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- Addressing the ABS Challenges

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The Economic Aspect of ABS

- The Ways to Optimise the Benefits –

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NOTE: Views and opinions in this presentation are those of author's and do NOT reflect the organisation to which the author belongs.

Contents of Presentation

1 Objective of the Presentation

- The objective of presentation is
  to clarify the economic aspects ABS
  so that its issues can be correctly understood.

- The economic factors are obviously crucial factors
  of benefits to be shared.

- Despite this fact, there exist some misunderstandings
  and confusions.

- This presentation, therefore, tries to clarify
  the aspects involved.

2 2. Economic Factors

2.1 Costs

■ Cost in general (variable, fixed, and sunk costs)

☐ Variable cost : Inputs of for the factory, such as materials and labours, are counted as variable costs.

☐ Fixed cost : Initial expenditure on factory building itself is a fixed cost.

☐ Sunk cost : Sunk costs is defined as a cost incurred in the past that will not be affected by any present or future decision. Sunk costs should be ignored in determining whether or not a new investment is worthwhile. A typical example is the fixed costs of dead stock.

■ Average cost/Marginal cost

☐ Average cost : For instance, in the automobile factory, the average cost should be;

(total costs)/(the number of production).

☐ Marginal cost : the marginal cost should be an increase in cost that accompanies the increase in one unit of output. It can be obtained by the partial derivative of the cost function with respect to output;

(∂ total variable costs)/(∂ additional input of production).

Transaction costs

- A transaction cost is defined as a cost incurred in making an economic exchange. When the exchange system, say, ‘market’ is well organised, the transaction cost is expected to be low. Typical components of the exchange system are information, infrastructure, and institutions.
- Example: An IT company in Tokyo or Beijing.
- This cost is very important in the context of ABS/certification options, because the transaction cost becomes higher as information on the resources becomes vague and unreliable.

Opportunity cost

- The opportunity cost is defined as a forgone benefit.
- Example: Suppose that you are an undergraduate student about to graduate. You have two options; obtaining the job or completing postgraduate study. When you choose postgraduate study, the tuition fee will be a 'direct' cost. In addition to the direct cost, you have to bear opportunity costs. If you have chosen obtaining the job, you must have obtained the salaries. The salaries that must have been obtained (*i.e.* foregone salaries) are the opportunity cost of choosing postgraduate study.
- This cost is very important in the context of ABS, because we have to bear higher opportunity cost as the ABS process are time-consuming.

■ Valuation of the Costs

☐ Valuation of the costs is not always easy.

