Definitions of Sustainability from the Literature

(Compiled by Annie Pearce and Leslie Walrath)

Definition	Source	Key Issues
"We came to see that a new development path was required, one that sustained human progress not just in a few places for a few years, but for the entire planet into the distant future. Thus 'sustainable development' becomes a goal not just for the 'developing' nations but for industrial ones as well." (4)	WCED - World Commission on Environment and Development. (1987). Our Common Future. Oxford University Press, Great Britain. [Pezzey 1989].	Scope: Developing and industrial nations, entire planet, present and distant future Humans - progress (objective)
"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs." (43)	WCED - World Commission on Environment and Development. (1987). Our Common Future. Oxford University Press, Great Britain. [Pezzey 1989].	Development Present needs - met (objective) Future needs - maintain ability to be met (objective) Poverty - "overriding priority" given to alleviation (objective) Technology - limits human ability to meet needs from environment (factor) Social organization - limits human ability to meet needs from environment (factor)

"Living standards that go beyond the basic minimum are sustainable only if consumption standards everywhere have regard for long-term sustainability. Yet many of us live beyond the world's ecological means, for instance in our patterns of energy use. Perceived needs are socially and culturally determined, and sustainable development requires the promotion of values that encourage consumption standards that are within the bounds of the ecological possible and to which all can reasonably aspire." (44)	WCED - World Commission on Environment and Development. (1987). Our Common Future. Oxford University Press, Great Britain. [Pezzey 1989].	Living standards Consumption standards - "within the bounds of the ecological possible", "to which all can reasonably aspire" (objectives) Promotion of values (mechanism) Ecological means - consumption within them (objectives) Scope: long-term Needs - perceived, socially and culturally determined
"Economic growth and development obviously involve changes in the physical ecosystem. Every ecosystem everywhere cannot be preserved intact." (45)	WCED - World Commission on Environment and Development. (1987). Our Common Future. Oxford University Press, Great Britain. [Pezzey 1989].	Economic growth and development Physical ecosystem - not preserved intact (objective)
"The loss [i.e., extinction] of plant and animal species can greatly limit the options of future generations, so sustainable development requires the conservation of plant and animal species." (46)	WCED - World Commission on Environment and Development. (1987). Our Common Future. Oxford University Press, Great Britain. [Pezzey 1989].	Plant and animal species - avoid extinction or loss (objective) Plant and animal species - conservation (mechanism) Future generations - maintain options (objective) Future generations - conserve plant and animal species (mechanism)
"...satisfy the multiple criteria of sustainable growth, poverty alleviation, and sound environmental management." (10)	World Bank. (1987). Environment, growth and development. Development Committee Pamphlet 14, World Bank, Washington, DC. [Pezzey 1989].	growth (objective) poverty - alleviation (objective) environmental management (mechanism)

"To a large degree, environmental management should be seen as a means of attaining the wider objectives of sustained economic growth and poverty alleviation." (18)	World Bank. (1987). Environment, growth and development. Development Committee Pamphlet 14, World Bank, Washington, DC. [Pezzey 1989].	Environmental management (mechanism) Economy - sustainable growth (objective) Poverty - alleviation (objective)
"...elevating concern about environmental matters...and developing the capacity to implement sound practices for environmental management...are [both] needed to reconcile, and, where appropriate, make tradeoffs among the objectives of growth, poverty alleviation, and sound environmental management." (28)	World Bank. (1987). Environment, growth and development. Development Committee Pamphlet 14, World Bank, Washington, DC. [Pezzey 1989].	Environment - environmental management (mechanism) Environment - elevate concern (objective) Environment - develop capacity to implement sound management (objective) Economic growth (objective) Poverty - alleviation (objective) Environment - sound management (objective)
"Sustainable utilization is a simple idea: we should utilize species and ecosystems at levels and in ways that allow them to go on renewing themselves for all practical purposes indefinitely." (18)	Allen, R. (1980). How to Save the World. Barnes & Noble Books, Totwa, NJ. [Based on IUCN 1980]. [Pezzey 1989].	Species and ecosystems - sustainable utilization (mechanism) Species and ecosystems - self-renewal (objective) Human needs (implied) - met using species and ecosystems (mechanism)

"The importance of ensuring that utilization of an ecosystem or species is sustainable varies with a society's dependence on the resource in question. For a subsistence society, sustainable utilization of most, if not all its living resources is essential. ... The greater the diversity and flexibility of the economy, the less the need to utilize certain resources sustainably but by the same token the less the excuse not to." (18)	Allen, R. (1980). How to Save the World. Barnes & Noble Books, Totwa, NJ. [Based on IUCN 1980]. [Pezzey 1989].	Species and ecosystems - sustainable utilization (mechanism) Societal needs and dependencies - utilization of ecosystem or species resources (mechanism) Societal needs and dependencies - economy (mechanism)
"...it is essential...to ensure that...people protect those parts of the biosphere that need protecting and modify the rest only in ways that it can sustain." (20)	Allen, R. (1980). How to Save the World. Barnes & Noble Books, Totwa, NJ. [Based on IUCN 1980]. [Pezzey 1989].	Biosphere - protection (mechanism) Biosphere - sustainable modification (mechanism) Human needs (implied) - met (objective)
"sustainable development - development that is likely to achieve lasting satisfaction of human needs and improvement of the quality of human life." (23)	Allen, R. (1980). How to Save the World. Barnes & Noble Books, Totwa, NJ. [Based on IUCN 1980]. [Pezzey 1989].	Human needs - satisfaction (objective) Quality of human life - improvement (objective) Human needs - sustainable development (mechanism) Quality of human life - sustainable development (mechanism)

"The Commission defined sustainable development as meeting the needs and aspirations of present generations without compromising the ability of future generations to meet their needs. It requires political reform, access to knowledge and resources, and a more just and equitable distribution of wealth within and between nations...."	Brundtland, G.H. (1989). "Protecting the Global Commons," Earth Ethics, Fall, 12.	Needs and aspirations of present generations - met (objective) Needs and aspirations of present generations - sustainable development (mechanism) Needs of future generations - ability to be met (objective) Needs of future generations - sustainable development (mechanism) Sustainable development - political reform (mechanism) Sustainable development - access to knowledge and resources (mechanism) Sustainable development - just and equitable distribution of wealth within and between nations (mechanism)

"Ecologically sustainable development can then be thought of as changes in economic structure, organization and activity of an economic ecological system that are directed towards maximum welfare and which can be sustained by available resources." (271)	Braat, L.C., and Steetskamp, I. (1991). "Ecological-Economic Analysis for Regional Sustainable Development," in Ecological Economics, R. Costanza, ed. Columbia University Press, New York, pp. 269-288.	(Human) welfare - maximize (objective) (Human) welfare - met with available resources (objective) Resources - use within availability (objective) Ecologically sustainable development - changes in economic structure, organization, and activity (mechanism)
"Sustainable development describes a process in which the natural resource base is not allowed to deteriorate. It emphasizes the hitherto unappreciated role of environmental quality and environmental inputs in the process of raising real income and the quality of life." (8)	Pearce, D.W., Warford, J.J. (1993). World Without End. Oxford University Press, Washington, DC.	Natural resource base - undeteriorating (objective) Undeteriorating natural resource base - sustainable development (mechanism) Real income - raise (objective) Raising real income - environmental quality (mechanism) Raising real income - environmental inputs (mechanism) Quality of life - raise (objective) Raise quality of life - environmental quality (mechanism) Raise quality of life - environmental inputs (mechanism)

"In order to break its association with a limited, instrumental view of conservation and development, and in order to suggest some of the positive moral dimensions of the new social paradigm, most of our authors grope for a richer symbolic language with which to speak about the concept of sustainable development -- 'authentic integral development' (Goulet), 'ecological/holistic world view' (Sterling), 'reverential development' (Skolimowski), 'ecosophical development' (Naess), 'noosphere' (Laptev), 'just, participatory ecodevelopment' (Crocker), 'communalism' (Omo-Fadaka), 'desirable society' (Sivaraksa)." (10)	Engel, J.R. (1990). "Introduction: The Ethics of Sustainable Development," in The Ethics of Environment and Development, J. Engel and J.G. Engel, eds. University of Arizona Press, Tuscon. 1-23.	Development - authentic (objective) Development - integral (objective) World view - ecological/holistic (objective) Development - reverential (objective) Development - ecosophical (objective) Ecodevelopment - just, participatory (objective) Society - desirable (objective) Noosphere Communalism
Ignacy Sachs gave this definition in 1974: "A style of development that, in each ecoregion, calls for specific solutions to the particular problems of the region in light of cultural as well as ecological data and long-term as well as immediate needs." (186)	Hettne, B. (1990). Development Theory and the Three Worlds. John Wiley &Sons, New York.	Problem solving - sustainable development (mechanism) Problem solving - ecoregion-specific (objective) Problem solving - incorporating cultural data (mechanism) Problem solving - incorporating ecological data (mechanism) Long-term human needs - met (objective) Immediate human needs - met (objective)

"Sustainable economic development....In general terms, the primary objective is reducing the absolute poverty of the world's poor through providing lasting and secure livelihoods that minimize resource depletion, environmental degradation, cultural disruption, and social instability." (103)	Barbier, E.B. (1987). "The Concept of Sustainable Economic Development," Environ. Conserv., 14(2), 101-110.	Poverty - lasting and secure livelihoods (mechanism) Poverty - reduce (objective) Resources - minimize depletion (objective) Environment - minimize degradation (objective) Culture - minimize disruption (objective) Society - minimize instability (objective)
"Sustainable development is here defined as a pattern of social and structural economic transformations (i.e., 'development') which optimizes the economic and societal benefits available in the present, without jeopardizing the likely potential for similar benefits in the future. A primary goal of sustainable development is to achieve a reasonable (however defined) and equitably distributed level of economic well-being that can be perpetuated continually for many human generations." (36)	Goodland, R., and Ledec, G. (1987). "Neoclassical Economics and Principles of Sustainable Development," Ecological Modelling, 38, 19-46.	Economic and societal benefits to present humans - optimization (objective) Economic and societal benefits to future humans - maintain potential (objective) Economic well-being - reasonable and equitably distributed (objective) Sustainable development - continually perpetuated economic well-being (objective) Sustainable development - social and structural economic transformations (mechanism) "many human generations" (scope)

"...sustainable development implies using renewable natural resources in a manner which does not eliminate or degrade them, or otherwise diminish their usefulness for future generations.....Sustainable development further implies using non-renewable (exhaustible) mineral resources in a manner which does not unnecessarily preclude easy access to them by future generations..... Sustainable development also implies depleting non-renewable energy resources at a slow enough rate so as to ensure the high probability of an orderly societal transition to renewable energy sources." (37)	Goodland, R., and Ledec, G. (1987). "Neoclassical Economics and Principles of Sustainable Development," Ecological Modelling, 38, 19-46.	Renewable natural resources - non-degrading use (objective) Future generations (scope) Non-renewable (exhaustible) mineral resources - use which minimizes entropy gain (objective) Non-renewable energy resources - use at "slow enough rate" (objective) Energy resource use - orderly societal transistion to renewable sources (objective)

"Environmental protection is integral to issues such as trade, development, energy, transport, agriculture and economic planning. Therefore, environmental considerations must be taken into account in economic decision-making. ... In order to achieve sustainable development, we shall ensure the compatibility of economic growth and development with the protection of the environment. Environmental protection and related investment should contribute to economic growth..." (paragraph 37 of Paris Summit Communique)	Group of Seven. (1989). Communique from the 15th Annual Economic Summit in Paris. New York Times, 17July 1989, p. A5. [Pezzey 1989].	Economy - growth and development (objective) Environment - protection (mechanism) Sustainable development - compatibility of economic growth and development with protection of the environment (mechanism) Trade - environmental protection (mechanism) Development - environmental protection (mechanism) Energy - environmental protection (mechanism) Transport - environmental protection (mechanism) Agriculture - environmental protection (mechanism) Economic planning - environmental protection (mechanism)

"Guidelines for a Responsible Natural Resources Policy: (6) ...activities should be considered that would be aimed at maintaining over time a constant effective natural resource base. This concept was proposed by Page (1977) and implies not an unchanging resource base but a set of resource reserves, technologies, and policy controls that maintain or expand the production possibilities of future generations." (337)	Howe, C.W. (1979). Natural Resource Economics - Issues, Analysis and Policy. John Wiley & Sons, New York, NY. [Pezzey 1989].	Natural resource base - constanteffective state (objective) Mechanisms: Constant effective natural resource base: • not unchanging • set of resources reserves, technologies, and policy controls Maintain or expand the production possibilities for future generations
"In simple terms [sustainable development] argues for (a) development subject to a set of constraints which set resource harvest rates at levels no higher than managed or natural regeneration rates; and (b) use of the environment as a 'waste sink' on the basis that waste disposal rates should not exceed rates of (natural or managed) assimilation by the counterpart ecosystem." (58)	Pearce, D. (1988). "Optimal Prices for Sustainable Development," in Economics, Growth, and Sustainable Environments, D. Collard, D. Pearce, and D. Ulph, eds. St. Martin's Press, New York. [Pezzey 1989].	Sustainable development - resource harvest (mechanism) Sustainable development - waste to ecosystems (mechanism) Resource harvest - less than managed or natural regeneration rates (objective) Waste to ecosystems - less than natural or managed assimilation rates (objective) Waste disposal - environment as "sink" (mechanism) Resource generation - ecosystems (mechanism) Development - resource generation and waste sink (mechanisms)

