

Living Societal Systems Meaning and Multiple Values for Quality of Life

Harry Donkers
Independent researcher
Innonet
Irenestraat 3H
5141 GJ Waalwijk
The Netherlands

Abstract

In our world we are faced with major problems and crises, such as climate and food crisis, poverty, AIDS, etc. In the paper we argue that the effects of the problems and crises can be mitigated or solved with less harm when we learn more from living natural systems, realizing that the phenomenon of consciousness is a fundamental characteristic that man distinguishes from the world of animals and plants. We develop a new Living societal systems model starting from the elements of living natural systems, such as source of energy, reproduction, biodiversity and evolution, and translating them into elements of living societal systems. Core of the findings is located in addressing two main factors. The first one is taking responsibility for a meaningful life for which in this paper we develop the concept of 'reciprocal solidarism'. The second one is the concern for reproductive cycles of multiple values for which in this paper we develop the concept of 'creative moderation'. These two factors can be seen as forms of the bipolar development lines competition versus cooperation and renewal versus control, respectively. These developmental lines fit into an ontological coordinate system that serves as a tool for further analysis of living societal systems. To work this out we develop a classification of multiple values and discuss the autopoietic pattern of living societal systems. We look at innovation, which we interpret as the analogue of evolution, pay attention to the structure and process of living societal systems and discuss the role of boundaries and levels. Though living societal systems are in principle self-organizing, in practice we see a lot of phenomena that interfere with self-organizing systems. Therefore it is necessary to guide or manage the developments, based on a thorough measurement. This societal systems management consists of five management categories: management of multiple values, multiple values cycles' management, process management, structural innovation management and multi-level management. We present some examples. It is not necessary in living societal systems to build systems from scratch on. Well-chosen targets or lever points suffice. The paper ends with conclusions and an indication for further work.

Keywords: living systems, living societal systems, meaning, reproduction, multiple values, reciprocal solidarism, creative moderation

1. Introduction

People realize that in our days we are faced with major problems and severe crises, such as food crises and poverty, AIDS, climate crisis, sustainability and health problems, mental diseases, societal and inner-city-decays, and recently, the bank crisis. Well-being of mankind is heavily threatened. These problems plague our world and touch each and every one of us. There are at least two basic causes of these problems and crises. It is our opinion that these causes are located in a neglect of meaning and an exaggerated attention towards monovalues (pure economic and financial or monetary) in our modern society. This inspires us to incorporate these two phenomena in a new approach in the field of complexity and living systems theory. We discuss what we can learn from the living systems in nature and apply their basic principles to living societal systems. As in living natural systems, the sun is the source of energy and life is (re)produced, in our concept of living societal systems 'meaning' is the source of energy and 'values' are (re)produced. As biodiversity is an essential component in living natural systems multiple values are essential in living societal systems. Upon these assumptions we develop a living societal systems model to deal with the abovementioned large problems and crises. In our approach, it is not necessary to see the societal world as an engineered society, but it is enough to intervene if certain basic conditions are not met.

Section 2 begins with living systems theory, identifying analogies in the societal world. It turns out that meaning and reproduction of multiple values play a central role. In section 3 it appears that living societal systems to function as self-organizing systems require two balancing items, which we name reciprocal solidarism and creative moderation. These balancing items are linked to competition versus cooperation and renewal versus control, respectively, and fit in a coordinate system with an individual - collective dimension on the one hand and an inside - outside dimension on the other hand. The coordinate system helps us to analyze living societal systems. Section 4 presents a classification of values, multiple values consistency is systematically observed and multiple values cycles are discussed. In section 5 we discuss the adaptive aspects of living societal systems, both incremental and radical. The structure and processes in living societal systems is discussed in section 6. Section 7 deals with boundaries and levels in living societal systems and goes further into the interlinkages between levels. Though living multiple values systems are in principle self-organizing, some phenomena may interfere with self-organizing systems. This asks for a societal systems management, which will be discussed and illustrated with some examples in section 8. Section 9 contains some conclusions and presents recommendations for further work.

2. Outline of the Living Societal Systems Model

Since the thirties of the last century a scientific view was developed on the prevailing deductive and mathematical paradigm of science in physics and technology: testing single phenomena in laboratories. Biologists argued that facts should not be studied in isolation, but in relationship with each other. A general systems theory (cybernetics) was developed, which provided ideas of backward linkages and self-regulating and, later, self-organization. This led to a coherent theory about living systems, and integration of matter and form. Maturana and Varela (1989) used the term autopoiesis for such a system that is capable of reproducing and maintaining itself. Autopoiesis is the (organization) pattern of life (Capra, 1996). In literature several other authors are working on complex and living systems: Bertalanffy (1968), Miller (1978), Luhmann (1990), Kneer & Nassehi (1993) and Holland (1995).

Basic elements of living natural systems according to the abovementioned authors are: utilization of energy, reproduction (cycles), diversity, evolution, structures and processes, boundaries and levels. In this section we start from these elements and identify analogies in the societal world. See Table 1 for a summary.

Table 1: Comparing Natural and Societal Systems

	Natural systems	Societal systems
Source of energy	Sun as the source of energy	Meaning as the source of energy
Reproduction	Reproduction of life (cycles)	Reproduction of values (cycles)
Diversity	Biodiversity of life	Multiple values
Adaptation	Evolution (natural selection, mutation)	Innovation (social, technological causes)
Structure	Structures, like the organelles (i.e. DNA) in a cell	Aims of actors, value creation, sources, communication and institutions
Process	Processes, like the metabolism in a cell	Goals, learning, realization and validation
Environment	Boundaries, open to the environment, like membranes in a cell	Boundaries and levels

In natural systems the sun ultimately functions as the source of energy. Solar energy flows from photosynthetic organisms through food chains to organisms at the top of the food pyramid. When applying living systems theory to societal systems we appeal, along the thoughts of Luhmann (1990), to the concept of 'meaning' as the ultimate source that provides energy to the system. What all people want is stipulating a meaning in their lives. The process of meaning, as a value, is a universal process, which confronts everybody in this world.

In the context of self-organization the notion of entropy is important. Entropy is the aspiration of all systems towards the largest possibility of freedom or chaos. An ordered system will change spontaneously in a system of disorder. According to the second law of thermo dynamics self-organization in a chaotic system is only possible if energy is added. And that is exactly what happens in natural systems by the sun and the radioactive processes in the deep-earth.

Therefore, in nature the self-organization principle is a spontaneous process where some form of global order or coordination arises out of the local interactions between the components of an initially disordered system. In social systems energy is added by the concept of meaning. This behavior, arising from the consciousness of human beings, suggests that self-organization (decentralization) could also be expected in living social systems.

Living organisms distinguish themselves by the ability of (re)production. In natural systems 'life' is produced and reproduced. What could be the basic element of (re)production in societal systems? Luhmann (1990) takes 'communication' as a basic element. We think this is a too narrow basis for societal systems. Communication indeed is an important element, but it is, just like the aims of the actors themselves, part of the structures and processes of societal systems. In our opinion 'values' are key elements in living societal systems. Values can indeed be seen as recursively produced and reproduced in societal systems. The significance of a value, which is initiated by a need, is eventually followed by a satisfaction, and lead to possible adjustments or renewals of the needs. This adds a dynamic element that bridges the succeeding values: the (re)production of values. We distinguish between different kinds of values, using the symbol of a 'value tree' to present the coherence. Reproduction takes place in cycles. From nature we learn that cycles play a critical role in the development of life. In societal systems we also recognize succeeding life cycles. The importance of cycles translated to societal systems means that we should look at value streams and cycles.

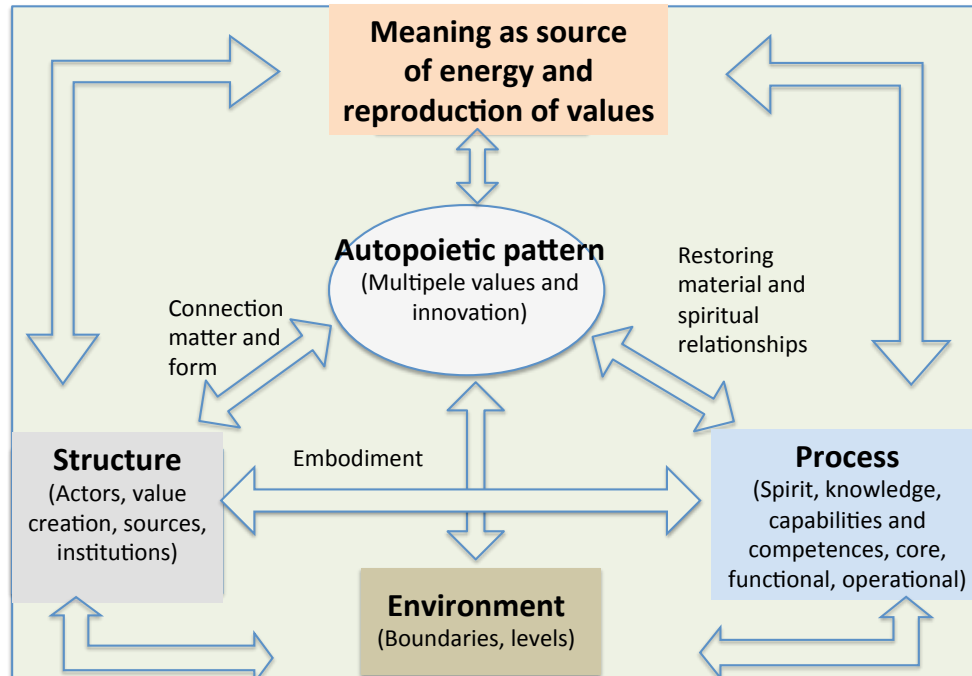
Biodiversity is the most characteristic feature of life. Natural systems are successful and prepared for unknown challenges because of their heterogeneity. In our societal systems, where we have values as basic elements, this means that we must not only look at values, but at 'multiple' values. This means that we take into account the different aspects of values, such as ethic, cultural, social, economic and ecological aspects.

Living natural systems are adaptive systems. Evolution in Darwinian theory is the ability in living natural systems to currently survive and to meet the challenges of the future. Natural selection and mutation are key mechanisms of evolution in natural systems, constantly realized through balancing of competition versus cooperation and renewal versus control respectively. Transposed to living societal systems innovation takes the place of evolution. In innovation, often induced by societal and/or technological causes, also balancing competition versus collaboration with suppliers and competitors and renewal versus sustaining mechanisms are crucial. Evolution has incremental and radical impacts. Radical variations could arise by the creative power of mutation, and the 'mutation-selection theory' or 'mutationism' says that these variations could be inherited to offspring through stable non-mixing genetic factors. As evolution innovation has continuous incremental impacts (exploitation) and discontinuous radical impacts (exploration). A system is composed of interrelated parts or components (structures) that cooperate in processes (behaviour). The incremental changes influence the process of a system while the radical changes influence the structure of a system.

Every living system functions unique and has properties and features that none of the components can achieve separately. Living systems are systems with 'boundaries' that are open to their environment. Certain conditions are necessary, both within the system and with respect to the environment. Living systems are entirely on its own and at the same time a part of a larger whole, building a level structure.

As in Table 1 is summarized, we conclude that the living values systems applied to society in principle are self-organizing systems that interact with their environment and consist of actions for realization of meaning and reproduction of multiple value streams and cycles on the basis of an autopoietic pattern, structures and processes. The elements: meaning, reproduction of values, multiple values, cycles, innovation, environment, structure and process are mutual interdependent. By placing them in a network of relationships we obtain a scheme of the Living multiple values systems model, as is done in Figure 1.

In this model the basic components of a (societal) living system are scheduled. At the center of this model is autopoiesis. We recognize the (organization) pattern of Capra (1996). The embodiment of this pattern is laid down in the structure. The process creates a continuous embodiment. The relationship between pattern and structure connects matter and form. In Capra's view it is the pattern, structure and process that is of interest in living systems. There is also a difference between our view and that of Capra. In our view the autopoietic pattern is linked to meaning and reproduction of values. In this way the pattern, structure and process is, as it were, governed by meaning and reproduction of values.

