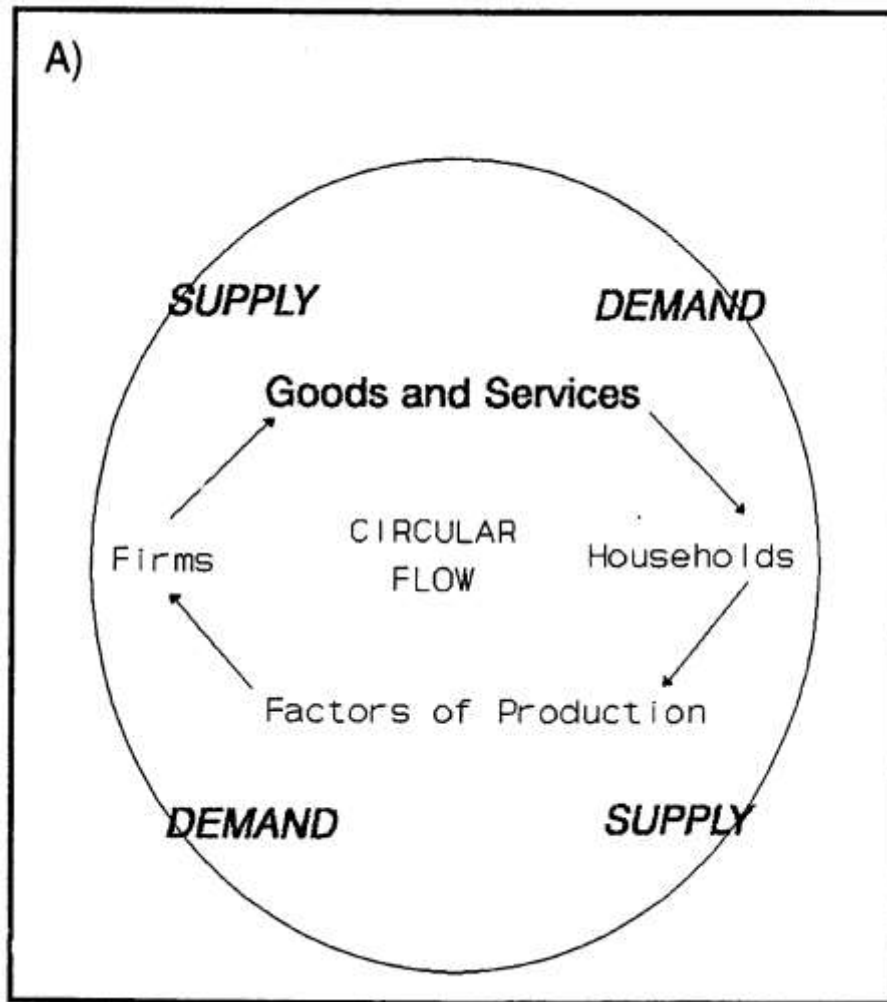


# Economics and Biodiversity

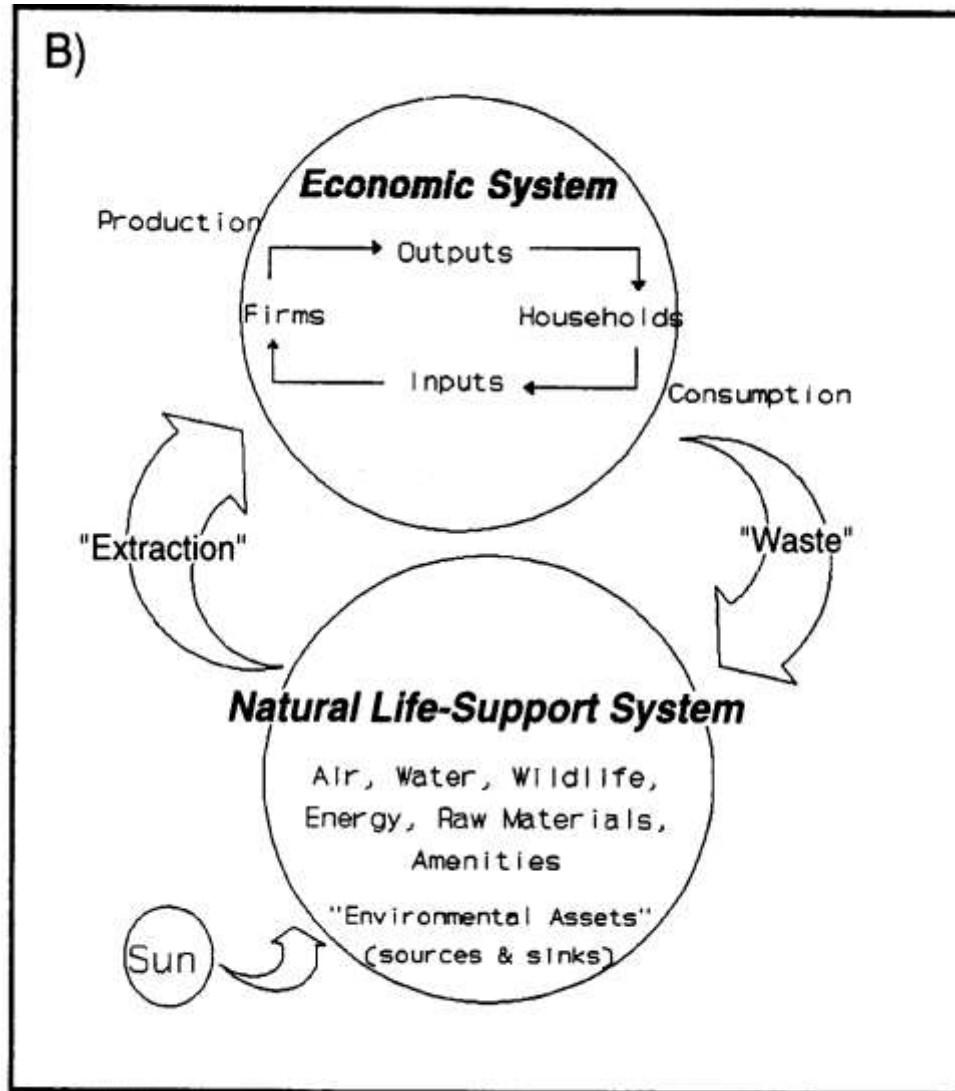
- **Economics** is a science of analysis of **use of limited and scarce resources to achieve human needs.**  
(bio-resources vs increasing demand).
- The basic challenge to any **economic system** is “How the scarce resources should be allocated to get maximum human satisfaction”
- **Environmental Economics** provides thoughts for creating an argument and answer **to valuing environmental goods and services for human well-being and to protect ecosystems.**