"A major challenge in the coming decades is to learn how long-term, large-scale interactions between environment and development can be better managed to increase the prospects for ecologically sustainable improvements in human well-being." (5)	Clark, W.C. and Munn, R.E. (1986). Sustainable Development of the Biosphere. Cambridge University Press, Cambridge, UK. [Pezzey 1989].	Ecologically sustainable development - manage interactions between environment and development (mechanism) Human well-being - improvement (objective) Scope: long-term, large-scale
"[The] sustainable society is one that lives within the self-perpetuating limits of its environment. That society...is not a 'no-growth' society. ... It is, rather, a society that recognizes the limits of growth...[and] looks for alternative ways of growing." (1)	Coomer, J.C. (1979). "The nature of the quest for a sustainable society." In Coomer, J.C., ed. Quest for a Sustainable Society. Pergamon Press, New York. [Pezzey 1989].	Environment - humans take only within "self-perpetuating limits" (objective)
"Socially sensitive interpretations of sustainable development emphasize the opportunity for a return to community values, local control over resources, community-based development and other forms of decentralized government..." (22)	Rees, W.E. (1990). "The Ecology of Sustainable Development," The Ecologist, 20(1), 18-23.	Social elements Mechanisms only..... Community values Resource control - local Community-based development Decentralized government
DuBose: "...in order for a course of action to be sustainable it should be compatible with the local culture by respecting the structure of the society and values of the people..." (114) - p.7 in DuBose 1994	Dower, N. (1992). "Sustainability and the Right to Development," in International Justice and the Third World, Attfield, R., and Wilkins, B., eds. Routledge Publishing, New York.	Local culture - actions should respect (objective) Structure of society - actions should respect (objective) Values of the people - actions should respect (objective)

"But there are also some basic requirements to reach ... a situation [of sustainable development]. First of all, there should be a worldwide political will to attain a sustainable development. One cannot expect this will to exist in a world of poverty, so that sustainable development requires an equity oriented policy." (88)	Nijkamp, P. and Soeteman, F. (1988). "Ecologically sustainable economic development: key issues for strategic environmental management." International Journal of Social Economics, 15(3/4), 88-102. [Pezzey 1989].	Intergenerational equity - alleviate poverty (objective) Worldwide political will (mechanism)
"If sustainable development is to be achieved, we will have to devise institutions, at all levels of government, to reallocate the use of stock resources towards the future, curb the pace and disruption of global climatic changes, reverse the accumulation of toxins in the environment and slow the loss of biological diversity. These are the key resource and environmental issues that must be addressed." (608)	Norgaard, R.B. (1988). "Sustainable development: a coevolutionary view." Futures, 20(6), December, 606-620. [Pezzey 1989].	Government institutions (mechanisms) Stock resources - reallocate use towards the future (objective) Global climate - curb changes (objective) Environment - reverse accumulation of toxins (objective) Biological diversity - slow loss (objective)
"Until the use of hydrocarbons, development was a process of social system and ecosystem coevolution that favoured human welfare. ...Obviously this coevolutionary process did not result in sustainable development for all societies. Many suffered, some were overtaken by others and the welfare of the survivors did not steadily increase. But at least those societies which historically met their demise did not take the global environment with them." (617)	Norgaard, R.B. (1988). "Sustainable development: a coevolutionary view." Futures, 20(6), December, 606-620. [Pezzey 1989].	Human welfare - steadily increase (objective) Social and ecological systems - coevolution (objective) Global environment - avoid destruction (objective)

"In simple terms [sustainable development] argues for (a) development subject to a set of constraints which set resource harvest rates at levels no higher than managed or natural regeneration rates; and (b) use of the environment as a 'waste sink' on the basis that waste disposal rates should not exceed rates of (natural or managed) assimilation by the counterpart ecosystems. ... ... There are self-exhaustible resources, so that 'sustainabilitists' tend to think in terms of a resource set encompassing substitution between renewables and exhaustibles. Equally self-evident is the implicit assumption that sustainability is a 'good thing' - that is optimizing within sustainable use rates is a desirable objective. On these terms, sustainability could imply use of environmental services over very long time periods and, in theory, indefinitely." (58)	Pearce, D.W. (1988). "Optimal prices for sustainable development." in Collard, D., Pearce, D., and Ulph, D., eds. Economics, Growth and Sustainable Environments. St. Martin's Press, New York. [Pezzey 1989].	Resource harvest - less than managed or natural regeneration rates (objective) Waste to env't - less than natural or managed assimlation rates (objective) Self-exhaustible resourcs - substitute with renewables (mechanism) Sustainable use rates - optimize (objective) Environmental "services" - use over indefinite time periods (objective) Time frame = "very long" or "indefinite"

"Sustainable development is categorized by economic change subject to 'constancy of the natural capital stock' - the stock of environmental assets is held constant while the economy is allowed whatever social goals are deemed appropriate. Such a rule, which has its own difficulties, accommodates the main concerns of the advocates of sustainability - equity between generations, equity within a generation, economic resilience to external shocks, and uncertainty about the functions and values of natural environments in social systems. It may also accommodate some of the concerns of the 'deep ecology' movement by respecting rights in nature." (598)	Pearce, D.W. (1988). "Economics, equity and sustainable development." Futures, 20(6), December, 598-605. [Pezzey 1989].	Sustainable development - economic change (mechanism) Economy - change subject to constancy of natural capital stock (objective) Natural capital stock/environmental assets - hold constant (objective) Economy - fluctuate according to social goals (objective) Between generations - equity (objective) Within generations - equity (mechanism) External economic shocks - resilience (objective) Nature - rights respected (objective) Functions/values of natural environments in social systems - uncertainty (factor)

"We take development to be a vector of desirable social objectives, and elements might include: - increases in real income per capita - improvements in health and nutritional status - educational achievement - access to resources - a 'fairer' distribution of income - increases in basic freedoms. ...Sustainable development is then a situation in which the development vector increases monotonically over time." (4)	Pearce, D.W., Barbier, E., and Markandya, A. (1988). Sustainable development and cost benefit analysis. LEEC Paper 88-03, IIED/UCL London Environmental Economics Centre, 3 Endsleigh St., London WC1. [Pezzey 1989].	Development - increases in per capita real income (objective) Development - improvements in health and nutrition (objective) Development - education (objective) Development - resource access (objective) Development - fairer distribution of income (objective) Development - increase in basic freedoms (objective) Development - increases monotonically over time (objective)
"We summarize the necessary conditions [for sustainable development] as 'constancy of the natural capital stock'. More strictly, the requirement is for non-negative changes in the stock of natural resources such as soil and soil quality, ground and surface water and their quality, land biomass, water biomass and the waste assimilation capacity of receiving environments." (6)	Pearce, D.W., Barbier, E., and Markandya, A. (1988). Sustainable development and cost benefit analysis. LEEC Paper 88-03, IIED/UCL London Environmental Economics Centre, 3 Endsleigh St., London WC1. [Pezzey 1989].	Natural capital stock - constancy (objective) Soil and soil quality - non-negative changes (objective) Ground and surface water and their quality - non-negative changes (objective) Land biomass - non-negative changes (objective) Water biomass - non-negative changes (objective) Waste assimilation capacity of receiving environments - non-negative changes (objective)

"Over the last decade or so international attention has increasingly become focused on the problem of ensuring that modern development on this planet takes place at a pace which the earth's environment can sustain. ... Economic growth is a necessary precondition for environmental improvement but it is possible and necesary to plan for economic growth which is environmentally sustainable."	Ridley, N. (1989). Policies against Pollution: The Conservative Record - and Principles. Centre for Policy Studies, London. [Pezzey 1989].	Development - pace is environmentally sustainable (objective) Economy - growth (objective) Environment - improvement (objective) Environmental improvement - economic growth (mechanism) Economic growth - environmentally sustainable (objective)
"...the health of the economy and the health of our environment are totally dependent upon each other. The [British] Government espouses the concept of sustainable economic development. Stable prosperity can be achieved throughout the world provided the environment is nurtured and safeguarded."	Thatcher, M. (1988). Speech at 1988 Royal Society Dinner (September). [Pezzey 1989].	Economy - health (objective) Environment - health (objective) World's people - stable prosperity (objective) Economic development - sustainable (objective) Stable human prosperity - nurturing and safeguarding environment (mechanism) Economic health and environmental health - interdependency (property)

"In broad terms the concept of sustainable development encompasses: (1) help for the very poor because they are left with no option other than to destroy their environment; (2) the idea of self-reliant development, within natural resource constraints; (3) the idea of cost-effective development using different economic criteria to the traditional approach; that is to say development should not degrade environmental quality, nor should it reduce productivity in the long run; (4) the great issues of health control, appropriate technologies, food, self-reliance, clean water, and shelter for all; (5) the notion that people-centred initiatives are needed; human beings, in other words, are the resources in the concept." (98)	Tolba, M. (1987). Sustainable Development-Constraints and Opportunities. London: Butterworth (1987). [Pezzey 1989].	Poor people - help to keep them from destroying environment (mechanism) Development - self-reliant (objective) Development - within natural resource constraints (objective) Development - cost-effective using fair economic criteria (objective) Environmental quality - no degradation (objective) Productivity - no reduction in long run (objective) Development - maintain environmental quality (objective) Development - maintain productivity in long run (objective) Human needs (implied) - health control for all (mechanism) Human needs (implied) - appropriate technologies for all (mechanism) Human needs (implied) - food for all (mechanism) Human needs (implied) - self-reliance for all (mechanism) Human needs (implied) - clean water for all (mechanism)

"The current state of scientific knowledge ... leads inexorably to the conclusion that anyone driven by either long-term self-interest, or concern for poverty, or concern for intergenerational equity should be willing to support the operational objectives of sustainable development." (p. 17, paraphrasing Repetto 1986)	Lele, S.M. (1990). "Sustainable Development: A Critical Review," World Development, forthcoming. [Pezzey 1989].	Self-interest - long term (objective) Poverty - alleviation (objective) Between generations - equity (objective)
"The precise meaning of terms such as 'sustainable resource usage', sustainable growth' and 'sustainable development' has so far proved elusive." (5)	Turner, R.K. (1988). "Sustainability, resource conservation and pollution control: an overview." In Turner, R.K., ed. Sustainable Environmental Management: Principles and Practice. Belhaven Press, London. [Pezzey 1989].	Resource usage - sustainable (objective) Growth - sustainable (objective) Development - sustainable (objective)
"The World Conservation Strategy...gave considerable prominence to the sustainability concept, although its precise meaning and practical applications were not presented in a detailed and operational form." (576)	Turner, R.K. (1988). "Sustainable global futures - common interest, interdependency, complexity and global possibilities." Futures 19(5), 574-582. [Pezzey 1989].	
"Two principles of 500-year planning: Principle 1: Future generations should not inherit, from present generations, unacceptable risks of death owing to environmental or other preventable catastrophes. Principle 2: Future, as well as present, generations may inherit constraints on their primary freedoms as sacrifices for enjoying the conditions of Principle 1."	Tonn, B.E. (1989, forthcoming). [Pezzey 1989].	Future generations - should not inherit unacceptable risks of death (objective) Future generations - constraints on primary freedoms (possible side effect) Present generation - constraints on primary freedoms (possible side effect)
"The sustainability criterion suggests that, at a minimum, future generations should be left no worse off than current generations." (33)	Tietenberg, T.H. (1984). Environmental and Natural Resource Economics. Scott, Foresman & Co., Glenview, IL. [Pezzey 1989].	Future generations - no worse than current generations (objective)

"1. Objectives of the world conservation strategy: Conservation has three basic objectives: (1) To maintain essential ecological processes and life support systems. (2) To preserve genetic diversity. (3) To ensure that the utilization of living resources and the ecosystems in which they are found, is sustainable." (4)	Talbot, L.M. (1984). "The World Conservation Strategy." In Thibodeau, F.R. and Field, H.H., Sustaining Tomorrow - A Strategy for World Conservation and Development. University Press of New England. [Pezzey 1989].	Sustainability - conservation (mechanism) Essential ecological processes and life support systems - maintain (objective) Genetic diversity - preserve (objective) Living resources and source ecosystems - sustainable utilization (objective)
"...a society that invests in reproducible capital the competitive rents on its current extraction of exhaustible resources, will enjoy a consumption stream constant in time. ...this result can be interpreted as saying that an appropriately defined stock of capital - including the initial endowment of resources - is being maintained intact, and that consumption can be interpreted as the interest on that patrimony." (141)	Solow, R.M. (1986). "On the intergenerational allocation of natural resources." Scandinavian Journal of Economics, 88(1), 141-149. [Pezzey 1989].	Sustainable use of exhaustible resources - replaced by investment in reproducible capital (mechanism)
"...the main text [of WCED 1987] combines views that have often been regarded as hard to reconcile. Traditional objectives of economic growth are believed to be compatible with sustainability. In fact, the position taken by the Commission is that a high level of GNP growth will facilitate the transistion towards sustainability." (20)	Soderbaum, P. (1988). "Sustainable development - a challenge to our world views and ideas of economics." In Stockhold Group for Studies on Natural Resource Management, Perspectives of Sustainable Development: Some Critical Issues Related to the Brundtland Report. SGN, Stockholm. [Pezzey 1989].	Sustainability - economic growth (mechanism) => Questionable!

