

SOCIAL **C**OST **B**ENEFIT **A**NALYSIS

A Seminar by

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Plan of Presentation

- What is Social Cost Benefit Analysis (SCBA)?
- Project Evaluation
- Social Costs and Social Benefits
- Concept of Shadow Prices
- Objectives, Scope and Relevance of SCBA
- Advantages & Disadvantages of SCBA
- Distinguishing between SCBA & Monetary Cost Benefit
- Approaches to SCBA
 - UNIDO approach
 - L-M Approach (Little-Mirrlees Approach)
- References

What is SCBA ?

“**Social Cost Benefit Analysis**” (SCBA) is a tool to **determine merits of a project** on the basis of current and future socio-economic impacts.”

SCBA is a systematic and formal method of evaluation of the project in terms of **Costs and Benefits**. Social cost-benefit analysis refers to cases where the project **has a broad impact across society** and, as such, is usually carried out by the government.



Best use of limited resources



Maximise Social welfare



**Fiscal Instrument
to improve the
efficiency**

Project Evaluation

Ways to make the most efficient use of scarce resources

Determination of composition of the budget

Allocation of total funds among alternative projects

Benefits \geq Costs

Worthiness of Project



Net social benefit > 0



$$NSB = PV (B - C)$$

The process of judging whether or not a project should be accepted is called *project evaluation*.

Impact of SCBA

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graph TD; A[Impact of SCBA] --> B[Positive (Social Benefit)]; A --> C[Negative (Social Cost)];
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Positive
(Social Benefit)

Negative
(Social Cost)

Social – Cost Benefit Analysis

Systematic and formal method
of evaluation



Benefits

Costs



Whether a project
should be
undertaken

Social Costs and Social Benefits

Social Costs: The costs of off-putting impacts of a project on society, environment, ecology, human, animal, mankind.

Social Benefits: The benefits of a project other than economic gain.

Social Costs	Social Benefits
Subsidies offered	Taxes raised
Environmental degradation	Improvement of environment
Depletion of energy	Products and Services
Unemployment caused	Indirect employment creation
Human services used	Socio-economic developments

Example of Project Ranking

Projects	Cost (C)	Benefits (B)	Net Benefits (B-C)	B/C	B/C Ranking
I	200	400	200	2.00	2
II	145	175	30	1.21	5
III	80	104	24	1.30	4
IV	50	125	75	2.50	1
V	300	420	120	1.40	3
VI	305	330	25	1.08	6
VII	125	100	-25	0.80	7

Here Project IV is selected as 1st priority, as it is having 1st Rank in B/C ratio. Even though it is having medium Net Benefits, Project IV is very good in Benefits/Cost Ratio.

Social Costs and Social Benefits

Example 1 : Social Costs of Tea Industry

Environmental degradation :

- Cutting of trees and shrubs
- Water pollution due to insecticide use
- Air pollution from factory

Ecological imbalance :

- Shrinkage of habitat of wild animal
- Reduction of grazing land

Human Services Used :

- Shortage of labour for crop cultivation

Usage of Public utility :

- Consumption of Power

Global Warming :

- Factory's carbon emission



Social Benefits of Tea Industry

Improvement of environment :

- ✓ Tree planting
- ✓ Tree plantation

Employment creation :

- ✓ Direct employment
- ✓ Indirect employment

Foreign Exchange earning :

- ✓ Social Welfare
- ✓ Education
- ✓ Health Care



Example 2 : Social Costs of Construction of a Bridge on a River

- Increased pollution during construction
- Migration of labour from farming
- Shortage of price hike of raw materials
- Unemployment to people engaged in ferries
- Abolishing of small shops existed at Ferry ghats
- Loss of farms and houses of some families

Social Benefits of Construction of a Bridge

- ✓ Employment to workers during construction
- ✓ Less cost in travel and transportation
- ✓ Saving of time of people
- ✓ Employment in toll tax collection
- ✓ Social Welfare



Concept of 'Shadow Pricing'

The term "**Shadow Price**" or "Shadow Pricing" is used to refer to monetary values assigned to currently unknowable or difficult to calculate costs. The origin of these costs is typically due to an externalization of costs or an unwillingness to recalculate a system to account for marginal production.

For example, consider a firm that already has a factory full of equipment and staff. They might estimate the shadow price for a few more units of production as simply the cost of the overtime. In this manner some goods and services have near zero shadow prices, for example information goods.

To let us make ourselves very clear with the concept of **shadow pricing**, come, let us delve into one more example.

Suppose if you plan to travel from Mysore to Bangalore in your car, what will be the cost of journey for 140kms if car gives a mileage of 20 km/ltr and price of petrol is Rs. 70/ltr ?

You might estimate the cost of that trip by only including the cost of petrol; but you are unlikely to include the wear on the tires, the depreciation cost of car per km, the insurance cost, the rare possibility of an accident and its consequences and so on.

