Ecological Economics 84 (2012) 84–90

Contents lists available at SciVerse ScienceDirect

Ecological Economics

journal homepage: www.elsevier.com/locate/ecolecon

Analysis

Utopias and realism in ecological economics — Knowledge, understanding and improvisation

Stig Ingebrigtsen, Ove Jakobsen *

Centre for Ecological Economics and Ethics, Bodø Graduate School of Business, University of Nordland, Norway

ARTICLE INFO

Article history:
Received 11 April 2012
Received in revised form 30 August 2012
Accepted 26 September 2012
Available online 25 October 2012

Keywords:
Ecological economics
Organic worldview
Transdisciplinarity
Ecological man
Utopian realism
Transition Towns

ABSTRACT

"What we are going through at the present time is not just an economic-financial crisis, but a crisis of humanity" (Max-Neef, 2010, p. 200). Despite problems within it, it is ecological economics which is now emerging as the most potent opponent to neo-classical economics. "It is ecological economics which addresses the most profound failure of neoclassical economics, the failure to deal adequately with resource depletion and environmental destruction both locally and globally" (Costanca, 1991). The complex challenges are anchored in a deep conflict between mainstream economics and the natural and social conditions, to harmonize this connection it would seem necessary to develop a valid understanding of the interconnectedness between economy, nature and society. The idea behind this article is four-fold. Firstly, we describe and discuss the ontological worldview in ecological economics. Secondly, the epistemological consequences of the ontological preconditions are discussed. Thirdly, some of the main concepts and principles in ecological economics are focused on. Fourthly, we discuss the realism of radical solutions in ecological economics.

1. Introduction

To improvise, artists need knowledge of fundamental structures in music, painting or literature. In addition, to create great art it is necessary to have a holistic understanding of the context. Following the same line of argumentation we claim that ecological economists need to possess knowledge about fundamental principles, understanding of the context and improvisation skills in order to solve the challenging problems we are facing today. According to Max-Neef; "What we are going through at the present time is not just an economic-financial crisis, but a crisis of humanity" (Max-Neef, 2010, p. 200). The dominant economic model, based upon mono-disciplinarity, abstraction, reductionism, and causality, is not suitable whether this be for understanding the interconnectedness of the problems, or implementing appropriate solutions.

Costanca argues that "despite problems within it, it is ecological economics which is now emerging as the most potent opponent to neo-classical economics. It is ecological economics which addresses the most profound failure of neoclassical economics, the failure to deal adequately with resource depletion and environmental destruction both locally and globally" (Costanca, 1991). But, we agree with Røpke when she argues that ecological economics still suffers from a weak identity (Røpke, 2005, p. 286). To develop the identity of ecological economics it is necessary to strengthen the reputational autonomy of ecological economics. To do this we have to revitalize the discussion concerning the ontology and the epistemology.

The complex challenges are anchored in a deep conflict between mainstream economics and the natural and social conditions, to harmonize this connection it would seem necessary to develop a valid understanding of the interconnectedness between economy, nature and society. The idea behind this article is four-fold. Firstly, we describe and discuss the ontological worldview in ecological economics. Secondly, the epistemological consequences of the ontological preconditions are discussed. Thirdly, some of the main concepts and principles in ecological economics are focused on. Fourthly, we discuss the realism of radical solutions in ecological economics.

The most fundamental demarcation line between ecological economics and neo-classical economics is at the ontological level. Ecological economics is based on an organic worldview whereas neoclassical economics is anchored in a mechanic worldview. The consequence is that ecological economics cannot be understood, at the epistemological level, using a mono-scientific perspective. To understand the connection between economy, nature and society we need a transdisciplinary science. In addition, to find practical solutions that work, ecological economists must have improvising skills based on knowledge of the fundamental principles in ecological economics together with a transdisciplinary understanding of the economical, natural, and social context. We use Gidden's concept "utopian realism" to illustrate how solutions that seem utopian from a neo-classical perspective may well be realistic from an ecological economical perspective.

* Corresponding author. Tel.: +47 75517681; fax: +47 75517268.
E-mail address: ove.jakobsen@hibo.no (O. Jakobsen).

0921-8009/$ – see front matter © 2012 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.ecolecon.2012.09.015

2. An Ontological Worldview in Ecological Economics

To discover and articulate the fundamental principles in ecological economics we have to develop a scientific platform enabling us to discover what is invisible from the angle of the dominant neo-classical economic paradigm. To do this, it is necessary to distinguish between ontology, the philosophical study of being, and epistemology, the philosophical study of knowledge. It is not possible to reduce being to knowledge of being. "Ontology is always in principle distinct from epistemology, even where our knowledge of the known world is unquestioned" (Bhaskar et al., 2010, p. 2).