"[Sustainable growth] means economic growth that can be supported by physical and social environments in the foreseeable future. An ideal sustainable society would be one in which all energy would be derived from current solar income and all non-renewable resources would be recycled." (10f)	Pirages, D.C. (1977). "A social design for sustainable growth." in Pirages, D.C., ed. The Sustainable Society - Implications for Limited Growth. Praeger, New York. [Pezzey 1989].	Scope: foreseeable future Energy - all from current solar income (mechanism/objective) Non-renewable resources - recycled (mechanism/objective) Economy - growth supportable by physical and social environments (objective)
"This does not mean that sustainable development demands the preservation of the current stock of natural resources or any particular mix of human, physical and natural assets. As development proceeds, the composition of the underlying asset base changes." "There is a broad agreement that pursuing policies that imperil the welfare of future generations, who are unrepresented in any political or economic forum, is unfair."	Repetto, R. (1986). World Enough and Time. Yale University Press, New Haven.	Preservation (objective) – no one resource or asset should be preserved – asset base changes with development – Future generations (objective) – do imperil those who cannot speak for or defend their welfare

"The core of the idea of sustainability, then, is the concept that current decisions should not impair the prospects for maintaining or improving future living standards. ... This implies that our economic systems should be managed so that we live off the dividend of our resources, maintaining and improving the asset base. This principle also has much in common with the ideal concept of income that accountants seek to determine: the greatest amount that can be consumed in the current period without reducing prospects for consumption in the future." (10)	Repetto, R. (1985). The Global Possible - Resources, Development and the New Century. Yale University Press, New Haven. [Pezzey 1989].	Future living standards - not impaired by current decisions (objective) Economic systems - managed to live off dividend of resources (mechanism) Resources - live off dividend (objective) Asset base - maintain and improve (objective)
"All economic growth in the future must be sustainable: that is to say, it must operate within and not beyond the finite limits of the planet." (120)	Porritt, J. (1984). Seeing Green - The Politics of Ecology Explained. Basil Blackwell, Oxford. [Pezzey 1989].	Economy - growth within finite limits of the planet (objective)
"The sustainability criterion requires that the conditions necessary for equal access to the resource base be met for each generation." (13)	Pearce, D.W. (1987). "Foundations of an ecological economics." Ecological Modelling 38, 9-18. [Pezzey 1989].	Each generation - equal access to the resource base (objective)

"The key concept [regarding natural resource degradation in developing countries] is ‘sustainability’. Changes in resource management practice toward sustainable resource use could at least contribute to the preservation of the renewable resource base and hence to the direct well-being of the population and to the future of the macroeconomy." (102)	Pearce, D.W. (1988). "The sustainable use of natural resources in developing countries." in Turner, R.K., ed., Sustainable Environmental Management: Principles and Practice. Belhaven Press, London. [Pezzey 1989].	Resource use - preservation of renewable resource base (objective) Sustainable resource use - well-being of population (outcome) Sustainable resource use - future of macroeconomy (outcome) Sustainable resource use - changes in resource management practice (mechanism) Scope: developing countries Natural resources - avoid degradation (objective)

"We developed our own simple, anthropocentric working definition by which we mean sustainability to be the indefinite survival of the human species (with a quality of life beyond mere biological survival) through the maintenance of basic life support systems (air, water, land, biota) and the existence of infrastructure and institutions which distribute and protect the components of these systems." (133)	Liverman, D.M., Hanson, M.E., Brown, B.J., and Merideth, R.W., Jr. (1988). "Global Sustainability: Toward Measurement." Environmental Management, 12(2), 133-143.	Human species - indefinite survival (objective) Quality of life - more than "mere biological survival" (objective) Quality human survival - maintenance of life support systems (mechanism) Quality human survival - existence of infrastructure and institutions which distribute and protect life support systems (mechanism) Air systems - maintenance and protection (objective) Water systems - maintenance and protection (objective) Land systems - maintenance and protection (objective) Biota - maintenance and protection (objective) Scope: indefinite

"It may only be a matter of time before the metaphor of sustainability becomes so abused as to be meaningless, certainly as a device to straddle the ideological conflicts that pervade contemporary environmentalism." (29) "Sustainability is a much broader phenomenon [than sustainable development], embracing ethical norms pertaining to the survival of living matter, to the rights of future generations and to institutions responsible for ensuring that such rights are fully taken into account in policies and actions." (30)	O'Riordan, T. (1988). "The politics of sustainability." In Turner, R.K., ed. Sustainable Environmental Management: Principles and Practice. Belhaven Press, London. [Pezzey 1989].	Living matter - survival (objective) Future generations - respecting rights (objective) Future generations' rights - institutions and policies (mechanism)
"...much of the desertification literature also suggests that desertification is nonoptimal from both the producer's and society's perspective. Sustainable use is generally put forward as the optimal strategy. [Morey then shows how sustainable land use may or may not be optimal.]" (551)	Morey, E.R. (1985)."Desertification from an economic perspective." Ricerche Economiche, 39(4), 550-560. [Pezzey 1989].	Resource (implied) use - optimal (objective)
"The basic idea [of sustainability] is simple in the context of natural resources (excluding exhaustibles) and environments: the use made of these inputs to the development process should be sustainable through time. ....If we now apply the idea to resources, sustainability ought to mean that a given stock of resources - trees, soil quality, water and so on - should not decline." (9-10)	Markandya, A. and Pearce, D.W. (1988). "Natural environments and the social rate of discount." Project Appraisal, 3(1), 2-12. [Pezzey 1989].	Natural resources - sustainable use of inputsover time (objective) Environments - sustainable use of inputs over time (objective) Resource stock - no decline (objective) Trees - no decline (objective) Soil quality - no decline (objective) Water - no decline (objective)

"In the narrowest sense, global sustainability means the indefinite survival of the human species across all the regions of the world. A broader sense of the meaning specifies that virtually all humans, once born, live to adulthood and that their lives have quality beyond mere biological survival. Finally the broadest sense of global sustainability includes the persistence of all components of the biosphere, even those with no apparent benefit to humanity." (717)	Brown, B.J., et al. (1987). "Global sustainability: toward definition." Environmental Management, 11(6), 713-719. [Pezzey 1989].	Scope: global, indefinite, all regions of the world Human species - indefinite survival (objective) Humans - virtually all live to adulthood, once born (objective) Human quality of life - beyond mere biological survival (objective) Biosphere components - all persist, regardless of utility to humans (objective)
"...in a pedagogical sense sustainability requires that all processes operate only at their steady state, renewable level, which might then suggest a return to a regulated caveman culture." (323)	Burness, H.S. and Cummings, R.G. (1986). "Thermodynamic and economic concepts as related to resource-use policies: reply." Land Economics, 62(3), 323-324. [Pezzey 1989].	Processes - steady state (objective) Processes - renewable (objective)

"'Sustainable', by definition, means not only indefinitely prolonged, but nourishing for the self-actualizing of persons and communities. The word 'development' need not be restricted to economic activity, much less to the kind of economic activity that now dominates the world, but can mean the evolution, unfolding, growth, and fulfillment of any and all aspects of life. Thus 'sustainable development', in the broadest sense, may be defined as the kind of human activity that nourishes and perpetuates the historical fulfillment of the whole community of life on earth." (10)	Engel, J.R. (1990). "Introduction: The Ethics of Sustainable Development," in The Ethics of Environment and Development, J. Engel and J.G. Engel, eds. University of Arizona Press, Tuscon. 1-23.	Sustainable == "indefinitely prolonged; nourishing" Persons and communities - indefinitely prolonged (objective) Persons and communities - nourished (objective) Persons and communities - self-actualizing (objective) Development == "evolution, unfolding, growth, and fulfillment of any and all aspects of life" Life on earth - nourished and perpetuated (objective)
"This chapter will address these two opposing meanings of 'sustainability' and their respective development paradigms. It will differentiate between sustainability as a narrow economic ideal and sustainability as an ethical ideal, between sustainability of privileges and sustainability of life on Earth." (28)	Kothari, R. (1990). "Environment, Technology, and Ethics," in The Ethics of Environment and Development, J. Engel and J.G. Engel, eds. University of Arizona Press, Tuscon. 27-35.	Distinguishes between economic and environmental sustainability in terms of privilege versus ethics

"[I]t is an obligation to conduct ourselves so that we leave to the future the option or the capacity to be as well off as we are. It is not clear to me that one can be more precise than that. Sustainability is an injunction not to satisfy ourselves by impoverishing our successors...There is no specific object that the goal of sustainability, the obligation of sustainability, requires that we leave untouched." (181)	Solow, R.M. (1993). "Sustainability: An Economist's Perspective," in Economics of the Environment: Selected Readings. R. Dorfman and N.S. Dorfman, eds. W.W. Norton & Company, New York, 179-187.	Sustainability - human conduct to preserve future options (mechanism) Future generations - capacity to be as well off as present (objective) Present humans - don't impoverish future generations (objective) Present humans - satisfaction (objective)
"While other attributes such as color or temperature can be ascribed to isolated objects, this is not the case with sustainability. It is somewhat of a misnomer to say that a technology in and of itself is sustainable. This is not to say that therefore nothing is sustainable or that sustainability can not occur -- it is simply that our way ofspeaking of sustainability is imprecise and misleading. Sustainability does not describe a quality that resides within the confines of an individual technology or practice but refers instead to the nature of the relationship between the technology and its context." (14)	DuBose, J.R. (1994). Sustainability as an Inherently Contextual Concept: Some Lessons from Agricultural Development. Unpublished M.S. Thesis, School of Public Policy, Georgia Institute of Technology, Atlanta, GA.	Sustainability == relationship between technology and its context
"Even the narrow notion of physical sustainability implies a concern for social equity between generations, a concern that must logically be extended to equity within each generation." (43)	WCED - World Commission on Environment and Development. (1987). Our Common Future. Oxford University Press, Great Britain. [Pezzey 1989].	Between generations - social equity (objective) Within generations - social equity (objective)

"The core of the idea of sustainability, then, is the concept that current decisions should not impair the prospects for maintaining or improving future living standards....This implies that our economic systems should be managed so that we live off the dividend of our resources, maintaining and improving the asset base....This does not mean that sustainable development demands the preservation of the current stock of natural resources or any particular mix of human, physical, and natural assets." (10)	Repetto, R. (1985). The Global Possible - Resources, Development, and the New Century. Yale University Press, New Haven, CT. [Pezzey 1989].	Future living standards - not impaired by current decisions (objective) Economic systems - managed to live off dividends (mechanism) Asset base - maintained or improved (objective) Natural resources - not necessarily preserved in any particular state (objective)
"The sustainable community, as the architect planner Sim Van der Ryn suggests, 'exacts less of its inhabitants in time, wealth, and maintenance, and demands less of its environment in land, water, soil, and fuel.' I would add that it also demands more of its inhabitants in terms of participation, cooperation, and civicness, and provides more opportunities for these as well." (2)	Veiderman, S. (1993). "The Economics and Economy of Sustainability; Five Capitals and Three Pillars." presented at the Delaware Estuary Program Conference on "Preserving Our Future", November 30, 1993, Philadelphia, PA.	Human time - exact less (objective) Human wealth - exact less (objective) Human maintenance - exact less (objective) Environment (land, water, soil, fuel) - demand less (objective) Human participation - demand more, and provide opportunities (objective) Human cooperation - demand more, and provide opportunities (objective) Human civicness - demand more, and provide opportunities (objective)

"Sustainability is a relationship between dynamic human economic systems and larger, dynamic, but normally slower-changing ecological systems, such that human life can continue indefinitely, human individuals can flourish, and human cultures can develop--but also a relationship in which the effects of human activities remain within bounds so as not to destroy the health and integrity of self-organizing systems that provide the environmental context for these activities." (25)	Norton, B.G. (1992). "A New Paradigm for Environmental Management," in Ecosystem Health: New Goals for Environmental Management, R. Costanza, B.G. Norton, and B.D. Haskell, eds. Island Press, Washington, DC, 23-41.	Human economic systems and ecological systems (interrelated) Human life - continue indefinitely (objective) Scope: indefinite Human individuals - flourish (objective) Human cultures - develop (objective) Effects of human activities - remain bounded so as not to destroy ecosystems (objective) Self-organizing ecosystems - health and integrity not destroyed (objective)
"Sustainability within the economic paradigm is sustainability of human welfare through the sustenance of the productive capacities of the economy; sustainability in the ecological paradigm makes essential reference to crucial productive capacities of ecological processes and systems."	Norton, B.G. (forthcoming?). "Evaluating Ecosystem States: Two Competing Paradigms," Ecological Economics.	Human welfare - sustained (objective) Human welfare - sustained productive economic capacities (mechanism) Ecological processes and systems - sustained productive capacities (objective)
"The market does not distinguish an ecologically sustainable scale of matter-energy throughput from an unsustainable scale, just as it does not distinguish between ethically just and unjust distributions of income. Sustainability, like justice, is a value not achievable by purely individualistic market processes." (320)	Daly, H.E. (1986). "Thermodynamic and economic concepts as related to resource-use policies: comment." Land Economics, 62(3). 319-322. [Pezzey 1989].	Sustainability = a value

"By ‘growth’ I mean quantitative increase in the scale of the physical dimensions of the economy; ... By ‘development’ I mean the qualitative improvement in the structure, design and composition of physical stocks and flows, that result from greater knowledge, both of technique and of purpose." (323)	Daly, H.E. (1987). "The economic growth debate: what some economists have learned but many have not." Journal of Environment and Economics Management, 14(4), 323-336. [Pezzey 1989].	Development = qualitative improvement resulting from greater knowledge and purpose
"... ‘growth’ is if you get just an increasing number of the same type of mail coaches. And if you pass from traveling in mail coaches to traveling by railway, that is ‘development’." (294)	Georgescu-Roegen, N. (1988). "About economic growth - a variation on a theme by David Hilbert." Economics and Development of Cultural Change. 36(3) Supplement, S291-S307. [Pezzey 1989].	Development = increase in technology
"[S]ustainability is by default taken to mean ‘the existence of the ecological conditions necessary to support human life at a specified level of well-being through future generations, what I call ‘ecological sustainability’."	Lele, S.M. (1990). "Sustainable Development: A Critical Review," World Development, forthcoming. [Pezzey 1989].	Human life - supported at specified level of well-being (objective) Human life - existence of supporting ecological conditions (mechanism) Scope: future generations
"In principle, such an optimal [sustainable growth] policy would seek to maintain an ‘acceptable’ rate of growth in per-capita real incomes without depleting the national capital asset stock or the natural environmental asset stock." (12)	Turner, R.K. (1988). "Sustainability, resource conservation and pollution control: an overview." In Turner, R.K., ed. Sustainable Environmental Management: Principles and Practice. Belhaven Press, London. [Pezzey 1989].	Real incomes - growth without depleting capital or environmental asset stock (objective) Sustainable growth - policy (mechanism)