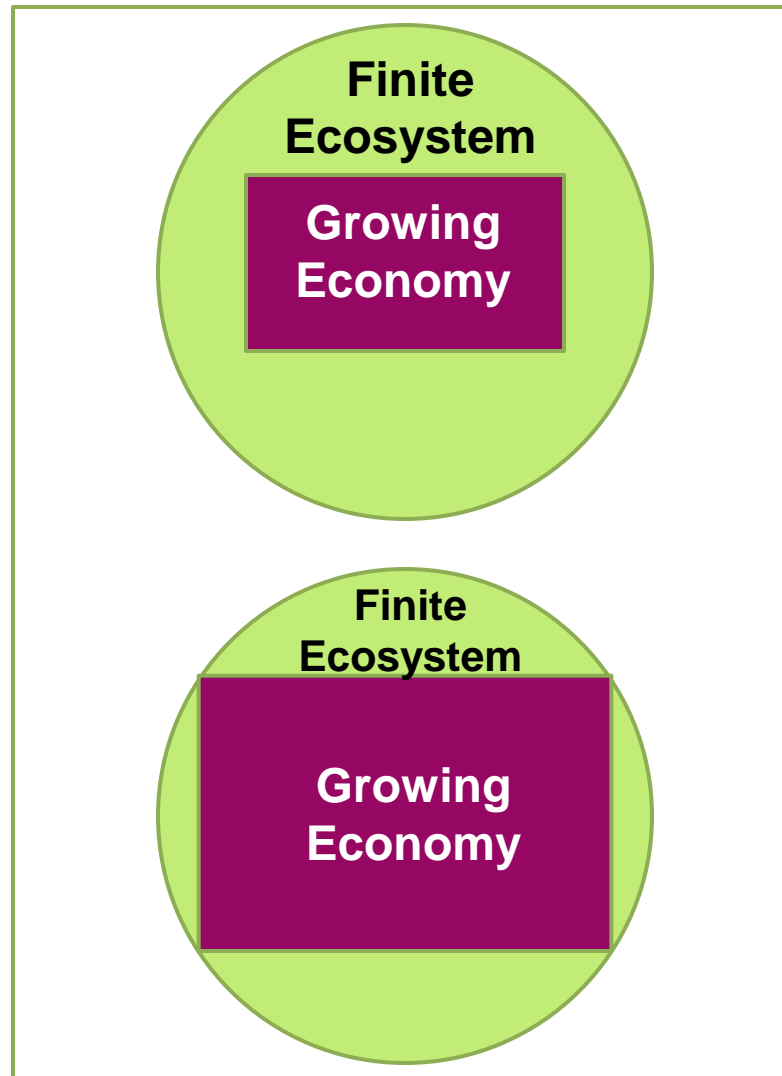
# THE ECONOMY AS AN ISOLATED SYSTEM



# LINKING ECONOMIC AND ECOLOGICAL SYSTEMS



# THE ECONOMY DEPENDS ON ECOSYSTEM / BIODIVERSITY





## What are we doing in EE?

- Valuation
- Damage assessment
- Economic instruments:
  - \* compensation
  - \* subsidies
  - \* taxes
  - \* royalties
  - \* fines etc.



- **For biodiversity conservation, one should find Innovative Approach: Access and Benefit Sharing (ABS)**
- **Overall challenge: How to operationalize ABS principles using Economic instruments?**



# Biodiversity: Economic Significance Vs Market Failure

- Globally more than 1.3 billion people depend on biodiversity and on basic ecosystem goods and services for their **livelihood** (CBD, 2012)
- Biodiversity goods and ecosystem services are **prospected** but in an **unorganized manner**
- Reason: There are **no defined market or economic instruments** for biodiversity and ecosystem services.



## Challenges

- In Biodiversity supply, demand and price mechanism do not function properly
- Biodiversity values are **implicit** in general rather than explicit (*often not captured by markets*).
- Most of the biodiversity are in **common land**
- Property rights of biodiversity are not clearly defined.
- The right in biodiversity / bio-resources is not protected
- **Excluding others from using the good is not possible and hence rights based approach is difficult.**



- In biodiversity case market failure exists
- Result: **Over-extraction** of bio-resources and **extinction**





