

SUSTAINABILITY:

DEFINING THE CONCEPT

Introduction

In the first essay in this series, I offered the opinion that, regardless of how long we have claimed to practice sustainability in this province and country, we have failed miserably. The term “sustainability” has been over-used, misused, and misunderstood over the past 25 years. Emphasis has been placed on the term, ‘sustainable development,’ which has been used interchangeably with ‘sustainability,’ and which has been interpreted by many sectors to mean economic growth only. Over a number of years, this has resulted in the ignoring (and subversion in some jurisdictions) of ecological and social sustainability. In my view, none of our leaders (government and industry) has shown any level of understanding of the concept, “sustainability,” what it is and what it requires, especially in terms of natural balance and a social contract. We need to re-think our strategies for sustainability to bring them more in line with the biological context of the word, and we need to understand that we cannot sustain our lives in isolation of the natural world.

What does the term, “sustainability,” mean? My Oxford Concise Dictionary does not provide a definition of “sustainability” but it defines “sustain(able)” as: keep going continuously. So, perhaps a suitable definition is: “...capacity for continuance into the long-range future.”¹ Brundtland (1987) defined ‘sustainable development’ as: “development which meets the needs of the present while leaving equal or better opportunities for future generations to meet their own needs.”² Brundtland also identified the three components of sustainability: economic, environmental, and social. Thus, sustainable development can be considered as the process by which we move towards sustainability. The definition of ‘sustainability’ then begs the question: How do we sustain our economy, environment, and social and cultural values all together? It seems to me we have to consider sustainability as a long-term, ecologically-centered concept, which accords equal rights, space, and opportunity to survive and thrive, to all life forms with which we share this planet. As I view it, the purpose of sustainability is to maintain a diverse and productive Planet Earth and a desirable quality of life for people, for current and future generations. I think the place to start this discussion of sustainability is with the basis of life on our planet, i.e., ecological sustainability.

Ecological Sustainability

Ecological Capital: To understand ecological sustainability, we first need to examine the concept of “ecological capital.” Ecological capital is that part of the natural world of which we humans make some use or from which we derive some benefit. In economists’ terms, it is any stock or flow of energy and matter which yields valuable goods and services¹. Ecological capital is the basis of all production in the human economy, and the provider of the essential services without which human society could not sustain itself or survive.

¹ Porritt, J. 2007. Capitalism as if the world matters. Earthscan, London, UK.

² Brundtland, G. (ed.) 1987. Our common future. World Commission on Environment and Development. Oxford University Press, Oxford, UK.

Porritt (2007)¹ defines three different types of ecological capital:

- (1) **resources**, some of which are renewable (e.g., wildlife, wild foods, farm produce, timber, fish, and water), while others are not (e.g., minerals, fossil fuels, gravel, rock);
- (2) **sinks** (e.g., soils, oceans and other water bodies, air-sheds, landscapes) which can absorb, neutralize or recycle materials; and
- (3) **services**, such as climate regulation, clean air, clean water, pollination, and habitats.

Thus, ecological capital provides a number of functions of which we make use either directly or indirectly: e.g., the flow of ecological resources as vital inputs to our economy; the accommodation of the bi-products, residues and wastes of that economy; and the supply of services which are essential to sustain not just the human economy but the whole of life itself on Earth. Ecological sustainability can be defined as the maintenance of these key environmental functions, which, in turn, depend upon their resilience and renewability.

Ecological Sustainability: As a graduate student, I had the extraordinary opportunity to study some of the smallest creatures in forest soils, biota which are near the bottom of the food chain in forest ecosystems. I use the word “extraordinary” because a high-powered microscope was needed to view these organisms – organisms we cannot see with the naked eye and which are involved with ecological processes we cannot see, hear, or touch (some of them we *can* smell). In other words, this is a world unknown to the vast majority of people on the planet, but is the key to all forest growth and productivity. While they stand at the top of the forest ecosystem, the trees are not the most significant ecological component in the forest – they are the culmination of intense biological activity, 95% of which occurs belowground.

