

Sustainability: Definition and Five Core Principles

A New Framework

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The Sustainability
Laboratory

Introduction

The concept of “sustainable development,” as coined by the World Commission on Environment and Development, and with it, the term “sustainability” itself, have been gaining increasing recognition in recent years all around the world. Widespread use, however, has led to growing ambiguity, so that today both terms are employed within a very broad spectrum of meaning, often to the point of trivialization.

The definition and set of five sustainability principles proposed below seeks to advance and restore rigor to the ideas underlying the concept of sustainability. Its development was informed by a number of existing frameworks and was inspired, in particular, by the work of R. Buckminster Fuller.

The principles are articulated in a general fashion but can receive specific operational meaning in relation to particular cases, for example: sectors of the economy, development issues, business strategies, investment guidelines, or initiatives taken by individuals. These principles are expressed in relation to five fundamental domains:

The Material Domain

Constitutes the basis for regulating the flow of materials and energy that underlie existence.

The Economic Domain

Provides a guiding framework for defining, creating and managing wealth.

The Domain of Life

Provides the basis for appropriate behavior in the biosphere with respect to other forms of life.

The Social Domain

Provides the basis for social interactions.

The Spiritual Domain:

Identifies the necessary attitudinal orientation and provides the basis for a universal code of ethics.

The result is a set of five core principles, each with its own derived policy and operational implications. The set is systemic in nature, meaning that each domain affects all the others and is affected by each in return. This systemic aspect is fundamental. It reflects the interdependent nature of reality itself. It has far-reaching implications for policy and for any competent attempt at developing a strategy for change. It implies that in seeking a transition to sustainability as the organizing principle in a new world order, a piecemeal approach—emphasizing some aspects, while neglecting others—is unlikely to yield effective, lasting results.

Definition of Sustainability

Transforming world society and the world's economy to a sustainable basis is the most significant challenge of our time. This challenge is unprecedented in scope. Its context is the planet as a whole. It requires a fundamental shift in consciousness as well as action. It calls for a fresh vision, a new dream and new approaches for shaping evolving new realities.

Earth is exquisitely configured to accommodate life with abundance, but we humans have consistently compromised every vital component of its intricate fabric. This trend must be reversed and a lasting balance restored.

The ultimate objective of establishing the concept of sustainability as an organizing principle for the planet is to foster a well-functioning alignment between individuals, society, the economy and the regenerative capacity of the planet's life-supporting ecosystems. This alignment represents a particular type of dynamic equilibrium in the interaction between a population and the carrying capacity of its environment. It is this specific equilibrium that must be the focus of a meaningful definition of sustainability.

Currently, the prevailing definition of sustainability emphasizes cross-generational equity, which is clearly an important concept, but which poses difficulties, since future generations' needs are not easy to define or determine. Anchoring an alternative definition to the relationship between a population and the carrying capacity of its environment offers superior operational leverage, as it contains a number of key variables, all potentially measurable: population size, rate of resource consumption, impacts on the absorption capacity of sinks, a measure of well-being, and the like. Hence, the following definition of sustainability, which applies generally to all species populations, and is true in the specific context of human population:

Sustainability

A dynamic equilibrium in the process of interaction between a population and the carrying capacity of its environment such that the population develops to express its full potential without producing irreversible, adverse effects on the carrying capacity of the environment upon which it depends.

This equilibrium has been greatly disturbed in our time, with the exponential intensification of human activity and the resulting demand on resources, as well as the generation of waste byproducts that exceed the planet's regeneration and absorption capacities. Together, these factors make the current trajectory of human affairs unsustainable.

The principles that follow are grounded in this definition. They are expressed in relation to five key domains, which represent the primary dimensions of the population-environment interaction.

The Material Domain



Underlying Premise

All the physical processes which provide the basis for human existence are subject to the primary laws of physics, for example, the first law of thermodynamics, which addresses the fundamental conservation of energy in the universe, and the second law, which stipulates the direction of energy events. These laws prescribe the ultimate limits of possibilities in physical systems and, therefore, underlie the productive potential in the use of resources.

The second law underscores the ultimate increase of entropy and disorderliness in all physical systems. At the same time, there are clearly cosmic processes which work to create and increase order, at least temporarily. These processes are evident on Earth in the manifest progression from simple organic molecules, to individual organisms, to societies, to whole ecosystems, and to human consciousness itself.

By virtue of the innate ability to apply disciplined intelligence to designing universally advantageous configurations of energy and matter—arranging and rearranging components of the physical domain—humans have the potential to be powerful agents of order creation. This inherent design ability provides the essential means for ensuring lasting abundance.