# Linkages Between Biodiversity and Bio-resources

Biodiversity

Bio-resources

Forests  
Water body  
Paddy fields  
Garden

Medicinal plants  
Honey  
Timber  
Fish  
Fruits  
Grains  
Seeds



# Types of Genetic or Bio-resources

Genetic or Bio-resources

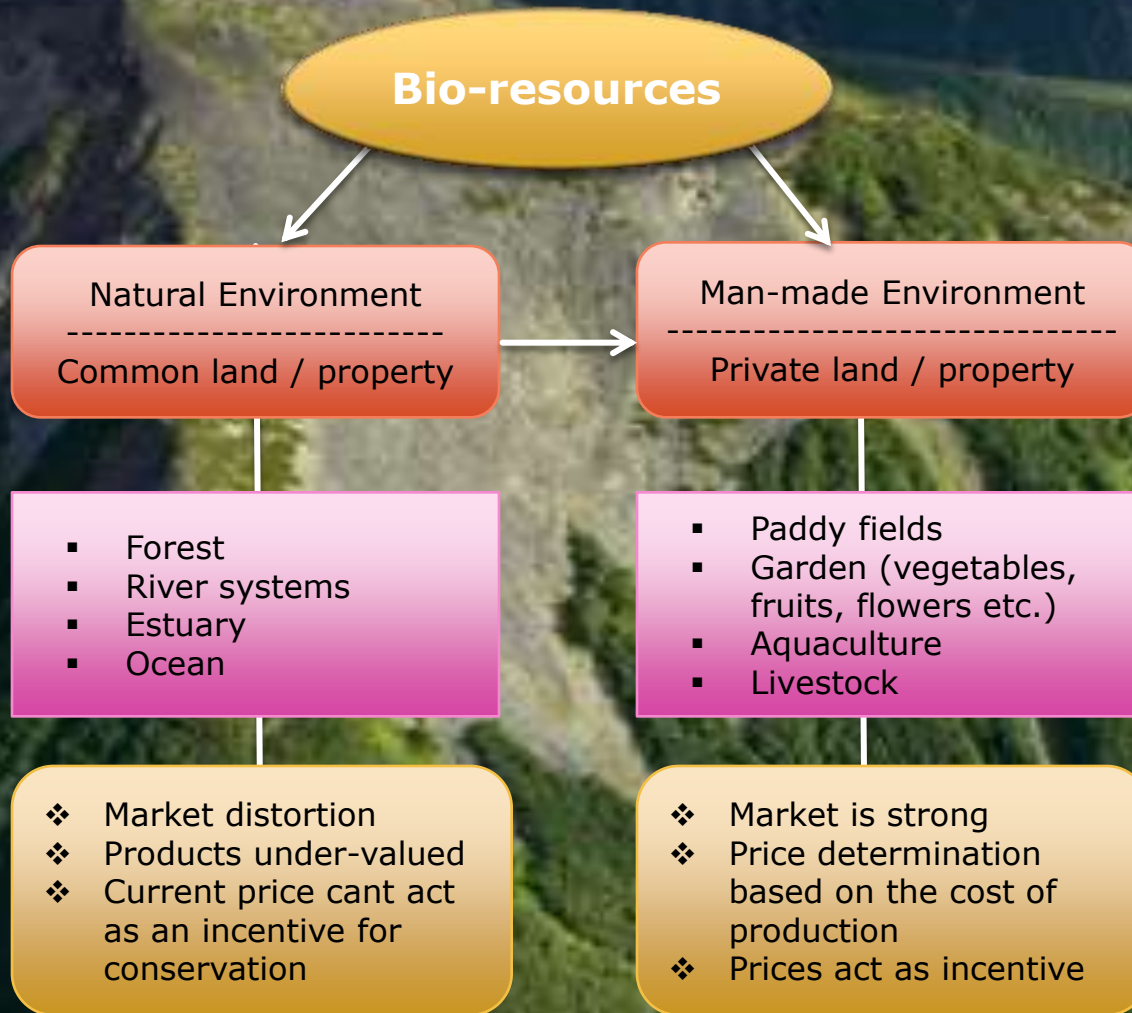
IN – SITU  
Eco-system and  
Natural Habitation

EX – SITU  
Botanical Garden,  
Commercial /  
University Collection





# Bio-resources: Property Rights



# ABS an Emerging Option for Biodiversity Management and Innovative Financing

**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**).

- **ABS Philosophy is**: Providers of bio-resources are entitled to receive fair benefits from the users.
- The negotiation between a provider and a user of resources should be (monetary / non-monetary), based on the true/actual value of the resources.



## ABS can:

(i) ABS balances the rights of uses of bio-resources with the rights of provider of such resources.

(ii) Enable that biodiversity is managed as **a community good**



(iii) Support biodiversity-based **businesses and ecosystems in a sustainable manner**