"It makes no sense to talk about the sustainable use of a non-renewable resource (even with substantial recycling effort and reuse rates). Any positive rate of exploitation will eventually lead to exhaustion of the finite stock." (13)	Turner, R.K. (1988). "Sustainability, resource conservation and pollution control: an overview." In Turner, R.K., ed. Sustainable Environmental Management: Principles and Practice. Belhaven Press, London. [Pezzey 1989].	Non-renewable resource - any use is unsustainable (effect)
"...in this [sustainable development] mode...conservation becomes the sole basis for defining a criterion with which to judge the desirability of alternative allocations of natural resources." (21)	Turner, R.K. (1988). "Sustainability, resource conservation and pollution control: an overview." In Turner, R.K., ed. Sustainable Environmental Management: Principles and Practice. Belhaven Press, London. [Pezzey 1989].	Natural resource allocation - conservation (mechanism)
"Rather than eliminating the [positive] discount rate, the present-value criterion should be complemented by other criteria, such as sustainability. ....For example, we might choose to maximise present value subject to the constraint that future generations are not made worse off." (432)	Tietenberg, T.H. (1984). Environmental and Natural Resource Economics. Scott, Foresman & Co., Glenview, IL. [Pezzey 1989].	Future generations - not worse off (objective) Present value - maximized (objective)
"This does not mean that sustainable development demands the preservation of the current stock of natural resources or any particular mix of human, physical and natural assets. As development proceeds, the composition of the underlying asset base changes." (10)	Repetto, R. (1985). The Global Possible - Resources, Development and the New Century. Yale University Press, New Haven. [Pezzey 1989].	Resource asset base - can change over time (mechanism)
"There is broad agreement that pursuing policies that imperil the welfare of future generations, who are unrepresented in any political or economic forum, is unfair." (11)	Repetto, R. (1985). The Global Possible - Resources, Development and the New Century. Yale University Press, New Haven. [Pezzey 1989].	Future generations - don't imperil welfare (objective)

"...sustainability might be redefined in terms of a requirement that the use of resources today should not reduce real incomes in the future..." (11)	Markandya, A. and Pearce, D.W. (1988). "Natural environments and the social rate of discount." Project Appraisal, 3(1), 2-12. [Pezzey 1989].	Resource use - does not reduce future real income (objective) Real income - not reduced in future (objective)
"One can identify four primary criteria for sustainable development when it is conceived as an ethical ideal: a holistic view of development; equity based on the autonomy and self-reliance of diverse entities instead of on a structure of dependence founded on aid and transfer of technology with a view to 'catching up'; an emphasis on participation; and an accent on the importance of local conditions and the value of diversity." (34)	Kothari, R. (1990). "Environment, Technology, and Ethics," in The Ethics of Environment and Development, J. Engel and J.G. Engel, eds. University of Arizona Press, Tuscon. 27-35.	Development - should be holistic (objective) Present generation - equity based on self-reliance (objective) Present generation - participation (mechanism) Local conditions - value (objective) Diversity - value (objective)
"[Sustainability] can be accomplished by leaving adequate resources, be they natural or manmade....[G]oods and services can be substituted for one another...what we are obligated to leave behind is a generalized capacity to create well-being, not any particular thing or any particular natural resource."	Solow, R.M. (1993). "Sustainability: An Economist's Perspective," in Economics of the Environment: Selected Readings. R. Dorfman and N.S. Dorfman, eds. W.W. Norton & Company, New York, 179-187.	Resources (natural or man-made) - leave adequate (mechanism) Future generations - leave capacity for well-being (objective)
"...you are almost forced logically to think about equity not between periods of time but equity right now..." (185)	Solow, R.M. (1993). "Sustainability: An Economist's Perspective," in Economics of the Environment: Selected Readings. R. Dorfman and N.S. Dorfman, eds. W.W. Norton & Company, New York, 179-187.	Between generations - equity (objective) Within generations - equity (objective)
"[S]ustainability is a vague concept. It is intrinsically inexact. It is not something that can be measured out in coffee spoons. It is not something that you could be numerically accurate about." (187)	Solow, R.M. (1993). "Sustainability: An Economist's Perspective," in Economics of the Environment: Selected Readings. R. Dorfman and N.S. Dorfman, eds. W.W. Norton & Company, New York, 179-187.	Sustainability = inexact concept that cannot be measured

"Clean air, clean water, safety in city parks, low-income housing, education, child care, welfare, medical care, unemployment (insurance), transportation, recreation/cultural centers, open space, wetlands..."	Wolf, H. Seattle Audobon Society.	Sustainability = health, safety, education, social responsibility, access to all resources
"Here sustainable development means a program of domestic economic and political reform that... yields 'broad-based economic progress accomplished in a manner that protects and restores the quality of the natural environment, improves the quality of life for individuals and broadens the prospects for future generations.' It means, in other words, maintaining economic growth while producing the absolute minimum of pollution, repairing the environmental damages of the past, using far fewer non-renewable resources, producing much less waste, and extending the opportunity to live in a pleasant and healthy environment to the whole population."	US Presidents Council on Sustainable Development	Domestic, national (scope), economic, political reform (mechanism), protect and restore natural environment (objective), improve quality of life (objective), broaden prospects for future generations (objective), maintain economic growth while protecting and conserving resources (objective), well being of whole population (objective)
"Sustainability is the optimal balance of natural, economic, and social systems over time."	The Florida Center for Community Design & Research	Sustainability = optimal balance
"A sustainable community is one whose energy economy does not use more energy in a given time than falls on its hinterlands as sunlight in that time, and in which the material economy is circular rather than linear."	Risemberg, R. "A Paradigm for Sustainability".	Use no more energy than is provided by the sun (objective), circular as opposed to linear resource flows (objective)

"Sustainable Production is the creation of goods and services using processes and systems that are: non-polluting; conserving of energy and natural resources; economically efficient; safe and healthful for workers, communities, and consumers; and, socially and creatively rewarding for all working people."	Lowell Center for Sustainable Production	Non-polluting (objective), conservation of energy and natural resources (objective), economic efficiency (objective), promotes health (objective), socially and intellectually rewarding (objective)
"Sustainable society - Society whose long term prospect for continuing to exist are good. Such a society would be characterized by an emphasis on preserving the environment, developing strong peaceful relationships between people and nations, and an emphasis on equitable distribution of wealth."	(Summer, 1995).“Coop America Quarterly”, No. 37.	Global (scope), long-term existence (objective), preserving the environment (mechanism), developing peaceful relationships (mechanism), equitable distribution of wealth (mechanism)
"Sustainable communities foster commitment to place, promote vitality, build resilience to stress, act as stewards, and forge connections beyond the community"	Northwest Policy Institute, University of Washington Graduate School of Public Affairs Seattle, Washington	Commitment to a place (objective), promote vitality (objective), resilience to stress (objective), stewardship (objective), relationships with other communities (objective)

"In a sustainable community, resource consumption is balanced by resources assimilated by the ecosystem. The sustainability of a community is largely determined by the web of resources providing its food, fiber, water, and energy needs and by the ability of natural systems to process its wastes. A community is unsustainable if it consumes resources faster than they can be renewed, produces more wastes than natural systems can process or relies upon distant sources for its basic needs."	"Sustainable Community Roundtable Report," South Puget Sound.	Balance of all systems (objective), consumption does not exceed resource renewal (mechanism), does not produce more waste than nature can process (mechanism), does not rely on distant sources for basic needs (mechanism)
"Sustainable development...[is] the process of building equitable, productive and participatory structures to increase the economic empowerment of communities and their surrounding regions."	Interfaith Center on Corporate Responsibility	Increase economic empowerment of community (objective), equity (mechanism), productivity (mechanism), participatory (mechanism)
"Sustainable Development is positive change which does not undermine the environmental or social systems on which we depend. It requires a coordinated approach to planning and policy making that involves public participation. Its success depends on widespread understanding of the critical relationship between people and their environment and the will to make necessary changes."	Hamilton Wentworth Regional Council	Positive change (objective), does not undermine natural or social resources (mechanism), coordinated policies and planning (mechanism), public participation (mechanism), understanding of human relationship to nature (mechanism)

"Then I say the earth belongs to each . . . generation during its course, fully and in its own right, no generation can contract debts greater than may be paid during the course of its own existence."	Jefferson, T., (1789). U.S. President.	Earth belongs to all generations (scope), balance (objective), one generation does not create debt for future generations to pay (mechanism)
"Sustainable development: a concept that implies the precautionary principle. A healthy and continued multi stakeholder consultation will go a long way towards ensuring sustainability"	United Nations, (2000). "Cleaning Up Our Mining Act: A North-South Dialogue," New York.	Sustainable development = concept, healthy and involved stakeholders (mechanism)
"Treating the Earth as though we intend to stay."	The National Assembly of Wales	Sustainability = responsible longevity
"A new and integrated way of thinking about choices right across Government, and throughout society, so that we can all share in the highest quality of life now, without passing on a poorer world to our children."	Department of the Environment, Transport and the Regions, U.K.	Sustainability = choice, integrated approach (mechanism), highest quality of life now without compromising the future (objective),
"… a system of natural resource management that is capable of providing an equivalent, or expanding, output over time."	Smith, F.L.,"The Market and Nature," in The Environment: Opposing Viewpoints.	Sustainability = balanced system of natural resource management

"Ultimately, the goal of sustainability is to achieve short- and long-term health and prosperity for all people via better management of our social, economic and ecological systems of support. Because a healthy world is not possible without healthy communities, a majority of the efforts to promote sustainability must take hold at the local level. The goal of community sustainability, then, becomes a vital, needed ethic, one that involves identifying practical, integrative approaches to the challenge of balancing social well-being, economic health, and environmental quality. Communities that choose to work for a balance between these elements are more likely to thrive into the future."	(1994). Community Sustainability Resource Institute.	Local communities (scope), Short and long-term health and prosperity for all people (objective), management of social, economic, ecological systems (mechanism), balance between systems (objective)
"The word sustainable has roots in the Latin subtenir, meaning 'to hold up' or 'to support from below.' A community must be supported from below – by its inhabitants, present and future. Certain places, through the peculiar combination of physical, cultural, and, perhaps, spiritual characteristics, inspire people to care for their community. Theses are the places where sustainability has the best chance of taking hold."	Muscoe, M. (Winter,1995). "A Sustainable Community Profile," in Places.	Sustainability = support from inhabitants both present and future, people care for their community (objective)

"Sustainability is the [emerging] doctrine that economic growth and development must take place, and be maintained over time, within the limits set by ecology in the broadest sense - by the interrelations of human beings and their works, the biosphere and the physical and chemical laws that govern it . . . It follows that environmental protection and economic development are complementary rather than antagonistic processes."	Ruckelshaus, W.D. (September, 1989). "Toward a Sustainable World," in Scientific American.	Sustainability = doctrine, economic growth and development maintained over time within ecological limits (objective), interrelation of social and natural laws (mechanism), environmental and economic development are complimentary (objective)

"A sustainable community effort consists of a long-term, integrated, systems approach to developing and achieving a healthy community by jointly addressing economic, environmental, and social issues. Fostering a strong sense of community and building partnerships and consensus among key stakeholders are also important elements of such efforts. The focus and scale of sustainability efforts depend on local conditions, including resources, politics, individual actions, and the unique features of the community. The sustainable communities approach has been applied to issues as varied as urban sprawl, inner-city and brown field redevelopment, economic development and growth, ecosystem management, agriculture, biodiversity, green buildings, energy conservation, watershed management, and pollution prevention. Many of these issues and other community problems cannot easily be addressed by traditional approaches or traditional elements within our society. Many people feel it is better to address such problems through a more collaborative and holistic systems approach because such problems are diffuse, multidisciplinary, multi-agency, multi-stakeholder and multi-sector in nature."	Lachman, B.E. (1997). "Linking Sustainable Community Activities to Pollution Prevention: A Sourcebook," Critical Technologies Institute.	Community (scope), long-term, integrated, systems approach (mechanism), healthy community (objective), economic, environmental, social issues (mechanism), foster partnerships and consensus among stakeholders (mechanism), dependent on local conditions and resources (factor), collaborative and holistic systems approach (mechanism), problems are diffuse and shared by multiple parties, agencies, sectors (factor)
"Sustainability refers to the ability of a society, ecosystem, or any such ongoing system to continue functioning into the indefinite future without being forced into decline through exhaustion. . . of key resources."	Gilman, R., President of Context Institute	Sustainability = ability of a system to function indefinitely without decline

"Sustainability means living within the resources of the planet without damaging the environment now or within the future. It also means having an economic system that provides a genuine quality of life, rather than depending on increased consumption."	West London Friends of the Earth	Living within resources of the planet (objective), no damage to the environment (mechanism), economy that provides genuine quality of life (objective), consumption does not increase (mechanism)
"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."	Leopold, A. "A Land Ethic", in Sand County Almanac	Sustainability = preservation of biotic integrity, stability and beauty
" 'Sustainable' describes actions, policies, programs, etc, - by individuals, groups, corporations, or government entities - that could be adopted by all such individuals, groups, corporations, or government entities without eventually destroying the requisite resources, or resulting in gross inequities among people."	Nicholas, S., Department of Planning, City of Seattle	Sustainability = description of actions, policies and programs that do not destroy resources or create human inequity
"Actions are sustainable if: There is a balance between resources used and resources regenerated; Resources are as clean or cleaner at end use as at beginning; The viability, integrity, and diversity of natural systems are restored and maintained; They lead to enhanced local and regional self-reliance; They help create and maintain community and a culture of place; Each generation preserves the legacies of future generations."	McCloskey, D., Professor of Sociology, Seattle University	Balance between resources used and generated (objective), resources not diminished with use (objective), viability, integrity, diversity of nature preserved (objective), local and regional self reliance (objective), future generations preserved (objective)