According to Capra (1982) a mechanic worldview presupposes that physical matter is identical with reality. "The material universe, including the living organisms, (…) was a machine that could be understood completely by analyzing it in terms of its smallest parts" (Capra, 1995, p. 21). Everything could (at least in principle) be explained in terms of imposed physical laws. The social sciences, including neoclassical economics are characterized by the idea that bits of matter are isolated individuals (atomism), related to one another purely externally (causality). Interpreted from a mechanistic worldview the market is nothing more than a mere mechanism based on the interplay between egocentric individuals governed by market mechanisms and competitive power. All that happened; "had a defined cause and gave rise to a definite effect" (Capra, 1995, p. 120).

This means that mechanical explanations describe every biological or social event as a pattern of non-biological occurrences. The future of any part of the system may – in principle – be predicted with absolute certainty if its state at any time is known in detail. In other words, mechanism is a worldview claiming that physical matter is reality, complete and total. Everything in the universe can be explained in terms of imposed physical laws. Accepting that the whole universe is completely causal and deterministic has serious consequences with regard to the opportunities for human creativity, freedom and self-realization. Interpreted from a mechanistic worldview a consequence of this line of argumentation is that 'dead' nature can provide no reasons, and it aims at nothing.

The mechanical worldview is useful for the description of, and appropriate for dealing with delimited physical phenomena we encounter in our daily environment. However, we must be aware of the problems connected to using abstractions based on the limited worldview of mechanism. According to Whitehead's "fallacy of misplaced concreteness" we tend to forget that the mechanic worldview is an abstraction, and even worse, we tend to mistake the abstraction for the concrete actuality. When emotions and values are missing, we lose the connectedness between economy and living nature and society.

Whitehead's philosophy of organism confronts the established mechanic worldview. He criticized the mechanic worldview by referring to the separation between "body" and "mind". Dualism is deeply rooted in European philosophy from the beginning of the seventeenth century. Whitehead argued that the separation between body and mind still characterizes most sciences in the modern world; "The notion of the mechanical explanation of all the processes of nature hardened into a dogma of science" (Whitehead, 1967a, p. 60) during the 20th century.

Capra (1982) characterizes the organic worldview by nonlinear interconnectedness of living entities. This means that individual and community make each other and require each other at the same time. Daly and Cobb Jr. argues that; "a group or community cannot be understood if the unit of analysis is the individual taken by himself. A society is clearly something greater than the sum of its parts" (Daly and Cobb, 1994, p. 7). Nature and society are self-sustaining and have their own reason. According to Whitehead "A society is more than a set of entities to which the same class-name applies. "The self-identity of a society is founded upon the self-identity of its defining characteristics and upon the mutual immanence of its occasions (…) and the creative advance into the future" (Whitehead, 1967b, p. 204).

Even if different authors focus on different aspects of the ontological worldview, we can conclude that the ontology of ecological economics must be built on an organic worldview based on a concept of nature and society as collective phenomena, not as the sum of atoms or individuals. Within this complex and dynamic framework individual behavior is both multi-faceted and context-dependent. Accepting the organic worldview as a frame of interpretation has far-reaching consequences for our understanding of the interplay between economy, nature and society.

As an example, we have to rethink the status of life. Whitehead is arguing that the term "life", refers to the enjoyment of emotions like, "self-enjoyment", "freedom", "creativity", "purpose", and "subjectivity", derived from the past and aimed at the future. This leads to a conclusion that "life" and "mind" are interwoven with matter. Nothing in nature can be what it is, except as an integrated part of a dynamic whole.

The Renaissance genius and painter Leonardo da Vinci explains the interconnectedness of mind and matter in the following way, "the human body was an outward and visible expression of the soul; it was shaped by its spirit" (Capra, 2007, p. 11). According to Capra, Leonardo clearly recognized that the anatomies of animals and humans involve mechanical functions. "Nature cannot give movement to animals without mechanical instruments" (Capra, 2007, p. 11). In contrast to a mechanical interpretation Leonardo was convinced that even if the means of the body's movements were mechanical, its origin was the soul. In a generalized way this means that the nature of all living creatures was spiritual, not mechanical. Interpreted in the context of ecological economics, this means that even if the context of interpretation is organic, we must focus on mechanical phenomena as well, for example as means of production, distribution, consumption and redistribution (reprocessing of waste).