In spite of the immense possibilities that are achievable by thoughtful superior design—creating order and slowing the proliferation of entropy—our current industrial infrastructure is wasteful, destructive, fragmented and grossly inefficient. With the appropriate intention, it could be reimagined, redesigned and reconfigured in order to deliver an enduring, regenerative advantage for all.

The First Principle

Contain entropy and ensure that the flow of resources, through and within the economy, is as nearly non-declining as is permitted by physical laws.

Policy and Operational Implications

- ▶ *Strive for highest resource productivity*
- ▶ *Employ regenerative energy sources, and continuously recycle non-regenerative resources*
- ▶ *Amplify performance with each cycle of use*
- ▶ *Affect an unbroken, closed-loop flow of matter and energy in a planetary production infrastructure conceived as a whole*
- ▶ *Control leakages and avoid stagnation, misplaced concentrations or random diffusion of chemical elements during cycles of use*
- ▶ *Advance a service, performance-leasing orientation for managing durable goods*

The Economic Domain

2

Underlying Premise

Economies consist of markets where transactions occur, and guiding frameworks by which transactions are evaluated and decisions about economic commitments are made. Often treated as though they reflect an independent, objective reality, such frameworks ultimately represent human constructs rooted in values, biases, and dominant interests and concerns. These latter factors determine the adoption of the underlying economic perspective: whether focused on short-term, linear and narrow objectives, or on long-term, comprehensive, eco-sensitive cycles of return.

The accounting framework presently used to guide our economy grossly distorts values. It systematically ignores important cost components, like the impacts of depletion and pollution, for example. Economists are beginning to reflect on the inadequacies inherent to the narrow concept of growth that dominates measurement of national economies, and some even highlight the basic absurdity of counting consumption as if it were income, a common practice in the way we treat natural resources.

Inadequate measurements—and the regulations and subsidies that often accompany them—drive markets and continue to fuel the destructive effects of the economy as a whole. The prevailing conventions of our accounting framework exacerbate such effects and limit the scope of individual initiatives seeking better practices. This self-reinforcing pattern is clearly one key dimension requiring radical change.

The Second Principle

Adopt an appropriate accounting system to guide the economy, fully aligned with the planet's ecological processes and reflecting true, comprehensive biospheric pricing.

Policy and Operational Implications

- ▶ *Employ a comprehensive concept of wealth related to the simultaneous enhancement of five key forms of capital: Natural, Human, Social, Manufactured and Financial*
- ▶ *Align the world's economy with nature's regeneration capacity and incorporate critical "externalities" in all cost and benefit accounts*
- ▶ *Embody a measure of well-being and human development in economic calculations*
- ▶ *Design regulation and taxation policies to accentuate desirable and eliminate adverse outcomes, optimizing the whole*
- ▶ *Rely on market mechanisms—transparent and calibrated to reflect "true" costs—for allocation of capital assets*

The Domain of Life

3

Underlying Premise

The adaptive success of our species and its quick propagation almost everywhere on Earth comes at the expense of many other forms of life. The destruction of individual animals, species, habitats and whole ecosystems—a trend now reaching ominous proportions—is a deep cause for alarm.

Complex, self-organizing, living systems—brains, societies, and ecosystems including rainforests, coral reefs, and industrial economies alike—depend on their very complexity, their internal variety, for long-term viability. Lasting stability in all such systems, science tells us, is in fact a direct function of complexity, of an inherent redundancy, which allows for the emergence and reemergence of different configurations in response to changing events. Monocultures, by contrast, are brittle in principle—the antithesis, in this context, of vibrant life.

On this point, contemporary science seems to converge with the intuition of many of the world’s ancient wisdom traditions, which insist on the uniqueness and fundamental sacredness of all forms of life.

The Third Principle

Ensure that the essential diversity of all forms of life in the biosphere is maintained.

Policy and Operational Implications

- ▶ *Assume responsible stewardship for our planet’s web of life*
- ▶ *Harvest species only to regeneration capacity*
- ▶ *Conserve the variety of the existing gene pool*
- ▶ *Shape land use patterns to reduce human encroachment on other forms of life and enhance biological diversity in areas of human habitat*

The Social Domain

4

Underlying Premise

Work of early 20th century scientists, mathematicians, and philosophers of science brought to the fore the fundamental fallibility of human knowledge, questioning the notion of an ultimate truth. This suggests that, in true ecological fashion, myriad expressions and species of truth should be allowed to coexist without any particular one seeking to aggressively dominate others.

Recent findings in the neurological sciences point out that the human nervous system is more plastic than heretofore believed. It seems that neural circuits, conditioned by past experiences to emphasize “fight or flight” behavior, can be retrained by persistent individuals’ efforts to favor those higher centers of the brain, which regulate for a more inclusive, compassionate stance. Arguments based on the notion of an entirely fixed “human nature” are therefore questionable.

