Criteria for an Appropriate Technology

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We have prepared a description of the criteria we believe apply to the use of appropriate technology. The nexus of these criteria forms a focus for planning a technology subordinate to human ecological needs to replace our current technology which overrides and dictates human development in so many ways.

The attached checklist and score sheet can be used in a rough way to evaluate specific projects of State agencies. The checklist can be used to evaluate alternative means to satisfy given objectives.

It can also be used to reformulate problems and issues to give more workable results. The checklist has been amplified through more extensive description of each criterion.

We welcome your comments on these criteria and your suggestions for the use of this method. We hope to be able to refine this approach into a significant evaluative tool for general use in government and society.

APPROPRIATE	INAPPROPRIATE
ECOLOGICAL	
1. Does not release pollutes/ poisons into environment	Pollutes/poisons environment
2. Protects existing natural habitat	Destroys natural habitat
3. Restores viability of ecosystems	Destroys viability of ecosystems
4. Recycles organic nutrients/ and creates topsoil	Wastes nutrients destroys topsoil
5. Produces food	Destroys food production (potential or actual)
6. Conserves renewable resources	Overuses renewable resources
ENERGETIC	
7. Conserves non-renewable resources	Uses and wastes non-renewable resources
8. Promotes use of renewable energy sources	Uses non-renewable energy sources
9. Promotes use of recycled materials	Doesn't use recycled materials
10. Reduces transportation dependence	Increases dependence on transportation
ECONOMIC	
11. Long life	Short life
12. Low cost (initial and/ or lifetime)	High cost
13. Promotes small-scale production, local ownership, economy	Promotes large-scale centralized enterprises bioregional
14. Promotes "right livelihood" (meaningful work, income)	Dehumanizing/ impoverishing work or lack of work
15. Labour/skill-intensive	Capital-intensive
SOCIAL/POLITICAL/CULTURAL	
16. Provides human habitat	Destroys human habitat
17. Promotes social flexibility/ adaptability	Reduces social adaptability
18. Promotes self-reliance and community cooperation	Promotes centralized control
19. Understandable/usable	Understandable to and

at community level	run by specialists
20. Creates/maintains natural beauty	Destroys natural beauty

DESCRIPTION OF CRITERIA FOR AN APPROPRIATE TECHNOLOGY

TO THE READER:

Appropriate technology should be socially feasible, in the sense that it can overcome social and institutional barriers to implementation without major social upheaval. We should also use our knowledge of barriers to design implementation strategies. We intend these criteria to be used in a skilful rather than dogmatic manner. For example, while solar energy is an extremely valuable approach, some of the currently proposed solar energy systems represent, in our view, clearly inappropriate technology: they are hideously expensive, highly complicated, centralized systems, etc. Thus, we must consider technical performance (efficiency) in the light of relative costs (full social cost or social opportunity cost) compared to realistic and currently available systems. For example, the highest social and economic payoffs in building energy conservation are, in order of decreasing desirability, changes in comfort standards, strong conservation measures, passive solar energy systems (sun-tempered, climate-based design), and, only then, active solar energy systems (such as flat-plate collectors, focusing collectors, etc.)

ECOLOGICAL

1. Should not release into the environment either an overload of naturally occurring substances such as sewage or persistent chemical poisons which the biosphere is totally unprepared to deal with.

2. Does not build in or otherwise affect particularly valuable habitats; leaves unaffected and protects natural habitat around building areas instead of tearing out and replacing with non-native “ice-plant and evergreen” landscaping.

3. Where possible, restores damaged ecosystems to original state, such as reopening diked marshlands to tidal flow. Where ecological fabric has been so damaged or destroyed that restoration to an original state is impossible, creates a new, but viable, biological system (extensive replanting and management.)

4. Prevents erosion and other means of destruction of topsoil and its fertility. Prevents dumping/waste of organic nutrients that could fertilize/create topsoil (animal waste from feed lots, park/garden clippings, etc.) and recycles organic nutrients into land via wastewater spray irrigation, composting, mulching, etc.