So, **Shadow Price** can be thought of as the cost of decisions made at the margin without consideration for the total cost.

Objectives of SCBA

The main focus of Social Cost Benefit Analysis is to determine:

1. Economic benefits of the project in terms of shadow prices;
2. The impact of the project on the level of savings and investments in the society;
3. The impact of the project on the distribution of income in the society;
4. The contribution of the project towards the fulfilment of certain merit wants (self-sufficiency, employment etc).

Scope & Relevance of SCBA

SCBA can be applied to both Public & private investments –

- **Public Investment**: SCBA is important specially for the developing countries where govt. plays a significant role in the economic development.
 - **Private Investment**: Here, SCBA is also important as the private investments are to be approved by various governmental & quasi-governmental agencies.
1. SCBA enables Governments to make logical decisions.
 2. SCBA brings into force international and national legislations for safeguarding:
 - ✓ Social Justice
 - ✓ Over exploitation of National Resources and Human Resources
 - ✓ Sustainable Development

Advantages and Disadvantages of SCBA

- ✓ The ability to identify the projects that maximize the welfare of the country.
 - ✓ The ability to objectively assess and quantify the purpose projects in relation to community needs.
 - ✓ Exposure of the basis for decision-making for projects and opportunity for public criticism.
 - ✓ Ability to rank and prioritize limited resources so that the maximum benefit is realized.
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- ❑ Difficulty in measuring social costs and benefits and converting them into monetary term.
 - ❑ Over statement of the value of social benefits
 - ❑ Complexity
 - ❑ Conflict between social welfare and financial justification.

Distinguishing between SCBA & Monetary Cost Benefit

Social Cost Benefit Analysis is different from the Cost Benefit Analysis (or Monetary Cost Benefit Analysis or CBA) in the following terms:

- Market Imperfections
- Externalities
- Taxes & Subsidies
- Concern for Savings
- Concern for Redistribution
- Merit Wants
- Employment and Standard of Living

➤ **Market Imperfections:**

- Rationing
- Prescription of minimum wage rates

➤ **Externalities:**

A project may have both beneficial or harmful external effects that are considered in SCBA, but not in Cost Benefit Analysis. Therefore, both the effects are to be assessed and considered before sanctioning a deal in SCBA.

Positive-externalities could be in the form improvement in technology and negative-externalities could be in the form of increase in pollution and destruction of ecology.

➤ **Taxes & Subsidies:**

From the social point of view, taxes & subsidies are nothing but transfer payments. But in Cost Benefit Analysis, taxes & subsidies are treated as monetary costs and benefits respectively (i.e., expenses and income).

➤ **Concern for Savings:**

In SCBA, the division between benefits & consumption is relevant wherein higher valuation is placed on savings. But in CBA such division is irrelevant.

Impact of the project on general savings and investment level is to be considered.

➤ **Concern for Redistribution:**

CBA in a private firm does not bother how its benefits are distributed across various groups in the society.

In SCBA, the distribution of benefits is very much concerning issue where, the project should not lead to accumulating income in the hands of a few but, it should equally distribute the income.

➤ **Merit Wants:**

Goals and preferences not expressed in the market place, but believed by policy makers to be in the larger social interest, may be referred to as merit wants.

For example, the government may prefer to promote an adult education programme or a balanced nutrition programme for school-going children.

While Merit wants are not relevant from private point of view, they are important from the social point of view (SCBA).

➤ **Employment and Standard of Living:**

How a project affects employment and standard of living of people in society, will be taken into account as well in SCBA. The deal should lead to increase in employment and standard of living. But, for Monetary Cost Benefit Analysis this is irrelevant.

Approaches to SCBA

Towards the end of the 1960s and 1970s two principal approaches for Social Cost Benefit Analysis emerged. They are:

1. **UNIDO Approach**
2. **L-M Approach (Little-Mirrlees approach)**

UNIDO Approach: This approach is mainly based on the publication of UNIDO (United Nations Industrial Development Organization) named *Guide to Practical Project Appraisal* in 1978.

The UNIDO approach of Social Cost Benefit Analysis involves five stages:

1. Calculation of *financial profitability* of the project measured at market prices.
2. Obtaining the net benefit of the project measured in terms of *shadow prices (or economic prices or efficiency prices)*. (Objective of SCBA-1)
3. Adjustment for the impact of the project on *Savings & Investment*. (Objective of SCBA-2)
4. Adjustment for the impact of the project on *Income Distribution*. (Objective of SCBA-3)
5. Adjustment for the impact of the project on *Merit and Demerit Goods* whose social values differ from their economic values. (Objective of SCBA-4)

Stage-1: Calculation of financial profitability of the project

The measurement of financial profitability of the project in the 1st Stage is similar to the financial evaluation of the project. This includes the Study of Cash Flow Statement, Balance Sheet, Means of Financing, Depreciation, Tax factor etc.