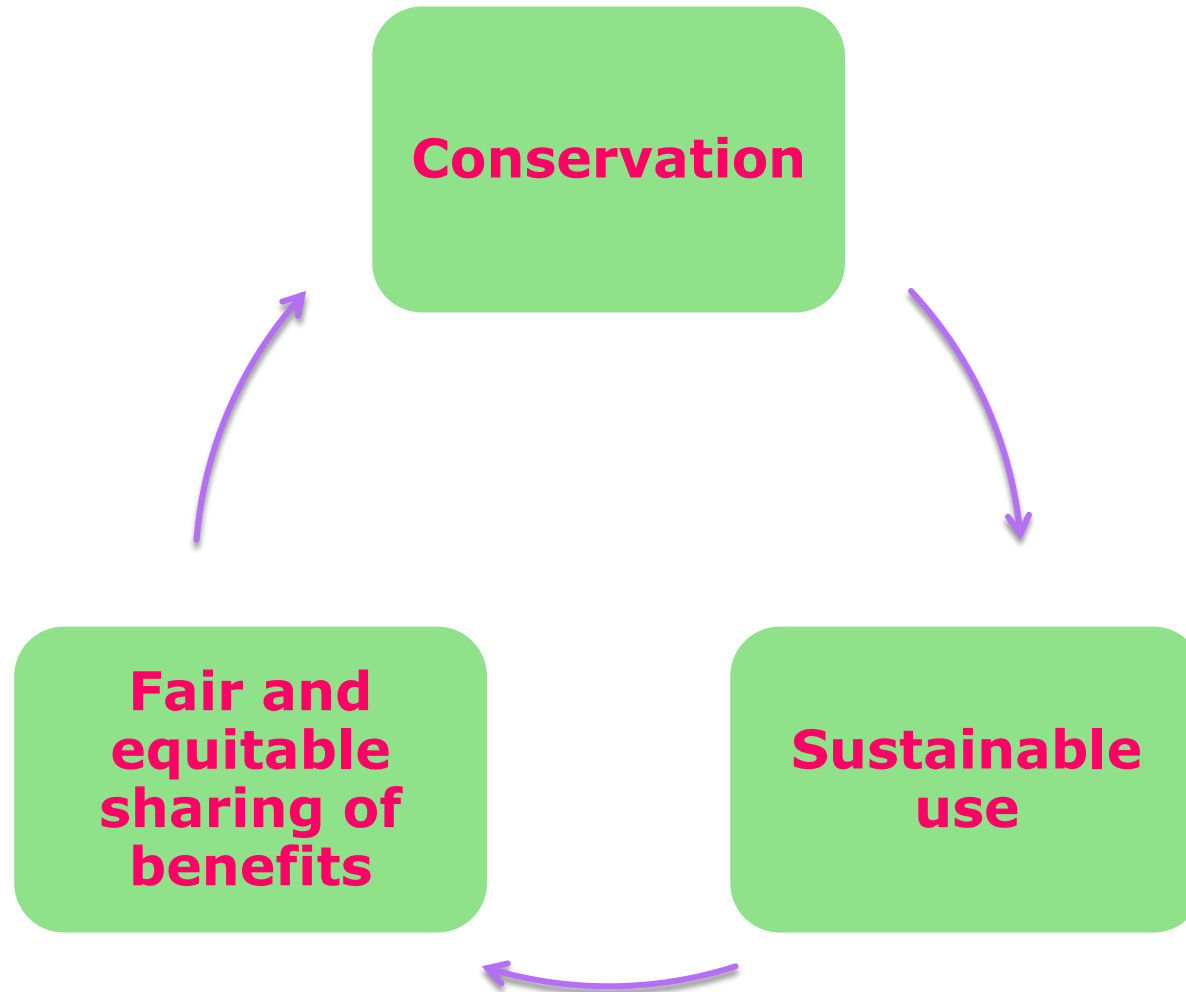
- ABS acts as an ***economic incentive*** in conservation and sustainable use of biodiversity (local community or providers of bio-resources obtain fair share of the benefits attain its production).