"A transition to sustainability involves moving from linear to cyclical processes and technologies. The only processes we can rely on indefinitely are cyclical; all linear processes must eventually come to an end."	Henrik-Robert, K., M.D., Founder of The Natural Step, Sweden	Transition to cyclical processes and technologies (objective), discontinuation of linear processes (mechanism)
"Development is a whole; it is an integral, value-loaded, cultural process; it encompasses the natural environment, social relations, education, production, consumption, and well-being." - Dag Hammarskjold Foundation	Duncan, T. (1994). "Principles of sustainable development," in Off Course: Restoring the Balance Between Canadian Society and the Environment. International Development Research Centre (IRDC), Ottowa, pp. 57-66.	Development = integral, value-loaded, cultural process, natural environment (factor), social relations (factor), education (factor), production (factor), consumption (factor), well-being (factor)
"· · · · · Environmentally Conscious Design (ECD)- design which addresses all environmental impacts of a product throughout the complete life-cycle of the product, without unduly compromising other criteria like function, quality, cost and appearance. · · · · · "	McAloone, T.C. (2000). "Industrial Application of Environmentally Conscious Design", 26.	Addresses all environmental impacts throughout the lifecycle (objective), does not compromise function, quality, cost, appearance (objective)
"· · · · · Sustainable development does not mean having less economic development: on the contrary, a healthy economy is better able to generate the resources to meet people's needs, and new investment and environmental improvement often go hand in hand. (UK strategy, 1994) · · · · · "	McAloone, T.C. (2000) "Industrial Application of Environmentally Conscious Design", 28.	Healthy economy (factor), new investment (factor), economy and environment are complimentary (objective)

"· · · · · Sustainability is a symmetric treatment of the present and of the long-term future, which places a positive value on the very long run, together with explicit recognition of the intrinsic value of environmental assets. · · · · · "	Chichilnisky, G., Heal, G. M., and Vercelli, A. "Sustainability: Dynamics and Uncertainty", 8.	Symmetric treatment of both the present and future (objective), positive value on long-term future (factor), recognition of environmental asset value (factor)
"· · · · · (Sustainable development as) development which ensures that the utilization of resources and the environment today does not damage prospects for their use by future generations (CCREM, 1987). · · · · · "	Rees, W.E., "Understanding Sustainable Development", in Sustainable Development and the Future of Cities.	Ensures use of resources and environment both today and tomorrow (objective), future generations (factor)
"· · · · · A definition most proponents of an economic concept of sustainable development wo uld be likely to accept is the following: development is defined here to be sustainable if it does not decrease the capacity to provide non-declining per capita utility for infinity. · · · · · "	Neuvnayer, E. (1999). "Weak Versus Strong Sustainability", 9.	Provides capacity for non-declining continual service to every person forever (objective)
"No one element can by itself indicate sustainability; it is the nexus of relations between elements working in harmony that indicates sustainability -- like an equation for which an answer cannot be derived from one variable alone but requires the interaction of the variables for solution." (15)	DuBose, J.R. (1994). Sustainability as an Inherently Contextual Concept: Some Lessons from Agricultural Development. Unpublished M.S. Thesis, School of Public Policy, Georgia Institute of Technology, Atlanta, GA.	Sustainability = nexus of relationships between many elements, requires interaction of all variables (factor)

"· · · · Sustainable development is a process of change in which the direction of investment, the orientation of technology, the allocation of resources, and the development and aspirations without endangering the capacity of natural systems to absorb the effects of human activities, and without compromising the ability of future generations to meet their own needs and aspirations. (Roy F. Weston, 1994) · · · · "	McIsaac, G.F., and Morey, N.C. (1998). "Engineers' Role in Sustainable Development", in Considering cultural Dynamics, No.4, 110.	Sustainable development = process of change, does not diminish capacity of natural systems (objective), effects of humans (factor), future generations (factor)
"· · · · · The concept of sustainable development has, over a rather short period of time, become commonplace in environmental economics, There is, however, some confusion about the use of the terms sustainability and sustainable development (Goodland, 1995), distinguishes environmental sustainability, economic sustainability, social sustainability and sustainable development. Environmental sustainability is defined as maintenance of life-support systems, economics sustainability is the economic tantamount of environmental sustainability, being defined as maintenance of economic capital. This definition of economic sustainability falls back on the Hicksian definition of income (Hicks, 1939): the maximum amount of income that can be spent without reducing real consumption in the future. Social sustainability is defined as maintenance of social capital. Sustainable development should integrate the three types of sustainability and use them to start to make development sustainable. · ·· · "	Jeroen, C.J.M, Van Den Bergh, and Hofkes, M.W. (1998). "A survey of economic modeling of sustainable development", in Theory and Implementation of Economic Models for Sustainable Development.	Integration of the three types of sustainability (objective), economic sustainability (factor), environmental sustainability (factor), social sustainability (factor)

"The terms "sustainable" and "green" -- when applied to construction, the built environment or building materials -- are used interchangeably but are not easily defined. . . Many of these `green' design methods are just common sense," says Pfeiffer, president of Barley + Pfeiffer Architects in Austin, Texas. For example, he explains, "You don't put on a dark-colored roof in the South because it collects heat; you orient the building to the prevailing breezes and away from the sun so you can take advantage of natural cooling. You don't necessarily have to build exotic wall systems or windows; if you use common sense, you'll have a great start toward what people are calling `green construction.'"	Klein, J. (May, 2000). "Greening the Home Office," in Building Design and Construction.	Sustainable = common sense
"The process of managing social demands without eroding life support properties or mechanisms of social cohesion and resilience."	Choucri, N. (1997). "Global System for Sustainable Development Research TDP-MIT." Unpublished notes. Cambridge, Ma. MIT.	Sustainability = management of social demands, life supporting properties (factor), society (factor)
"A sustainable society implicitly connotes one that is based on a long-term vision in that it must foresee the consequences of its diverse activities to ensure that they do not break the cycles of renewal; it has to be a society of conservation and generational concern. It must avoid the adoption of mutually irreconcilable objectives. Equally, it must be a society of social justice because great disparities of wealth or privilege will breed destructive disharmony."	Hossain, K. (1995). "Evolving Principles of Sustainable Development and Good Governance." In Ginther, K, Denters, E., and de Waart, P., eds. Sustainable Development and Good Governance, Kluwer Academic Publishers Norwell, Ma.	Long-term vision (objective), consequences of human activity (factor), conservation (mechanism), social justice (mechanism)

"Sustainable development should be a process which allows for the satisfaction of human necessities without compromising the basis of that development, which is to say, the environment."	Winograd, M. (1995). "Environmental Indicators for Latin America and the Caribbean." In Trzyna, T., ed. A Sustainable World: Defining and Measuring Sustainable Development. Published for IUCN by California Institute for Public Affairs, Sacramento, CA.	Sustainable development = a process, satisfies human needs (factor), does not compromise environment (factor)
"Sustainability is whether (not the extent to which) the productive potential of a certain natural system will continue (for a long time, at least several decades) under a particular management practice (intensity and type of technical and social activities, e.g. inputs of energy, nutrients, genetic variety, harvesting procedures, and cyclic variations over time)."	Carpenter, R. (1995). "Limitations in Measuring Ecosystem Sustainability." In Trzyna, T., ed. A Sustainable World: Defining and Measuring Sustainable Development. Published for IUCN by California Institute for Public Affairs, Sacramento, CA.	Sustainability = continued productive potential, particular management system (factor)
"Sustainable development is a complex of activities that can be expected to improve the human condition in such a manner that the improvement can be maintained."	Munro, D. (1995). "Sustainability: Rhetoric or Reality." In Tryzna, T., ed. A Sustainable World: Defining and Measuring Sustainable Development. Published for IUCN by California Institute for Public Affairs, Sacramento, CA.	Sustainable development = activities that improve human condition, maintained over time (factor)

"Biogeophysical sustainability is the maintenance and/or improvement of the integrity of the life-support system on Earth. Sustaining the biosphere with adequate provisions for maximizing future options includes providing for human economic and social improvement for current and future human generations within a framework of cultural diversity while: (a) making adequate provisions for the maintenance of biological diversity and (b) maintaining the biogeochemical integrity of the biosphere by conservation and proper use of its air, water and land resources. Achieving these goals requires planning and action at local, regional and global scales and specifying short- and long-term objectives that allow for the transition to sustainability."	Munasinghe, M. and Shearer, W. (1995). "An Introduction to the Definition and Measurement of Biogeophysical Sustainability." In Munasinghe, M. and Shearer, W., ed. Defining and Measuring Sustainability: The Biogeophysical Foundations. Distributed for the United Nations University by the World Bank, Washington, D.C.	Sustainability = maintenance / improvement, integrity of Earth's life support system (objective), maximize future options for humans (objective), future generations (factor), biological diversity (factor), conservation (factor), integrity of biosphere (factor), resources (factor), goals (mechanism), planning (mechanism), local, regional, global (scope)
"Biophysical sustainability means maintaining or improving the integrity of the life support system of Earth."	Fuwa, K. (1995). "The Meaning of Sustainability: Biogeophysical Aspects." In Munasinghe, M. and Shearer, W., ed. Defining and Measuring Sustainability: The Biogeophysical Foundations. Distributed for the United Nations University by the World Bank, Washington D.C.	Sustainability = maintaining or improving, integrity of life support systems on Earth (objective)
"The sustainable development concept includes 3 parts: 1) the environment is an integral part of the economy and vice versa; 2) intra-generational equity; 3) inter-generational equity"	Breitmeier, H. (1995). "Sustainable Development: Criteria and Indicators: Workshop #3." Manuscript on file at IIASA, Laxenburg, Austria. IIASA	Sustainable development = concept, environment is part of the economy (factor), economy is part of the environment (factor), future generations (factor), equity (factor)

"Sustainability: An ecological system is healthy and free from 'distress syndrome' if it is stable and sustainable, that is, if it is active and maintains its structure (organization) function (vigor) and autonomy over time and is resilient to stress."	Costanza, R. (1994). "Environmental Performance Indicators, Environmental Space and the Preservation of Ecosystem Health," In Global Change and Sustainable Development in Europe. Wuppertal Institute, Nordrhein-Westfalen, Germany.	Sustainability = stable, healthy (objective), free from distress (objective), maintains structure and function (objective), maintains autonomy (objective), resilient (objective), time (factor)
"Sustainable development means adjusting economic growth to remain within bounds set by natural replenishable systems, subject to the scope for human ingenuity and adaptation via careful husbanding of critical resources and technological advance, coupled to the redistribution of resources and power in a manner that guarantees adequate conditions of liveability for all present and future generations."	O'Riordan, T. and Yaeger, J. (1994). "Global Environmental Change and Sustainable Development," In Global Change and Sustainable Development in Europe. Wuppertal Institute, Nordrhein-Westfalen, Germany.	Adjusting economic growth (mechanism), boundaries set by natural systems (factor), husbanding of critical resources (factor), technological advance (factor), redistribution of resources and power (mechanism), future generations (factor), guarantees liveability for all (objective), all (scope)
"Sustainability: A new way of life and approach to social and economic activities for all societies, rich and poor, which is compatible with the preservation of the environment."	Kato, S. (1994). "Salzburg Seminar on Environment and Diplomacy." Working Group on Sustainable Development. Salzburg Seminar, Salzburg, Austria.	Sustainability = way of life, all societies (scope), social (factor), economic (factor), preservation of environment (factor)

"Sustainable living: such ways of life which strive for ideals of humanism and preservation of Nature, based on responsibilities towards present as well as future generations of Humankind and on respect for life and non-living parts of Nature. Sustainable society: a society following sustainable ways of life, establishing a dynamic harmony with Nature, based mostly on the use of renewable sources of energy and raw materials. Each civilization, society, nation, ethnic group could search for its own way to sustainable living, respecting its own cultural roots, economic conditions, and environmental situation and taking into account the collective wisdom of Humankind."	Vavrousek, J. (1994). "Salzburg Seminar on Environment and Diplomacy," Working Group on Sustainable Development. Salzburg Seminar, Salzburg, Austria.	Sustainability = way of life, strive for ideals (mechanism), humanity (factor), nature (factor), preservation (factor), present (factor), future generations (factor), respect (factor), establish dynamic harmony (mechanism), renewable source (factor), cultural roots (factor), economy (factor), environment (factor), collective wisdom (factor), humankind (factor)
"Sustainable development means achieving a quality of life (or standard of living) that can be maintained for many generations because it is: 1. socially desirable, fulfilling people's cultural, material, and spiritual needs in equitable ways; 2. economically viable, paying for itself, with costs not exceeding income; 3. ecologically sustainable, maintaining the long-term viability of supporting ecosystems."	IUCN, World Conservation Union. (1993). "Guide to Preparing and Implementing National Sustainable Development Strategies and Other Multi-sectoral Environment and Development Strategies," International Institute for Environment and Development.	Sustainable development = quality of life or standard of living, maintained for many generations (objective), socially desirable (factor), cultural (factor), material (factor), spiritual (factor), needs (factor), equity (factor), economics (factor), cost (factor), income (factor), ecology (factor), long-term viability (factor), ecosystems (factor)

"Sustainable economic development is continuously rising, or at least non-declining, consumption per capita, or GNP, or whatever the agreed indicator of development is."	Pearce, D. (1993). “Blueprint 3,” In CSERGE, Earthscan Publications, London.	Sustainable economic development = non-declining consumption per capita
"Ecologically sustainable development means using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased."	Australian Government. National Strategy for Ecologically Sustainable Development. (1992). Australian Government Publishing Service, Canberra.	Sustainable development = increasing total quality of life, community (factor), resources (factor), ecological processes (factor), maintain (mechanism), use (mechanism), conserve (mechanism), enhance (mechanism), present (factor), future (factor)

