

RURAL TECHNOLOGY

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Brain storming

- Meant for the rural people
- A technology to improve the standard of living of rural people
- Development of rural area
- To improve the scientific knowledge of rural people
- For improving agricultural production
- Keeping the traditional values, and improving the living standards.

Criteria for designing technology

- (1) How is it useful for the society in which you are introducing it?
- (2) How does it improve productivity?
- (3) Does it enhance or undermine employment?
- (4) How far - democratization of technology control and the decision making process?
- That is, technology must be in the control of and answerable to the people who should have a say in whether or not they need a particular technology.

Examples of rural technologies

- Leak proof tap
- Jugaad- automobile
- It is manufactured from discarded parts of tractors, cars, and in one case, aircraft tires.
- It runs on a 5 horse power diesel engine and it costs under Rs. 10,000 (US \$225).
- But it adequately serves the purpose for which it was built.
- It takes produce from the farm to the market. It drops children to school.
- It transports old people around the village.
- The fare is about Rs. 2 (5 cents) and can vary depending on the region and the distance involved.
(<http://www.rtbi.in/Ashok/14.pdf>)



Rural innovations

Ideal Tractor for Small Farms





Classification of rural technology



Appropriate technology

Affordable technology

Frontier technology

Intermediate technology

Appropriate technology

- The expected outcomes of a technology are compared to a list of characteristics generally associated with '(appropriateness).
- Defined in terms of the expected socio-economic impacts on the poor in rural and/or urban areas, and the environmental impacts.
- Based on benefit-cost analysis and other techniques for social and environmental impact analysis.
- The appropriateness of a technology depends on how it is used, what it is used to produce, and who gains and loses as a result of the production and consumption decisions.

- Appropriate technology projects typically differ from conventional technology projects in their reliance on small-scale equipment and processes (often locally made), and different amounts, kinds, and sources of raw materials.
- less capital intensive; more labor intensive; less dependent on scarce foreign exchange for imported goods; and easier to operate, maintain, and repair.
- are labor saving in comparison to traditional methods of production.
- strategy also increases the participation of the poor in the development decisions that affect them

- **Traditional technologies** are those that have been used in production or consumption for at least 25 years. In some cases, they have been introduced from another less developed country (LDC) rather than being of indigenous origin. Traditional technologies usually rely on human or animal power, or renewable energy sources.
- **Upgraded traditional technologies** incorporate key elements of traditional technologies, but have been improved to take advantage of the potential for higher inherent efficiencies (e.g. thermodynamic properties or extraction rates) or economies of scale.

- ✓ upgrading traditional technologies is often the most cost effective way of reaching the rural and peri-urban poor.
- ✓ Upgraded traditional technologies often retain the accumulated environmental knowledge of local people and are
- ✓ more compatible with cultural values, local skills for operation as well as repair,
- ✓ and resources than are down-scaled modern technologies.

- **Off-the-shelf modern technologies** have been in use for a relatively short time, generally less than 25 years. They are often larger in scale than traditional technologies.
- **Down-scaled modern technologies** are versions of modern technologies that have been adapted for a smaller scale of production or consumption, or to match the available resources.
- ✓ In down-scaling modern technologies, many of the economies of scale that make the, technology efficient may be lost
- ✓ products of down-scaled modern technologies may be less suited to the incomes and preferences of low-income or rural consumers
- **Innovative replacement technologies** are generated by application of new scientific and engineering knowledge

- ✓ shelf modern technologies and innovative replacement technologies tend to be less appropriate for small farms and firms in LDCs
- ✓ because the research that produced these technologies was carried out in developed countries, where the relative factor proportions are very different.
- ✓ However, some of the older modern technologies may be appropriate, especially for mediumscale, urban enterprises

Key factors in the appropriateness of a technology

1. **Scale of equipment and processes**

2. **Cost savings** (a) Capital (b) Operating, maintenance and replacement (c) Foreign exchange

3. **Generation of profits** (a) Increased production (b) Higher prices for products (c) Value added locally through processing

4. **Socioeconomic impacts and distribution of benefits**

(a) Directly increases employment for rural and low-income people

i. Creation of new jobs

ii. Higher wages due to better labor productivity or skills

iii. Reduced labor displacement

(b) Increases net incomes of other enterprises

i. Greater demand for locally produced raw materials

ii. Higher profits in subsequent use or processing of the products

iii. Reduced share for middlemen

(c) Provides benefits to rural or low-income consumers

i. Reduced prices

ii. Improved quality of products

iii. Greater availability of products

5. **Environmental Impacts**

(a) Natural resources consumption

(b) Amenities (c) Health

Examples of appropriate technology



Affordable technology

- Criteria ?
- Adopting cost-effective standards for a wider range of technologies
- Ensuring universal access

Examples?



Frontier technology



- next phase in the evolution of modern technology.
- “emerging technology” to describe conceptual tech that is years from being developed.
- intersection where radical forward thinking and real-world implementation meet.
- the framework we’re using to build the future of workplace health, safety & corporate sustainability.

Examples of frontier technologies include robotics and artificial intelligence (AI), autonomous vehicles, machine learning, block chain **technology**, drones, renewable energy.



Intermediate technology

- Prof. E.F. Schumpeter, in his book “Small is Beautiful”, advocated intermediate technique for underdeveloped countries.
- Technologist is engaged with total development which includes social and cultural factors, and in practice may be concerned with management, accountancy and marketing rather than engineering or technology.
- ‘Socially Appropriate Technology’
- generally associated with relatively basic devices often made out of old machine parts, cloth, or wood, more-advanced technologies—such as energy-efficient light bulbs, solar-powered lightbulbs, or small adsorption pot-in-pot refrigerators—may also be used.
- Larger-scale, more-expensive solutions, such as modern industrial factories to press waste parts of banana plants and stalks of other harvested crops into fibreboard, may also be reasonable in some areas, since farmers whose stalks would otherwise have gone to waste could benefit by using the fibreboard.

- Intermediate-technology solutions may also combine cutting-edge research with simple materials.
- For example, medical research into the spread of cholera led to the use of cloth filters made out of old articles of clothing to collect water.
- Those filters substantially reduce pathogens, which is useful in poor villages where disinfectants and fuel for boiling water are not readily available.
- At the other end of the technological spectrum, high-efficiency solar-powered light-emitting diode (LED) lights are used in remote areas of Nepal, replacing kerosene lamps or wood fires that emitted pollutants and posed a fire risk.

Characteristics of Intermediate technology

- (i) Work places of intermediate techniques are to be established in villages and towns, not in big cities.
- (ii) These workplaces should involve more workers, low costs and minimum inputs particularly the capital.
- (iii) Methods of production should be simple so that the demand for “High Skills’ or highly educated persons keeps low. Process of production, organisation, supply of raw material, credit and other activities must be as simple as possible.
- (iv) Production should largely be based upon local materials and local workers.
- (v) There must be facility of repair at door step.

Need

1. Unemployment
2. Migration
3. Scarcity of capital
4. Simple process



Importance

1. Dual economy
 2. Traditional sector
 3. Improvement of the poor
 4. Other miscellaneous
- problem: scarcity of capital and abundance of labour, unemployment



Additional resources and references

- <https://www.tandfonline.com/doi/pdf/10.1080/07349165.1987.9725594>
- <https://www.britannica.com/technology/intermediate-technology>