The trees grow relatively slowly, needing 80 – 450 years (depending on species and biogeoclimatic zone) to reach the point at which growth starts to slow and tree senescence begins. As the forest has aged, a new crop has begun to regenerate in the understory. As with human communities, the tree canopy is comprised of the elders and retirees (old growth), the work force (faster growing, younger trees), and the younger generation (seedlings and saplings). Plant diversity is low to moderate, and changes in the numbers of trees, for example, occur quite slowly unless there is a natural disturbance event such as wind throw or wildfire. Such ecosystems are thought to represent stability, and, without major disturbance, are deemed to be sustainable.

If we look belowground, we see a somewhat different story. The scene is one of an incredibly large diversity of organisms working intensely to decompose and recycle the nutrients returned to the forest floor on an annual basis. These organisms live in a myriad of habitats as diverse as the community of decomposer organisms. The bulk of the organisms fluctuate in abundance very quickly and, sometimes very dramatically, dependent on ecological conditions; for the micro-organisms at the base of the food chain, these fluctuations can occur on an hourly basis; for some of their predators, this can be on a daily basis. Biological activity occurs on a year-round basis, with peaks in activity dependent primarily on the amount of available soil moisture. While soil temperature does influence rate of biological activity it doesn't appear to prevent activity during the winter months. Micro-organism abundance can vary from those lower numbers seen when summer drought conditions exist to much higher (sometimes 2 – 3 orders of magnitude) when soil moisture conditions improve.

Thus, this biomass turns over very quickly, much more quickly than does the vegetation (including the trees) aboveground. We have seen also that so-called stable systems are

characterized by fluctuating ecological factors (e.g., climate, weather), organism abundance, metabolic activity, and habitat structure. These fluctuations occur frequently on a seasonal and annual basis. But, the bottom line in all of the activity in a forest ecosystem is that it occurs within the limits of resource availability; i.e., availability of living space, food, water, and oxygen, primarily. The trees, for example, can grow only as fast as the supply of nutrients and water will allow. The trees cannot establish a line of credit and use up future resources – they are limited by what is currently available, the ecological capital.

A natural forest ecosystem also represents ecological balance – all forest organisms are interconnected and dependent upon one another, and all forest organisms are dependent upon the environmental resources provided. Upset the resource supply (changing climate, weather extremes, low soil moisture, timber harvesting, soil disturbance and degradation) and ecological balance and stability can be affected, often to the point of being suppressed. Resource supplies and availability can become limited; the ecosystems can become less resilient and capable of regeneration; ecological services can be degraded.

What has been described above for forested ecosystems can be said for other ecosystems the world over, with special emphasis on agricultural soils.

One of the biggest barriers to ecological sustainability is the substantial disconnect between the human population and the natural world. Over the past 50 years we have ‘progressed’ from a nation of people working on the land to a nation which has very little direct connection to the land. This disconnect has been accompanied by a decrease in awareness and understanding of mankind’s natural heritage and how dependent we are upon it.

Social and Cultural Sustainability

The concepts of social and cultural sustainability are less well understood and appreciated than is that of ecological sustainability. Social sustainability deals with the inter-relationships of people within society, not just numbers we read and hear about (e.g., population size and shifts, demographics, number of jobs, per capita income). Thus, it seems that the obvious purpose of social sustainability is to facilitate the building of a stronger society by fostering positive personal relationships among people.

Cultural sustainability engenders the passing on of learning and knowledge from one generation to the next. Much of our culture emerges from the creativity, artistry, intelligence and ingenuity of people, our human capital, and comes at little or no cost to society.

Social Capital: Putnam (2000)³ defined social capital as: the features of social life – networks, norms and trust – which enable participants to act together more effectively to pursue shared objectives. Social capital can be considered the essence of a civilized society¹. Social capital is reflected in the ability of people to relate to each other; to form families, communities, and nations; to agree on processes of governance and trade; and to define shared principles and values which are essential for any *civilized* society¹. As social resources are depleted, societies tend toward hardship, strife and incivility, just as the depletion of energy resources causes natural systems to tend toward entropy. It seems to me that our social resources are at least as important as our ecological resources in supporting and sustaining a desirable quality of life.

³ Putnam, R. 2000. *Bowling Alone: The Collapse and Revival of American Community*. Simon & Shuster, New York.