"Sustainable development is an intuitively powerful concept that, as commonly understood, provides a useful guide for development practitioners. It involves trade-offs between biological, economic, and social systems and is found in the interactive zone between these systems. There are a number of international factors that may be necessary, but insufficient, conditions for sustainable development on a national level, including peace, debt reduction, more propitious terms of trade and non-declining foreign aid. There are also several dilemmas related to the concept, including the role of growth as the unquestioned objective of economic policy, techniques for measuring sustainable development, the trade-offs between conflicting environmental goals and the limited time and distance horizons of elected politicians."	Holmberg, j. ed. (1992). "Making Development Sustainable," Island Press, Washington D.C.	Sustainable development = concept, provide a guide (objective), trade-offs (factor), biological (factor), economic (factor), social (factor), systems (factor), interactive zones (factor), peace (factor), debt reduction (factor), trade (factor), non-declining foreign aid (factor), conflict with economic policy (factor), conflict with measuring sustainable development (factor), conflicting environmental goals (factor), politicians (factor)
"A sustainable society is one that can persist over generations, one that is far-seeing enough, flexible enough, and wise enough not to undermine either its physical or its social systems of support."	Meadows, D. (1992). "Beyond the Limits," Chelsea Green Pub. Co., Post Mills, VT.	Does not undermine physical or social systems of support (objective), persists (factor), generations (factor), far-seeing (factor), flexible (factor), wise (factor)

"Sustainable development means that economic activities should only be extended as far as the level of maintenance of man-made and natural capital will permit. A narrower definition of sustainability excludes the substitution between natural and man-made assets and requires maintenance of the level of natural assets as well as man-made assets. A sustainable development seems to necessitate especially a sufficient water supply, a sufficient level of land quality (prevention of soil erosion), protection of existing ecosystems (e.g. the virgin tropical forests) and maintaining air and water quality (prevention of degradation by residuals). In these cases, the sustainability concept should not only imply constancy of the natural assets as a whole (with some possibility of substitution) but constancy of each type of natural asset (e.g. of the specific ecosystems)."	United Nations Statistical Office. (1992). "SNA Draft Handbook on Integrated Environmental and Economic Accounting," UN Publications, New York, NY.	Economic activities do not extend beyond the maintenance of man-made and natural capital (objective), sufficient water supply (factor), sufficient land quality (factor), protection of ecosystems (factor), air quality (factor), water quality (factor), constancy of natural assets (factor), substitution (factor)
"[Sustainability of development] is concerned with (a) the rights of future generations to the services of natural and produced assets and (b) whether the formal and informal institutions which affect the transfer of assets to future generations are adequate to assure the quality of life in the long-run."	Norgaard, R. (1992). "Sustainability of the Economics of Assuring Assets for Future Generations." World Bank, Working Paper Series No. 832, Asia Regional Office.	Assure quality of life in the long-run (objective), rights (factor), future generations (factor), services (factor), natural assets (factor), produced assets (factor), institutions (factor), transfer of assets (factor)

"Sustainable development means basing developmental and environmental policies on a comparison of costs and benefits and on careful economic analysis that will strengthen environmental protection and lead to rising and sustainable levels of welfare."	World Bank. (1992). "World Development Report, 1992: Development and the Environment," Oxford University Press, New York, NY.	Strengthen environmental protection (objective), rising levels of welfare (objective), policies (mechanism), cost (factor), benefit (factor), economic analysis (factor)
"Sustainable development may be defined as the development and management of natural resources to ensure or enhance the long-term productive capacity of the resource base and improve the long-term wealth and well-being derived from alternative resource use systems, with acceptable environmental impacts."	Schultink, G. (1992). "Evaluation of Sustainable Development Alternatives: Relevant Concepts, Resource Assessment, Approaches and Comparative Spatial Indicators," In International Journal of Environmental Studies. Vol. 41 pp. 203-224.	Sustainable development = management of natural resources, ensure long-term productive capacity (objective), resource base (factor), wealth (factor), well-being (factor), alternative resources (factor), systems (factor), environmental impacts (factor)
"Sustainable development involves a process of deep and profound change in the political, social, economic, institutional, and technological order, including redefinition of relations between developing and more developed countries."	Strong, M. (1992). "Required Global Changes: Close Linkages Between Environment and Development," In Kirdar, U., ed. Change: Threat or Opportunity, United Nations, NY.	Sustainable development = process of profound change, political (factor), social (factor), economic (factor), institutions (factor), technology (factor), relationships (factor), relative development of countries (factor)
"Sustainable development: The amount of consumption that can be sustained indefinitely without degrading capital stocks, including natural capital stocks."	Costanza, R. and Wainger, L. (1991). "Ecological Economics," In Mending the Earth. North Atlantic Books, Berkeley.	Sustainability = consumption without degradation, capital (factor), natural capital (factor)

"Maintenance of a steady state is one of the operational definitions of sustainable development. A steady state is a dynamic state in which changes tend to cancel each other out... Maintenance of a steady state in terms of resources, species and pollution would imply the following: -use of (conditionally) renewable resources should, within a specific area and time span, not exceed the formation of new stocks. Thus, for instance, yearly extraction of groundwater should not exceed the yearly addition to groundwater reserves coming from rain and surface water; -use of relatively rare nonrenewable resources, such as fossil carbon or rare metals, should be close to zero, unless future generations are compensated for current use by making available for future use an equivalent amount of renewable resources."	Opschoor, H. and Reijnders, L. (1991). "Indicators of Sustainable Development: An Overview," In Kuik, O. and Verbruggen, H., ed. In Search of Indicators of Sustainable Development, Kluwer Academic Publishers, Netherlands.	Sustainable development = maintenance of a steady state, dynamic (factor), resources (factor), species (factor), pollution (factor), use of renewable stocks should not exceed formation of new stocks (objective), use of nonrenewable resources should be close to zero (objective), compensation (factor), availability for future use (factor), future generations (factor)
"Sustainable development - an approach that will permit continuing improvements in the quality of life with a lower intensity of resource use, thereby leaving behind for future generations an undiminished or even enhanced stock of natural resources and other assets."	Munasinghe, M. and Lutz, E. (1991). "Environmental-Economic Evaluation of Projects and Policies for Sustainable Development," In Environment Working Paper No. 42, World Bank.	Sustainable development = an approach, continuing improvements in quality of life (objective), lower intensity of resource use (objective), future generations (factor), undiminished or enhanced future stock (objective)

"[Sustainable development] is usually applied to less developed countries and the kind of economic and social development needed to improve the living conditions of the world's poor without destroying or undermining the natural resource base. The process of improving the living conditions of the poorer majority of mankind while avoiding the destruction of natural and living resources, so that increases of production and improvements in living conditions can be sustained in the longer term."	International Institute for Environment and Development (1982)	Applies to less developed countries (scope), economic and social development (mechanism), improve living conditions of poor without destroying the natural resource base (objective), increased production can be sustained (objective)
"A more appropriate and universal definition might be development that occurs within the carrying capacity of the natural and human environment."	McCormick, J. (1991). "Reclaiming Paradise," University Press, Bloomington, IN.	Carrying capacity (factor), natural environment (factor), human environment (factor)
"Sustainable development - improving the quality of human life while living within the carrying capacity of supporting ecosystems."	IUCN, UNEP, and WWF. (1991). "Caring for the Earth," Gland, Switzerland.	Improve quality of human life (objective), carrying capacity of ecosystem (factor)
"Ecologically sustainable development is a condition in which society's use of renewable resources takes place without destruction of the resources or the environmental context which they require."	Solomon, A (1990). "Towards Ecological Sustainability in Europe: Climate, Water Resources, Soils and Biota," Laxenburg, Austria. IIASA	Sustainable development = condition, society (factor), use of resources (factor), without destruction (objective), environmental context (factor)

"The sustainable development concept constitutes a further elaboration of the close links between economic activity and the conservation of environmental resources. It implies a partnership between the environment and the economy, within which a key element is the legacy of environmental resources which is not "unduly" diminished."	Organization for Economic Cooperation and Development, OECD. (1990). "ISSUESPAPERS: On Integrating Environment and Economics," Paris.	Sustainable development = concept, links between economy and environment (factor), resources (factor), partnership (factor), legacy (factor), resources not unduly diminished (objective)
"The phrase sustainable development has been criticized, for example, by O'Riordan (1985) as a contradiction in terms. If development is equated with economic growth, this criticism is indeed justified: Malthusian limits prevent sustained growth in a finite world... Ultimately, however, uncontrolled economic growth will cause the quality of the environment to deteriorate, economic development to decline and the standard of living to drop. Of course, the word development does not necessarily imply growth. It may convey the idea that the world, society or the biosphere is becoming "better" in some sense, perhaps producing more, or meeting more of the basic needs of the poor. The word therefore involves a value judgement. In principle, development could become sustainable through structural changes (economic, political, cultural or ecological) or a succession of technological break-throughs."	Munn, R. E. (1989). "Towards Sustainable Development: an Environmental Perspective," In Archibugi, F. and Nijkamp, P., ed. Economy and Ecology: Towards Sustainable Development, Kluwer Academic Publishers, The Netherlands.	Sustainable development = value judgement, structural change (mechanism), technological break-throughs (mechanism), becoming better (objective)

"Our standard definition of sustainable development will be non-declining per capita utility - because of its self-evident appeal as a criterion for inter-generational equity."	Pezzey, J. (1989). "Economic Analysis of Sustainable Growth and Sustainable Development," World Bank Environment Department, Working Paper No. 15, Washington D.C.	Sustainable development = non-declining per capita utility, inter-generational equity (objective)
"Sustainable development is the maintenance or growth of the aggregate level of economic well-being, defined as the level of per capita economic well-being."	Haveman, R. (1989). "Thoughts on the Sustainable Development Concept and the Environmental Effects of Economic Policy," In OECD seminar, "The Economics of Environmental Issues," Paper No. 5, Paris.	Sustainable development = per-capita economic well-being, maintain or grow (objective)

"Sustainable economic development: (The broad objective...is) to find the optimal level of interaction between three systems -- the biological and natural resource system, the economic system, and the social system. A broad consensus does exist about the conditions required for sustainable economic development. Two interpretations are now emerging: a wider concept concerned with sustainable economic, ecological and social development; and a more narrowly defined concept largely concerned with environmentally sustainable development (i.e. with optimal resource and environmental management over time). The wider, highly normative view of sustainable development (endorsed by the World Commission on Environment and Development) defines the concept as "development the meets the needs of the present generation without compromising the ability of future generations to meet their own needs." In contrast, concern with optimal resource and environmental management over time - the more narrowly defined concept of environmentally sustainable development - requires maximizing the net benefits of economic development, subject to maintaining the services and quality of natural resources."	Barbier, E. (1989). "Economics, Natural Resource Scarcity and Development, "Earthscan Publications Ltd., London.	Optimal level of interaction between environmental, economic, and social systems (objective)

Sustainable development means that a set of "development indicators" is increasing over time.	Holmberg, J., ed. (1992). "Making Development Sustainable," Island Press, Washington D.C.	sustainable development = indicators increasing over time
Sustainable economic growth means that real GNP per capita is increasing over time and the increase is not threatened by "feedback" from either biophysical impacts (pollution, resource problems) or from social impacts (social disruption). *Sustainable development* means that per capita utility or well-being is increasing over time. *Sustainable development* means either that per capita utility or well-being is increasing over time with free exchange or substitution between natural and man-made capital. or that per capita utility or well-being is increasing over time subject to non-declining natural wealth. There are several reasons why the second and more narrow focus is justified, including: -Nonsubstitutability between environmental assets (the ozone layer cannot be recreated); -Uncertainty (our limited understanding of the life-supporting functions of many environmental assets dictates that they be preserved for the future); -Irreversibility (once lost, no species can be recreated); Equity (the poor are usually more affected by bad environments than the rich)."	Pearce, D., Markandya, A. and Barbier, E. (1989). "Blueprint for a Green Economy," Earthscan Publications Ltd., London.	Sustainable development = per capita utility increasing over time = well-being increasing over time, free exchange or substitution of capital (mechanism), natural capital (factor), man-made capital (factor), non-declining natural wealth (objective), non-substitutability (factor), uncertainty (factor), irreversibility (factor), equity (factor)

"Thus we need to nail down the concept of sustainable development. I propose five increasingly comprehensive definitions. First we can start at the local level and simply ask whether a region's agricultural and industrial practices can continue indefinitely. Will they destroy the local resource base and environment or, just as bad, the local people and their cultural system? Or will the resource base, environment, technologies and culture evolve over time in a mutually reinforcing manner? This first definition ignores whether there might be subsidies to the region - whether material and energy inputs or social inputs such as the provision of new knowledge, technologies and institutional services are being supplied from outside the region."	Norgaard, R. (1988). "Sustainable Development: A Co-Evolutionary View," In Futures, Vol. 26. No. 6.	Local (scope), agricultural and industrial practices continue indefinitely (objective), destruction of local resource base and environment (factor), destruction of people and culture (factor), mutually reinforcing evolution of resource base, environment, technology, culture (factor)
"Second, we can ask whether the region is dependent upon non-renewable inputs, both energy and materials, from beyond its boundaries. Or is the region dependent on renewable resources beyond its boundaries which are not being managed in a sustainable manner?"	Norgaard, R. (1988). "Sustainable Development: A Co-Evolutionary View," In Futures, Vol. 26. No. 6.	Regional (scope), resource dependency (factor), resource management (factor)
"Third, we can become yet more sophisticated and ponder whether the region is in some sense culturally sustainable, whether it is contributing as much to the knowledge and institutional bases of other regions as it is culturally dependent upon others."	Norgaard, R. (1988). "Sustainable Development: A Co-Evolutionary View," In Futures, Vol. 26. No. 6.	Regional (scope), cultural dependency (factor), cultural contribution (factor)

“Fourth, we can also question the extent to which the region is contributing to global climate change, forcing other regions to change their behavior, as well as whether it has options available to adapt to the climate change and surprises imposed upon it by others. From a global perspective, this fourth definition of sustainable development addresses the difficulties of going from hydrocarbon energy stocks to renewable energy sources while adapting to the complications of global climate change induced by the transitional net oxidation of hydrocarbons.”	Norgaard, R. (1988). "Sustainable Development: A Co-Evolutionary View," In Futures, Vol. 26. No. 6.	Global (scope), change imposed upon others (factor), adaptation (factor), transition difficulty (factor)
“Fifth, and last, we can inquire of the cultural stability of all regions in combination, are they evolving along mutually compatible paths, or will they destroy each other through war. These definitions become increasingly encompassing. All, however, address sustainability of changing interactions between people and their environment over time."	Norgaard, R. (1988). "Sustainable Development: A Co-Evolutionary View," In Futures, Vol. 26. No. 6.	Global (scope), compatible cultural evolution (factor), war (factor), change (factor), interaction (factor), people (factor), environment (factor), time (factor)