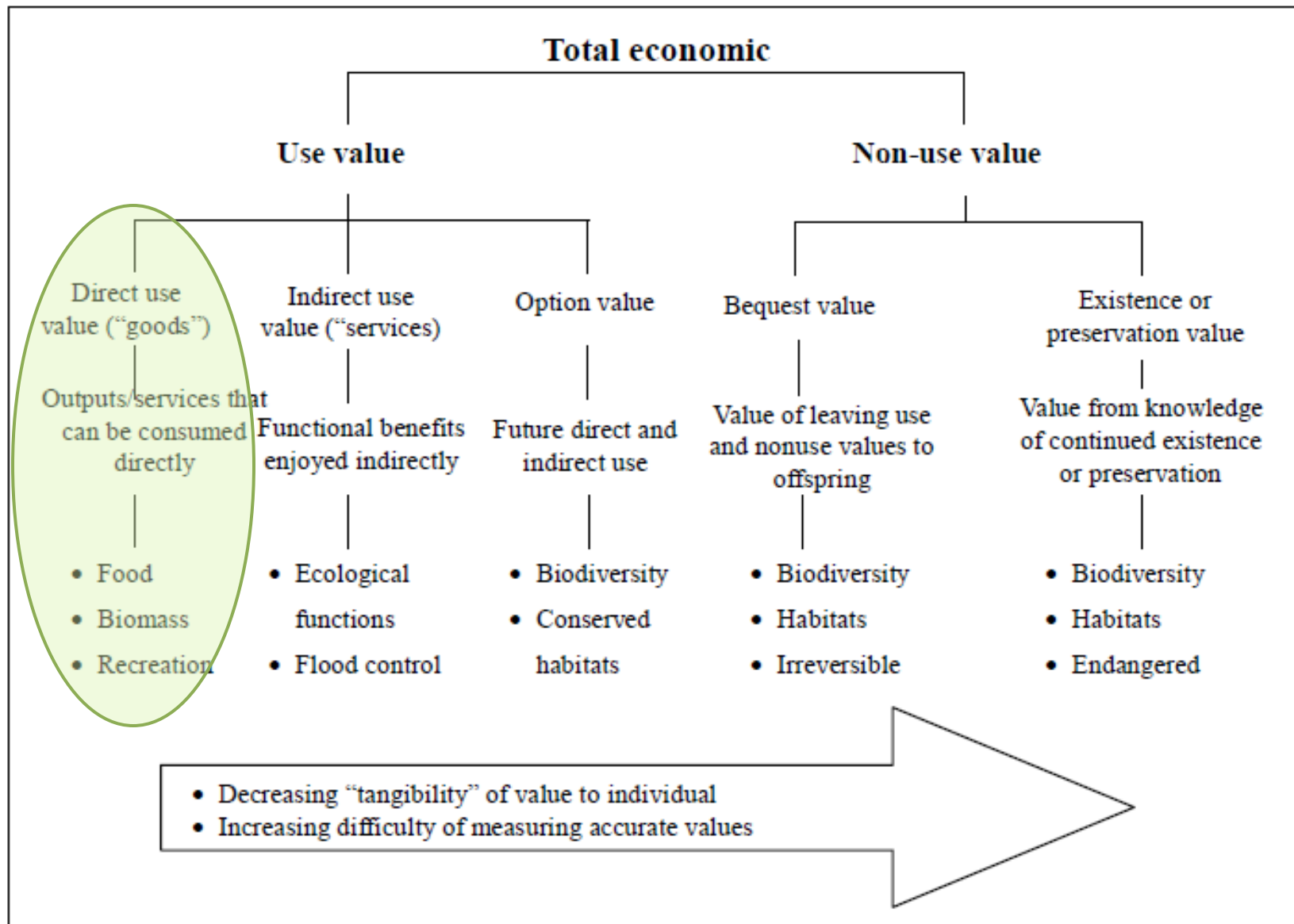
- ***Economic valuation of biodiversity and biological resources is an important tool for well-targeted and calibrated economic incentive measures (CBD).***



# CBD and Biological Diversity Act: Objectives



# Valuation of Biodiversity and Ecosystems



**Fig. 1** Total Economic Value of Coastal Resources



## Annual Economic Value of Forests of Himachal Pradesh (as per 2000 prices)

Category	Goods and Services	Physical Value	Monetary value (Rs. Crore)
Direct Consumptive benefits (A)	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
			<b>1083.00</b>
Direct Non-consumptive benefits (B)	6.Eco-tourism	66.56 lakh - Tourists	<b>6657.00</b>
<b>Total Direct Benefits (A+B)</b>			<b>7740.00</b>
Indirect Benefits (C)	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
<b>Total Indirect Benefits (C)</b>			<b>98924.00</b>
<b>Total Economic Value (A+B+C)</b>			<b>1,06,664.00</b>

Source: Madhu Verma (2000)

# Valuation Methods

## Ecosystems

- Market prices
- Replacement costs
- Damage cost avoided
- Production function
- Hedonic price
- Travel cost and
- Contingent valuation
- Participatory env. valuation
- Benefits transfer