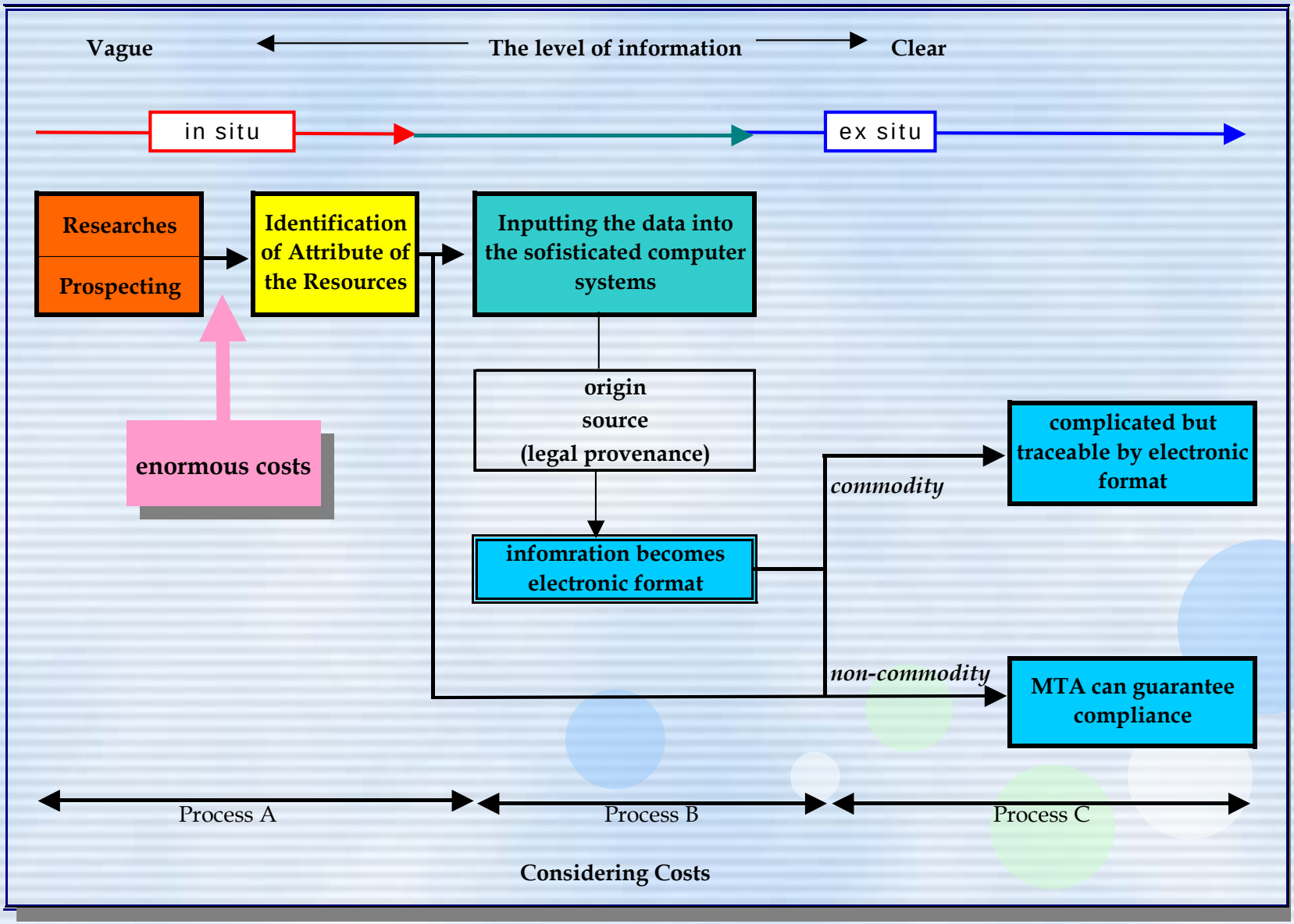
☐ Regarding costs in general and average/marginal costs, it is easy. You can calculate them from expenditure and production function.