"What should UNCTAD do to make development sustainable: It would be well on the way to reduce international inertia that hinders sustainable development if it took some of the actions mentioned below: UNCTAD should: -include environmental issues as an item on its agenda; -give more attention to the concepts of "environment" and "sustainable development;" -study in detail relationships between environment and development, and between growth and natural resource utilization. What are the effects of different development strategies on the environment: Is growth possible without severe exploitation of global natural resources? Can donor countries and international organizations make it a condition that future assistance not be used for activities that damage the environment? -introduce a new goal for development, a better environment, by using longer a perspective on development issues. Better use of natural resources are already an object of negotiation; -take account of environmental requirements and sustainable development on every level of negotiations; -establish a special committee or working group on environmental issues. Sustainable development can be discussed in all existent committees and working groups, especially in the Committee on Commodities; provide information to other international actors, initiate and co-ordinate international actions, and follow up implementation actions concerning environment and sustainable development."	Meissari-Polsa, T. (1988). "UNCTAD and Sustainable Development - A Case Study of Difficulties in Large International Organizations," In Stockholm Group for Study on Natural Resources Development, Perspective on Sustainable Development, Stockholm.	Political/organizational (scope), include environmental issues in agenda (mechanism), study relation=ship between environment and development (mechanism), study relationship between growth and resource use (mechanism), study effect of growth strategies on environment (mechanism), possibility of penalties for organizations that damage the environment (mechanism), introduce goals (mechanism), better use of resources (factor), account for environmental requirements in all negotiations (mechanism), establish special committee (mechanism), discussion (mechanism), provide information to other organizations (mechanism), coordinate actions (mechanism), follow up (mechanism)

"More difficult to define is sustainability. The common use of the word "sustainable" suggests an ability to maintain some activity in the face of stress -- for example to sustain physical exercise, such as jogging or doing push-ups -- and this seems to us also the most technically applicable meaning. We thus define agricultural sustainability as the ability to maintain productivity, whether of a field or farm or nation, in the face of stress or shock."	Conway, G. and Barbier, E. (1988). "After the Green Revolution: Sustainable and Equitable Agricultural Development," In Futures, (20) No. 6.	Sustainability = ability to maintain activity despite stress or shock
"Sustainable development - to be the indefinite survival of the human species (with a quality of life beyond mere biological survival) through the maintenance of basic life support systems (air, water, land, biota) and the existence of infrastructures and institutions which distribute and protect the components of these systems."	Brown, B. J., et.al. (1988). "Global Sustainability: Towards Measurement," In Environmental Management, Vol. 12. No. 2.	Sustainable development = indefinite survival of human species, maintenance of life support systems (mechanism), protective infrastructure and institutions (mechanism)
"Sustainable development - economic development that can continue indefinitely because it is based on the exploitation of renewable resources and causes insufficient environmental damage for this to pose an eventual limit."	Allaby, M. (1988). "MacMillan Dictionary of the Environment," 3rd ed., MacMillan Press Ltd., London.	Sustainable development = economic development, continued indefinitely (objective), exploitation of renewable resources (factor), causes insufficient damage to pose limitations (factor)

"The term "sustainable development" suggests that the lessons of ecology can, and should be applied to economic processes. It encompasses the ideas in the World Conservation Strategy, providing an environmental rationale through which the claims of development to improve the quality of (all) life can be challenged and tested."	Redclift, M. (1987). "Sustainable Development," Methuen, London.	Provides criteria to test and challenge claims of development (objective)
"The concept of sustainable economic development as applied to the Third World... is therefore directly concerned with increasing the material standard of living of the poor at the "grassroots" level, which can be quantitatively measured in terms of increased food, real income, educational services, health care, sanitation and water supply, emergency stocks of food and cash, etc., and only indirectly concerned with economic growth at the aggregate, commonly national, level. In general terms, the primary objective is reducing the absolute poverty of the world's poor through providing lasting and secure livelihoods that minimize resource depletion, environmental degradation, cultural disruption and social instability."	Barbier, E. (1987). "The Concept of Sustainable Economic Development," In Environmental Conservation, Vol. 14 (No.2).	Third World (scope), increase material standard of living (objective), food (factor), real income (factor), education (factor), health care (factor), sanitation (factor), water supply (factor), emergency stocks (factor), reduce absolute poverty of poor (objective), provide lasting livelihoods (mechanism), minimize resource depletion (factor), environmental degradation (factor), cultural disruption (factor), social instability (factor)

"Sustainable development: The ability of humanity to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional changes are made consistent with future as well as present needs."	World Commission on Environment and Development. (1987). “Our Common Future,” Oxford University Press, Oxford.	Sustainable development = process of change, consistent with future and present needs (objective), resources (factor), investment (factor), technology (factor), institutions (factor), humanity (factor)

"The World Commission does *not* believe that a *dismal* scenario of mounting destruction of national global potential for development - indeed, of earth's capacity to support life -- is an *inescapable destiny*. The problems are *planetary* - but they are not insoluble. I believe that history will record that in this crisis the two greatest resources, land and people, will redeem the promise of development. *If we take care of nature, nature will take care of us*. Conservation has truly come of age when it acknowledges that if we want to save *part* of the system, we have to save the *system itself*. This is the essence of what we call *sustainable development*. There are many dimensions to sustainability. First it requires the elimination of poverty and deprivation. Second, it requires the conservation and enhancement of the resources base which alone can ensure that the elimination of poverty is permanent. Third, it requires a broadening of the concept of development so that it covers not only economic growth, but also social and cultural development. Forth, and most important, it requires unification of economics and ecology in decision-making at all levels."	Prime Minister H. Gro Brundtland, (1986). "Sir Peter Scott Lecture," Bristol.	Planetary (scope), problems are not insoluble (factor), must save the whole system to save a part of the system (objective), eliminate poverty (mechanism), conserve resource base (mechanism), enhance resource base (mechanism), broaden concept of development (mechanism), economic growth (factor), social and cultural development (factors), unify economy and ecology in decisions at all levels (mechanism)

"Sustainable development - maintenance of essential ecological processes and life support systems, the preservation of genetic diversity, and the sustainable utilization of species and ecosystems."	IUCN, WWF and UNEP. (1980). "The World Conservation Strategy," Gland, Switzerland.	Sustainable development = maintaining essential processes and systems, ecology (factor), life support (factor), genetic diversity (factor), utilization (factor), species (factor), ecosystems (factor)
"Sustainability is an economic state where the demands placed upon the environment by people and commerce can be met without reducing the capacity of the environment to provide for future generations. It can also be expressed in the simple terms of an economic golden rule for the restorative economy: Leave the world better than you found it, take no more than you need, try not to harm life or the environment, make amends if you do."	Hawken, P. (1993). "The Ecology of Commerce," HarperCollins Publishers, New York, NY.	Sustainability = economic state, demands met without reducing future capacity (objective), people (factor), environment (factor), future generations (factor), do no harm (mechanism), make amends (mechanism)

"From the human-centered perspective, sustainable can be defined as the indefinite survival of the human species through the maintenance of basic life-support systems (air, water, land, biota), along with the infrastructure and institutions needed to protect the components of these systems. However, the broadest definition goes well beyond the merely biological to include the creation and indefinite maintenance of societies which are nourishing to self-actualizing persons and communities. In the context of "Sustainable Development", human consciousness must focus sharply and critically on the kind of economic "development" which now dominates the world. It must insist upon the inclusion of values, under the rubric of "development", which consider as supremely important the evolution, growth and fulfillment of all aspects of life. We can identify three primary criteria for sustainable development as an ethical ideal: 1) a holistic view of development; 2) equity based on the autonomy and self-reliance of diverse entities and not, as in the current capitalist paradigm, a structure of dependence based on aid and technology transfer with a view to 'catching up' and 3) an emphasis on participation which respects the importance of local conditions and the value of diversity. Implicit in these criteria are two important principles of governance: participatory democracy and a biocentric (life-centered, interconnected) view of things. In sum, sustainable development may be defined as "the kind of human activity that nourishes and perpetuates the whole community of life on Earth."		Earth (scope), sustainable development = human activity that nourishes and perpetuates life on Earth, creation and indefinite maintenance of societies and communities (objective), nourishing (factor), human consciousness (factor), economic development (factor), values (factor), evolution (factor), growth (factor), fulfillment (factor), life (factor), holistic view (factor), equity (factor), autonomy (factor), self reliance (factor), participation (factor), diversity (factor), governance (factor), democracy (factor), biocentric view (factor)

In its broadest sense, sustainable development strategy aims at promoting harmony among human beings and between humanity and nature. According to the WCED report (1987), the pursuit of sustainable development requires: -"a political system that secures effective citizen participation in decision-making, -an economic system that is able to generate surpluses and technical knowledge on a self-reliant and sustained basis, -a social system that provides for solutions for the tensions arising from disharmonious development, -a production system that respects the obligation to preserve the ecological base for development, -a technological system that can search continuously for new solutions, -an international system that fosters sustainable patterns of trade and finance, an administrative system that is flexible and has the capacity for self-correction."	WCED report, (1987).	Sustainable development = promotion of harmony among humans and nature, political system (mechanism), participation (factor), economic system (mechanism), surplus (factor), technical knowledge (factor), self reliant (factor), social system (mechanism), tension (factor), disharmony (factor), production system (mechanism), respect (factor), obligation to preserve (factor), ecological base (factor), technological system (mechanism), solutions (factor), international system (mechanism), trade (factor), administrative system (mechanism), flexible (factor), self-correction (factor)
"Within the context of built facilities and infrastructure, sustainability means maintaining or improving the performance of built facilities to meet the needs of stakeholders, while taking care not to hinder the ability of future generations to meet their own needs."	Pearce, A.R. (1998). "Sustainable Facilities and Infrastructure Program: Identifying Issues and Prioritizing Actions." Program Description, Georgia Tech Research Institute; Electro-Optics, Environment, and Materials Laboratory; Safety, Health, & Environmental Technology Division; Atlanta, GA.	Sustainability = maintaining or improving performance, needs of stakeholders (factor), future generations (factor)

"In addition to the traditional criteria of cost, time, and quality, three general objectives should shape the implementation of sustainable design and construction. These objectives are: - Accommodating human needs and aspirations - Avoiding negative environmental impacts - Minimizing consumption of matter and energy."	Pearce, A.R., DuBose, J.R., and Vanegas, J.A. (1996). "Rehabilitation vs. Greenfield Construction Using Sustainability as a Decision Criterion," Proceedings of the 1996 Green Building Conference, Wilmington, NC.	Cost (factor), time (factor), quality (factor), accommodate human needs (objective), avoid negative impact on environment (objective), minimize material and energy consumption (objective)
"Sustainable design is 'a collective process whereby the built environment achieves new levels of ecological balance through new and retrofit construction, towards the long term viability and humanization of architecture'. Focusing on environmental context, sustainable design merges the natural, minimum resource conditioning solutions of the past (daylight, solar heat and natural ventilation) with the innovative technologies of the present, into an integrated 'intelligent' system that supports individual control with expert negotiation for resource consciousness. Sustainable design avoids the further thinning out of land use, the dislocated placement of buildings and functions. Sustainable design introduces benign, non-polluting materials and assemblies with lower embodied and operating energy requirements, and higher durability and recyclability. Finally, sustainable design offers architecture of long term value through 'forgiving' and modifiable building systems, life-cycle instead of least cost investments, and 'cherishable' delight and craftsmanship.	Loftness, V., Hartkopf, V., Mahdavi, A., and Shankavaram, J. (1994). "Guidelines for Masterplanning Sustainable Building Communities." Proceedings, CIB TG 16, Sustainable Construction. Tampa, FL.	Sustainable design = collective process, achieve new levels of ecological balance (objective), long-term viability (factor), humanization (factor), merges natural with technology (mechanism), intelligent systems (objective), resource consciousness (factor), land use (factor), placement (factor), benign materials (factor), non-polluting (factor), energy (factor), durability (factor), recyclability (factor), long-term value (objective), forgiving (factor), modifiable (factor), life-cycle (factor), cherishable (factor), delight (factor), craftsmanship (factor)

"Like an equation in which the terms are multiplied by one another, many different values can be assigned to the variables while still yielding the same answer. Sustainability does not require a specific configuration of these variables (culture, environment and society) -- there are numerous and perhaps limitless possible ways in which they could interact sustainably. This is not to deny that there are perhaps some non-negotiable elements that would have to be present in any imaginable sustainability scenario such as air, water, food, and maybe even specific animal species. Even while recognizing that there are some essential elements in the equation the possible permutations are many."	DuBose, J.R. (1994). "Sustainability as an Inherently Contextual Concept: Some Lessons from Agricultural Development," In Unpublished M.S. Thesis, School of Public Policy, Georgia Institute of Technology, Atlanta, GA.	Multiple possibilities (scope), air (factor), water (factor), food (factor), species (factor), essential elements (factor)

"Thus, when one talks about sustainability, one is not talking about the conservation of any one thing, asset, or much less, industry. One is talking about the transformation of assets and opportunities, and how fair that transformation is both across generations and across people of the current generation. No one industry is essential to sustainability. Sustainability is concerned with the portfolio of assets and how that portfolio changes. The issue for an industry is how the sustainability paradigm creates challenges and new opportunities. How the industry adapts to this new social and environmental paradigm determines whether the industry sustains. The construction industry's fortunes are inextricably intertwined with both the environment and sustainability. The construction industry affects the environment in a number of ways: it consumes resources, contributes to waste, and, by its very nature, alters the environment. Also, the construction industry has a role in many of the important aspects of sustainability. It is or can be involved, for example, in the transformation of assets, reduction of wastes, and improvement of energy efficiency. Thus, a move toward the sustainability paradigm will have an impact on the construction industry, and how well the construction industry adapts to the new paradigm will affect the facility with which sustainability is achieved."	Liddle, B.T. (1994). "Construction for Sustainability and the Sustainability of the Construction Industry," Proceedings, CIB TG 16, Sustainable Construction. Tampa, FL.	Sustainability = transformation of assets and opportunities, fairness (factor), generations (factor), portfolio of assets (factor), industry (factor), adaptation (factor), social and environmental paradigm (factor), industry and environment intertwined (factor), resource consumption (factor), waste (factor), altering the environment (factor), adaptation (mechanism)