Figure 1: Living Societal Systems Model

In practice, we often see that value streams and cycles are hampered. E.g. in history stirring time periods occurred, attended by serious crises and conflicts. We think that in practice societal systems can adapt to changing conditions. This principle of self-organization, however, only works when no disturbing factors are present. So it is necessary to guide living societal systems by societal systems management, based on a thorough measurement of the relevant aspects. This makes it possible to restore the value streams and cycles where they are interrupted.

3. Meaning and Reproduction of Values

3.1 Reciprocal Solidarity

The maintenance of living things depends upon their ability to use energy. As the sun is the ultimate source of energy in natural systems we propose to use the concept of 'meaning' as the ultimate source of energy in societal systems. Thinking about meaning is a search for meaning, sense or aim of life, and the feelings and thoughts thereby. This is a universal process, a primitive activity with which everyone in this world is confronted with. When this process is interrupted, life is ruined. Meaning is a logical consequence of consciousness. Consciousness is one of the most striking differences between natural and societal systems. It is a characteristic that man distinguishes from the world of animals and plants. Consciousness is the core of human beings. The free will, which can be seen as the core of consciousness, is the driving force of the concept of meaning.

Swaab (2011) means that a 'free will' of humans is an illusion because structure and function of the human brains will be determined by heredity and environmental influences in an early stage of human development. We think this thesis is too extreme. We argue that freedom and a free will exists. The search for meaning has played, and still plays, a large role in the development of mankind and society. This process of meaning is experienced by people, both individual and/or in social connections, in many different ways.

As De Waal (2013) argued the origin of our morals is older than man and lies in nature. He gives examples of behaviour of anthropoids or other social animals that goes in the direction of altruism and empathy. They help each other in a way that interferes with their own interests. We interpret this phenomenon as a natural conviction that tells us that social beings realize that they only can survive in reciprocity. On the one hand we have to deal with the limitations or restrictions of the self with an eye on room for the other, and on the other hand we have to deal with limitations or restrictions of the other with an eye on room for the self. This is a kind of social solidarity, reciprocal solidarity or twin solidarity. To stress the two-sided dimension of this ethics we call this concept 'reciprocal solidarity'.

What all people want is stipulating a meaning in their lives. Meaning, sense or aim is to be shaped by different ways. Most people do this on the basis of moral or spiritual intuitions. Taylor (1989) distinguishes between 3 sources of meaning (moral dimensions):

- a. People may lay claims to respect;
- b. Strong validation (in fact an order of values because we value some things higher than others);
- c. Dignity.

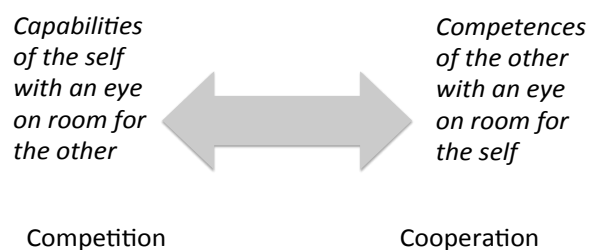
The explicit backgrounds of these dimensions are called ‘frames of reference’. From these frames ‘meaningful connections’ emerge. That could be visions, convictions, beliefs or religions.

Different thoughts about meaningful connections all have roots in this reciprocal solidarism. In a mentalist conception meaning, sense or aim is shaped by oneself. This conception indicates that meaning has an origin in the world. In a spiritual conviction one may put in the center a higher power, a Supreme Being or God. In this conviction human internal has a transcendent origin, of a divine, higher reality or other nature. Within spiritualism we can distinguish between nominalism and religion. Nominalism is a human created philosophy of life. Religion may consist of a belief in non-theistic (natural) worldviews or belief in theistic worldviews (creation by a god). However, the different thoughts about meaningful connections were and are often a source of conflict. A basic reason for this could be that the conceptions of meaningful connections, that people use, sometimes were and are seen as (too) dogmatic.

We think that a view where people realize that they only can survive in reciprocity could be a basic starting point in the search for meaning. Herewith the inter-human responsibility comes into the picture for other persons or groups of persons. It means appreciation for the self and for the other. Room for the self and for the other is, however, not possible without some limitations or restrictions.

Ancient philosophers through the endeavours towards a virtual life, how to live, answered the question. In the course of ages, this puzzle picture disappeared to the background. Since the eighties of the former century Amartya Sen and Martha Nussbaum (Nussbaum, 1994) again paid attention to the virtues. They developed a capabilities approach that could establish a world of global justice, when supported by all democracies. These are in fact individual capabilities. Some of these capabilities can be seen as capabilities of the self with an eye on room for the other. In our concept of reciprocal solidarism we also should need collective competences of the other with an eye on room for the self. Balancing reciprocal solidarism is a dynamic adaptive phenomenon.

Figure 2: Balancing Reciprocal Solidarism



Balancing reciprocal solidarism can be seen as a form of competition of living organisms that co-exist in the same environment for selfish benefit versus cooperation of groups of organisms for their common mutual benefit. This is linked with the process of natural selection that, as we saw in the previous section, is one of the mechanisms in the evolution of living systems.

Many people live according to reciprocal solidarism, without even realizing this constantly, but many don't. This is a serious question that demands for a continuously weighing of interests. This will get crucial on moments that decisions are required. Then it is important that one shows readiness to balance these interests, so that a dialogue is possible, that could lead to realizing reciprocal solidarism. There are various fields of tension. We mention the tension: good – evil (Epicurus).

According to Elias (1982) involvement hinders a good development of social sciences in the tension: involvement – reserve. Another field of tension relate to freedom. Freedom is a concept that is hard to define. Charles Taylor distinguishes between freedom as an opportunity-concept and freedom as an exercise-concept. This is related to the distinction between negative and positive freedom. Negative freedom is passive and is about maximizing the range of choice and minimalist policy (as in neo-liberalism). That demands for a struggle for freedom (Gescinska, 2011). With a link to the capabilities approach of Martha Nussbaum we can say that positive freedom is about what a human is able to do. Authenticity and autonomy are important factors (Joep Dohmen). With freedom we have a great moral responsibility (Sartre) and ‘fear for freedom’ (Erich Fromm) may exist, that can turn into totalitarianism. Existentialism interferes with essentialism, which originates from the idea that humans are predestined for something in advance.

Meaning forms the basis of living societal systems. Reciprocal solidarism as a form of balancing competition versus cooperation is the mechanism to realize this. It is, however, not so self-evident as balancing competition versus cooperation in natural systems. It is coupled with a struggle and with the development of capabilities and competences. In section 4 we go into further detail with respect to these values.

In living natural systems competition is a critical force. Regarding competition, the individual that is better adapted to the environment, will survive and pass on its genes to the offspring. Competitive interactions occur when a positive change for one component goes at the expense of other components. This definition states that competitive interactions will occur when a component’s increase in gain implies a decrease in the benefit, or performance, of other components. An example of competition in natural system is the working of immune systems. When a lymphocyte encounters a new pathogen, which is a biological agent that causes disease, at first the detection and response will be slow. The reason for this is that there are only a few lymphocytes that can bind to the new pathogen. To increase the efficiency of the immune system, the activated lymphocytes will start to clone themselves and will therefor grow exponentially. In the mean time the pathogens will also replicate and grow exponentially. Hence there arise competitive interactions between these two components. The pathogens struggle to survive while the lymphocytes struggle to keep the pathogens out of the body.

This doesn’t mean that competition is the only force in natural systems. Also cooperation enables components of natural systems to do extraordinary things. Within natural communities close cooperative loops are formed resulting in indirect benefit to all species involved. Cooperative interactions occur when a positive change for one component also increases the collective benefit of a group of components. Hence cooperative interactions occur when a component shares its prize or gain with other components. An example of cooperation is finding a shortest path between a food area and the nest of ants in a colony. Deneubourg et al (1990) showed that ants that are presented with a choice of several paths from the nest to a food area would choose the path with the strongest pheromone trail. Though in the beginning neither path have a strong pheromone trail, the ants that selected the shortest path will return to the nest earlier than the ants that selected the longest path. New ants will then select the shortest path because it has a much stronger pheromone trail. The pheromone trail on the shortest path will thus increase in strength and most of the ants will select this path.

The driving force for a lot of the complex biological systems in nature therefore is cooperation and competition. Balancing competition and cooperation is realized in nature. Natural organisms find a harmony between concern for living on their own and the practice of working together. Understanding these interrelationships form examples for mastering balancing between competition and cooperation in the human world. We conclude that there is some parallel between reciprocal solidarism in societal systems and natural selection in natural systems.

3.2. Creative Moderation

Living organisms distinguish themselves by the ability of (re) production. In natural systems ‘life’ is produced and reproduced. These systems maintain by the production of basic elements out of basic elements and form an emergent level of order with its own dynamics. So are the components that are produced in a living cell again included in the network that these components produced. Also societal systems are networks of elements, which produce elements on the basis of their elements.

Luhmann (1990) makes a parallel between autopoiesis in natural systems and autopoiesis in societal systems. Luhmann select communications as the basic elements of societal systems. Seidl (2004) provides a good survey of this. We don’t follow Luhmann in his choice of communications as productive and reproductive elements. He sees transactions as communication.

Economic transactions are seen as economic communications. Such a concept is too broad and adds little. Communication indeed is an important element but it is, just like the aims of the actors, part of the structures and processes of societal systems. We choose a different approach. In our opinion 'values' are recursively produced and reproduced by a network of values in societal systems.

We take values in value streams and cycles as productive and reproductive elements. To a large extent we can use analogues thoughts of Luhmann to demonstrate that values can be seen as basic elements of societal systems.

This is not an asymmetric process of conveyance of signification of goods and services of a supplier to a demander. We must not see values as properties of separate products or services, but as an – analytic - combination of three components, each realized by selection:

1. Needs (perception of values) (which value is desired);
2. Ability to realize a perception (forms of will with capacities and support) (how to realize a value and why);
3. Satisfaction (realization of the value perception) (the difference between perception and the ability to realize this) (the extent to which the need has been met) (manifestation of interests of actors).

Needs originate from the nature of the actors. Needs are connected with meaning. That's why needs are never individual, but always interfere with the way somebody standing in life. Also, it is not necessary that the ability to realize a perception is individual, which means that it is not necessary that everybody themselves develop the capacities to realize their own needs. People may develop capacities with a need on other fields that can be exchanged as counter offer to an offer of the desired value. This is the process of labour division. The significance of a value is ultimately determined by satisfaction, by the degree to which the realization of value perception contributes to the desired value.

Only as a unity the three selections form a value. Values are pure societal, and cannot be attributed to one individual.

Whose satisfaction is at stake? It is about satisfaction/completion, implicated by next values. Thus, the signification of a value (what difference a value makes for later values) is just retrospectively defined by later values. It is about a satisfaction/completion on the level of a 'value stream'.

The determination of a value in retrospect by succeeding values (in the value stream) connects to a fourth selection type: accepting or rejecting of the signification of the value and the accompanied adjustment or renewal of the needs. This is already a part of the next value.

The distinction between satisfaction and accepting or rejecting the signification of a value and the accompanied adjustment or renewal of the needs (as part of the next value) adds a dynamic element that bridges the succeeding values. This completes the process of (re) production of values. For a further discussion of reproduction see a.o. Karl Marx (*Das Kapital*), and also Althusser and Balibar (1970), Gramsci (1971) and Burawoy (1976).

Values do not merely exist, but have to be produced and reproduced. In accordance with the general autopoiesis concept values only exist as values by their relationship with other values. In this sense it is the network of values, which produces values. In other words it is the context of other values that makes it count as value. Notably only values can realize values.

Margulis (1998) and other scientists argue that all life on Earth began from bacteria. As a consequence, the evolution of bacteria to all forms of life we find today is a reflection of the natural abundance and creative capacity of living organisms. Similarly to living organisms, societal organizations must maintain an abundance and creative mentality and increase their capacity to create. There is a certain hierarchy in needs (Maslov). That means that also many dimensions adhere to perception of values. In realizing these perceptions one must take into account of this diverse values (multiple values). The signification of a value, at the level of the value stream, will also deal with the diverse values. E.g. a need leads to a selection of modes of production for certain products or services, to a certain satisfaction and to a new need. These processes are steered by and supplied with energy by meaning.