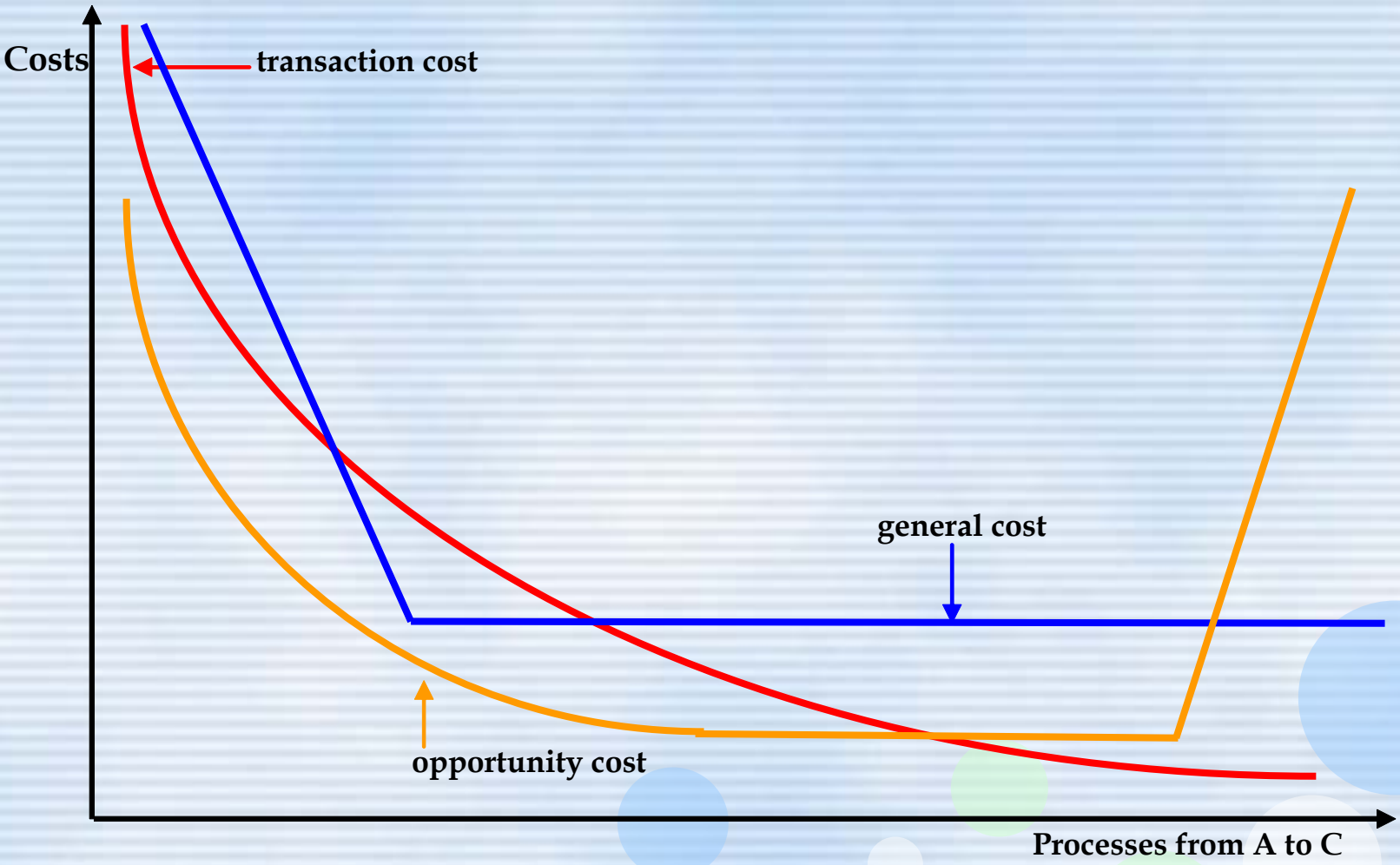
☐ In contrast, regarding the transaction costs, they can hardly be calculated/evaluated, despite the fact that the notion is widely accepted.

☐ Furthermore, regarding the opportunity costs, the valuation methods are under development.

☐ The opportunity of costs caused by delay of ABS can be evaluated by the foregone benefits, which may be obtained by, for instance, R&D of pharmaceuticals from biological and genetic resources. Evaluation methods are, however, underdevelopment.

Figure 1


Vague
The level of information
Clear
in situ
ex situ
Researches
Prospecting
Identification of Attribute of the Resources
Inputting the data into the sofisticated computer systems
origin
source
(legal provenance)
infomration becomes electronic format
enormous costs
commodity
complicated but traceable by electronic format
non-commodity
MTA can guarantee compliance
Process A
Process B
Process C
Considering Costs


