9. Ecological economics: a new paradigm ahead

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When the last tree has been cut down, the last fish caught, the last river poisoned, only then will we realize that one cannot eat money.

Native American saying.

9.1 INTRODUCTION

We are living in complex and turbulent times – "with amazing scientific discoveries, technological inventions, industrial and commercial expansion, population increase, social transformations, new systems of transportation and communication, vast educational and research establishments, ventures into space" (Berry 2007, p. 57) – in other words a brilliant time. But there is another more destructive aspect – "mountains are ripped apart for the underlying coal and ore deposits; rivers are polluted with human and industrial waste, the air is saturated with toxic substances, the rain is turned to acid, the soil is sterile with chemicals, the higher forms of life is endangered, the great mammals have been killed off almost to the point of extinction, the tropical forests are being ruined, and many coral reefs are endangered beyond repair" (Berry 2007, p. 57).

These are the negative side effects following the modern industrial society and are to a large extent the unintended consequences of the mechanistic worldview. Merton warned against "unanticipated consequences of purposive social action" (Merton 1936, p. 894), and he differentiated between the consequences in the following categories: (a) consequences to the actor, (b) consequences to other persons mediated through (1) the social structure, (2) the culture and (3) the civilization (Merton 1936, p. 895). According to Merton we could, to a large extent, interpret the destructive aspects of modernity as unintended consequences of a society which is far from being in harmony with the natural and social conditions.

Soon the continuing ecological losses may well begin to stress both the economic and social systems. As ecosystems become more degraded the greater is the risk that these systems will be pushed over the edge. According to Lindner; "We ... live in historically unprecedented times of risk, but also in historically unprecedented times of opportunity" (Lindner 2012, p. xxv).

9.2 FOCUS ON SYMPTOMS

If we try to solve these serious challenges by no more than a one-sided treatment of the most visible symptoms, a number of paradoxes could well be the consequence. For example initiatives to stimulate economic growth have been recommended to solve the financial crisis, while we know that continued growth in the economy will only serve to worsen the environmental problems. When the rich countries use billions of dollars to stimulate growth in production and consumption, the result widens the gap between rich and poor, in both the national and global perspectives. Growth in production and consumption in the rich countries often leads to reduced resource efficiency, the life cycle of products becomes shorter, the distance between production and consumption increases, and the amounts of waste grow dramatically. Our tendency to overexploit resources is currently reinforced not only by powerful technologies, but also by cultural norms, particularly those associated with the paradigm of economic growth which is, currently, globally dominant.

We don't talk to each other and this lack of interdisciplinary communication is a serious threat to the understanding of how the different symptoms hang together. Specialized fields of science have tended to focus on the different symptoms. Each specialty and each subject is increasingly isolated, partly as a result of its own specialized vocabulary of terms and expressions that are unintelligible to outsiders. Some would say this is a verbal electric fence set and designed to keep outsiders out but however we look at it the problem is the same: it is difficult to communicate across disciplinary boundaries. Into the vacuum comes abstract, specialized knowledge which sets aside general and practical insights. Alfred North Whitehead (1978), the English philosopher, warned nearly 100 years ago against what he called "the fallacy of misplaced concreteness." Whitehead believed that we tend to forget that theories and models are abstract representations of reality. Even more illusory is our insistence on equating between abstract knowledge and reality.

9.3 RADICAL CHANGES

When we look at the future through the lens of neo-classical economic theory, which focuses on nothing more than short-term profit maximization, the time horizon is too short and the perspective too narrow to contain the complex phenomena which include the relationships between ecological sustainability, social welfare and individual quality of life.

Evolution, both biological and cultural, has been characterized by slow development over long periods of time, followed by sudden revolutionary leaps of profound change. Scientific development is, according to the philosopher Thomas Kuhn (1962), characterized by revolutionary paradigm shifts. Kuhn argued that fundamental changes occurred only when the established explanations do not make the cut for solving society's challenges. Problems that could not be solved within the established paradigm were called anomalies. If the anomalies increase in number and severity science goes into a phase of crisis, which allows for a paradigm shift. This presupposes that an alternative paradigm, able to deal with the anomalies, is developed.

Multiple crises – financial, economic, food, energy – have caused governments and other bodies to look more critically at systematic and structural issues related to national and global economies. Since several crises converge to reach their maximum level of tension simultaneously we can conclude, in accordance with Max-Neef, that this is "a crisis for humanity" (Max-Neef 2010, p. 200). To solve the most urgent problems economic theory and practice has to go through radical changes. Both the financial crises, poverty crises and the climate crises remind us of the gravity of the problems. Most alternative measures of human well-being (alternative to the conventional measure of money flows as reflected in GDP) show that; "quality of life in the industrialized world peaked in the mid-1970s and has been going downhill ever since" (Dawson 2006, p. 12). In the same period GDP has continued to climb. According to Daly the consequences of this development are that, in addition to a loss of well-being, we also face a "possible ecological catastrophe" (Daly 2007, p. 14).