3. Epistemological Consequences of the Organic Worldview

Costanca defines ecological economics as a "transdisciplinary field of study that addresses the relationships between ecosystems and economic systems in the broadest sense" (Costanca, 1991, p. 3). Transdisciplinarity postulates that organic, integrated, dynamic reality cannot be understood using the perspective of specific individual disciplines. To grasp the complexity of reality, cooperation between different disciplines is of great importance. Max-Neef distinguishes between weak and strong transdisciplinarity. On the one hand, weak transdisciplinarity refers to inter-scientific dialog, strong transdisciplinarity, on the other hand, refers to "a new discipline (…) a different manner of seeing the world, more systemic and more holistic" (Max-Neef, 2005, p. 15). Strong transdisciplinarity can be seen as an extension of interdisciplinarity because it involves both "inner-scientific cooperation between various disciplines and fields as well as cooperation between science and society" (Jahn et al., 2012, p. 2). Following this line of argumentation we agree with Spash's conclusion "that ecological economics as a radical movement is required today, more than ever, in order to criticise and change the social organisations and institutions that spread false beliefs about economic, social and environmental reality" (Spash, 2012, p. 46). Accordingly ecological economics needs strong transdisciplinarity.

To illustrate the epistemological consequences of an organic worldview we focus on how wealth is measured in economics. From the neo-classical perspective wealth, measured as GDP per capita, is seen as a good indication of a country's standard of living. However, an increase in GDP alone is not enough to measure wealth. One must see GDP in relation to the magnitude of the population. Therefore GDP per capita is seen as a better indication of wealth. An increase in GDP per capita – growth – is therefore considered very important in most countries. Several models have been used to explaining growth — from simple neoclassical models, purely considering real capital to more advanced models also seeing human capital (education etc.) and technological, management and organizational improvement (innovation)

important (weak transdisciplinarity). Using this perspective, growth is necessary to raise the standard of living or indeed just secure it with a raise in population. Growth is also important in relation to political stability and employment.

Therefore, it is not surprising to see the efforts and means used by most countries (including EU) to handle economic crises. The financial crisis is handled through measures stimulating growth in the global economy. To do this huge amounts of money are transferred from the authorities to the banks to stimulate an increase in production and consumption (in the rich countries). But the growth imperative, implicit in neoclassical economics and the solution of the financial crises is incompatible with the fact that "the biosphere is finite, non-growing, closed (except for the constant input of solar energy), and constrained by the laws of thermodynamics" (Daly, 2007, p. 13). This provides an illustrative example of the importance of ontological presuppositions in scientific explanations and practical problem-solving. In a mechanic worldview, in which everything is reduced to matter (material growth), central aspects of a human being and nature get lost.

We have to leave the mono-scientific perspective in order to grasp the holistic nature of things. From a strong transdisciplinary perspective the market actors, are mutually interdependent, within integrated networks based on ethical values and norms.

To illustrate the importance of norms and values it is appropriate to give stronger emphasis to the "lifeworld" than the "system" as described in Habermas' theory of communicative action (Habermas, 1987). The lifeworld is the medium of symbolic and cultural reproduction of society, in contrast to the system which refers to the structures and established patterns of instrumental action we find in mainstream economics and governmental bureaucracy. Money and power are the steering media, or coordinating mechanisms, respectively. Via the medium of money the economy is differentiated by way of an institutionally complex set-up within the horizon of the lifeworld. According to Habermas, organizations not only disconnect themselves from cultural commitments and from attitudes and orientations specific to given personalities; "they also make themselves independent from lifeworld contexts by neutralizing the normative background of informal, customary, morally regulated contexts of action" (Habermas, 1987, p. 309). The lifeworld concerns the informal and un-marketized domains of social life: "family, and household, culture, political life outside organized parties, mass media, voluntary organizations, and so on." (Finlayson, 2005, p. 51). Membership in the lifeworld entails possession of culturally transmitted understanding; "scientific, artistic–literary, and moral–legal; and also the ability to enter into social relationships, guided by accepted social and ethical norms" (Braaten, 1991, p. 80).

According to Habermas, the lifeworld, "offers both an intuitively pre-understood context for an action situation and resources for the interpretative process in which participants in communication engage as they strive to meet the need for agreement in the action situation" (Habermas, 1990, p. 136). In other words, these unregulated spheres of sociality provide the context against which communicative action takes place. Habermas (1987) indicates that identity problems result from the fact that action systems grow out of the horizon of the lifeworld. The communicative infrastructure in the lifeworld is "threatened by two interlocking, mutually reinforcing tendencies: systemically induced reification and cultural impoverishment (Habermas, 1987, p. 327).

The system can only operate on the basis of resources of meaning that come from the lifeworld. The tendency of "the system to colonize the lifeworld leads to greater fragility and to disequilibrium or instability" (Finlayson, 2005, p. 56). The increasing unbalance between system and lifeworld leads to "social pathologies". When stripped of their ideological veils, "the imperatives of autonomous subsystems make their way into the lifeworld from the outside" (Habermas, 1987, p. 355). The consequence is that organizations disconnect themselves from cultural commitments and from attitudes and orientations specific to given personalities; "they also make themselves independent from lifeworld contexts by neutralizing the normative background of informal, customary, morally regulated contexts of action" (Habermas, 1987, p. 309).