"[Sustainability means] balancing society's expenditure of natural and human resource with available 'income'….A cornerstone of sustainable development policy is the principle of community and regional economic control. The aim is to retain as many resources as possible within the community, to spur economic growth and increase community well-being….The issues of resource control - what to build, where to build, and budget - are basic to sustainability in design….To advance the cause of sustainability, characteristics other than visual must be accorded aesthetic value…for example, qualities of architecture such as durability, harmony, and spirituality might be considered aesthetic….We can also develop an ethic and an aesthetic based on the three R's - Reuse, Recycle, Renovate - the three L's - Low cost, Loose fit, Long life - and the old Yankee adage, 'Use it up, wear it out, make it do or do without."	St. John, A. (1992). "The Sourcebook for Sustainable Design: A Guide to Environmentally Responsible Building Materials and Processes," Boston Society of Architects, Boston, MA.	Sustainability = balancing society's expenditure of resources with available income, community (scope), community (factor), regional economy (factor), retain as many resources as possible (objective), economic growth (factor), well-being (factor), resource control (mechanism), broaden definition of aesthetic value (mechanism), develop ethics and aesthetics (mechanism), reuse (factor), recycle(factor), renovate (factor), low cost (factor), loose fit (factor), long life (factor)

"Sustainable development or sustainability is generally defined as a constraint on present consumption to ensure that future generations will inherit a resource base no less than the previous generation inherited. In meeting this intergenerational goal, sustainability is concerned with two types of limits the environment imposes on growth or development – source limits and sink limits. Source limits refer to the environment's finite capacity to provide resources – both renewable and nonrenewable, and both mere production inputs and essential, nonsubstitutable "natural" services. The sink limit refers to the environment's capacity to assimilate the wastes that economic growth and development cause. On a national level, sustainability is a resource management and pollution control problem. On the global, level, sustainability is concerned with intragenerational equity, cross-boundary pollution, the loss of biodiversity, and the aesthetic value of nature. Although definitions of sustainability vary, there are some important common themes: a concern for the environment, and appreciation of the crucial difference between development and growth, and most importantly, a concern for both inter- and intragenerational equity."	Liddle, B.T. (1994). "Construction for Sustainability and the Sustainability of the Construction Industry," In proceedings, CIB TG 16, Sustainable Construction, Tampa, FL.	Sustainable development = constraint on present consumption, future generations (factor), resource base (factor), limits imposed by environment (factor), source limits (factor), sink limits (factor), capacity to provide (factor), renewable (factor), nonrenewable (factor), nonsubstitutable (factor), natural services (factor), capacity to assimilate (factor), waste (factor), resource management and pollution control (objective), intragenerational equity (objective), biodiversity (objective), value of nature (objective), difference between development and growth (factor), inter and intragenerational equity (factor)

"…'sustainable development…improves the quality of human life while living within the carrying capacity of supporting ecosystems' [Quoting IUCN 1991]. As construction is largely involved with the improvement of the quality of human life, the ideals of sustainable development could feasibly be attained if construction could demonstrate a responsible approach towards operating within the carrying capacity of supporting ecosystems. Thus, in order to attain 'sustainability', the construction industry should uphold a number of key principles which encompass economic, social, and environmental considerations."	Hill, R.C., Bergman, J.G., and Bowen, P.A. (1994). "A Framework for the Attainment of Sustainable Construction," In proceedings, CIB TG 16, Sustainable Construction. Tampa, FL.	Improve quality of life (objective), carrying capacity of ecosystem (factor), responsible approach (mechanism), economic considerations (factor), social considerations (factor), environmental considerations (factor)
"The present day greening of construction has its roots in the oil crises of the 1970s. These traumatic events resulted in a major movement towards energy conservation, energy efficiency, and alternative energy sources. A second series of crises over local water shortages in the recent past has spurred the development of more water conscious design. Indoor air quality, sick building syndrome, and groundwater contamination have forced us to remove toxics from our interior spaces and reconsider the use of chemicals on our landscaping. The notion presented in this paper is that all these issues are interconnected, that they can and should be covered under the heading of 'sustainable construction.' "	Kibert, C.J. (1994). "Establishing Principles and a Model for Sustainable Construction," In proceedings, CIB TG 16, Sustainable Construction. Tampa, FL.	Interconnected issues (factor), energy conservation (factor), energy efficiency (factor), alternative energy sources (factor), water conscious design (factor), indoor air quality (factor), sick building syndrome (factor), groundwater contamination (factor), toxics (factor), chemicals (factor)

"The site should be designed to be 'sustainable' in the broad sense of the word; that is, the site (and the building) should remain livable/usable over time. All site-related decisions should be made bearing in mind their effect upon future generations and environments outside the site. A long-term approach should also be applied to economic pay-back decisions."	North Carolina Recycling Association. (1994). "North Carolina Green Building Charette: Final Report," North Carolina Recycling Association, Raleigh, NC.	Sustainable = livable and usable over time, future generations (factor), environment (factor), long-term economic decisions (factor)
"[Sustainability is] a system state in which no internal (intra-system) or external (extra-system) constraints are violated that would threaten the stability of the system into the foreseeable future. Given this definition, a sustainable system is one in which the following constraints are met: 1) stakeholder satisfaction-basic needs met; 2) Resource base impact-no or neutral impacts; 3) Ecosystem impact-no or neutral impacts."	Pearce, A.R. (1999). "Sustainability and the Built Environment: A Metric and Process for Prioritizing Improvement Opportunities, "In Ph.D. Dissertation, School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA.	Sustainability = system state, no violation of internal or external constraints (objective), stability (factor), future (factor), stakeholder needs (factor), impact on resource base (factor), impact on ecosystem (factor)

"Sustainability, I argue, is a community's control and prudent use of capital -- all forms of capital: natural capital, human capital, human-created capital, social capital, and cultural capital -- to ensure, to the degree possible, that present and future generations can attain a high degree of economic security and achieve democracy while maintaining the integrity of the ecological systems upon which all life and all production depends."	Veiderman, S. (1993). "The Economics and Economy of Sustainability; Five Capitals and Three Pillars," presented at the Delaware Estuary Program Conference on "Preserving Our Future," Philadelphia, PA.	Community (scope), control and prudent use of capital (objective), natural capital (factor), human capital (factor), social capital (factor), cultural capital (factor), present generation (factor), future generations (factor), high degree of economic security (objective), achieve democracy (objective), maintain integrity of ecosystems (objective), life and production dependent upon ecosystems (factor)
"Sustainable Design is the systematic consideration, during design, of a project's life cycle impact on environmental and energy resources…While responsible stewardship of the environment is important, sustainable design also provides a better physical environment for students and staff, at lower life cycle costs for the school district" (p. 1-1)	Poudre County School District, CO.	Sustainable design = systematic consideration of life-cycle impact of resources, responsible stewardship of environment (factor), provide better physical environment (objective), lower life-cycle cost (objective)

– "High-performance entails designing, constructing, and operating facilities with a focus on the following: -Sustainability, which is a long-term view that balances economics, equity, and environmental impacts; -An integrated approach, which engages a multidisciplinary team at the outset of a project to work collaboratively throughout; and -Feedback and data collection, which quantifies both the finished facility and the process that created it and serves to generate improvements in future projects" (p. P1).	Triangle J. Council of Governments, "High-Performance Guidelines," NC.	Balance economics, equity and environmental impact (objective), long-term (factor), integrated approach (mechanism), multidisciplinary team (mechanism), collaboration (mechanism), feedback (mechanism), data collection (mechanism), process (factor), improvements in future projects (objective)
"High-performance schools are healthy, comfortable, energy efficient, resource efficient, water efficient, safe, secure, adaptable, and easy to operate and maintain. They help school districts achieve higher test scores, retain quality teachers and staff, reduce operating cost, increase average daily attendance (ADA), reduce liability, while at the same time being friendly to the environment" (p. ii, Volume I)	Collaborative for High-Performance Schools, CA.	Healthy (objective), comfortable (objective), energy efficient (objective), water efficient (objective), safe (objective), secure (objective), adaptable (objective), easy to operate and maintain (objective), higher tenant productivity (objective), cost reduction (objective), reduce liability (objective), environment (factor)

"Green building design or development is defined [as] a process to design the built environment while considering environmental responsiveness, resource efficiency, and cultural and community sensitivity" (p. 7, LEED™ Reference Guide, Version 2.0)	U.S. Green Building Council.	Green development = process of design, environmental responsiveness (factor), resource efficiency (factor), cultural and community sensitivity (factor)
"Simply stated, sustainable design and development is good design" (p.i). A high-performance green building is one that: -Is created using a collaborative team approach; -Engages the local and regional communities in all project stages; -Integrates systems to improve efficiencies and human performance; -Considers true costs of its impact on the environment; -Considers life cycle costs; -Provides opportunities for interaction with the natural environment; -Uses resources efficiently; -Can be easily reconfigured and reused; -Has healthy indoor environments; -Uses appropriate technologies before using more complex solutions; -Includes environmentally sound operations and maintenance; -Educates occupants and users (p. iii).	Kobet, B. and Powers, W. (1999). "Commonwealth of Pennsylvania Guidelines for Creating High-Performance Green Buildings," Pennsylvania Department of Environmental Protection.	Sustainable design = good design, collaborative team approach (factor), engages community in all stages (factor), integrates systems (factor), improve efficiency (objective), improve human performance (objective), true costs (factor), impact on environment (factor), life cycle cost (factor), interaction (factor), resource use (factor), reuse (factor), reconfiguration (factor), health (factor), indoor environment (factor), technology (factor), operations and maintenance (factor), education (factor), occupants and users (factor)

"From the project outset, these building owners, designers, and contractors [of high-performance buildings] [are] actively committed to maximizing operational energy savings, providing healthy interiors, and limiting the detrimental environmental impacts of the buildings' construction and operation" (p.14).	City of New York (1999). "High Performance Building Guidelines," Department of Design and Construction, New York, NY.	Building owner (factor), designer (factor), contractor (factor), maximize operational energy savings (objective), provide healthy interior (objective), limit detrimental impact (objective), environment (factor), construction (factor), operation (factor)
"The concept of sustainable development reflects an understanding that we must meet the needs of the present without compromising the ability of future generations to meet their own needs. A Sustainable School not only embraces the concept of sustainability but is, in itself, a teaching tool for sustainability" (p.1).	Innovative Design (2001). "Sustainable Schools Guidelines," Raleigh, NC.	Needs of present (factor), needs of future generations (factor), teaching tool (factor)
"For a school to be built 'sustainably' implies the building's designers and builders have achieved an ideal – a building that uses resources at the same rate (or less) than the rate at which they can be replenished" (p. i).	City of Seattle	Sustainable = ideal, designers (factor), builders (factor), resource use is same or less than rate of replenishment (objective)
"A green school is environmentally conscious, fiscally responsible and well-connected to the real world".	Green Schools Program, Alliance to Save Energy	Environmentally conscious (objective), fiscally responsible (objective), connected to real world (objective)

“A sustainable school is one that maximizes the educational opportunities in its total life to create a learning community committed to a more sustainable future”.	New Jersey Sustainable Schools Network	Maximize educational opportunity (objective), total life (factor), create a learning community (objective), future (factor)
The high-performance task force promotes “design and construction standards for school renovation and construction which minimize energy consumption, produce an optimum learning environment, avoid the use of toxic materials or materials which produce indoor air quality problems and are appropriate to the local climate and environment”.	Charleston County Parents for Public Schools, High-Performance Task Force in South Carolina	Design and construction standards (mechanism), renovation (factor), construction (factor), minimize energy consumption (objective), optimize learning environment (objective), avoid use of toxic materials (objective), indoor air quality (factor), local climate and environment (factor)

"Sustainable 'green' schools are places where it is obvious that there is a concern for a sustainable future. 'Green' schools bring together environmental education and education reform by using curriculum and instructional strategies that are interdisciplinary and experiential, require parental and community involvement, have real-life applications and create ecological literacy. 'Green' schools encompass more than the building envelope; they also include the students and the curriculum".	Kirkbride, E. (2000). "Green (Sustainable) Urban Educational Facilities," In School Planning and Management, 39(4): 11.	Concern for future (factor), education (factor), community involvement (factor), students (factor), curriculum (factor)
"Green schools…are designed based on principles of resource efficiency and environmental sustainability".	Tremain, K. (1999). "Little Green Schoolhouse," In The New Democrat.	Resource efficiency (factor), environment (factor)
"A resource efficient school uses fewer resources and provides a higher quality learning environment than a school built with conventional design and construction practices".	Washington State University Cooperative Extension Energy Program	Uses fewer resources (objective), provides higher quality learning environment (objective), comparison with conventional design and construction practices (factor)
"Environmentally sustainable design of buildings refers to maximizing a building's positive impacts on nature, and minimizing its negative impacts, over the whole of its life".	Gelder, J. (1998). "Teaching Environmentally Sustainable Design in Schools," In PEB Exchange (2001), (35):14-16.	Maximize positive impacts (objective), nature (factor), minimize negative impacts (objective), whole life (factor)

"Sustainability is a principle which states that economic growth (i.e., the generation of wealth) can and should be managed so that natural resources are used in such a way that the resource needs of future generations are assured".	Weiss, J. (2000). "Sustainable Schools," In CEFPI Issue Track: 4.	Sustainability = principle, management of economic growth (objective), natural resources (factor), needs of future generation (factor)