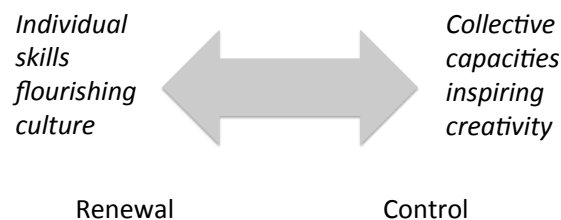
In nature performances, such as the 'birth' of a new species, are continuously embedded in the current abundance of the natural living systems. In societal systems innovation events occur that may contribute to economic prosperity, but also may have negative effects when these events are not correctly embedded in societal systems.

E.g. an innovation in a new transport technology may have positive effects on logistic services, but may also have negative effects on biodiversity, if not correctly embedded. Biodiversity is required to maintain the function of ecosystems. For maintaining multiple ecosystem functions simultaneously over time, even higher levels of biodiversity are required (Pasari et al, 2013). In practice some developments just happen, and afterwards comes the thinking. E.g. the world wide Internet is realized in practice, and only now we are going to think about the use of it. The same is the case with social media. We notice two struggling forces: creativity and embedding new developments in living systems.

We need to arrive at a certain weighing of these two forces. If not implemented correctly we may have to deal with unwanted developments. So is our post-liberal society, as seen by Sloterdijk (2013), a hybrid synthesis between a technological avant-gardism and an eco-conservative moderation. Therefore we need a balancing effort between what is possible and what needs to be maintained in order to allow value reproduction in the future. We call this concept ‘creative moderation’.

This concept should not be confused with the concept of ‘creative destruction’ that Schumpeter introduced in the fifties of the last century to indicate that new technology was a source of well-being and economic growth even if it destroyed old technology. As the pace of technological development was relatively low, this stimulation was understandable. We now live in a different time. Innovation speed has increased and technological development is growing explosively, which leads to a complexity that is likely to be out of control (Arthur, 2009). In this concept of creative moderation we need individual (creative) skills that flourish in the culture on the one hand and collective moderation (control) capacities that allows (or even inspires) creativity on the other hand.

Figure 3: Balancing Creative Moderation



Balancing creative moderation is a dynamic adaptive phenomenon, see Figure 3. It can be seen as a form of renewal of living organisms to survive in an environment versus control of groups of organisms for embedding in the same environment. This is linked with the process of mutation that, as we saw in the previous section, is one of the mechanisms in the evolution of living systems. In natural systems species experience spontaneous genetic mutations that provide novel traits. Nature selects the most beneficial trait, passing them along the subsequent generations. In natural systems this balancing activity is the process of mutation. We conclude that there is some parallel between creative moderation in societal systems and mutation in natural systems. It is, however, not so self-evident as balancing renewal versus control in natural systems. It is coupled with a struggle and there are skills and capacities needed to deal with this. In section 4 we go into further detail with respect to these values.

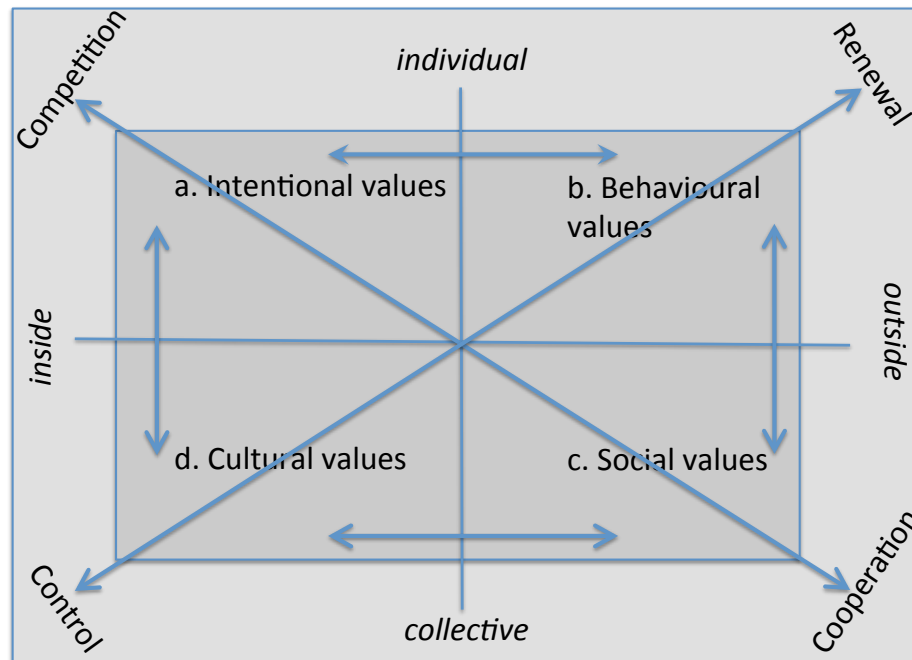
3.3 Ontological Scheme of Values

We now combine the results of the previous subsections with the ontological scheme of Wilber (1996) and ideas derived from Schwartz (2006) in his study on basic human values. This gives us a coordinate system, as in Figure 4, that is ideally suited to serve as a basis for the analysis of meaning and multiple values in living societal systems.

The ontological scheme in Figure 4 is a two-dimensional framework of an inside-outside dimension and an individual-collective dimension. The horizontal axis depicts the interior-exterior dimension that corresponds to the subjective/reflective experience in relationship to the objective or behaviour-based reality.

The vertical axis displays the individual-collective dimension, which refers to the relationship of the experience of self-agency and that of community. The axes divide the system into the four quadrants that correspond with the ontological scheme of Wilber (1996).

Figure 4: Ontological values scheme



Source: Own survey, derived from Wilber (1996) and Schwartz (2006)

The arrows in Figure 4 depict the dynamic development lines. We recognize that the discussions of reciprocal solidarism and creative moderation in the previous subsections fit in this scheme, being analyses within the category of values related to meaning (competition versus cooperation) and to reproduction of values (renewal versus control), respectively.

Development of Values Cycles (Congruence)

The horizontal and vertical arrows in Figure 4 show the dynamic development lines, that Schwartz (2006) mentions the cyclical development lines, portraying the pattern of relations of congruity among values. These arrows are telling us that the quadrants are not sharp divided, but there is a smooth path from one quadrant to the other. This also corresponds with the observation that in living systems there is a circular structure. In organizations these arrows symbolize the continuous and incremental change that organizations go through. These may include 'culture, goals, customer and community relations, ethics, corporate morals, marketing, governance and leadership' (Cacioppe and Edwards, 2005). Incremental changes typically occur from the co-evolution of the quadrants (Edwards, 2010).

In natural systems cycles are the central mechanism to maintain the situation. Well-known is the life cycle of a tree. We recognize four periods: A tree has after fertilization a growth phase, than seed formation and ultimately the tree dies. This is also the case in the relatively simple systems of the geosphere, that James Hutton already observed in 1788, and that is described by Westbroek (2013), and in the more complex biosystems, like the well-known water cycle and carbon cycle.

The importance of cycles translated to societal systems means that we should not only look at static values, but at value 'streams and cycles'. We look at values streams and cycles from Herakleitos' thoughts that everything we see, not *is*, but arises, develops, 'streams'. We can look at value cycles from multiple viewpoints. In the example of the water cycle we view to one aspect when we look at singular values, we view to the chain or network of connections between river, land and sea, when we look at e.g. abundance of water or in case of a flood, and we view the whole when we look at the life area of the fishes, soil fertility, possibilities for transport and tourism.

In societal systems value cycles are also mechanisms to maintain the situation in a sustainable way. In the short run we have the well-known product or business cycle: introduction, growth, maturity, satisfaction and decline. In the long run we have e.g. the Kondratieff's waves, driven by social or technological innovations, ranges from approximately forty to sixty years. The cycles consist of alternating intervals between high sectorial growth and intervals of relatively slow growth.

Also science develops in cycles. Research produces answers of the questions of the researchers and the answers demand for new questions. This is called the technological knowledge cycle (Westbroek, 2013).

In the web of life living organisms continuously exchange matter and energy and what is waste for an organism is food for another one. Our social organizations are living systems too and we expect them to imitate the cyclical principle of nature so that waste of business production and consumption is to be raw material for further production and consumption.

Oppositions between Competing Values (Conflicts)

The diagonal arrows in Figure 4 show the dynamics of development within a certain value category. Schwartz (2006) elaborated in such a way the development structure within the category of basic human values. These bipolar dimensions show the oppositions between competing values at a certain level. It portrays the pattern of conflicts among or balancing between values.

The drive that connects quadrants a. and c. is a natural force that seeks harmony between competition and cooperation. The arrow that connects quadrant b. and d. is a natural force that seeks harmony between renewal and control. We return to these conflicting values in section 5 after introducing a classification of multiple values in section 4.

Taborga (2012) and Wilber (1996) depicted developmental levels also as diagonal arrows in a similar coordinates system. These diagonal arrows correspond to the stages of development that individuals and organizations go through as they are exposed to life experiences. They have to do with boundaries and levels, Moving from one level of development to the next requires large transformational changes as a result of a significant experience and a process of reflection and inquiry. We return to this in section 7.

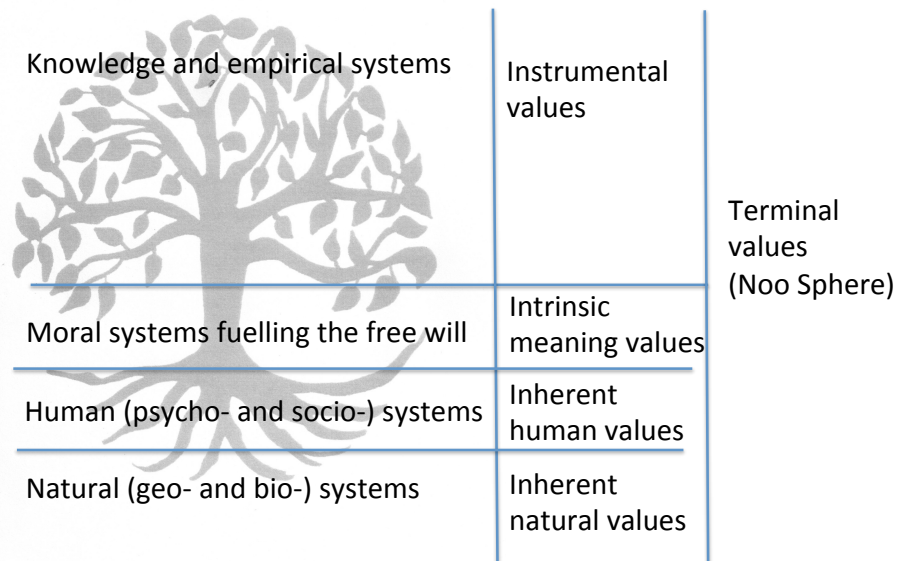
4. Multiple Values

4.1 Classification of Values

A value is a conception of worth, consisting of a triple of components: a perception, the ability to realize the perception and the realization itself. It relate to an individual or characteristic of a group of the desirable, which influences the selection from available, means and ends of action. Values are the desirable ends, goals or mechanisms, which makes human behaviour selective. Values not only orient but also determine human behavior (Reddy, 2006). A value of an item is an certain estimate of worth of that item. The estimate could be measured in monetary terms or otherwise. Carriers of values can take the form of products, services and information.

Not all values are of equal important. With Taylor (2009) we appreciate certain values higher than others. We do this from the notion that a certain type of acting, a certain life style or a certain way of feeling has an incomparable higher value than others, which are easily more approachable. Certain aims or values exist which are more desirable and in a higher degree than our common aims and values.

Values are living things that can be grouped together in certain categories, while all being dependent of each other. Classifications of values are presented by a number of authors, which often are partial classifications. Pavlina (2014) mentions 418 personal values alone. Reddy (2006) mentions several value classifications. See also Agle and Coldwell (1999). We present a thorough classification of values based on the different earth systems and spheres. We use the metaphor of a tree to present the classification, see Figure 5.