To solve the problems connected to the system's colonization of the lifeworld we need to expand the perspective of economics aiming at a balance between the system and the lifeworld. The challenge today is to increase the domain of the lifeworld. In other words, economy cannot be separated from society without being trapped by the fallacy of misplaced concreteness.

4. Concepts and Principles in Ecological Economics

Anchored in the ontological and epistemological discussion in the previous paragraphs we are now ready to describe and discuss some of the concepts and principles that we find most relevant for ecological economics. Although we are aware of the discrepancies concerning the paradigmatic preconditions among researchers within the field of ecological economics we argue that the change; from economic man to ecological man, from quantitative growth to qualitative development, from top–down management to bottom–up initiatives, from competition to cooperation, from globalized power structures to local circular networks are of great importance.

4.1. The Ecological Man

The first consequence of changing from a mechanic, monodisciplinary perspective to an organic perspective is that the traditional idea of the economic man has to be discussed critically. Questioning the economic actor, described as a one-dimensional "economic man", motivated only by self-interest and competition is of great importance. As an alternative to the economic man we suggest an integrated, co-responsible ecological man, who cooperates with other actors and who is co-responsible. The ecological man, living in the lifeworld, behaves in the economical world in accordance with fundamental ecological and humanistic values (Ingebrigtsen and Jakobsen, 2009).

The ecological man is based on the idea that economy should be embedded in social relations, instead of what we find in capitalist societies "social relations are embedded in the economic system" (Daly and Cobb, 1994, p. 8). Daly and Cobb Jr. criticizing the idea that society merely consists of statistical aggregations of individuals, argue that society is something greater than the sum of its parts. Daly develops an ethical principle appropriate for the ecological man saying that ethics is closer to the "ethical good" than to the physiological or psychologically felt utility. The challenge of the ecological man is to find economical solutions wisely in the service of the common good.

4.2. Qualitative Development

The second consequence of changing to a transdisciplinary perspective based on an organic worldview is a critical reflection on replacing quantitative growth by qualitative development. One of the most serious problems today, with regard to the goal of sustainability, is that quantitative growth is the primary objective in mainstream economics. Daly argues that, since growth is unsustainable, we need a new ethics to guide the actions within the economy in harmony with the limitations of the natural world. It seems that our key challenge is how to shift from an economic system based on unlimited growth to one that is both ecologically sustainable and socially just. The new ethics is suggested by terms like "sustainability", "sufficiency", "equity" and "efficiency".

To capture this cluster of values in one sentence, Daly suggests the following formulation; "We should strive for sufficient pr. capita wealth – efficiently maintained and allocated, and equitably distributed – for the maximum number of people that can be sustained over time under these conditions" (Daly, 1996, p. 220). Sufficient is meant

to illustrate what is necessary for "the good life". He points out that for a good life it is necessary, not only to look upon humanly created well-being, but also to the sustainability of the natural eco-systems. One possibility is to optimize the total number of human beings that through the years can live with sufficient wealth.

Understanding based on transdisciplinarity makes it possible to formulate a new concept of qualitative growth. Qualities arise from processes and patterns of relationships among the parts. "Hence, we cannot understand the nature of complex systems such as organisms, ecosystems, societies, and economics if we try to describe them in purely quantitative terms" (Capra and Henderson, 2009, p. 7).

Qualitative development gives priority to an increase of complexity, sophistication and maturity that enhances the quality of life more than quantitative growth in production and consumption. Spontaneous emergence of novelty is one of the hallmarks of life and therefore creativity as a key property of all living systems and the origin of qualitative development, learning and evolution (Whitehead, 1978).

4.3. Bottom–up Initiatives

The third consequence of changing to an organic worldview is the need for a critical reflection on bottom–up initiatives. We argue that top–down management is adapted to a mechanic worldview. According to Binney and Williams (1995) bottom–up initiatives encourage responsiveness and learning based on a living systems model. The living systems model helps organizations flourish because they allow their people to develop their potential to the full (Binney and Williams, 1995). The contrary, they emphasize as the top–down metaphor: being mechanical and linked to the view that control is paramount. In accordance with the mechanic worldview a top–down approach to problem-solving begins at the highest conceptual level and works down to the details. A top–down approach is essentially breaking down a system in order to gain insight into its compositional sub-systems. A top–down model is often specified using "black boxes", these make it easier to manipulate. However, black boxes often fail to be detailed enough to realistically validate the model.

Used in economics the implication is that top–down analysis might begin with looking at macro-economic trends and the solutions consist of decisions made at the highest management level (nationally or globally). The steering media, money and power are all of great importance in top–down management. The handling of the crises connected to climate change and financial breakdown are typical examples of a "system approach" (top–down) to problem-solving. The political leaders and the CEOs in the central banks diagnosed the problems and ordered the most appropriate medicine to cure the illness in the economy, society, and nature — without questioning the importance of the lifeworld preconditions. In other words, the COP 15 solutions to the climate crises provide illustrative examples of how the systems colonize the lifeworld.

