

Principles of Ecologically Sustainable Development

By

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Concept of sustainable development

- The original concept of sustainable development articulated in *Our Common Future* is of “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Concept of ecologically sustainable development

- In Australia, the adjective “sustainable” is qualified by the word “ecologically” to emphasise the necessary integration of economy and environment.

Principles of ESD

- Ecologically sustainable development (ESD) involves a cluster of elements or principles. Six are worth highlighting:
 - 1. principle of sustainable use
 - 2. principle of integration
 - 3. precautionary principle
 - 4. inter-generational and intra-generational equity
 - 5. conservation of biological diversity and ecological integrity
 - 6. internalisation of external environmental costs

Principle of sustainable use

- Natural resources should be used in a manner which is “sustainable” or “prudent” or “rational” or “wise” or “appropriate”.

Principle of sustainable use

- The concept of sustainability applies not merely to development but to the environment.
- The Australian National Strategy for Ecologically Sustainable Development defines ESD as “development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends”.

Principle of integration

- ESD requires the effective integration of economic and environmental considerations in the decision-making process.

Principle of integration

- The principle of integration was the philosophical underpinning of the report *Our Common Future*.

Principle of integration

- *Our Common Future* recognised that the ecologically harmful cycle caused by economic development without regard to and at the cost of the environment could only be broken by integrating environmental concerns with economic goals.

Principle of integration

- The principle of integration ensures mutual respect and reciprocity between economic and environmental considerations:
 - Environmental considerations are to be integrated into economic and other development plans, programs and projects and
 - Development needs are to be taken into account in applying environmental objectives.

Principle of integration

- The principle of integration has been refined recently to add social development to economic development and environmental protection.

Principle of integration

- The Plan of Implementation of the World Summit on Sustainable Development held in Johannesburg, 2002, noted the need to “promote the integration of the three components of sustainable development- economic development, social development and environmental protection- as interdependent and mutually reinforcing

pillars”.

Precautionary principle

- There are numerous formulations of the precautionary principle. The most widely employed formulation is as follows.

Precautionary principle

- If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

Precautionary principle: application

- In the application of the precautionary principle, public and private decisions should be guided by:
 - 1. careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
 - 2. an assessment of the risk- weighted consequences of various options.

Precautionary principle: conditions for application

- The application of the precautionary principle and the concomitant need to take precautionary measures is triggered by the satisfaction of two conditions precedent:
 - A threat of serious or irreversible environmental damage *and*
 - Scientific uncertainty as to the environmental damage.

Precautionary principle: first condition precedent

- It is not necessary that serious or irreversible damage have actually occurred- it is the *threat* of such damage that is required.
- The environmental damage threatened must attain the threshold of being *serious or irreversible*.

Precautionary principle: first condition precedent

- The threat of serious or irreversible damage must be

adequately sustained by scientifically plausible evidence.

- This condition will be fulfilled when empirical scientific data (as opposed to simple hypothesis, speculation or intuition) make it reasonable to envisage a scenario, even if it does not enjoy unanimous scientific support.

Precautionary principle: first condition precedent

- If there is no threat of serious or irreversible environmental damage (the first condition precedent is *not* satisfied), there is no basis on which the precautionary principle can operate.

Precautionary principle: second condition precedent

- The lack of full scientific uncertainty is in relation to the nature and scope of the threat of environmental damage.

Precautionary principle: second condition precedent

- The degree of scientific uncertainty that needs to exist in order to trigger application of the precautionary principle varies depending on the magnitude of environmental damage used in the formulation of the first condition precedent of the precautionary principle.

Precautionary principle: second condition precedent

- For the formulation of “serious or irreversible environmental damage”, the correlative degree of certainty about the threat is “highly uncertain of threat” or “considerable scientific uncertainty”.

Precautionary principle: second condition precedent

- If there is not considerable scientific uncertainty (the second condition is *not* satisfied) but there is a threat of serious or irreversible environmental damage (the first

condition precedent *is* satisfied), the precautionary principle will not apply.

Precautionary principle: second condition precedent

- Measures will still need to be taken but these will be *preventative* measures to control or regulate the relatively certain threat of serious or irreversible environmental damage, rather than *precautionary* measures which are appropriate in relation to uncertain threats.

Precautionary principle: shifting of burden of proof

- If both of the conditions precedent are satisfied, the precautionary principle will be activated.
- There will then be a shifting of the evidentiary burden of proof.