Figure 5: Values Tree

A tree is a good metaphor for demonstrating the coherence of values. Fundamental to the existence of a tree is that the roots and the soils are intertwined through the rhizosphere, which is the zone surrounding the roots of plants in which complex relations exist among the plant, the soil microorganisms and the soil itself (Hennig, 1996). In our classification inherent natural and inherent human values are both values that possess worth in and of itself on behalf of their nature. Like the trunk of the tree intrinsic values feed, accommodate and empower. The branches and twigs, leaves, buds, flowers and fruit of the crown correspond to the achievements of the instrumental values. Like the environment envelops the tree, the noo sphere envelops the universe.

Within the complete spectrum of values we distinguish between five broad categories. The distinguished values in each category are explicitly mentioned in Figure 6.

1. Inherent natural values (soil) are natural values in the geo and bio systems. The inherent natural values form the physical basis and the living flora and fauna of our planet. Inherent natural values are non-human values. Think about plants as spontaneous, self-maintaining systems, sustaining and reproducing itself, and about animals as spontaneous wildlife, born free and on its own. The geo and the bio systems also have value for humans. These values (ecosystem services) are the direct and indirect contributions of ecosystems to human well-being. See e.g. TEEB (2010) for an overview of ecosystem services. Though people use these values as instrumental values, the origin of these values is and remains inherent natural.
2. Inherent human values (roots) are human values in the psycho and socio systems. The inherent values form the set-up of our consciousness and the scheme of our social relationships. Looking at values with an inherent human dimension, we follow the theory of basic human values of Schwartz (2006). He studied basic values that individuals in all cultures recognize and he found a universal human value structure. This refers to all human values except spirituality. Note that Schwarz concluded that spirituality is not a value that has a broad meaning across cultures. This is in line with our value classification, where we treat the behaviour in the space of the free will as a separate value category.
3. Intrinsic values (trunk) are moral values fueling the free will behaviour of humans. It is an action-guiding concept that has reasons to behave in one way or another. These are the values of the concept of 'meaning'. The intrinsic values provide the energy for the living societal system. These values play a central role in determining what choices members of a culture view as ethical or unethical. We can see the capabilities, which Nussbaum (2000) lists, as individual capabilities that make it possible to achieve a meaningful life. We distinguish between capabilities equal to the self and capabilities providing inspiration. Apart from these individual capabilities intrinsic values involve also collective competences of groups of persons with respect to these moral values. These are competences of social being and competences defending the ego. Note that the individual capabilities equal to the self and the collective competences of social being are exact the intrinsic values that play a part in the reciprocal solidarism.

4. Instrumental values (crown) are values of mankind as a means to achieve something. They are based on application or usefulness in solving a problem or accomplishment of a goal. Instrumental values relate to everything that is known and applied by humans or by the society as a whole. It includes the knowledge and practices of mankind. In the first place the skills and capacities (both individual and collective) to produce and reproduce values are instrumental values. Note that the individual skills and collective capacities are exact the instrumental vales that play a role in balancing creative moderation. In the second place we discover instrumental values in three broad fields: input, throughput and output. For the production and reproduction of values we need sources (inputs). The production and reproduction of values takes place in modes of production (structures and processes), which themselves are also instrumental values (throughput). The results of the production and reproduction of values is also a field of instrumental values (output).
5. Terminal values (environment) are desirable values in the 'noosphere'. The noosphere is the mental envelope of our planet that can be seen as the space where all forms of consciousness interact or the space which Teilhard de Chardin called the omega point (Stikker, 1986). These values are at the top level of the goal hierarchy. Terminal values of the global system represent a position in life or society one desires to exist or achieve. To overcome the gap between our world now and the omega point of worldwide collective consciousness is not an automatism. It asks for a consciousness caring of our world. In this respect the call for 'a new world ethic of sustainability' of IUCN, UNEP and WWF (1991), based on principles related to our responsibility to care for nature (or ecological sustainability) and care for each other, could already be an important step.

Note that these categories are not the levels of living systems that we mentioned before. All categories of values play a role at each level. We will return to the levels in section 7.

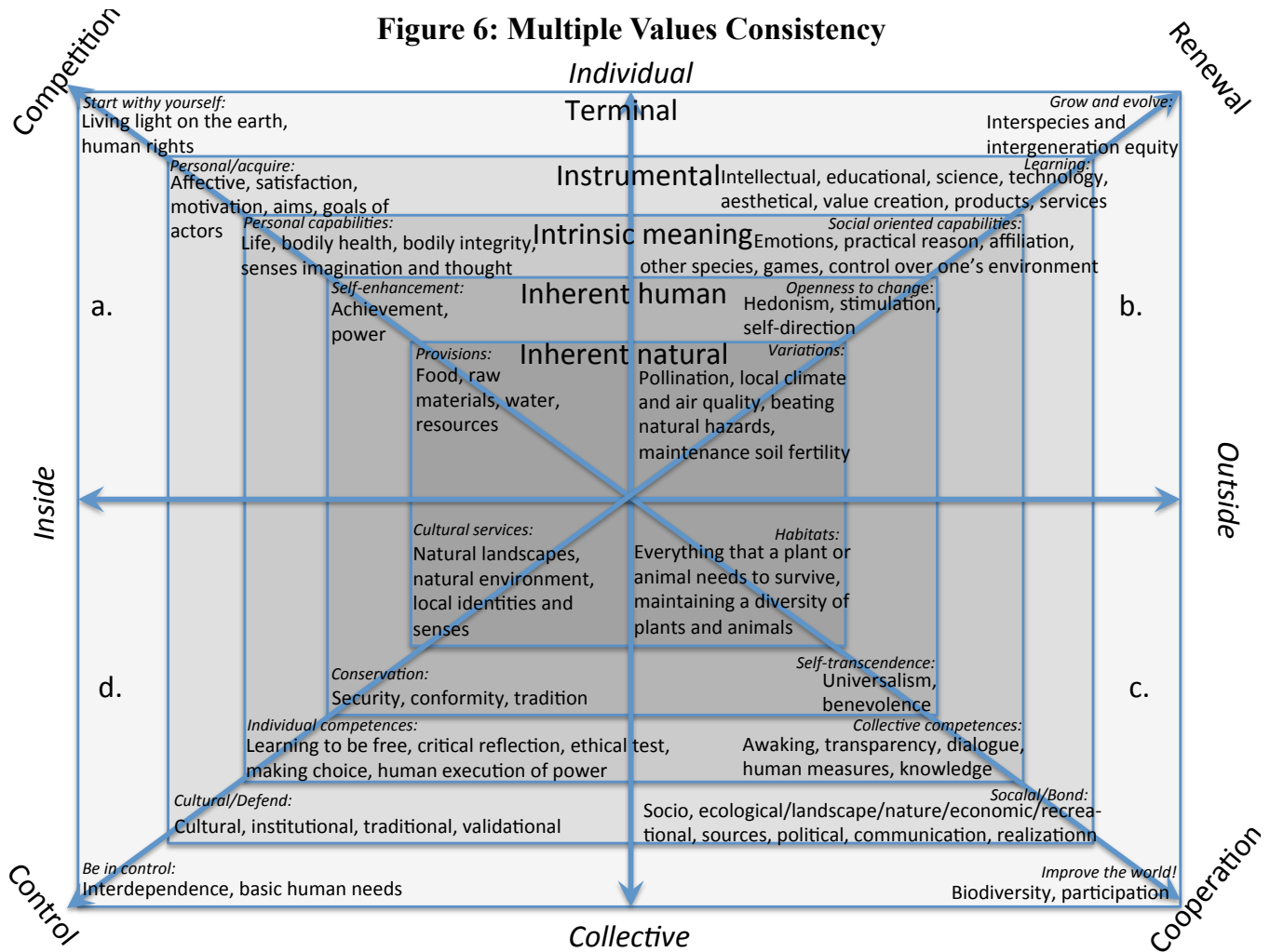
4.2 Multiple Values Consistency

We use the ontological scheme, developed in the previous section, to present a multiple values consistency. This way of presentation gives a multiple view of the values and provides a basis for a dynamic analysis in the next section. This means that for each category in the value classification we present an overview of the values in this category seen from the following viewpoints, corresponding with the respective quadrants:

- a. Values seen from an overall level of awareness, the way values make sense and relate to the world (the Intentional values);
- b. Values seen from a collection of emotions, cognitive processing and all manifested actions (the Behavioural values);
- c. Values seen from the viewpoint of policies and social norms (the Social values);
- d. Values seen from a pattern of basic underlying assumptions (the Cultural values).

In Figure 6 the result of this values discussion is summarized.

Figure 6: Multiple Values Consistency



In Figure 6 we look at a summary of the defined values. In the various squares the static analysis of values of different categories is summarized. In the next section we discuss the dynamic aspects of the value systems.

As diversity is an essential component in living natural systems, multiple values are essential in living societal system. Diversity provides heterogeneity. In our societal systems this means that we should not only look at single or mono values, but at ‘multiple’ values, presented in the multiple values consistency in figure 6.

Our common aim is to increase the general well being of mankind through steering of value streams and cycles, based on a creative and ethical philosophy. Spirituality in the context of social living systems is the story that provides meaning to our choices and actions. All social living systems have multiple goals.

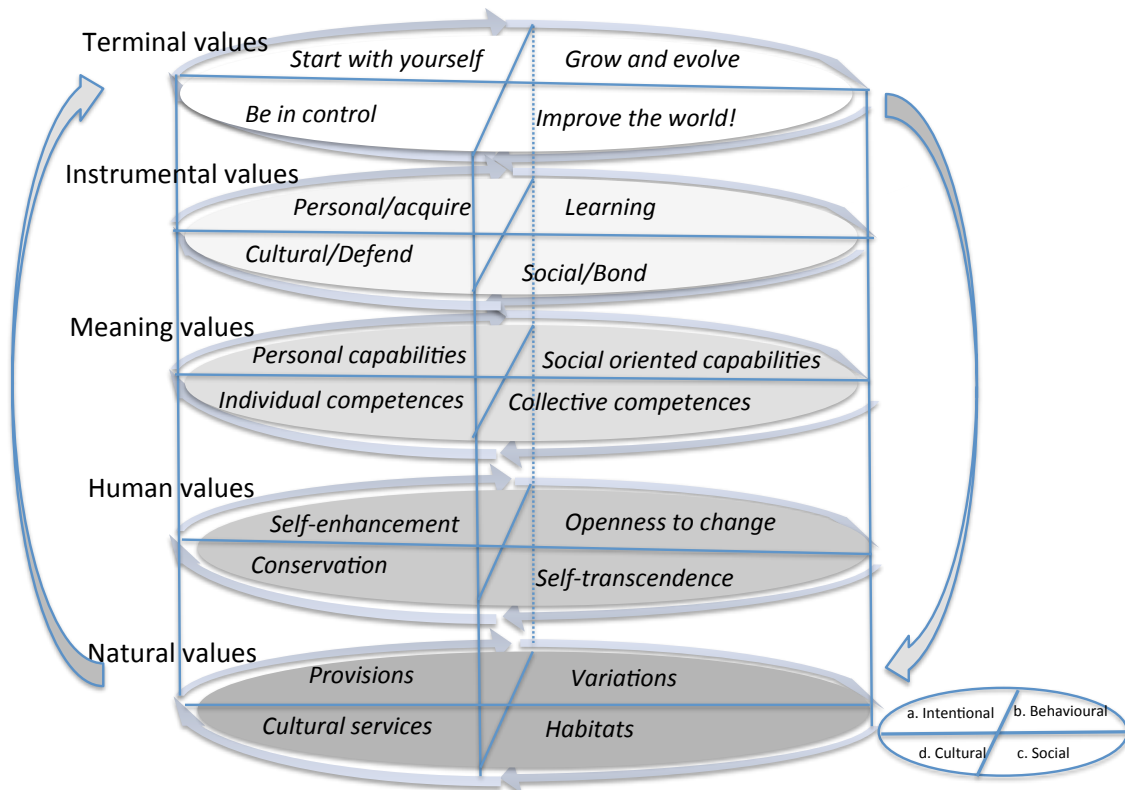
From the human search for meaning multiple value perceptions are created and capabilities and competences are marked that are needed for steering the value streams and cycles in society. This may lead to real multiple value streams and cycles. We, however, live in a complicated and deteriorated world, where these requirements are not always met. Concentrating on one mono value is an insufficient and meaningless act, which could lead to conflicts and stagnation. E.g. concentration on (mono) financial values may lead to overproduction and hyper consumption. Recently the constantly on-going speculative trading in debt securities, land and property lead to a bubble economy that Korten (2010) notes as a gap between phantom economy and real economy. Hawken (1993) believes that the transformational changes we require can be implemented only through the participation of the business community, and he states, "The promise of business is to increase the general well-being of humankind through service, a creative and ethical philosophy. Making money is, on its own terms, totally meaningless, an insufficient pursuit for the complex and decaying world we live in."