Putnam (2000)³ distinguished between two main types of social capital:

- (1) **Bridging** (or inclusive) **social capital**: this is outward looking and encompasses people from different social groups (e.g., civil rights movement, ecumenical religious organizations); more useful for accessing external assets and contacts.
- (2) **Bonding** (or exclusive) **social capital**: this is inward looking and tends to reinforce exclusive identities (e.g., urban gangs, shelters for the disadvantaged, church-based women's reading groups, popular country clubs); can create and foster in-group loyalty and solidarity; can offer strong support for the less fortunate community members.

Social capital can be negatively impacted through (a) changing locations and patterns of work, (b) the process of suburbanization taking people further away from the community centers, the traditional workplace, and essential services (e.g., medical), (c) television keeping people away from social activities and issues, and (d) generational culture changes. As we have seen in many second and third world countries, deliberate acts of oppression, exploitation, discrimination, injustice, or even indifference can also suppress social capital. Unfortunately, such acts seem to evolve as capitalism tends toward a corporatist (exploitative) culture, more and more of which we are seeing in North America. A corporatist economy generally places little value on human relationships (other than those which can be transformed into economic capital for financial gain), and has low levels of loyalty to employees and communities. Such corporations lack human compassion and tend to undermine the social fabric of families and communities as local and regional social capital is transformed into economic capital in the relentless pursuit of profits and growth.

Cultural Capital: Culture reflects a society's basic patterns of thought and behavior, which are shaped by customs and experience. Thus, the culture and customs of any society can be affected or managed only by the people themselves. Stocks of social capital accumulate through the processes and diversity of human cultures, which result in the learning, knowledge, customs, and heritage we have to pass on to the generation. Through our cultures, we strive to achieve more peaceful, productive, and harmonious relationships.

Human Capital: Human capital is defined as any one individual's physical capacity (strength, skill and health), intellectual capacity (knowledge, creativity, linguistic ability), emotional capability and skills (in empathy, conflict management and resolution, relationship building and maintenance, communications, and organizational awareness), and spiritual capacities; i.e., what any one of us brings to any working, playing, nurturing or loving relationship. Emotional abilities are essential to good leadership; good leaders are able to use their emotional intelligence to help build a working environment which nurtures employees and encourages (and rewards) them to do their best.

From a sociological perspective, however, it seems that human capital is now associated almost completely with the capacity of governments and other organizations to enhance opportunities for learning and education. With the growth of the knowledge economy has emerged an important change in the relationship between employers and employees. Human capital is no longer owned and stationary but rented and highly mobile.

Social and Cultural Sustainability: It is with social and cultural sustainability that our leaders seem to have the most difficulty understanding and developing appropriate visions and strategies. I suspect that most people believe that, among the three components of

sustainability, social and cultural capital should be the easiest to understand, and, perhaps, the most difficult to implement. But, if we care about human health and well-being, we need solutions to the challenges.

Why does it take inclement weather, such as a cold snap in urban environments, to evoke our compassion and prompt us to direct our attention and help to the homeless? Why do food banks struggle to maintain their supplies of food for the homeless and disadvantaged? Why do governments introduce taxation laws without any public discourse prior to the introduction (e.g., HST in British Columbia)? Why are costs of governing increasing but support for the poor and homeless is decreasing? Why are governance decisions made without public input?

Why the difficulties? There may be a couple of dominant reasons:

(1) perceived and real public apathy:

- the sources of this level of apathy are interesting to consider – public distrust of government; lack of public interest in government actions; lack of easily accessible information on issues and government actions; public feeling of not being important or involved; public feeling that there is little we can do;
- citizens focusing on surviving and prospering, doing “their own thing” regardless of impacts on the family, the community, and society in general;
- some of the apathy is based on the observable fact that governments will do anything and everything to be re-elected, but once they are re-elected, they will do as they please, sometimes acting contrary to election promises; and
- there is an inherent lack of transparency in our system of governance, and our current political leaders frequently hide behind this lack;

(2) costs:

- the costs of social and cultural sustainability involve, for the most part, spending taxpayers’ money, money (according to government) in increasingly short supply; governments are normally judged on how well they manage the public purse and on whether or not they have attained the most brownie points from benefiting the larger, common good;
- the costs of governance change with shifting demographics (e.g., costs of health care, maintaining a safe and efficient infrastructure, and costs of education);
- government revenues are, at best, unpredictable in an export-based, natural-resource economy; zero tolerance for deficit budgeting means, in times of financial stress, ethics and the social contract seem to vanish; cutting programs and placing more people in marginal situations is done for the greater good, i.e., balancing the annual budget.