9.4 UNECONOMIC GROWTH

Daly (2007) believes most developed countries are now in a period of uneconomic growth, in which further growth in market economic activity is actually leading to a reduction in well-being instead of enhancing it. There is a period in which economic growth does

contribute to improvement of well-being, but only up to the threshold point, beyond which, if there is more economic growth, well-being will begin to deteriorate. In a poor country that has not yet reached the threshold point, it is legitimate to point out that to overcome poverty economic growth is necessary. After the threshold the economy has reached a point in which the costs of growth outweigh the benefits.

Daly asks: "How can we fight poverty without growth?" He comes up with the following answer: "We might have to share!" (Daly 2007, p. 10). His answer is different from the message in the report from the World Commission on Environment and Development (WCED) which said that the best solution to the problems was to initiate "more rapid economic growth in both industrialized and developing countries" (Brundtland Report, WCED 1987, p. 89). To sum up, growth in the use of natural resources must give way to the "steady-state-economy", competition must be replaced by cooperation, generosity in sharing limited resources must be introduced to the economy to replace the principle of egocentric maximization of utility and profits. Development of quality of life must be more important than quantitative growth in GNP (Capra and Henderson 2009).

If we accept that the current environmental and social challenges cannot be solved by and within established economic theory and practice the way is clear for new and creative groundbreaking solutions. Since problem solving goes on at the meeting point between past and future, it is necessary to address the challenges with a thorough understanding of the social and economic developments up to the present day. In addition, it is essential to have realistic long-term visions for the future. To identify and address the major challenges, it is important that new ideas are rooted in individual and collective experience. It is neither desirable nor possible to force solutions that do not have a basis in human intuition, feelings and thoughts. Overwhelmed by, "the sheer quantity, complexity and brilliance of scientific knowledge, the interaction between our whole culture and the natural world, has become increasingly ignorant and insensitive" (Naydler 2009, p. 16). Here, then, is an aspect of the relationship between science and the contemporary ecological crisis which, despite being critical, is often overlooked.

9.5 REAL ECONOMY

Improved technology alone has found it difficult to reduce CO_2 emissions. Additional measures are required to address the climate crisis but these are difficult to implement without the radical switch from growth to

de-growth economy. This same reasoning applies to the problems arising from the global financial and debt crisis. According to Benedicter (2011), it is impossible to restore the established system through legal and ethical adjustments alone. We need to develop new solutions based on a change from a competitive to a cooperative economy, based on an ongoing dialogue between all concerned stakeholders. A new balance between the real and financial economies is our goal.

According to Daly, banks in recent decades were "engines creating money out of nothing. ... They extended credit, bought stocks on the margin, and dealt in derivatives – a fancy name for betting with unregulated, multiplying insurance policies" (Stuckey 2009). Because of the dramatic explosion of assets produced, the illusion arose that wealth was increasing. But the wealth existed only on paper. Domination by the financial economy today is so big that; "the term anomaly may be appropriate – an infirmity phenomenon in society" (Berglund 2007, p. 140). Liquid assets within the financial economy are invested in stocks, bonds and currencies. What creates the anomaly is that the assets are only to a limited extent channeled back into the real economy. Following this line of reasoning the disproportionate relationship between the real economy and the financial economy explains some of the necessary conditions behind the financial crisis.

9.6 GREEN ECONOMY

To handle the challenges of our time, I have argued that there has to be a change both in economic theory and practice. How deep this change will need to be could be illustrated by drawing a demarcation line between "green economics" and "ecological economics". As a starting point we must accept that both perspectives are based upon a serious willingness to solve the environmental and social problems embedded in mainstream economics. Green economics by introducing changes based more or less on the same tool kit as used in mainstream economics and ecological economics by revising the ontological, epistemological and methodological preconditions for economics.

As a tool in elaborating these questions I distinguish between different interpretations of economic growth along the variables "green economy" and "ecological economics" versus "short term" and "long term" action plans. To solve economic and environmental problems representatives for green economy accept that in a short term perspective increased growth has the highest priority. In a longer term perspective they argue that the growth should be as green as possible. For ecological economists growth

is not part of the solution; indeed, on the contrary, growth is the core problem. In the short term it is necessary to move towards a de-growth economy. In the long term the focus has to turn towards qualitative development (Table 9.1).

Table 9.1 Different interpretations of growth

	Green economy	Ecological economic
Short term perspective	Economic growth	De-growth
Long term perspective	Green growth	Qualitative development

Arguments indicating that environmental responsibility is based on (green) growth are often found in the literature. To solve the problems we must have more resources to spend on the different enterprises. Greening the economical practice could be an efficient marketing tool to develop a good environmental reputation that is necessary to increase the company's competitive advantage and its profits. Economic internalization (Hopfenbeck 1992) could be one possible step in the process of greening the economy. When environmental and social costs connected to business activities are quantified and measured in the firm's accounting systems the problems connected to externalizing environmental damage are reduced. The idea is: by making the environment into a costly commodity business will be given an economic incentive to design environmentally friendly products, procedures and uses of resources. Following the same line of reasoning green taxes, laws and regulations are relevant tools.