Stage-2: Obtaining the net benefit of the project at shadow prices

Under UNIDO approach, for obtaining the net benefit of the project at shadow prices is done as follows:

Shadow pricing: The *shadow price* of a good measures the net impact on social welfare of a unit increase in the supply of that good by the public sector.

Choice of Numeraire : One of the important aspects of shadow pricing is the determination of the Numeraire.

Numeraire is the unit of account in which the value of inputs or outputs is expressed. To define the nummeraire, the following questions have to be answered:

- What unit of currency, domestic or foreign, should be used to express benefits/costs?
- Should costs and benefits be measured in current values or constant values?
- With reference to which point - Present or Future - should costs and benefits be evaluated?

Other things to consider in Stage 2 of UNIDO approach to SCBA are: Concept of tradability, Sources of Shadow Prices and Treatment of Taxes

Example of a '**Bridge Project**' to illustrate the calculation of Net Economic Benefit in terms of shadow prices or economic prices. (Stage 2 of UNIDO approach)

Presently, a ferry service, operated privately, is being used to cross a river. The ferry operator charges Rs. 3 per person. It costs him Rs. 2 per person. Currently per year 50,000 persons use the ferry service for crossing the river.

Now the Government is considering construction of a bridge over the river. It is estimated that after the bridge is constructed 2,50,000 persons will cross the river on the bridge. The bridge is expected to cost Rs. 3 million initially and its annual maintenance cost would be Rs. 10,000. It has an indefinitely long life. Once the bridge is constructed the ferry operator is expected to close down the ferry service and sell the ferry boats for Rs. 1,00,000.

Solution:- Now the social costs and benefits of constructing the bridge may be defined as follows:

Costs:

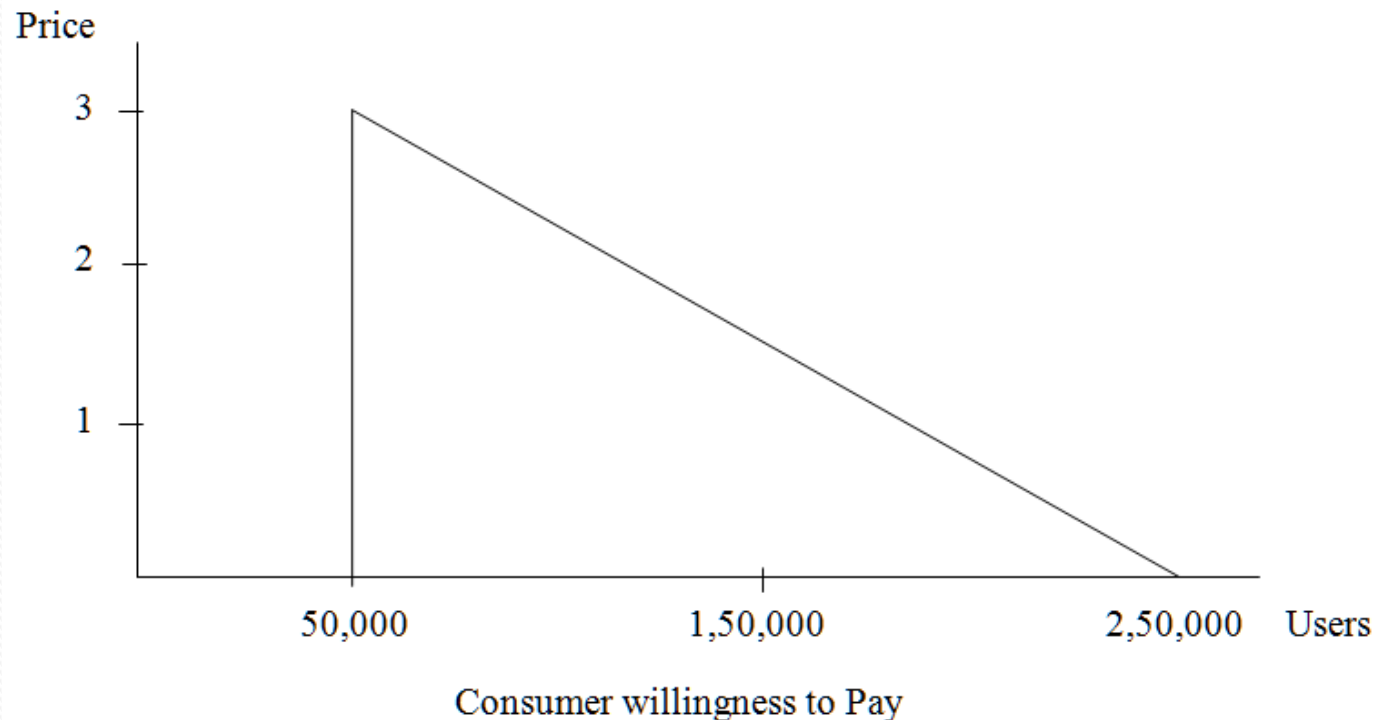
- 1) Construction cost = Rs. 30,00,000 (This is one shot cost)
- 2) Maintenance cost = Rs. 10,000 (This is an annual cost)