Social/cultural sustainability has faced (and continues to face) systemic barriers in that the goals of social/cultural sustainability fall within the theory and ethics of the social contract, while in practice are included in consequentialism goals of economic analyses (e.g., determining socio-economic impacts). The goals and processes of social/cultural sustainability are diverse, many, complex, and inter-related; the current proponents of economic sustainability seem focused on only one goal, the economic bottom line.

As a society, we play loosely with our stocks of social and human capital. If our society is to continue to progress, our human capital must learn to conserve and continually restore our stocks of social capital. While the most effective place to start with this is at the community level, a sustainable economy must encourage and support continual social investments at all

levels of governance. Widespread fostering of new and more positive personal relationships will help counter the effects of the depletions of social capital. A sustainable social economy will ensure that the rates of restoration will exceed the rates of depletion – this has to be the fundamental nature of the social economy.

We must recognize three basic types of rights of all people to ensure sustainability:

- all people must be afforded a basic right to be protected from economic exploitation;
- all people must be afforded a basic right to a diverse, productive, clean and healthy environment; and
- future generations must be afforded social, economic, and environmental rights equal to the rights afforded the current generation.

Social justice, economic security, ecological integrity, and inter-generational equity are the four ethical and moral cornerstones, i.e., the social contract, upon which a sustainable economy must be built.

Economic Sustainability

Economic capital: An important part of understanding economic sustainability is to first comprehend what is meant by economic capital. Economic capital can be divided into two categories: manufactured capital and financial capital¹.

Manufactured Capital: Manufactured capital is what we refer to as buildings, infrastructure, and production technologies. Manufactured capital represents material goods essential for the production process but not part of the output from the process. The process of conversion of natural capital to manufactured capital was, at one time, relatively modest and localized, and resulted in, for the most part, low environmental and social impacts. From the mid-1700s until today, the balance between the natural world and the industro-technical world has been altered substantially because of technological developments and innovations. Add the discovery and increasing availability of cheap fossil fuels to this process and we have an unhealthy (unsustainable?) dependence of humans on the multitude of types of manufactured capital.

Financial Capital: Financial capital is comprised of paper assets (stocks of money, bonds and equities), markets (stock exchanges), institutions (banks, lenders, asset managers, and insurers), and social conventions. Paper assets have no value in themselves but, fundamentally, we can consider them simply as derivatives of the underlying manufactured, natural, social and human capital stocks². This then places financial capital within the sphere of social capital.

Financial capital, as with all other types of capital, depreciates as it is utilized and can be degraded if abused. Financial capital requires wise investment and vigilant stewardship if it is to continue providing the flow of services required at the same rate and quality. Issues regarding both the ownership and the usage of financial capital are at the core of what sustainability truly means, and to the prospects of fashioning a genuinely sustainable future for humankind.

Economic Sustainability: While achieving “economic sustainability” should have been relatively straightforward, we have seen signs over the past two years that this is not so. It has become apparent that, over the past 20 years, we have pursued, to the point of degradation, a model of capitalism which can succeed only by liquidating the life-support systems which

sustain us, and by systematically widening the “equity gaps” upon which any social cohesion depends in the long run.

The Greek word for “economy” is “*oikonomia*” – *oikonomia* refers to the study of resource stewardship for the overall well-being of the household, society, and natural environment. Contrast this definition with that which seems to pervade our thinking today: managing scarce resources for the wealth of individuals.

A sustainable economy is inherently complex and hierarchal, in that, theoretically, it integrates the individual, social and ecological economies into a harmonious whole. Individuals are forced to re-think the conventional wisdom of “more is better,” and to search for success through harmony and balance among the individual, social and moral aspects of their lives. The most difficult challenges in developing and managing a sustainable economy are likely to arise from the integration of the economic, social and ecological dimensions to maintain a positive, dynamic balance among the three. The most difficult will tend to be at the margins or interfaces among the three.