If in natural systems the variety is too small the process of natural selection is hampered and the possibility arise that one species becomes dominant. We see this happen e.g. in the outreach of diseases. The familiar biblical plagues may be another example.

4.3 Multiple Values Cycles

Essential in nature is the life cycle. We already mentioned some examples of value cycles in previous sections. The life cycle of an organism may be short or long. Within the various values categories we can discern values cycles, as presented in Figure 7.

Figure 7: Multiple Values Cycles



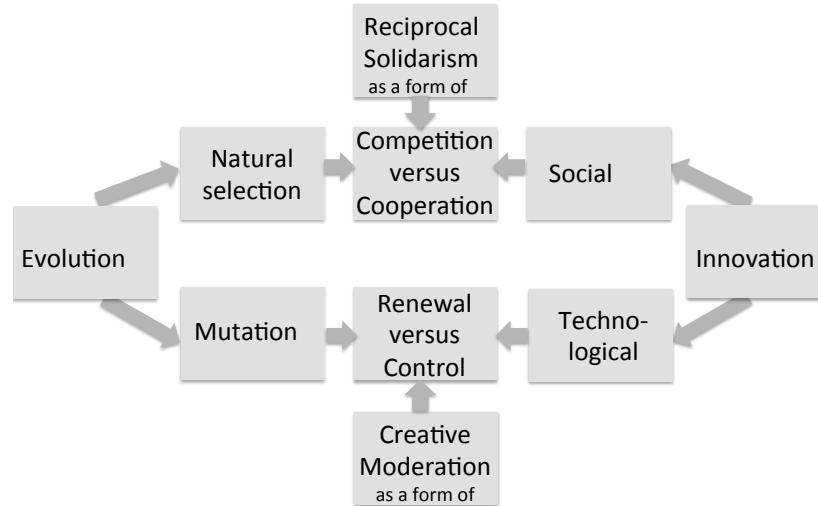
Apart from the ‘horizontal’ value cycles within each value category we also may observe ‘vertical’ value cycles between the values categories. Value cycles in one value category may influence the value cycles in other value categories.

5. Adaptation

Besides offering heterogeneity, diversity also forms the basis for the ability to adapt to changing conditions. Key mechanisms of evolution in natural systems are natural selection and mutation. Natural selection and mutation are not possible without variations. The possibilities of natural selections and mutations are the only way to be prepared for unknown challenges and therefor are prerequisites for successful living natural systems.

In section 3 we concluded that natural selection is fed by competition versus cooperation and mutation is realized through renewal versus control. In societal systems innovation takes the place that evolution has in natural systems. As mechanisms of innovation we discover changes in the components of the structure of the system, in most cases due to social and technological causes. These mechanisms are also fed by competition versus cooperation and renewal versus control, respectively We conclude that there is a parallel between natural selection and mutation in natural systems and social and technological efforts in societal systems. This is realized through balancing competition versus cooperation and renewal versus control. See Figure 8.

Figure 8: Adaptation



We make a distinction between adaptations in the short run and adaptations in the long run.

5.1 Incremental Values Changes

In this part of the section we concentrate on incremental changes. Radical changes are discussed in subsection 5.2. We may study adaptation on the basis of the ontological values scheme of Figure 4. The diagonal relationships between the quadrants form the central adaptive forces.

Table 2: Balancing Forces in Incremental Changes

	Competition versus cooperation		Renewal versus control	
	Personal focus	Social	Self-expansion	Cultural
Nature	Provisions	Habitats	Variations	Cultural services
Human	Self-enhancement	Self-transcendence	Openness to change	Conservation
Intrinsic	Personal capabilities	Collective competences	Social oriented capabilities	Individual competences
Instrumental	Personal/ acquire	Social/ bond	Learning	Cultural/ defend
Terminal	Start with yourself	Improve the World!	Grow and evolve	Be in control

In Table 2, we look at the conflicts/harmony between competition and cooperation, and renewal and control in different value categories.

Balancing Natural Values

Balancing competition versus cooperation and renewal versus control is constantly realized in nature. Evolution cares for this harmony.

In natural systems the dimension of competition versus cooperation contrasts provisions with habitats (natural selection). This dimension captures the conflict between values that emphasize concern for living on their own and values that emphasize the practice of working together. The dimension of renewal versus control contrasts variations and cultural services (mutation). This dimension captures the conflict between values that deal with the structure and the function of things.

Balancing Human Values

The dynamics of human values yield a structure of relations among values common to culturally diverse groups, suggesting a universal organization of human motivations. Individuals and groups differ in the priorities they assign to these values.

In human living systems the dimension of competition versus cooperation contrasts self-enhancement and self-transcendence. This dimension, according to Schwartz (2006), captures the conflict between values that emphasize pursuit of one's own interests and relative success and dominance over others (power, achievement) and values that emphasize concern for the welfare and interests of others (universalism, benevolence).

"If you talk to people in aboriginal or indigenous cultures, you find the highest societal values is cooperation. And competition is a very low value. And competition beyond certain boundaries is considered mental illness," says author Thom Hartmann in *I Am*. "You look at our culture, and cooperation is considered a relatively low value. And competition is considered the highest value. We celebrate the most powerful competitors." But is competition the true essence of human nature? Thom says that scientists decided to test this hypothesis and found that it is not (<http://www.oprah.com/oprahshow/Tom-Shadyac-From-Millionaire-to-Mobile-Home/6#ixzz2rsnJWkfo>). Though our culture may be built around competition, *I Am* strives to answer the question of whether it's competition or cooperation that is the essential nature of humans. We think both phenomena are important and it is a meaningless effort trying to investigate whether competition or cooperation is the essence of human nature.

The dimension renewal versus control contrasts openness to change and conservation. This dimension captures the conflict between values that emphasize independence of thought, action, feelings and readiness for change (hedonism, stimulation, self-direction) and values that emphasize order, self-restriction, preservation of the past and resistance to change (security, conformity, tradition).

Balancing Meaning Values

In intrinsic meaning values the dimension competition versus cooperation contrasts personal capabilities and collective competences. This dimension captures the conflict between values perceived as equal to the self against those with an interpersonal character (reciprocal solidarism). The dimension of renewal versus control contrasts external capabilities and personal competences. This dimension captures the conflict between values that provide inspiration and values for the defense of the ego.

We note that the dynamics of meaning is more than reciprocal solidarism. It also includes capabilities providing inspiration versus competences defending the ego.

Balancing Instrumental Values

In the dimension competition versus cooperation there is a tension between personal/acquire and social/bond. In the dimension renewal versus control the tension is between learning and cultural/defend. Balancing instrumental values is about skills and capacities that play a role in the production and reproduction of values as well as about input, throughput and output values. Balancing learning and cultural values include the needed individual skills and collective capacities (creative moderation). Balancing personal and social values include the collective skills and individual capacities.

In instrumental values we often observe, both in practice and in literature, a mentioned contradiction between economic and ecological values. From our analysis we conclude that there is no significant contrast between these values. Of course an object may have more economic than ecological value or the reverse. But the real contrast is between the personal and social values. If e.g. transparency falls short, this could result in inadequate motivations.

In economics, Adam Smith introduced competition as the 'invisible hand' that guides the market economy. The invisible hand is essentially a natural phenomenon that guides the market economy through competition for scarce resources. Adam Smith (1776, p. 477): "... and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. ... By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it." Smith described wealth produced in a self-regulating market. It was self-regulating because people produced according to what people would buy and people consumed according to what they wanted and could afford. Freedom to trade and competition were part of the self-regulating market: *laissez faire*. We still believe that the invisible hand and freedom to trade is a self-organizing drive in societal systems. However, as supposed by Adam Smith, there should be free competition.

But in practice in many places there is no free competition. We are confronted with powers that create mono- and oligopolies in societal systems.

In the world market there may be freedom to trade but there is no free competition. Oligopolistic tendencies are prevalent on the world market and on the national markets. As an example we notice that at the world market level only a few large firms control the agricultural commodity markets.

Balancing Terminal Values

The proverb: ‘Improve the world! Start with yourself’ illustrates the tension in the dimension competition versus cooperation. In the dimension renewal versus control there exists tension between grow and evolve and be in control. Other possible conflicts exist between e.g. living light on the earth and biodiversity. Also possible conflicts exist between interspecies and intergeneration equity and basic human needs.

5.2 Radical Changes

Both evolution and innovation may have severe impacts in the long run. As radical changes in natural systems are the result of severe adjustments in natural selection and/or mutations, radical changes in societal systems are the result of severe adjustments in social and/or technological developments. The balancing scheme for radical changes is presented in Table 3.

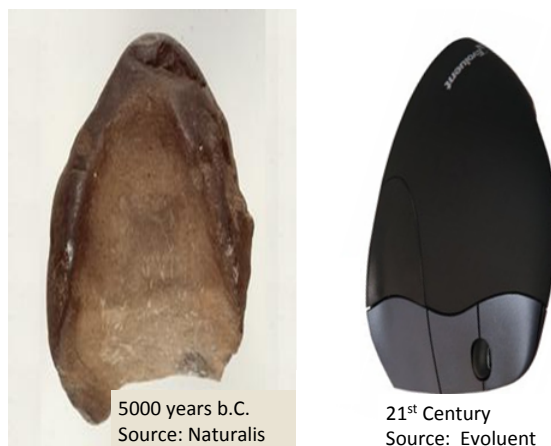
Table 3: Balancing Forces in Radical Changes

	Competition versus cooperation		Renewal versus control	
	Personal focus	Social	Self-expansion	Cultural
Social	Leadership	Organization	Researchers	Research groups
Technological	Facilities	Equipment	Eureka findings	Innovations

In history we see cyclical movements that were initiated from social and/or technological events. According to Piore and Sabel (1984) rare breakthroughs in technology are followed by periods of expansion culminating in a crisis. There are brief moments with a possibility of a choice of alternative directions. Also Gray (2009) believes in a cyclical conception of history. The cyclical movements started about 5 million years ago, when the human phenomenon came into being.

Between the Stone Age and the current Information Age a stirring time period of 7000 years occurred with succeeding cycles, induced by technological and/or social causes, and attended by serious crises and conflicts. Figure 9 presents a curious example of this long cycle with an inclusive tremendous social and technological development.

Figure 9: Technological Development of Mankind, from Flint to Mouse



It is remarkable that we again use instruments with the same form, but with endless more possibilities. To get more insight in the developments in this time period we present in Figure 10 a number of successive life cycles with a social and/or a technological cause.

Figure 10: Societal Life Cycles

Development world religions									
Creation of states			Colonialism				Great depression		Bank-crisis
Rise and cause of social-economic life cycles									
tot - 3000	- 3000 tot 500	500 - 1500	1500 - 1600	1600 - 1700	1700 - 1800	1800 - 1900	1900 - 1950	1950 - 2000	2000 -
Pre-history	Antiquity	Middle-ages	Renaissance	Golden Age	Lighting	Industrialisation	World-wars Ideologies	Cold war	Information era
					Steam-engine	Rail-ways	Cars	Tv Com-puters	Internet Nano-technology
Rise and cause technological life cycles									

In the long run weighing competition versus cooperation as a consequence of the principle of reciprocal solidarism lead to several cyclical developments, mostly from a social-economic motive. Weighing renewal versus control as a consequence of the principle of creative moderation lead to several cyclical developments mostly from a technological nature.