Benefits:

- 1) Value of ferries released = Rs. 1,00,000 (one time benefit)
- 2) Savings in the cost of ferry operations = Rs. 1,00,000/year
- 3) Increase in consumer satisfaction : This is equal to willingness to pay of 2,00,000 additional persons who are expected to use the bridge.

Since the first additional person is willing to pay almost Rs. 3 (the charge of the ferry operator) and the last person is willing to pay almost nothing (there is no toll for using the bridge) the average willingness to pay of additional users, assuming that the demand schedule is linear, is Rs. 1.50.

So the willingness to pay of 2,00,000 additional persons is $2,00,000 \times \text{Rs. } 1.50 = \text{Rs. } 3,00,000$ as shown below



Stage-3: Adjusting Impact of the project on Savings and Investments

The purposes of this stage 3 are to :

- Determine the amount of income gained or lost because of the project by different income groups (such as project other than business, government, workers, customers etc.)
- Evaluate the net impact of these gains and losses on savings
- Measure the adjustment factor for savings and thus the adjusted values for savings impact.
- Adjust the impact on savings to the net present value calculated in stage two.

For example: A project appoints 1,000 labourers at a wage rate of Rs. 150 per day. These workers were ready to work for a daily wage of Rs. 100.

Therefore, the gain of the group of 1,000 workers from the project is $\{(150 - 100) \times 1,000\} = \text{Rs. } 50,000$ per day.

Stage-4: Adjusting Impact of the project on Income Distribution

Government considers a project as an investment for the redistribution of income in favour of economically weaker sections or economically backward regions.

This stage provides a value on the effects of a project on income distribution between rich & poor and among regions.

Distribution Adjustment Factor (Weight) is calculated and the impacts of the project on income distribution have been valued by multiplying the adjustment factor with the particular income of a group. This value will then be added to the net present value re-calculated in stage three to produce the social net present value of the project.

Stage-5: Adjusting Impact of project on Merit and Demerit Goods

Merits good is one for which the social value exceeds the economic value. (ex: Oil, Creation of employment etc.)

Demerits good is one social value of goods is less than the economic value. (ex: Cigarette, Alcohol, etc.)

Adjustment to the net present value of stage 4 is done as per the below procedure :

- ✓ Estimating the present economic value
- ✓ Calculating the adjustment factor
- ✓ Multiplying the economic value by adjustment factor to obtain the adjusted value
- ✓ Adding or subtracting the adjusted value to or from the net present value of the project as calculated in stage four.

L-M Approach (Little-Mirrlees Approach)

I.M.D Little & J.A.Mirrlees have developed this approach for analysis of Social Cost-Benefit Analysis.

The core of this approach is that the social cost of using a resource in developing countries differs widely from the price paid for it. Hence, it requires **Shadow Prices** to denote the real value of a resource to society.

L-M Numeraire is *present uncommitted social income*.

The resources – inputs & outputs – of a project are classified into mainly: Labor, Traded Goods & Non-traded Goods

Therefore, to find out the real value of these resources, we should calculate –

Shadow Wage Rate (SWR)

The purpose of computing the SWR is to determine the opportunity cost of employing an additional worker in the project. For this we have to determine –

- ✓ The value of the output foregone due to the use of a unit of labor
- ✓ The cost of additional consumption due to the transfer of labor

Shadow price of Traded Goods

Shadow price of traded goods is simply its border or international price.

- If a good is exported, its shadow price is its FOB price;
- If a good is imported, its shadow price is its CIF price.

Shadow price of Non-traded Goods

Non-traded goods are those which do not enter into international trade by their very nature. (e.g. land, building, transportation). Hence, no border price is observable for them.

Similarities between UNIDO & L-M Approach:

There is considerable similarity between the UNIDO approach and the L-M approach. Both the approaches call for:

- ✓ Calculation of Shadow Prices to reflect social value.
- ✓ Usage of Discounted Cash Flow Techniques.
- ✓ Taking into account about the effect of a project on savings, investment and income of a society.

Differences between UNIDO & L-M Approach:

UNIDO Approach	L-M Approach
Domestic currency is used as Numeraire	International Price is used as Numeraire
Consumption is the measurement base	Uncommitted Social Income is the measurement base
SCBA objectives are met through stage by stage	At one place all SCBA objectives are fulfilled

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THANK YOU