A bottom–up approach to problem-solving keeps in harmony with the organic worldview. The point is that individual elements (organisms in ecosystems, human beings in economics) interact and adapt to changing conditions. A bottom–up approach pieces together the systems to give rise to greater organic systems, thus making the original systems, sub-systems of the emergent system. In a bottom–up approach the individual base elements of the system are first specified in great detail. These elements are then linked together through inherent relations to form larger sub-systems, which are then in turn linked, sometimes at many levels; until a complete system is formed (everything hangs together).

This strategy often resembles a "seed" model, whereby the beginnings are small but eventually grow in complexity and completeness. However, this kind of "organic strategies" may result in a tangle of elements and subsystems, developed in isolation and subject to local optimization as opposed to meeting a global purpose. While top–down management is mainly based on a mechanic system approach, bottom–up initiatives are based on lifeworld conditions (organic systems).

4.4. Cooperation

The fourth consequence of organic transdisciplinarity is the need for a reflection on introducing cooperation as a substitute for competition as the steering principle in economics. It can be argued that the principle of competition is insufficient to establish solutions based upon an organic worldview. Welford stresses that "productive cooperation (…) always (will) be superior to blind competition and recognizing cooperative opportunities are part of recognizing interconnectedness" (Welford, 2000, p. 141). Hence, Welford's argumentation is based on the presupposition that the market cannot be defined as an aggregate of autonomous actors; instead the market must be considered an integrated whole.

Growing awareness of the interaction between the economy, nature, and culture increases the need for dialog and for developing new forms of coordination, both within the economy and between the various sectors of society. More generally we could say that we have to expand the domain of the lifeworld through establishing arenas for dialog and cooperation between companies, interest groups, authorities, and organizations. Dialog-based cooperation involves innovative approaches to many of the challenges related to economy, environment and society. The lifeworld not only forms the context for the process of reaching understanding, it also furnishes the resources to do this.

An important purpose of establishing formalized arenas for communicative and dialog-based interaction is to ensure that all actors involved are included in the identification, planning and implementation of concrete solutions. To be involved means either to "contribute" or to be "affected" by the action. In this way the actors are made responsible for the joint effort to realize the aims of sustainable development. According to this line of argumentation it is necessary to establish communicative arenas connecting actors in cooperative networks to secure a balance between mechanic and organic thinking, between system and lifeworld and between bottom–up and top–down initiatives.

Co-operation means that different actors in the market try to find solutions in which all relevant information and values are considered. In an economic context, the participants are typically defined as stakeholders. Freeman defines the organization's stakeholders as; "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman, 1984, p. 46). In practice, different stakeholders have their own values and aims, and the organization has to interact with the stakeholders for mutual benefit. Values are not reduced to preferences (weak evaluations), since the stakeholders' fundamental values (strong evaluations) are also taken into consideration (Taylor, 1985). In co-operative decisions the ideal is to establish a platform of consensus, i.e. to find solutions all stakeholders can agree upon. This way of thinking is different from voting in which the plain majority wins all power. In co-operation all the stakeholders have a common starting attitude saying; you may be right and I may be wrong (Habermas, 1990; Popper, 2011).

4.5. Local Circular Networks

The fifth consequence of shifting to an organic ontological platform and epistemological transdisciplinarity is the question concerning change of focus in the direction of local circular networks more than globalized superstructures. Introducing the concept "circulation economics" (Ingebrigtsen and Jakobsen, 2007) makes it possible to describe the interconnectedness between production, distribution, consumption, redistribution (reprocessing of waste) and new production. The internal circular processes are depending on input–output relations with society and nature. On the one hand, energy and materials are extracted from nature (low entropy) and different kinds of wastes (high entropy) are returned to nature. On the other hand, all kinds of economic activities

depend on knowledge and values created in society. Experience from economic practice is taken back to society. The transition from a linear model to a circular model implies that the ends of the value chain are tied up through connective links. In this way it is possible to connect the goals for reprocessing of waste with increased use of recycled materials in the production of new commodities.

It is important to stress that one should not recycle at any cost. Recycling may be inefficient both in economical and ecological terms. From an environmental point of view, it is unwise to use more energy or matter to keep the recycling process going than we gain from it. Alternatives to recycling are incineration, through which the energy contents are extracted. But this process can only happen once. When the material is destroyed by fire, it is lost forever. By recycling the material, multiple instances of exploitation are conceivable. The real value of recycling emerges from the framework of an integrated system of material, energy and waste management.