During time we see that the development of values show continually increasing complex forms. This is in accordance with the notion of entropy and the second law of thermo dynamics. Only those more complex forms survive which have the possibility to adapt to their environment. This, in fact, is the evolutionary theory of Darwin. However, is this a form of progress? Whether there is talk of progress we only can judge in retrospect. For the future we do not have a guarantee that evolution or societal development will lead to progress. Bregman (2013) after all does not speak of progress, but of ‘faith of progress’. Faith of progress according to Bregman is the motor of development, though it is put on the test lately.

6. Structure and Process

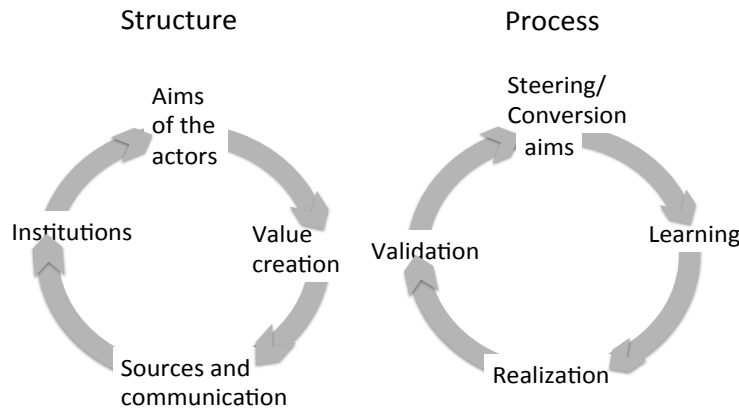
The study of complex systems represents a new approach to science that investigates how relationships between parts give rise to the collective behaviors of a system and how the system interacts and forms relationships with its environment. Both in living natural and societal systems, certain conditions are necessary, within the system as well as with regard to the environment. According to Holland (1995) in complex – adaptive - systems large numbers of active and diverse elements (agents or actors) are connected with each other. In these complex - adaptive – systems Holland (1995) distinguished between 7 basics: properties for aggregation, non-linearity, streaming (property to move) and diversity, and mechanisms for aggregation (tagging), anticipation (internal models) and building blocks. The physical embodiment of these basic factors is laid down in the structure of the system. It is composed of the interrelated parts or components. The way in which these elements cooperate tells us how the processes work.

To illustrate the elements of the structures and processes of living systems we use the basic concepts of living systems. We also derive points from the remarks that were made by prominent thinkers like deSantis (1998), Diamond (2014) and Haines (2011), and from the Yearbook of the Society for General Systems Research (Academy of Management Journal, December 1972).

Each part of a living system is interconnected to any other part and participates to the successful living of the system. Partnership is an essential characteristic of both natural and societal systems. In this section we throw some light on the structure and processes of living systems, see Figure 11. The components of the structure consist of the aims of the actors, the value creation, the sources and institutions. Every process starts with control, administrative (steering and change) processes. Learning (creating the functions and facilities) is the second step.

Then operational processes for realization are started. Finally we evaluate the results of the processes. This shows that both in the structure as well as on the process we have to do with cyclical activities.

Figure 11: Structure and Process



In order to determine our thoughts we can see, as a broad comparison, the structure and the process as playing a certain game. The structure describes the game and the process tells us about playing the game. The game is about value creation. The actors are seen as the players. The playing field is formed by the sources and the playing rules are laid down in the institutions. In the processes the actors set a goal (steering), develop strategies (learning), set tactical (operational) steps and evaluate the result of the game.

In the structure we distinguish four main categories:

- a. Aims of the actors (players)

Members of societal organizations are aware of their interdependence and they cooperate with each other in order to coexist and synergistically share the wealth of their different competencies. A human community is composed of all the relationships of its members and therefore a sustainable healthy community must nourish all of these relationships among its members.

In terms of the structure of the system we might identify the following players: (1) business firms (suppliers of raw materials and parts, manufacturers of finished industrial and consumer goods, intermediaries, industrial customers); (2) consumers; (3) government and intergovernmental organizations; (4) NGO's, to name the most obvious. In principle, there seems to be nothing in the form of the current system.

The actors work together on the basis of a certain item that binds. This could be developing aims for e.g. cooperation in a certain region. Based on this item actors develop a 'dream' or a concept that serves as a long-term steering mechanism.

The junctions of the actors are the relationships or opportunities for interaction. Therefore, societal organizations must not only engage in fierce competition against each other; instead, they must differentiate their capabilities to create and they also must cooperate with each other.

- b. Value creation (game)

Values are created in a transformation system that operates in a certain environment and determines the way in which inputs, throughputs and outputs are transformed. In general these are not linear input/output-relations. As Holland mentioned we must think that actors mostly work on unpredictable and non-linear manners. Causes and effects are not closely related. Sometimes trying to go faster is ultimately slower. Moreover it is not enough to concentrate on single values, but multiple values strike back to the whole transformation system.

- c. Sources and communication (playing field)

Important elements in the value creation are the sources used in the transformation system: the technology, the organization, and the information and communication structure. This 'triad' is an important throughput factor of the production manner.

- d. Institutions (playing rules)

Institutions are the norms and rules of a society. We distinguish between formal (laws, written agreements) and informal institutions (habits, unwritten laws).

In the process we distinguish four main categories:

- a. Steering/conversion aims

People set process goals, but can achieve their goals and outcomes in many different ways. Von Bertalanffy used the term equifinality, emphasizing that the same end state may be achieved via many different paths or trajectories.

- b. Learning (strategic steps)

In learning, according to Holland (1995), we deal with a system that consists of a set of detectors (if/then) rules and effectuators in relation to the environment (performance system), assigns successes and failures to parts of this system (credit assignment) and that changes the capacities of actors by changing failures through new options (rule discovery). As Holland argued it is important that the rules fulfil one syntax for all actors and interactions. Haines (2011) developed a concept of strategic consistency and operational flexibility.

Healthy living systems evolve and maintain themselves through conserving anything that works well and discarding anything that doesn't work. Societal organizations can learn from this principle by focusing more on what runs well than on problems. Learning means also that people adjust by the feedback that they get from the internal and external environment. The more feedback they receive from the environment through all aspects of their boundaries, the more likely they longer and more effectively sustain their existence.

- c. Realizations (tactical steps)

The tactical steps determine who, what, where and when of the control process, making implementation possible.

- d. Validating

In the last step we evaluate the result of the process with regard to the original steering/conversion aims.

Living systems move between stability and instability, between order and chaos. A certain degree of instability or chaos may be powerful moments for creative change. Thoughts may have consequences with an influence on what is possible.

Openness and flexibility should be the hallmark of a free market based economic system. A problem is that systems are less open and flexible. Large businesses and government organizations are generally structured along more hierarchical lines, which may be rather less conducive to learning. Power structures are in place in any societal system and fulfill an important role in maintaining some order and stability but they also may uphold vested interests and can hinder learning.

A further problem relate to the capitalist market systems, which, as is well-known, are often rather less free and open than classical economic theory would posit as desirable and some firms may possess significant market power and thus the ability to stop new entrants and inhibit change.

7. Boundaries and Levels

Living systems are a 'whole' or a 'holon' on itself and at the same time part of a bigger holon (Wilber, 1996). The web of life is a network of networks of living systems. Von Bertalanffy introduced the distinction between open and closed systems. Living systems are open to the environment. Living systems must be understood holistically in their environment. In open systems there is interaction between the system and its environment. It is about systems with 'boundaries' that are open to their environment. Some components form a membrane that bound the network of interactions. Though there is no linear-causal effect between system and environment, importing resources from the environment is key to long-term viability. All systems have a tendency toward maximum entropy, disorder and death. Closed systems move toward this disorganization faster than open systems.

There must be some alignment between the individual self-interest of the actors and the vision and goals of the whole. We observe a balancing between the whole system and its purposes within its environment and the parts and their relationships. Each member of living systems balances its self-interest with the interest of the larger whole.

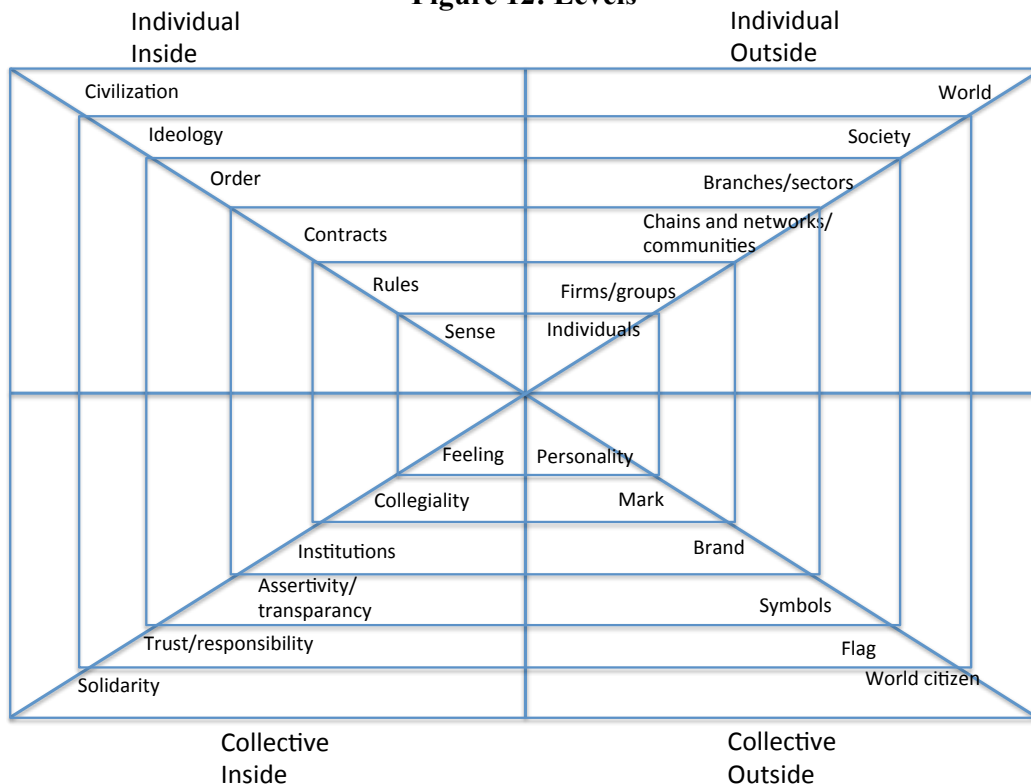
Parts play their role in the light of the purposes of the whole and the whole supports the role of components. All living systems are interconnected and the success or health of any given organism is dependent on the health or success of the larger related whole. An exclusive focus on one element or subsystem without simultaneous attention to other subsystems leads to suboptimal results and new disturbances. Natural forms of hierarchy could serve this principle. As open systems, organizations are only viable in mutual interaction with and adaptation to the changing environment. Therefore, members of societal organizations must align their individual self-interest with the vision and goals of the organizations.

Looking at the interaction between the levels we mention the general theory of living systems that Miller (1978) developed. He distinguished between eight nested hierarchical levels (cell, organ, organism, group, organization, community, society, and supranational system), where at each level several subsystems are active. We use a slightly different set-up of the levels. For societal systems it is not necessary to start with a cell. The lowest level could be individuals. See Figure 12. Note that at each level all categories of values play a role.

Characteristic of Wilber’s thought is that at a certain level we can only make progress if that level is completely understood from the perspectives individual – collective on the one hand from the perspective and inside – outside from the other hand. As a conclusion we can say that it is of no use trying to achieve biodiversity or even human rights if we are not able to reach an elementary harmony between cooperation and competition at the level of societies or even branches. Or, it is of no use trying to get interspecies and intergeneration equity or even basic human needs if we are not able to reach an elementary harmony between renewal and control at lower levels.

The four quadrants do not represent exclusive series; rather, they interact with one another as a collective whole, and relate to inside-outside and individual-collective forms of systems. The categories within each of the four quadrants are complementary perspectives; consequently, an “integral” approach can only be achieved when all categories in all quadrants are taken into account.

Figure 12: Levels



The left-upper quadrant expresses the internal feelings of the systems. This provides the orientation of the level. Forms of subjectivity and internal consciousness are coupled with the external forms of the right-upper quadrant. This quadrant expresses the level structure. The right-upper quadrant illustrates the “holarchy” of the systems, as presented above. The collective outside, or social (right-lower) quadrant, refers to the external, material, and explicit forms of the systems, and deals with the objective and concrete components.