Ecological economics accepts that because the traditional mechanical and linear way of thinking is limited, our problem solving often brings about unintended and undesirable effects. Financial and climate crises are examples of such unintended consequences. Holistic thinking, including adaptability, flexibility, learning, self-organization and cooperation are central in ecological economics. Ecological internalization implies that environmental and social responsibility are integral and integrated parts of business management. Creativity and divergent thinking are essential within ecological economics because it is more important to discover new questions than to find new answers to the old questions.

In accordance with this line of argument Max-Neef asserted; "it is no longer acceptable that Universities still teach economic theories of the nineteenth century in order to tackle twenty first century problems"

(Max-Neef 2010, p. 200). There seems to be a conflict between the physical impossible (continual growth) and the political impossible (limiting growth) (Daly 2007, p. 10). But the ecologic and economic crises we are facing in the beginning of the twenty-first century provide the most exciting opportunity for change. It is generally accepted that to break established habits we must see the benefits of the change *and* the cost of following the old track. Now, when we can clearly see the downside of the system we have been using, this is the moment to change our habits, our accounting, and our tired old assumptions about what the Earth can sustain. It's time to rein in our air money balloons and get our feet firmly planted on the real ground.

9.7 ECOLOGICAL ECONOMICS

Ecological economics is a field of economics that could bring the economic and ecological crisis down to Earth. Policies introduced in the next few years will make all the difference. Three questions of special importance arise and have to be addressed.

First, production and consumption must be sustainable in the long run. Economic growth, as both a "God" and an end in itself, is based upon the questionable assumption; "there are no limits to the planet's ability to sustain it" (Pearce 2001, p. 7). Instead sustainability implies recognition of the fact that natural and social capital are not infinitely substitutable by built and human capital, and that; "there are real biophysical limits to the expansion of the market economy" (Costanza 2008, p. 33). Hence, a sustainable economy must at some point stop growing, but it need not stop developing. In other words, there is no necessary connection between development and growth, and, conceivably, there could be development without growth (Georgescu-Roegen 1975).

Second, the distribution of resources and wealth must be fair. Fairness implies recognition that the distribution of wealth is an important determinant of social capital and quality of life (Costanza 2008, p. 33). We must move from an economy oriented toward the satisfaction of the wants of the rich part of the world, to an economy committed to satisfy the basic needs of all human beings. Instead of focusing on economic growth and increasing profits the global economy must include (possibly for the first time) moral considerations and equity.

Third, the allocation of resources must be efficient. Real economic efficiency implies the inclusion of all resources that affect sustainable human well-being in the system of allocation, not just goods and services being on the market. "Our current market allocation system excludes

most non-marketed natural and social capital assets and services, which are huge contributors to human well-being" (Costanza 2008, p. 34).

Boulding introduced the metaphor "Spaceship economy" to illustrate the conclusion that the only way "man can survive is by recycling earth's resources after use instead of continuing to exhaust its mines and pollute its reservoirs" (Kerman 1974, p. 14). And we must remember that there are no passengers on the spaceship, only crew, in other words we are all co-responsible.

9.8 CONCLUDING REMARKS

According to Eisenstein the present convergence of crises, "in money, energy, education, health, water, soil, climate, politics, the environment, and more – is a birth crisis, expelling us from the old world into a new" (Eisenstein 2011, p. xx). Lindner (2012) describes how destructive competition must not be chosen at the expense of life-enhancing cooperation. Instead of firing the engine of capitalism and wealth creation by prioritizing selfishness, individualism and narcissism, the ability to say yes to love, kindness, generosity, sympathy and empathy alleviates the birth woes for a new world.

Boulding argued that "economics has rested too long in an essentially Newtonian paradigm of mechanical equilibrium and mechanical dynamics" (Boulding 1981, p. 17), a reasonable conclusion is that our current environmental and societal dilemmas are due, in part, to a much distorted perception of reality. According to Rees; "Modern economic society operates from an outdated mechanistic perception of the natural dynamics of the Earth" (Fabel and St. John 2007, p. 104).

Pearce goes a step further and argues that the failure to address metaphysical questions has led to many of the central errors of conventional economics. Therefore, economics needs an internal metaphysical critique. Instead of focusing on physics, quantitative measures and products economists should discuss metaphysics, qualitative values, and processes (Pearce 2001). In my opinion the critique from Pearce is both valid and relevant for understanding the negative symptoms following mainstream economy; in addition the critique is an argument for the need of ecological economics.

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