At the same time, the system sciences tell us that societies, like all ecologies and living systems, depend on diversity and internal variety for robustness, long-term viability, and health, thus underscoring the importance of encouraging variety and plurality in social forms.

All the foregoing reinforce the still-fragile idea that open processes, responsive structures, plurality of expression, and the equality of all individuals ought to constitute the cornerstones of social life. As we enter the 21st century, however, the social domain continues to be dominated by the many worn-out assumptions, superstitions, biases, concepts, and structures of yesterday, all arresting possibilities for progress and change.

The Fourth Principle

Maximize degrees of freedom and potential self-realization of all humans without any individual or group adversely affecting others.

Policy and Operational Implications

- ▶ *Foster tolerance as a cornerstone of social interactions*
- ▶ *Enshrine universal rights within a framework of planetary citizenship*
- ▶ *Provide for inclusion and effective democracy in governance*
- ▶ *Ensure equitable access to life-nurturing resources*
- ▶ *Establish cooperation as a basis for managing global issues and planetary commons*
- ▶ *Eliminate war and outlaw trade in weapons technologies*
- ▶ *Promote sustainability literacy through education at all levels*
- ▶ *Embody sustainability-enhancing concepts in an effective planetary framework of legislation*

The Spiritual Domain

5

Underlying Premise

The human spirit has consistently sought to transcend material, biological, physiological, psychological, and technological limitations. This constant drive to touch a “beyond,” to take progressively more into the field of vision and to integrate an increasingly broader reality has great practical significance. With its intuitive reach for wholeness and completion, it fuels the development and evolution of individuals and societies alike.

The extent to which this deeply-rooted drive is allowed to manifest in the daily affairs of society affects the choices we make and the quality of our actions in the world. Ultimately, it underscores the difference between a greedy, egocentric, predatory orientation, and a nurturing, self-restrained, inclusive one, which honors the larger system of which we are a part and on which our very existence depends.

The essential quality of the spiritual domain, as it is acknowledged by all known wisdom traditions, is not easy to pin down. In the English language, the term “spiritual” carries opposing connotations: sacred, exalted, virtuous, divine, but also, insubstantial and occult. It is meant here to evoke the sense of a deep, underlying essence—a combination of inspiration, meaning, purpose, and all-encompassing values. The inherent imprecision in characterizing these concepts is manifest in the more elaborate way in which the fifth principle is expressed.

The Fifth Principle

Recognize the seamless, dynamic continuum
Of mystery, wisdom, love, energy, and matter
That links the outer reaches of the cosmos
With our solar system, our planet and its biosphere
Including all humans, with our internal metabolic systems
And their externalized technology extensions;
Embody this recognition in a universal ethics
For guiding human actions

Policy and Operational Implications

- ▶ *Acknowledge the transcendent mystery that underlies existence*
- ▶ *Seek to understand and fulfill humanity’s unique function in the Universe*
- ▶ *Honor the Earth with its intricate ecology, of which humans are an integral part*
- ▶ *Foster compassion and an inclusive, comprehensive perspective in the underlying intention, motivation and actual implementation of human endeavors*
- ▶ *Link inner transformation of individuals to transformations in the social collective, laying foundations for the emergence of a new planetary consciousness*

The Five Principles as an Integrated Whole

Deeper reflection on the concept of sustainability and the five core principles that prescribe it reveals that the spiritual dimension and its related principle are fundamental to the quality and coherence of the whole. It is rarely incorporated, however, in the conventional calculus of practical affairs.

As a guiding principle, the spiritual dimension does not carry the connotation of conventional religion. Rather, it evokes the integration of heart and mind, and the consciousness of the essential oneness at the center of being.

By anchoring the essence of human motivation and intention, the spiritual principle acts as the causal root that sets the tone for the whole. It drives the integration of the other four principles, related to the Material, Economic, Life, and Social domains. If integrated in a balanced way, it can infuse a common purpose, provide a common foundation, and stimulate common resolve. Lacking the ethical commitment implied by the spiritual principle, consideration of questions related to the four other domains, no matter how elaborately expressed, are reduced to mere technicalities.

By their very nature, language, logic and action force separation, discrimination and choice, resulting in the artificial distinction and sequencing of the five principles. A balanced and full integration of all five principles is essential, however, for conceptualizing and realizing sustainability as an enduring state.

The five domains underlying the principles interact and co-define one another. As in a holographic image, each embodies the whole in its own sphere. When the principles are thus integrated and seamlessly inform choices and actions, a state of sustainability, which otherwise appears as a difficult, distant goal, can be realized spontaneously and completely.

A Sustainability Laboratory Publication

First published 2005

New edition 2015

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