This quadrant shows the external presentation. The collective inside, or cultural (left-lower) quadrant, represents the internal meanings and identities that people share in similar systems. Each level contains the foundations of its predecessor and adds its own distinguishing and characteristic elements.

From Figure 12 we can analyze the relations of congruence within the levels. The conviction that sense can be developed as an exclusive value of individuals appears as an argument in the building of systems. Individuals present themselves as personalities with feeling.

People need rules when working together in firms or groups. They want to express this behavior in a mark, as an image of collegiality.

Lesser formal contracts keep people together in chains and networks or in communities. As an external presentation we often see some kind of a brand, built upon institutional cooperation.

Some order is needed in branches, sectors or regions. These systems use symbols to express themselves, and the culture is featured by assertivity and transparency.

Ideologies tie societies together. Societies present themselves to each other by using a flag. These systems appeal to trust and responsibility.

Civilization governs the world. Being a world citizen is the way to present, based on solidarity.

Table 4: Conflicts Within and Between Levels

	Competition versus cooperation		Renewal versus control	
	Personal	Social	Self-expansion	Cultural
Individual	Sense	Personality	Individuals	Feeling
Firms	Rules	Mark	Firms	Collegiality
Chains	Contracts	Brand	Chains	Institutions
Branches	Order	Symbols	Branches	Transparency
Societies	Ideology	Flag	Societies	Trust
World	Civilization	World citizen	World	Solidarity

Table 4 provides opportunities to analyze possible conflicts within and between levels.

8. Societal Systems Management

Living societal systems are in principle self-organizing. This means two things. In the first place it is not necessary to build systems from scratch on. It is perhaps even not possible to design a society according to some kind of a social model. The ‘makeable society’ was a construct in the seventies of the last century that received a lot of criticism. Social engineering is seeking to change behavior. However, it has some negative connotations. Though in the last decades social engineering is coming up and it aims to bring a sustainable society closer to us. In the second place in practice we see a lot of phenomena that interfere with self-organizing systems. As an example we mention the use of monopolistic or oligopolistic market power. So it is necessary to guide or coach the developments in societal systems. Through identification of bottlenecks in value streams and value cycles we are able to make things more equitable and sustainable.

The development of value cycles is determined by the interpretations and interactions between meaning and reproduction of value streams and cycles. This is the essential nature of the progress of humanity in this world. To be able to manage the value cycles, we must view to the functioning of the different parts of the developed model.

Measuring is an important instrument to gain insight in the developments of the multiple values streams and cycles and is necessary to make a good diagnosis. To measure is to know. According to Korten (2010) we get what we measure. Measuring encompasses in the first place qualitatively and in the second place quantitatively a characterization of mutual balancing of values and aspects. Hubbard (2010) defines measuring as a quantitatively expressed reduction of uncertainty, based on one or more observations. Measuring uncertainty takes place by assigning a set of probabilities to a set of possibilities. This is different from measuring risks, which consist of a series of possibilities, each with a quantified probability and a quantified loss.

We need adequate measuring instruments for a number of items. Sometimes it is necessary to make assumptions (Adrogué and Crespo, 1990).

Table 5: Societal Systems Management

		Competition versus cooperation	Renewal versus control
1. Multiple values management	Natural (Inherent)	Biodiversity	Vitality
	Human (Inherent)	Multicultural	Dynamics
	Meaning (Intrinsic)	Reciprocal solidarism (=Individual capabilities and coll competences)	Flexibility (= Collective capabilities and individual competences)
	Reproduction of values (Instrumental)	Interpersonal (= Collective skills and individual capacities)	Creative moderation (= Individual skills and collective capacities)
		Multifunctionality	Mastering learning
Omega (Terminal)	Sustainability	Lifetime mediation	
2. Multiple values cycles' management	All values categories	Resilience	Feed back
3. Process management	All values categories	Operate flexibly	Controlled evolvement
4. Structural innovation management	Social	Social system	Social technology
	Technological	Technological society	Technology
5. Multi-level management	Individual	Attitude	Motivation
	Firms	Participation employees	Involvement
	Chains	Chain power	Partnership
	Branches	Monopoly degree	Consultation propensity
	Societies	Democracy	Responsibility
World	Peace	Global citizenship	

Table 5 presents an overview of the different management options that can be used for coaching societal systems.

8.1 Multiple Values Management

In table 5 the various control factors playing in the different values categories are presented. Measuring and interpreting these control factors are the resources for the management of multiple values. Below we discuss the separate management items.

In the natural values category, for example, there is a possible conflict between concern of species for living on their own and the practice of living together, as we saw already in subsection 5.1. A control factor to judge this dimension is the degree of biodiversity. A control factor to judge renewal versus control in natural systems is vitality.

In the human values category among other things it appears that multicultural management could realize balancing self-enhancement versus self-transcendence. For balancing openness to change versus conservation we need dynamics management.

In section 3 about meaning we concluded that living systems can only operate in an autopoietic sense if people possess the capabilities and competences that are needed to effectuate reciprocal solidarism, which is a logical way in which people live together. We also concluded that it is not automatically satisfied: management of meaning is needed. People must have the necessary capabilities and competences to balance interests between the self and the social related to reciprocal solidarism. This means management of the capabilities: life, bodily health, bodily integrity, senses, and imagination and thought, and of the competences: awaking, transparency, dialogue, human measure and knowledge; see Figure 6. A management practice that comes close to the management of meaning is 'Coordinated Management of Meaning, CMM' (Pearce and Cronen, 1980). The coordinated management of meaning theorizes communication as a process that allows us to create and manage social reality. As such, this theory describes how we as communicators make sense of our world, or create meaning.

Meaning can be understood to exist in a hierarchy, depending on the sources of that meaning. Apart from management of reciprocal solidarism, also flexibility management is needed.

Management of reproduction of values is needed for balancing personal/acquire versus social/bond and for balancing learning versus cultural/defend. It has two aspects. In section 3 we learned that for creative moderation people must have enough skills and capacities to effectuate creative moderation. This means management of the skills: intellectual, educational, learning, science and technology and aesthetical and of the capacities: cultural, institutional and traditional; see Figure 6. Apart from this creative moderation management also interpersonal management is needed. The management input, throughput and output requires multifunctionality management and mastering learning management. Values are often defined in financial terms. A management approach that values define in either financial or non financial terms and is about what an organization will gain from doing (or not doing) something and how to maximize this is ‘Management of Value, MoV’ (<http://www.mov-officialsite.com>).

Terminal values may function as a guide to future values. If terminal values in a system are explicated we can judge them by looking at sustainability and lifetime mediation. We call this omega management.

8.2 Multiple Values (Life) Cycles’ Management

As mentioned before in multiple values (life) cycles all values categories play a role. Putting the possibilities together we may look at a part or the whole of value streams on the one hand and at singular or multiple values on the other hand. A multiple value cycle deals with multiple value flows, as seen from the viewpoint of the whole. Looking at values cycles has advantages because it forces people to take decisions. We have to avoid that (elements in) systems are able to grow and grow, and loose human or other values. Resilience and feedbacks are important management instruments.

It appears that only multiple value cycles are subject of a complete analysis. In the example of the food cycle we both look at the values stream from the soil to the mouth as well as from the mouth to the soil, and at the same time we look at the multiple values of food.

In the context of multiple values (life) cycles’ management we want to observe to what extent a societal system is a living system that is suitable for next generations. To judge this ability of living societal systems we have to specify the multiple values (life) cycle’s aspects. In this trajectory there is a link with Life Cycle Assessment (LCA) and especially with Sustainable LCA (S-LCA) (<http://www.thenaturalstep.org/en/sustainability-life-cycle-assessment-slca>). Apart from ecological analysis this S-LCA also pays attention to social and economic analysis. However, this is not the whole story. We need to look at adequate issues, which may vary between systems. Therefore, in general we need to develop a Multiple Values – Life Cycle Assessment (MV-LCA). E.g. in agriculture and food we distinguish, apart from social, economic and ecological aspects also food sovereignty and food safety aspects (Donkers, 2012). Food sovereignty and safety are added to the usual sustainability aspects people, planet and profit, to allow the agriculture and food system to provide physical and economic access to sufficient, safe and nutritious food for all people in the world.

8.3 Process Management

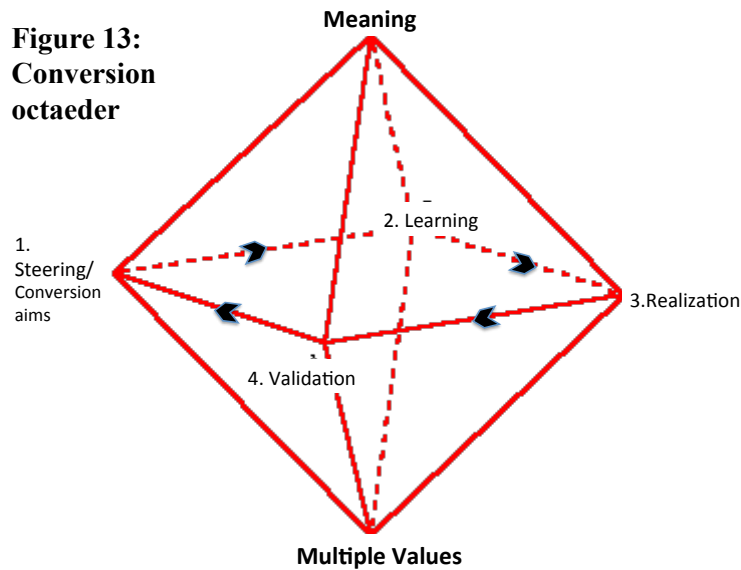
Apart from steering the way in which multiple values cycles operate, we use the same process management when we try to restore the multiple values cycles in case of possible derailments or when values cycles hamper. When phenomena are detected that interfere with self-organizing systems, we propose a conversion based on a thorough measurement of the relevant aspects.

Interventions could lead to conversions of value cycles leading to new realization of values. These new realizations do not automatically lead to healthy living social systems. Systems may derail.

It is not always necessary to develop huge conversions when value cycles are disrupted. In the opinion of Holland (1995) there are lever points, which could be used to intervene. Sometimes a small input in a system may have large predictable effects, e.g. the use of vaccines. This idea stems from an appealing example in chaos theory, where a butterfly spreading his wings in Africa causes a hurricane in Florida.

To guide this conversion process we have to identify which conversion is needed, what has to be learned, how this conversion can be realized and we must validate the realizations with respect to the living systems properties. These are the four steps of the process (Figure 11) that are repeated in the diamond of the octaeder in Figure 13.

**Figure 13:
Conversion
octaeder**



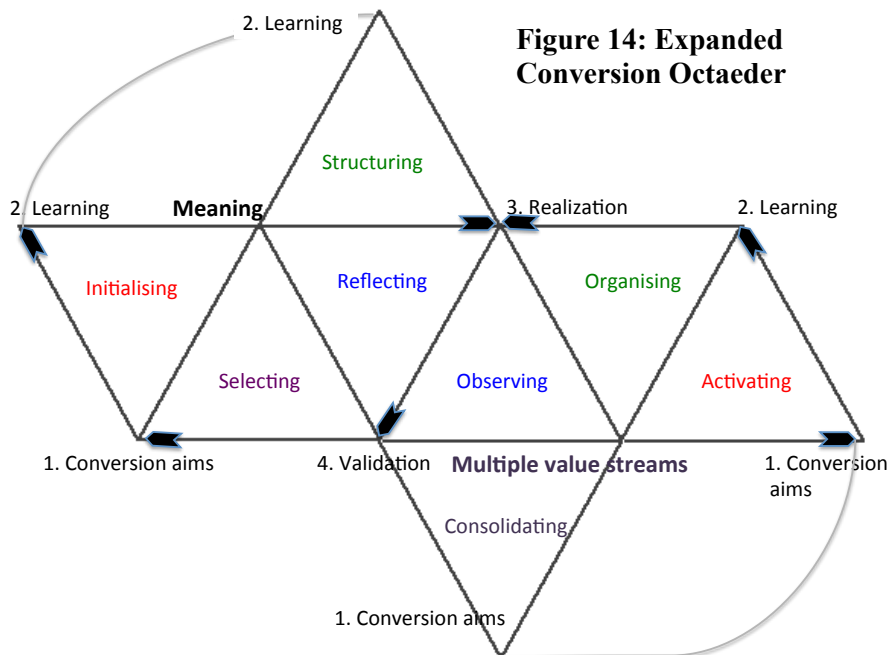
We recognize in figure 13 the four process steps and with each step we see an interaction with meaning and multiple values. In each of the four steps meaning and reproduction of multiple values play a part. The balancing items Operate flexibly and Controlled evolvment, as mentioned in Table 5, have to be executed over these four steps; see Table 6.