Costs
transaction cost
general cost
opportunity cost
Processes from A to C

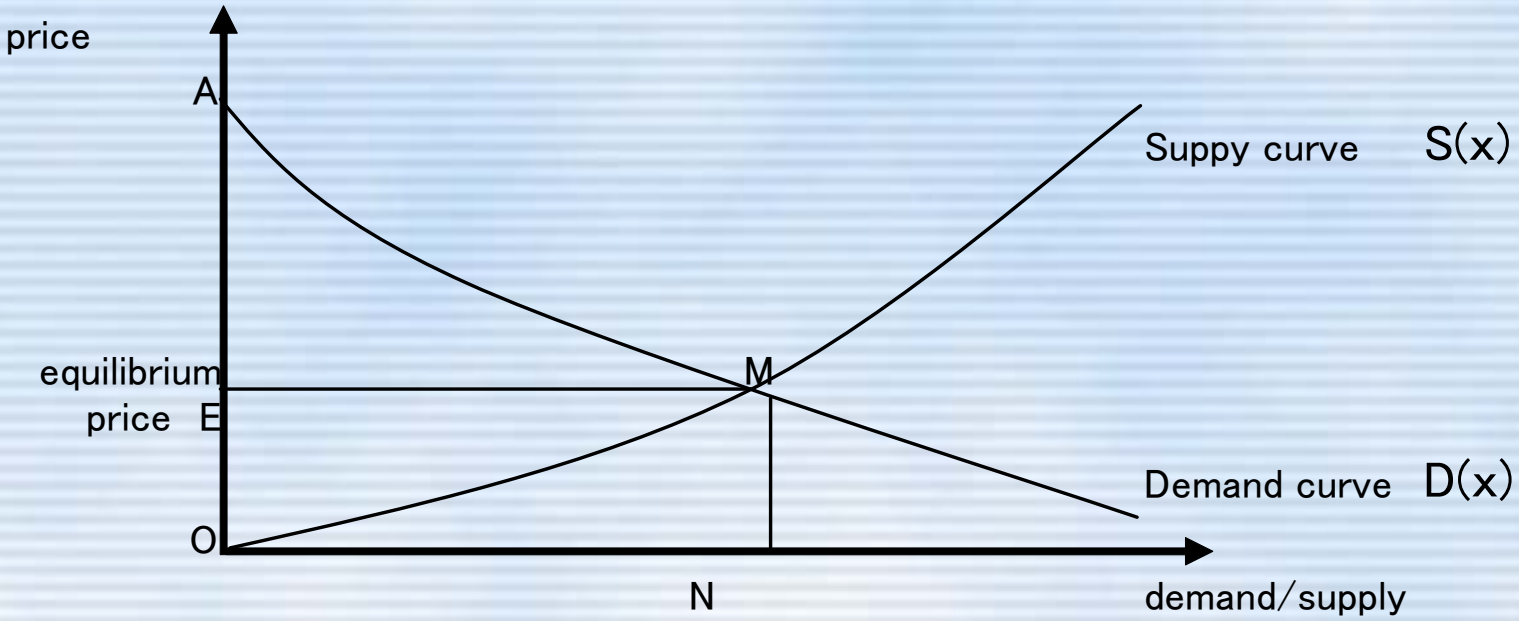
Process A has to bear **relatively high transaction costs and opportunity costs,** because resource users have to seek the providers and have negotiate to have a legal access to the resources. Seeking and negotiating processes explicitly and implicitly require costs and the costs are expressed as transaction costs. In addition, as negotiation takes time, especially users have to bear **opportunity costs** that are the foregone values of the future possible development of products.

Process B has to bear **costs in general**, because the products are still underdevelopment. In addition, costs for management occur from here.

Process C has to bear **costs in general**, such as management of the information and the maintenance of the equipments. In addition, there appear **the opportunity cost again** when the resources are commercialised through R&D.

2.2 Benefits

- The notion of benefit can be classified into two categories; for individuals and for the society as a whole.
- For individuals, benefits are of revenues.
- For the society as a whole, a typical benefit is consumers' surplus.
- In the context of ABS, as the Bonn Guidelines has classified, there are **monetary benefits and non-monetary benefits.**



consumers' surplus; AME

How do we evaluate the benefits?

Evaluation of benefits are not easy.

We have to calculate the values of the resources.

Valuation Methods

- **Direct use value**
  - **Consumptive**
  - **Productive**
  - **Non-consumptive**
- **Indirect use value**
- **Option value**
- **Bequest value**
- **Existence value**

Effects on Production Approach (Production Function Methods)

Methodology:

(market prices of the products developed from natural resources) ×(possibility of success of development) × (the number of species)

Advantages: Prices do exist.

Credibility: high (with conditions)

Limitation(s) : 1) possibility is controversial 2) the values are those of the past

Replacement Cost/ Preventive Expenditure Approach

Methodology:

When some entity is functioning to prevent the environment from some damages, the entity is though to have a value of replacing the damage

Advantages: Valid for negative phenomenon(e.g. pollution)

Credibility: low – intermediate

Limitation(s) : Damage should be valued.