Conclusions

There are several conclusions which can be drawn from the above discussion:

- (1) It would seem that the fundamental principles of industrial development are in direct conflict with the principles for sustainable economic development (Table 1). Many aspects of contemporary capitalism (e.g., the obsession of maximizing returns to shareholders; the belief that shareholders and their capital create wealth; the domination of present-day markets by huge funds far-removed from the context of the investment; seemingly transient investment funds being moved continually throughout the markets) are in direct conflict with the pursuit of sustainability. The focus on the bottom line and returns to shareholders has resulted in detached and indifferent shareholders who have little if any concern for the companies, and their products and services, and no concern for the employees or the communities in which the companies are based.
- (2) One of the perspectives which supporters and detractors of sustainable development both have pushed is the usage of technological innovation to decrease the environmental and social costs of each unit of production; i.e., improving resource efficiency. Thus, we have seen the emergence of the principles of eco-efficiency and eco-innovation. Unfortunately, since governments do not exhibit any understanding of what is required for sustainability, they are not facing and managing the resource productivity challenge with any evident strategy or vision. And, even if they did, it is quite probable that these efficiency gains would barely keep pace with the mushrooming increases in consumption all over the globe. Technology alone will not enable us to overcome these challenges; we must re-jig our thinking as well.

Table 1. Contrasting the traditional characteristics of industrial development with the characteristics of sustainable economic development⁴.

INDUSTIRAL DEVELOPMENT	SUSTAINABLE DEVELOPMENT
Must destroy boundaries to extract usefulness	Must rebuild boundaries to renew usefulness

⁴ Ikerd, J.E. 2005. Sustainable capitalism: a matter of common sense. Kumarian Press, Inc. Bloomfield, CT.

Demands specialization	Requires holism
Demands standardization	Requires diversity
Requires consolidation of control and creates dependent relationships of necessity	Empowers individuals, thus creating inter-relationships of choice

- (3) With the global population expected to rise to about 9 billion in the second half of the 21st Century, and with per capita consumption rates likely to continue to increase (especially in second and third world countries), the challenge of extracting more economic value out of less (throughput of energy and raw materials) becomes critical. We have recognized this in such things as zero waste and zero emissions programs, carbon neutrality, carbon taxes, resource efficiency, de-materialization, and eco-innovation.
- (4) Questions related to ecological sustainability persist because our present-day economies are inherently extractive of the natural resources upon which they must depend for productivity, and are exploitive of the societies within which they must function. Over the past 30 years, we have seen a reduction in biological diversity, ecological integrity, and social equity in many parts of the world, including Canada. Part of this result is because societies seem to have lost or ceded a responsibility to see that appropriate public policies are developed and implemented, and to ensure that our economy functions for the long-term benefits of society and our natural capital.
- (5) Again, over the past 30 years, we have seen that those who benefit from economic growth have been able to shape (co-opt) public policies to support maximum current growth, with little evident regard for future ecological or social sustainability. Environmental protection and social justice are still viewed as impediments, rather than priorities, in the public planning and policy process.
- (6) Threats to ecological sustainability arise continually: water pollution, air pollution, acid rain, soil erosion, loss of biological diversity, ozone depletion, global climate change, increasing rates of consumption, to name a few. There are growing threats to social sustainability: isolation, distrust, injustice, inequity, depression, addictions, litigation, confrontation, terrorism, and war. To some, such social challenges are opportunities for substantial economic benefit, e.g., war.
- (7) To a society accustomed to unending promises of 'more' and 'better,' promises of sustainability may not seem very inspiring. Sustainability suggests that we may have to settle for **enough** rather than **more** because **more** may not always be possible and **less** may sometimes be better. Thus, sustainability may seem limiting, restricting, and almost pessimistic in tone. It is important to remember that the fundamental flaw in today's economy and society is not a lack of quantity or quality of products, not even a lack of income or wealth. The flaw, instead, is the inability of today's economy to sustain continuing growth in production and the inability of greater wealth to sustain greater individual or societal well-being.

The above discourse has raised many more questions in my mind rather than provide all the answers I needed. That is a good thing.

Compiled and synthesized by:

J. Daniel Lousier, PhD
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