## Bio-resources

### Value Chain and Production Function Analysis

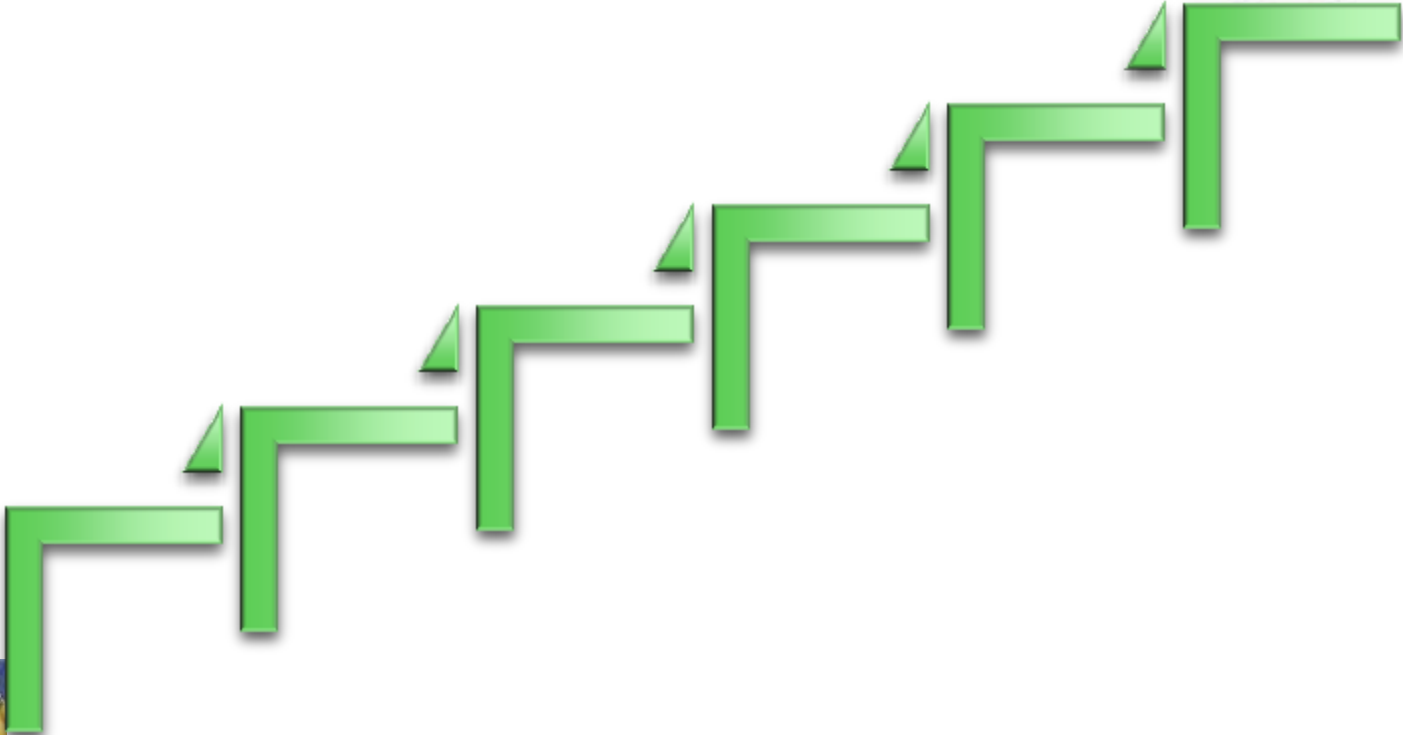
- Value chain refers to coordinated relationships between actors who are involved directly and indirectly in a **productive activity**, with the aim of taking a product from **supplier** → manufacturer → wholesaler → retailer → consumer



Based on actual market value



# Bio-product Value Addition



Based on notional value

# Forest Resources Valuation for ABS

- Forest resources are used for manufacturing different consumer products
- Resources are having markets
- But at forest gate market is weak (imperfect or inefficient), Price is low
- However many value added products are derived from forest resources
- Value addition: through **transaction costs** or **and processing / manufacturing costs**

→ Transaction costs



## Price of Certain NTFP (Rs/Kg.) from a Protected Area: Kerala

NTFP items	Collection price at forest gate	Sales price of the Federation	Final consumer price	Price spread	Collection price as % of final consumer 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)



## → Processing / Manufacturing Costs

- Certain forest 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.





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

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



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

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



# Therefore .....

- Biodiversity conservation, management and sustainable use is critical for **stable economic development**.
- Biodiversity Economics need to be studied and understood well
- Economic incentive is an option  
**ABS is an emerging principle.**
- Understanding the **real/true** value of bio-resources is a **pre-requisite** for **benefit sharing and ABS agreements.**



Photo set1: Various animal species



Photos from biskitz4chez 2004, and A.M. Okeyo, ILRI.



- The market for bio-resources is **highly imperfect** or **inefficient**, hence not able to fix the **equilibrium price**.
- The existing price for bio-resources at forest gate or any other collection point is **not the true VALUE**
- Valuation is an important **policy tool**: to fix benefit sharing and signing ABS agreements
- **ABS** is an internal financial source and incentive mechanism for preserving biodiversity.
- Reliable **database** is a **challenge** and **accuracy** of the value is always **debatable**.
- **NBA is currently working on methodology for bio-resources valuation.**





Thank You