Contingent Valuation Method/ Conjoint Analysis

Methodology:

Stakeholders are asked to state or choose the amount of Willingness to Pay (WTP) for conserving, in general, the pristine environment.

Advantages: Concrete figures will obtained anyhow.

Credibility: Depends on the subject to be asked.

Limitation(s) : Bias exists.

Travel Cost Method

Methodology:

When someone is visiting some place (e.g. a natural park), he/she is asked how often he/she visits the place and how much he/she spends the travel costs.

Advantages: Concrete figures will be obtained.

Credibility: intermediate

Limitation(s) : No distinction between the resources in the place.

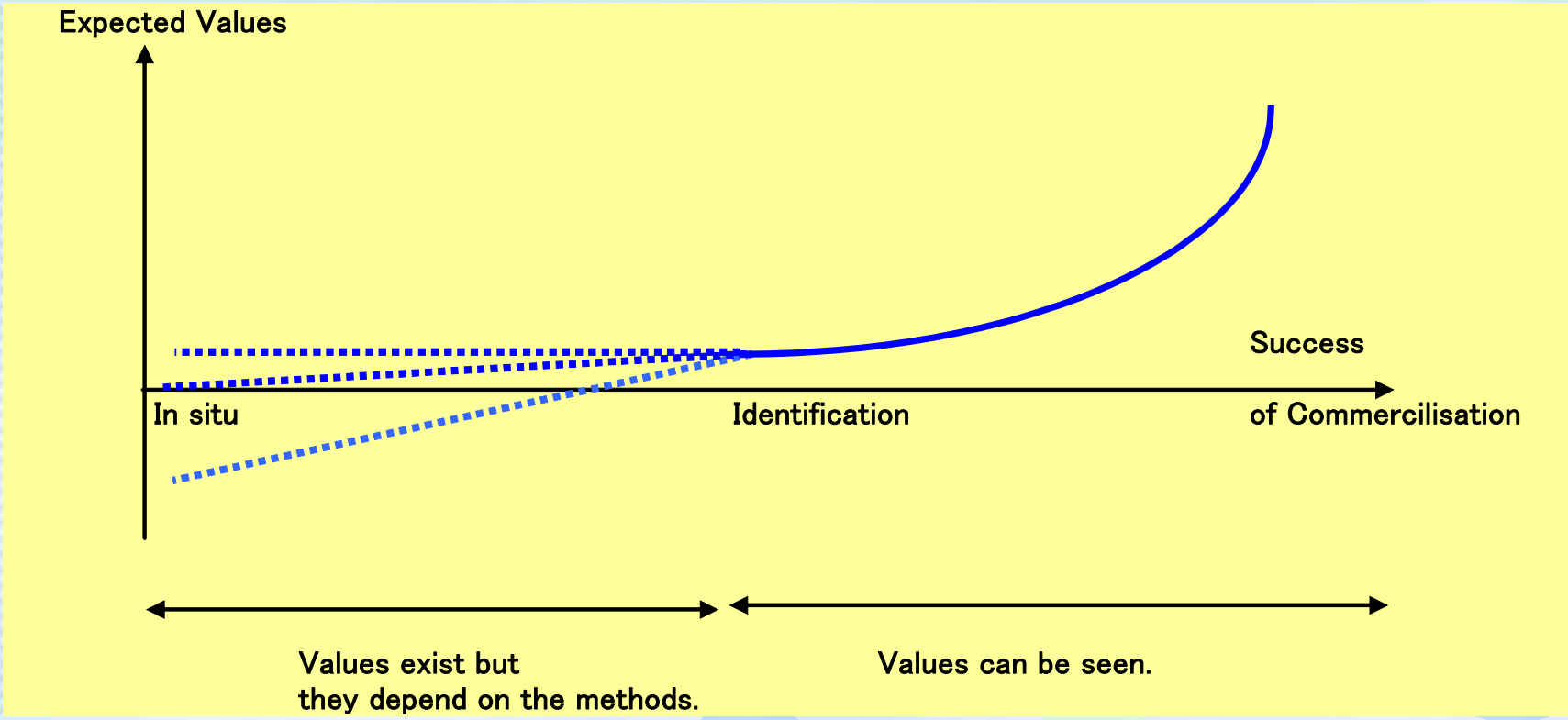
Hedonic Pricing Method

Methodology: The typical usage is for values in real estates. Suppose there is a beautiful park in front of house A and there isn't in front of house B. A difference in the real estate price is C. There are the number of D houses. The value of the park = C x D.