To be efficient, sustainable and fair, the circular networks in the economy should be based on cooperation through decentralized collaborative networks. According to Boulding, local circular networks perform better than what is possible through the enormous global power structures (Boulding, 1997). Schumacher follows the same line of argumentation when he claims that production from local resources for local needs is the most rational way of economy (Schumacher, 1993).

Giddens strengthens the argument by claiming that globalization leads to increased risks at different levels. When resources or services are no longer under local control, they cannot be locally refocused to meet unexpected contingencies, and "there is a risk that the mechanism as a whole can falter, thus affecting everyone who characteristically makes use of it" (Giddens, 1990, p. 126). To secure local control over resources and services, money is important. Money can be seen as the blood of the organism — not too much not too little. It is necessary to keep this balance to have a healthy organism and a healthy society. Local control over central resources and services is therefore important. Bottom–up initiatives have recognized that and introduced local currencies. This makes it easier to encourage "buy local first".

5. The Realism of Radical Solutions

According to Giddens there are four different adaptive reactions to crises we may face (Giddens, 1990, pp. 124–135); pragmatic acceptance, sustained optimism, cynical pessimism and radical engagement. Pragmatic acceptance means that we concentrate on day-to-day problems and forget about the big problems. Sustained optimism refers to a strategy where we believe that all problems can be solved by technological development. Radical engagement refers to an attitude saying that we should mobilize to solve the problems or reduce their impact on society and nature. Radical engagements which seek to further the possibilities of a fulfilling and satisfying life for all within a just and equal society are in accordance with the main goals of ecological economics.

As we have seen there is a need for fundamental changes in several areas. Giddens uses utopian realism to illustrate a strategy for this kind of deep change. Utopian indicates that the change needed is radical; realism indicates that the change can work in practice. To substantiate what is realistic Giddens refers to changes that can be found in practice.

When introducing solutions based on concepts and principles in ecological economics, the question is how this all would work in practice. In other words the concern is about implementation. According to Giddens the realism of the radical projects can be verified through examples showing that such policies are indeed already being implemented. According to Smith and Max-Neef it does create problems finding practical examples because; "The point is that policy is generally perceived as a macro top–down process that makes the news, and not as a bottom–up grassroots phenomenon that remains hidden in the consciousness of those directly involved in actions, and very rarely appears in the media" (Smith and Max-Neef, 2011, p. 172).

In this paragraph we will describe some examples indicating that principles and values in ecological economics are practiced in many different contexts in many different countries all over the world. To illustrate the realism in radical solutions we have chosen Transition Towns as an example.

Transition Towns were established at the beginning of the 21st century in Dartington, England. The Transition Town movement is based on initiatives trying to change existing cities, towns and villages in an environmental friendly and social integrative way, step by step. The focus is first and foremost on means to increase the local resilience and loosen the dependency on oil. Today there are more than 250 registered Transition Towns all over the world.

Hopkins argues that we have to rethink the stories underpinning our culture telling us that; "the future will be wealthier than the present, that economic growth can continue indefinitely, that we have become such an individualistic society that any common goals are unthinkable, that possessions can make you happy and that economic globalization is an inevitable process to which we have all given our consent" (Hopkins, 2009, p. 14). The stories are misleading and harmful for the economy (financial crises), the ecology (climate change) and society (stress, poverty and unfairness), and need to be transformed as soon as possible.

Transition Towns are initiated based on acceptance of "peak oil" and "climate change" the two great oversights of our times. Transition Towns is a way of thinking at what our future might hold, arguing that "by taking a proactive response rather than a reactive one, we can still shape and form that future, within the rapidly changing energy context, in such a way that it ends up preferable to the present" (Hopkins, 2009, p. 15). The transition movement offers the potential of an extraordinary renaissance — economic, cultural and spiritual by focusing on reducing growth;

- rebuilding local agriculture and food production,
- rethinking healthcare,
- rediscovering local building materials in the context of zero energy-building,
- rethinking waste management.

The aim is to change societies in the direction of increased local resilience by developing interconnecting processes within and between economy, society and nature. The main challenge is how significantly to increase resilience in existing societies through constructive evolutionary change processes.

The process starts when a group of motivated people within the local community come together to exchange ideas about how to respond to the challenges, and how to exploit the opportunities (bottom–up). The Transition Model points to some ideas of how to start the process by engaging a significant proportion of the people. The transition model includes the following stages (http://transitiontowns.org/) focusing on lifeworld thinking:

- awareness raising around peak oil, climate change and the need to undertake a community lead process to rebuild resilience and reduce carbon
- connecting with existing groups in the community
- building bridges to local government
- connecting with other transition initiatives
- forming groups to look at all the key areas of life (food, energy, transport, health, heart & soul, economics & livelihoods, etc.)
- kicking off projects aimed at building people's understanding of resilience and carbon issues and community engagement
- eventually launching a community defined, community implemented "Energy Descent Action Plan" over a 15 to 20 year timescale.