5. Produces food that is locally grown, emphasizing organic and labour intensive methods instead of total dependence on fossil-fuelled, spread-out monoculture.

6. Does not tax the viability of natural systems from the taking of renewable resources (destructive logging practices used in harvesting timber, dams to

supply domestic/agricultural water, etc.). Reduces flow rates of use of natural substances.

ENERGETIC

7. Conserves remaining amount of non-renewable for non-substitutable uses.

8. Encourages the use of solar, wind and other renewable energy sources on a decentralized household, community, bioregional) basis, using simple, low cost but long-lived systems wherever possible.

9. Promotes use of recycled products (glass, metal, paper) and building materials and supplies (wood windowpanes, pipe, water heaters, etc.). Demand could create an expanded scavenger/oriented demolition "industry".

10. Transportation accounts for over 25% of natural energy use because food and other materials are trucked in from long distances, because people live long distances from work, shops, and schools and because more energy efficient and non-polluting means of transport (mass transit, safe bike paths, pleasant pedestrian corridors, etc.) do not exist or have limited service. Need planning to get people places without their cars and to bring places closer to people (i.e., reintegration of community areas).

ECONOMIC

11. Reject planned obsolescence and "consumerism"; building shelter, energy systems, etc., with long lifetimes.

12. For buildings, energy systems, household appliances, vehicles, etc.

13. Small-scale means human-scale and ecologically workable scale. Local ownership (community control) vs. franchising (small units, but centrally controlled); cooperative as well as "private" ventures. Vertical integration of industries based on region's raw materials (e.g., forestry finished lumber furniture), so region isn't stuck with shipping out raw materials (low income) and buying back finished products at high cost.

14. Creates employment that is ecologically sound, socially needed and personally supportive. Less likelihood of displacement, with education, training and employment based on essential and enduring human and land management needs (shelter, food, soil fertility, etc.) rather than fluctuations in military/ industrial sector, consumer industries, etc. Creates more human oriented work settings.

15. Promotes employment by focusing on economic processes and outputs which use people and their skills rather than machines. Reduces investment needed per workplace to start new productive activities. Accepts slightly lower dollar income to increase overall social benefits. Can be more productive in many situations

(e.g., small-scale agriculture). For this country, we need to stress use of widely available technical and scientific skills and tools.

SOCIAL/POLITICAL/CULTURAL

16. Provides healthy, safe shelter for people. Includes new housing, rehabilitation, community buildings, neighbourhood preservation and rehabilitation, etc. Promotes public health without need for special medical facilities.

17. Keeps important options open for future social decisions; does not allow social subsystems (such as energy supply) to dominate social policy; acts to increase social equity and sense of common purpose. Helps non-violent, cooperative social behaviour to become the norm, rather than pathological seeking of self-interest.

18. Allows for local self-government; empowers people with access to basic social and economic resources and the ability to use them; promotes cooperative endeavours by producer, consumer and neighbourhood groups; acts to decentralize political and economic power; helps to revitalize rural life.

19. Promotes "cultural knowledge"-- widespread ability to understand, use and maintain technologies/techniques rather than dependence on specialists/experts. Reintegration of "science and technology" into variety of cultural settings, shaped by social needs and priorities.

20. Aids in restoring wholeness to people/nature interactions. Preserves settings of natural beauty. Creates or enhances aesthetic values in human and natural settings. Provides settings for personal stimulation and growth.