Precautionary principle: shifting of burden of proof

- A decision-maker must assume that the threat of serious or irreversible environmental damage is no longer uncertain but is a reality.
- The burden of showing that this threat does not in fact exist or is negligible effectively reverts to the proponent of the development plan, program or project.

Precautionary principle: preventative anticipation

- The activation of the precautionary principle results in the taking of measures to prevent environmental damage without having to wait until the reality and seriousness of the threats of environmental damage become fully known.
- This is the concept of preventative anticipation.

Precautionary principle: zero risk standard inappropriate

- A zero risk precautionary standard is inappropriate.
- Not every risk is unacceptable and needs to be prevented.

Precautionary principle: precautionary measures

- The type and level of precautionary measures that will be appropriate will depend on the combined effect of the seriousness and irreversibility of the threat and the degree of uncertainty.

Precautionary principle: precautionary measures

- This involves assessment of risk in its usual formulation, namely the probability of the event occurring and the seriousness of the consequences should it occur.
- The more significant and the more uncertain the threat, the greater the degree of precaution required.

Precautionary principle: allowing a margin for error

- Prudence also suggests that some margin for error should be retained until all the consequences of the decision to proceed with the development plan, program or project are known.
- This allows for potential errors in risk assessment and cost-benefit analysis.

Precautionary principle: allowing a margin for error

- Potential errors are weighted in favour of environmental protection.
- Weighting the risk of error in favour of the environment is to safeguard the ecological space or environmental room for manouvre.

Precautionary principle: allowing a margin for error

- One means or retaining a margin for error is to implement a step-wise or adaptive management approach, whereby uncertainties are acknowledged and the area affected by the development plan, program or project is expanded as the extent of uncertainty is reduced.

Precautionary principle: proportionality

- The precautionary principle embraces the concept of proportionality.
- In applying the precautionary principle, measures should be adopted that are proportionate to the threats.

Precautionary principle: proportionality

- Considerations of practicability need to be taken into account.
- There must be a proportionality of response or cost effectiveness of margins of error to show that the selected precautionary measure is not unduly costly.

Precautionary principle: not a prohibition

- The precautionary principle, when triggered, does not necessarily prohibit the carrying out of a development plan, program or project until full scientific certainty is attained.

Precautionary principle: part of package of ESD principles

- The precautionary principle should not be viewed in isolation, but rather as part of the package of principles of ESD.
- Precautionary measures selected should not only be appropriate having regard to the precautionary principle itself, but also in the context of the other principles of ESD.

Inter-generational equity

- ESD involves principles of equity: inter-generational and intra-generational equity.
- *Inter-generational equity* requires the present generation to ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

Intra-generational equity

- *Intra-generational equity* involves considerations of equity within the present generation.
- The use of natural resources by one country (or sector or

class within a country) needs to take account of the needs of other countries (or sectors or classes within other countries).

Intra-generational equity

- Intra-generational equity involves people within the present generation having equal rights to benefit from the use of natural resources and from the enjoyment of a clean and healthy environment.

Intra-generational equity

- It involves environmental justice.

Conservation of biological diversity and ecological integrity

- ESD mandates that the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making, including in the formulation, adoption and implementation of any economic and other development plan, program or project.

Conservation of biological diversity

- Biological diversity means the diversity of life and comprises:
 - *Genetic diversity* (the variety of genes in any population)
 - *Species diversity* (the variety of species)
 - *Ecosystem diversity* (the variety of communities and ecosystems).

Internalisation of external environmental costs

- ESD requires the internalisation of environmental costs into decision-making for any economic and other development plan, program or project.
- The principle requires accounting for both the short term and long term external environmental costs.

Internalisation of external environmental costs

- Internalisation of environmental costs can be undertaken in a number of ways.
- Environmental factors should be included in the valuation of assets and services.

Internalisation of external environmental costs

- The polluter pays principle should be adopted, i.e. those who generate pollution and waste should bear the costs of containment, avoidance or abatement.

Internalisation of external environmental costs

- The users of goods and services should pay prices based on the full life cycle of the costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.

Internalisation of external environmental costs

- Environmental goals, having being established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

Conclusion

- These ESD principles do not exhaustively describe the full ambit of the concept of ESD, but they offer guidance in most situations.

Conclusion

- These principles, if implemented, may ultimately realise a paradigm shift from a world in which the development of the environment occurs without regard to environmental consequences to one where a culture of sustainability extends to government, private development interests, communities and individuals.