As stated in the different points, the basic idea is that all projects aiming to reduce the use of fossil fuels and reducing CO_2 emissions

are based on communicative processes and cooperation between the involved actors. To increase the resilience a range of coordinated projects across all areas of economic and social life must be implemented. It requires the same amounts of creativity, ingenuity and adaptability to find solutions to the problems we face today (reducing the use of oil), as we needed on the way up the energy upslope. Instead of competing to find the most efficient solutions it is necessary to cooperate on integrated solutions and start acting early enough to create a way of living that is significantly more connected, more vibrant and more in touch with the environment than the oil-addicted treadmill we find ourselves on today.

Transition Towns is based on the precondition that climate change and the peak oil challenge are interwoven and must be considered as a whole (organic thinking). This means that we have to handle the problems connected to climate change and carbon reduction simultaneously. The transition initiatives make it feasible, viable, and attractive to do so.

If a local society wants to start a transition process they have to follow a checklist of items to be registered as a Transition Town (TT). This formal approach to registering Transition Initiatives hinges on a couple of key raisons d'être. Firstly, the trustees and funders of Transition Towns want to make sure that they promote to "official" status those communities which are ready to move into the stage at which additional levels of support such as speakers, guidance, materials, trainings, webspace, wiki, training, and networking forums are given. Secondly, in order to establish coordinated programs they need a formally established category of Transition Initiatives. Every Transition initiative depends on the mindset of the group driving the project and the connection to the local authorities. Thirdly, there is a commitment to participate in the communicative network by regularly contributing to the blog, giving presentations to other communities, working cooperatively, and striving for inclusivity. These criteria develop all the time, and are certainly not written "in stone".

TT forms groups to look at all the key areas of life (food, energy, transport, health & soul, economics & livelihoods, etc.). Therefore TT must focus on and balance both mechanic and organic issues.

It is of great importance to notice that TT is characterized by increased attention to the system domain. In other words, TT tries to establish a balance between the domains of system and lifeworld. The consequence of this attitude is that TT must renounce on the autonomy and perhaps on lifeworld issues. We find a balanced perspective regarding the interplay between "system" and "lifeworld". The lifeworld conditions are focused in a way that indicates that the problems in the modern society connected to the systems colonization of the lifeworld are being counteracted.

TT focuses on local resilience and actualization of (the extended) self is a vital part of the program. To develop resilience, TT also focuses on the material dimension and therefore has to balance between matter and spirit. TT also prefers local small-scale solutions.

TT is part of the existing society but the initiative to change comes from a group of engaged people wishing to cooperate with the local authorities to find solutions to specific problems. TT is based on bottom–up management ideas even if the authorities are invited to participate. The initiative to change comes from below. TT is based on cooperation and communication and not competition. TT agrees that the problems we face today concerning economy and natural and social environment are integrated and need to be solved through cooperation between the involved actors. TT invites everybody (in principle) to participate in cooperative networks and has to balance between bottom–up and top–down thinking. Local currencies as a mean for control over resources and services are also recognised as important for TT.

To be more specific, in Transition Town we find companies expressing an intention to contribute to generating positive social and societal spill-over effects of their economic activities. However, the problem is that in spite of more effective and less polluting methods of production, the problems connected to the rise in production and consumption more than outweigh the positive effects related to environmental and societal problems. It is therefore necessary to look at solutions that can possibly slow down the immense growth in the extraction of natural resources and emissions of waste to the eco-systems that prevent the eco-systems unfolding their potential.

6. Conclusion

In this article we have focused on how to solve the deep conflict existing between mainstream economics and the natural and social conditions. To harmonize the connection between economy and the environmental conditions we argue that it seems necessary to develop ecological economics based on an organic worldview (ontology) and a holistic science (epistemology) anchored in strong transdisciplinarity.

From the ontological and epistemological discussion we concluded that it was relevant to distinguish between two paradigms, one focusing on one-dimensional economic rationality, quantitative growth, top–down management, competition, and linear value chains; and another concerned with multi-dimensional rationality, qualitative development, bottom–up initiatives, cooperation, and circular value chains.

We formulated some of the consequences of this deep shift in different concepts and principles. In ecological economics the economic man is replaced by the ecological man. The ecological man lives in the lifeworld, and he/she behaves in the economical world in accordance with fundamental ecological and humanistic values. Quantitative growth is replaced by qualitative development. Qualitative development is focused on complexity, sophistication and maturity that enhance the quality of life more than quantitative growth in production and consumption. This means bottom–up initiatives — instead of top–down management. The creativity to ask new questions and to find new solutions is stimulated at local level. Instead of competition between actors in an atomized market, the basic market principle in ecological economics is cooperation between interrelated actors.