APPROPRIATE Technology & Development PERFORMANCE ASSESSMENT SYSTEM

More Appropriate (+) – Less Inappropriate (-)

	+10	+5	0	-5	-10
ECOLOGICAL PERFORMANCE					
Development Dimension No. 1	_____				
Development Dimension No. 2	_____				
Development Dimension No. 3	_____				
Development Dimension No. 4	_____				
Development Dimension No. 5	_____				
Development Dimension No. 6	_____				

ENERGETIC PERFORMANCE

Development Dimension No. 7 _____

Development Dimension No. 8 _____

Development Dimension No. 9 _____

Development Dimension No. 10 _____

ECONOMIC PARAMETERS

Development Dimension No. 11 _____

Development Dimension No. 12 _____

Development Dimension No. 13 _____

Development Dimension No. 14 _____

Development Dimension No. 15 _____

SOCIAL/CULTURAL PARAMETERS

Development Dimension No. 16 _____

Development Dimension No. 17 _____

Development Dimension No. 18 _____

Development Dimension No. 19 _____

Development Dimension No. 20 _____

TOTAL DEVELOPMENT SCORE _____

AVERAGE DEVELOPMENT PERFORMANCE
SCORE (total score divided by 20) _____

Note on Scoring Process and Criteria:

This checklist assesses the relative desirability of projects, programs and policies. The score values have no absolute meaning; we are interested instead in a range of scores. The checklist can be used to compare alternative means to approach properly formulated problem/possibility sets. A score of +10 means substantial adherence to the direction and spirit of the criterion.

A score of 0 indicates neutrality or non-applicability of the criterion. A score of -10 indicates the highest possible negative assessment of that particular development dimension.

(The following two sections are adapted from a Brochure written by CE Cook in the late 1980's)

THE NEED TO OBJECTIVELY COMPARE COST/BENEFIT PERFORMANCE OF DIFFERENT APPROACHES TO DEVELOPMENT

The process of socio-economic development is highly complex. Event the simplest directed change programmes involves different kinds of people and interest groups, each with their own distinctive values, interests, and hopes for the future.

Decisions about development constitute an arena within which different interests and ideologies often struggle for control over scare resources and seek to influence the 'minds and hearts' of the often passive 'targets' of development, the people in need of government services or public infrastructure.

The choice of a particular socio-technological approach to meeting basic human needs can permanently shape the future of society. It can determine what percentage of the people are able to meet their legitimate needs or how much of an outstanding development need gets met with the funds and manpower available.

It is important for politicians, policy makers, funding agents, planners, field workers, community organizers, and community leader to actively engage with each other in the search for the highest benefit/lowest cost approach to each development problem/opportunity. Often these decisions are made with out adequate information about the relative costs and benefits of alternative development approaches.

If this Appropriate Technology/Development Performance Assessment Methodology is rigorously used to assess the relative performance of alternative development technologies, designs, systems, approaches, etc., it will provide decision makers with a more objective basis for deciding how to spend scarce public resources in the struggle for development. The 20 Development Dimensions provide those responsible for planning, funding, implementing, and evaluating development programmes with an easy to understand and use matrix of critical parameters in terms of which it is possible to quickly compare the relative costs and benefits of different approaches to development.

The Development Performance Assessment Matrix codifies an implicit worldview about what constitutes the most appropriate kind of future society. This world view may not embody the values and worldviews of all members of society; other Development Dimensions can be added to the initial 20 criteria. It is also possible to rethink the most appropriate criteria to use in the evaluation of specialized zones and domains of development. For example, it is not fair to use the same development parameters to assess deep rural, peri-rural, peri-urban, and middle class urban zones of development.

THE DEVELOPMENT EQUATION: the macro parameters of development performance

Any development process or programme can be formally differentiated into four major components of performance – ECOLOGICAL, ENERGY, ECONOMIC, and SOCIAL/POLITICAL/
CULTURAL parameters. The Development Indicators used in the Assessment Matrix to measure the relative cost/benefit performance of alternative approaches to development can be questioned, added to, subtracted from and over time improved.

The purpose of the Development Performance Assessment Matrix is to help the different actors involved in the struggle for development to carefully review what is already known about the relative cost/benefit performance of alternative development approaches before major decisions are made about what is to be done with the scarce public resources available for the eradication of poverty and the building of 'the good society'.

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