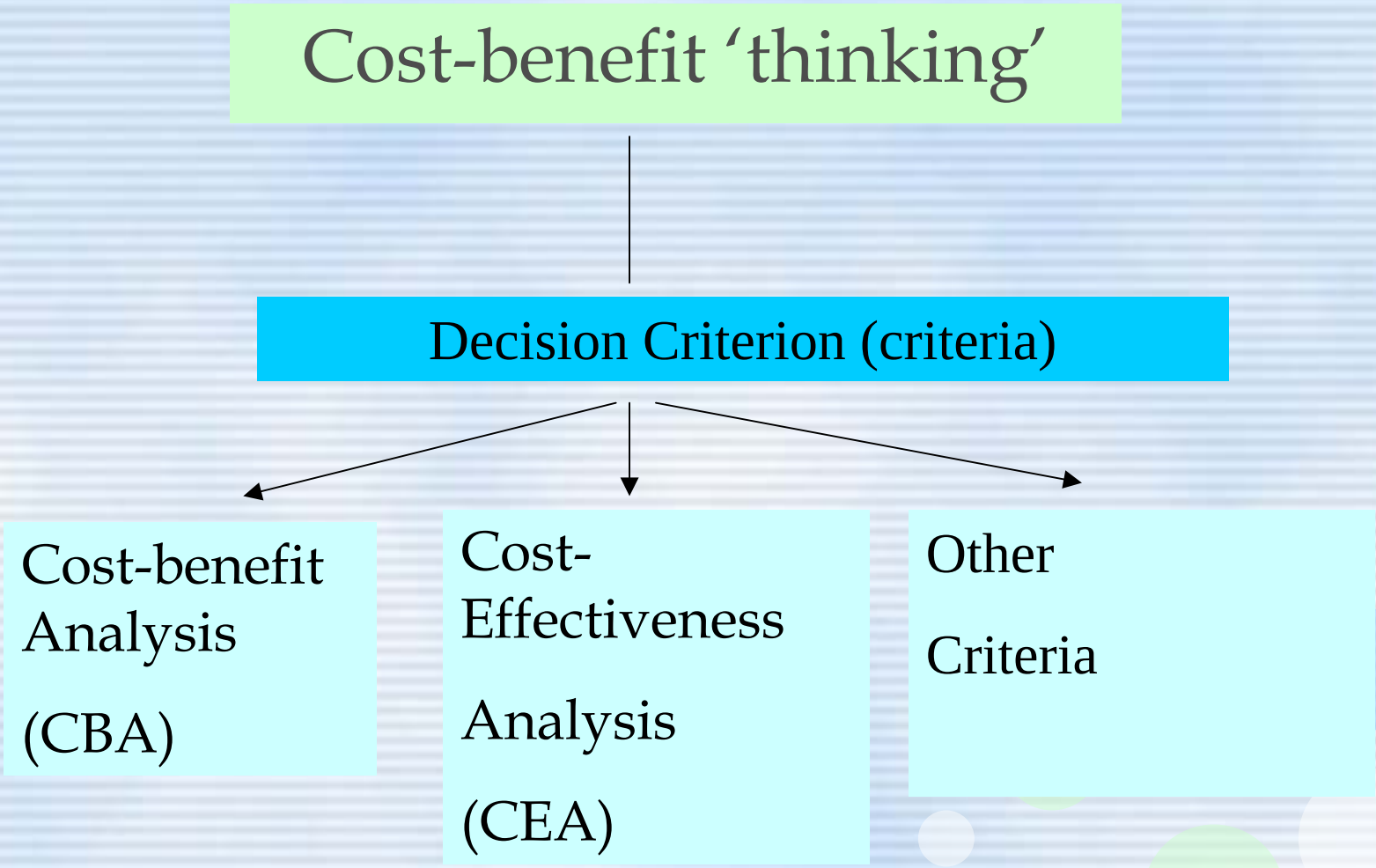
Advantages: Concrete figures will be obtained.