Following this line of argumentation it follows that economic activity should be based on nearness between resources, production, consumption, the reprocessing of waste. In other words, local networks are better than globalized superstructures. In addition to the topics discussed above we are aware of the importance of changing the monetary system in accordance with the principles in ecological economics permitting local currencies. We also accept that the transformation towards ecological economics depends on political initiatives to change some of the fundamental societal institutions. In the last paragraph we argued that it is possible to implement ecological economics in practice, despite the fact that the principles may seem utopian, by referring to examples showing that ecological economics does actually work in many cases already.

References

Bhaskar, Roy, et al., 2010. Interdisciplinarity and Climate Change — transforming knowledge and practice for our global future. Routledge, London.
Boulding, Kenneth E., 1997. What do we want to sustain? Environmentalism and human evaluations. In: Costanza, R. (Ed.), Ecological Economics — The Science and Management of Sustainability. Columbia University Press, New York.
Braaten, Jane, 1991. Habermas's critical theory of society. State University of New York Press.
Capra, Fritjof, 1982. The Turning Point — Science, Society and the Rising Culture. Flamingo, London.
Capra, Fritjof, 1995. The web of life — a new synthesis of mind and matter. Flamingo, London.
Capra, Fritjof, 2007. The Science of Leonardo. Anchor Books, New York.
Capra, Fritjof, Henderson, Hazel, 2009. Outside insights qualitative growth. Sustainable Business October.
Costanca, Robert, 1991. Ecological Economics — The Science and Management of Sustainability. Columbia University Press, NY.
Daly, Herman E., 1996. Beyond Growth — The Economics of Sustainable Development. Beacon Press, Boston.
Daly, H.E., 2007. Ecological Economics and Sustainable Development. Edward Elgar, Northhampton.

Daly, Herman E., Cobb, John B., 1994. For the Common Good – Redirecting the Economy Toward Community, the Environment, and a Sustainable Future. Beacon Press, Boston.
Finlayson, James Gordon, 2005. Habermas — A Very Short Introduction. Oxford University Press.
Freeman, Edward, 1984. Strategic Management — Stakeholder Approach. Pittman, Boston, MA.
Binney, George, Williams, Collin, 1995. Leaning into the Future. Nicholas Brearley, London.
Giddens, Anthony, 1990. The Consequences of Modernity. Stanford University Press.
Habermas, Jürgen, 1987. The Theory of Communicative Action —Lifeworld and System: A Critique of Functionalist Reason. Beacon Press, Boston.
Habermas, Jürgen, 1990. Moral Consciousness and Communicative Action. The MIT Press, Massachusetts.
Hopkins, Rob, 2009. The Transition Handbook — From Oil Dependency to Local Resilience. Green Books, Foxhole.
Ingebrigtsen, Stig, Jakobsen, Ove, 2007. Circulation Economics. Theory and Practice. Peter Lang, Oxford.
Ingebrigtsen, Stig, Jakobsen, Ove, 2009. Moral development of the economic actor. Ecological Economics 68, 2777–2784.
Jahn, Thomas, Bergmann, Matthias, Keil, Florian, 2012. Transdisciplinarity: between mainstreaming and marginalization. Ecological Economics 79, 1–10.
Max-Neef, Manfred, 2005. Foundations of transdisciplinarity. Ecological Economics 53, 5–16.
Max-Neef, Manfred, 2010. The world on a collision course and the need for a new economy. Ambio 39, 200–210.
Popper, Karl R., 2011. The Open Society and Its Enemies. Routledge Classics, London.
Røpke, Inge, 2005. Trends in the development of ecological economics from the late 1980s to the early 2000s. Ecological Economics 55, 262–290.
Schumacher, E.F., 1993. Small is Beautiful — A Study of Economics as if People Mattered. Vintage, London.
Smith, B. Philip, Max-Neef, Manfred, 2011. Economics Unmasked, From Power and Greed to Compassion and the Common Good. Green Books, Cornwall.
Spash, Clive L., 2012. New foundations for ecological economics. Ecological Economics 77, 36–47.
Taylor, Charles, 1985. Human Agency and Language — Philosophical Papers 1. Cambridge University Press, Cambridge.
Welford, Richard, 2000. Corporative Environmental Management — Towards Sustainable Management. Earthscan, London UK.
Whitehead, Alfred North, 1967a. Science and the Modern World. The Free Press, New York.
Whitehead, Alfred North, 1967b. Concept of Nature. Cambridge University Press, New York.
Whitehead, A.N., 1978. In: Ray Griffin, D., Sherburne, D.W. (Eds.), Process and Reality, Corrected edition. The Free Press, New York.

Further reading

http://transitiontowns.org/.