Credibility: high

Limitation(s) : Statistics needed.


Expected Values
Success
In situ
Identification
of Commercilisation
Values exist but
they depend on the methods.
Values can be seen.

3. Economic Tools



3.1 Cost-Benefit Analysis (CBA)

■ Cost-Benefit and Cost-Effectiveness analyses are of the criteria by which economic efficiency of activities is estimated.

■ In CBA, both benefits and costs are evaluated and compared.

■ CBA are classified into two categories: financial appraisal and economic appraisal.

Table 1

	Financial Appraisal	Economic Appraisal
For whom?	Firm/Entrepreneur	Nation as a whole
Objective of analysis	Profitability	Efficiency in social investment
Elements of benefits	Revenues	Social welfare (*e.g.* consumer's surplus)
Elements of costs	Expenditure	Opportunity costs / expenditure
Criteria	Absolute	Relative
Evaluation	FIRR>interest rate	EIRR>opportunity cost of investment

Criteria for CBA

1 $$\sum_{t=0}^{t=T} (B_t - C_t) \quad (1+r)^{-t} > 0$$

2 $$\sum_{t=0}^{t=T} B_t \quad (1+r)^{-t} \; / \; \sum_{t=0}^{t=T} C_t \quad (1+r)^{-t} > 1$$

3 Internal Rate of Return; IRR $\geqq$ interest rate/ opportunity cost of investment

- Regarding economic appraisal, criterion is a relative one, so one activity cannot be decided whether or not it satisfies the economic efficiency.
- Table 2 shows a hypothetical case of building highways for public infrastructure. In Table 2, option 2 will be chosen by criterion of economic appraisal of CBA.

Table 2

Options	Contents of the activities	IRR
1	Highway 1	17%
2	Highway 2	25%
3	Highway 3	8%

3.2 Cost-Effectiveness Analysis (CEA)

■ CEA is used when the benefit is qualitative. The benefit is qualitative and a target of activities clear. In other words, CEA is used when benefit cannot be evaluated and/or when evaluation itself of the benefits is meaningless.

■ Table 3 shows a hypothetical case of tackling with climate change in which three policy options are available. In Table 3, option 2 will be chosen, considering cost-effectiveness.

Table 3

Options	Contents of the policy	Cost per 1 ton CO2 equivalent reduction
1	Introduction of solar energy	$12
2	Methane capture in the disposal centre	$3
3	Introduction of oil in stead of coal	$8

3.3 Summary of Criteria of CBA and CEA

	CBA		CEA
	Financial Appraisal	**Economic Appraisal**	
Elements required	Costs, benefits	Costs, benefits	Costs
Absolute/relative	Absolute	Relative	Relative
Applicability to ABS	Possible, regarding costs	Some difficulties	Possible
Notes	Difficulties in evaluating benefits in situ situation	Difficulties in evaluating benefits in a whole process	Risks to underestimate of benefits

3.4 Other factors necessary for decision making

- Discounting
- Purchasing-Power-Parity (PPP)
- Monetary shares as ‘nuisance’ or ‘disturbance’ for a community

4. Concluding Remarks
Factors of optimisation

$$\sum_{t=0}^{t=T} \{Bt \cdot (A/100) - Ct\}(1+r)^{-t} + \sum_{t=0}^{t=T} \{Bt \cdot (100-A/100) - Ct\}(1+r)^{-t} > 0$$

Provider country

User country

A : share of the benefit

1 Valuation of the resources is a key to know the optimisation point, because values are the fundamental factors of benefits.

2 Benefits are always attached to the costs. The optimisation depends on the relationship between costs and benefits.

3 Some adhere ‘the share’ of the benefits. However, delay of access makes the stakeholders lose the whole benefits to be shared. The whole cost-benefit values will deteriorate as the opportunity costs emerge.

4 The loss is worse for providers, when PPP is considered.

Thank you very much

for your listening.