Table 6: Process Management

	Operate flexibly	Controlled evolvment
Steering and control aims	Initializing	Activating
Learning (strategical steps)	Structuring	Organizing
Operations (tactical steps)	Reflecting	Observing
Evaluating/validation	Selecting	Consolidating

These process management steps correspond to the surfaces or planes of the octaeder in Figure 13. This means that each plane has its own significance. The eight planes are in pairs connected with the four ribs of the diamond. The significance of the surfaces we can illustrate best by expanding the octaeder, as is done in Figure 14.

**Figure 14: Expanded
Conversion Octaeder**



a) Initializing and Activating

When certain conversions are identified, the initializing plane judges the conversion from the meaning point of view. Core activities in this plane relate to the role of the actors in the conversion and the development of the necessary capabilities and competences of the actors. These are conditions for realizing self-organization. Making outlines of the conversion paths, together and in correspondence with the meaning of all actors/stakeholders. The activating plane consists of drawing activity plans that can be executed. Taking into account and paying attention to the multiple values that are involved in the conversion.

b) Structuring and Organizing

The structuring plane contains measures to bring all plans in a timescale in correspondence with the involvement of the actors. Government policies for commodities affect the process of inputs, opportunity costs and consumer demand. The organizing plane sets up a smart execution program.

c) Reflecting and Observing

In the reflecting plane the results of the conversion are judged in relation to the original aims. The observing plane measures the (potential) effects of the conversion.

d) Selecting and Consolidating

In the selecting plane the actors make decisions about the follow out of the measures. New conversions may be recommended, if necessary. In the consolidating plane the necessary measures are taken to embody the result of the conversion, to lay down the agreements and to fix what one has learned.

8.4 Structural Innovation Management

Though the structure in principle is given in the short run, in the long run the elements of the structure themselves are subjects of change. This is e.g. the case when we deal with radical innovations or transitions. Therefore, also transition management or structural innovation management may be an interactive and integrated activity.

Table 7: Example of Structural Innovation Management

Process Structure	Steering and control aims	Learning	Operational	Evaluating/ Implementation
Actors	Bringing people together Common Vision Ambition Perceptions of problems	Make manifest opportunities and threats	Creating multi-actor networks	Redistribution of functions
Value creation	Perspective Ideas	'Doing better things' in stead of 'doing things better'	Creating multi values	Financing
Sources (triad: technology, organization, information and communication)	Idea improvement organization. Technology, information Reduction financial risks	Knowledge management	Co-evolution Multi-disciplinarity Change management	Product-Marketing-Combinations Developing tools
Institutions	Creating an innovative climate Identifying opportunities	Explicit part of learning needs	Ensure a balance of interests	Adjusting regulations

Source: Derived from Donkers and Jonkers (2003, p. 104)

From Table 7 it appears that it is necessary for structural innovation management to be able to act flexible between the elements of the structure and that of the process.

8.5 Multi-Level Management

Except when the whole world or the universe is seen as a living system, there are boundaries between other comparable living systems at a particular level. These boundaries may have a great influence on the way living systems operate.

Apart from these boundaries we observe that a certain level may influence the working of a living system at other levels and vice versa. The different levels in societal systems must be attuned to one another. This is the task of multi-level management. In the case when there is say of several parties we speak of multi-level governance.

Table 8: Example of a Level Structure of Local and Regional Food Systems

	Level	Governance
Producer-consumer	1. Short chains	Increasing direct markets between producers and consumers, through co-operation between practical farmers/producers and consumers.
Producer-consumer-government	2. Local food systems	Creating employment opportunities and making rural attractive, and exploiting urban challenges and opportunities for sustainable food production and biodiversity in urban and peri-urban areas through supporting, facilitating, urban and rural co-operation between practical farmers/producers, citizens, local governments and area parties.
	3. Regional food systems	Natural development self sufficiency and sustainable food security in the region through integral regional planning, regional co-operation, transparency, certification by (organizations of) producers and consumers, local and regional food systems, regional governments and area parties.
	4. Inter-regional food systems	Increasing efficiency, exchange information, products and services through creating logistics hubs, regulations, interregional co-operation, and responsibility by national governments, local and regional food systems and area parties.
	5. Cross-regional food systems	Attaining conditions favourable for national, regional and local interests through building international connections, international agreements, cross-regional co-operation, trust by national governments, international governance bodies, cross-regional and national food systems, representatives of international movements.

Source: Derived from Donkers (2013, p. 189)

Table 8 presents an application of multi-level management in local and regional food systems. At the level of short chains, various initiatives have taken smart forms, and associated developments are at times so strong that some believe they have become irreversible. Local and regional initiatives, though varied, include producers, consumers, and governments taking on formal roles in the development phase. The strength of all parties involved within a regional system improves considerably when more interregional forms of co-operation are undertaken. Many food initiatives are taking place in various countries; however, these national/interregional food systems are still in their infancy and deserve national government support. At the level of global/cross-regional food systems, most interactions take place at a global policy level of various institutions. In many cases, confrontations are observed between established institutions and societal movements.

9. Conclusions and Further Work

This paper is meant as a contribution to the theory of living systems. We combined results of earlier studies from different disciplines with new insights. Basic elements of living natural systems are used to develop a consistent and coherent framework for living societal systems.

Two main concepts are fundamental to our living societal systems model: the concept of reciprocal solidarism and the concept of creative moderation. The concept of reciprocal solidarism is based on the idea of Luhmann to use meaning as the source of energy in living societal systems. We combined this idea with findings of De Waal that social beings only survive in reciprocity, weighing the self and the other. Apart from some individual capabilities introduced by Nussbaum also certain collective competences are needed to effectuate this concept and make that people take responsibility for a meaningful life.

Management of meaning in general and of reciprocal solidarism in particular means in fact management of capabilities and competences as a form of balancing competition versus cooperation.

The concept of creative moderation is based on the new idea, presented in this paper, to take values as reproductive elements of societal systems, instead of selecting communications as reproductive elements as was done by Luhmann. These values have to be produced and reproduced now and in the future. This is a weighing between (creative) renewal and (moderate) control. Sloterdijk warned that this will not automatically lead to a synthesis that satisfies. We need several individual skills and certain collective capacities to realize this concept and make that people care for reproduction of values. Management of reproduction of values in general and of creative moderation in particular means in fact management of skills and capacities as a form of balancing renewal versus control.

From natural systems we learned that (reproduction) cycles and diversity are crucial and translated to societal systems this means that multiple values streams and cycles are characteristic features in living societal systems.

An ontological scheme is developed by a coordinate system where the vertical axis depicts the dimension of the individual-collective and the horizontal axis represents the dimension of inside-outside. The quadrants of this system can be used for looking at different sides of multiple values. Competition versus cooperation and renewal versus control fit in this scheme through the diagonal development lines.

The result of this approach is a coherent living societal systems model that offers possibilities for further development and application. The model schedules the autopoietic pattern, structure and process, like in the view of Capra. In our model, however, the pattern, structure and process is governed by meaning and reproduction of values. It is clear that in our living societal systems model multiple values play a crucial role. Therefore we developed a classification of values. Our classification, consisting of five categories, is capable to deal with the abovementioned concepts. The first class consists of inherent natural values, which form the physical basis of the living flora and fauna of our planet. The second class consists of inherent human values that represents our social relationships. According to these human values we refer to the theory of Schwartz. In the third class we record intrinsic values that consists of the abovementioned capabilities and competences for a meaningful life. The fourth class contains instrumental values, which consist of the values with respect to the reproduction of values. Apart from the abovementioned skills and capacities, also input, throughput and output values belong to this category. A fifth class of values is reserved for values at the top level of the goal hierarchy. These are terminal values in the mental envelope of our planet, which Teilhard de Chardin called the omega point.

In the way biodiversity is a prerequisite for living natural systems multiple values are a prerequisite for living societal systems. The horizontal and vertical development lines in the coordinate system offer possibilities to incorporate multiple value streams and cycles. The diagonal development lines of the coordinate system offer possibilities to study the adaptation mechanism in living societal systems. There is a parallel between evolution (induced by natural selection and mutation) in natural systems and innovation (mainly induced by social and technological efforts) in societal systems.

The structure of living societal systems consists of interrelated parts or components: aims of actors, value creation methods, communication structure and institutions. The process relate to behavioural activities: steering/conversion aims, tactical operational steps, learning and evaluating.

In the development structure within and between levels we return to Wilber's holistic approach and develop a nested hierarchical structure. Characteristic of Wilber's thought is that at a certain level we can only make progress if that level is completely understood from the perspective individual - collective and inside - outside.

Though living societal systems are in principle self-organizing, there are phenomena that interfere with the self-organizing principle. Therefore it is possible that we need to coach or manage some developments. Within the scope of societal systems management we distinguish between five management categories:

- Management of multiple values

Important items in the management of multiple values are reciprocal solidarism and creative moderation. These items may influence other multiple values and could best be addressed first. This management can be effectuated by developing capabilities, competences, skills and capacities programs at different levels.

- Multiple values cycles' management

After treatment of these items, all multiple values categories (natural, human, meaning, reproduction of values and omega) may form part of multiple values life cycle assessment (MV-LCA).

- Process management

Process management deals with incremental changes. It starts with identifying and execution of the process or conversion aims, followed by learning, realization and validation. Each of the four process steps interacts with meaning and multiple values. This provides eight process management steps that are shown as the surfaces of a conversion octaeder.

- Structural innovation management

Structural innovation management deals with radical changes. This may be the case when radical innovations or transitions are at stake. Then the components of the structure itself are subject to change. In structural innovation management the process steps are applied to the components of the structure itself.

- Multi-level management

Multi-level management deals with the relationships within and between levels. At a certain level similar living systems are separated by boundaries. It is the task of multi-level management to attune to one another the living systems within and between the various levels.

In this paper we presented the main elements of living societal systems in a concise manner. Of course the ideas developed in this paper are far from complete. The observations mentioned are merely a framework of living societal systems. The various items should be further developed. Moreover, there are many more examples to give that can explain the presented theory and can clarify the propositions. The goal of the authors is already achieved if the paper contributes to further discussion of this interesting field.

Acknowledgement

The author thanks dr. Lout Jonkers for his valuable comments on an earlier version of this paper.

References

- Adrogué, Cecilia & Crespo, Ricardo, (1990). Implicit Assumptions when Measuring in Economics: The Human Development Index (HDI) as a Case Study1 *Revista Cultura Económica*, Año XXVIII • N° 79, Dec. 2010: 33-42.
- Agle, Bradley R., & Coldwell, Craig B. (1999). Understanding research on values in business. *Business & Society*, Vol. 38, No. 3, p. 326-387.
- Althusser, L., & Balibar, E. (1970). *Reading capital*. NLB, London.
- Arthur, W. Brian, (2009). *The nature of technology, What it is and how it evolves*. Penguin Books. 247 pp.
- Bertalanffy, Ludwig von, (1968). *General systems theory: Foundations, development, applications*. Georg Braziller, New York.
- Bregman, Rutger, (2013). *De geschiedenis van de vooruitgang*. De Bezige Bij, Amsterdam.
- Burawoy, Michael, (1976). The functions and reproduction of migrant labor: Comparative material from Southern Africa and the United States. *American Journal of Sociology*, 82(5): 1050-87.
- Cacioppe R., & Edwards, M. (2005). Seeking the whole grail of organizational development: A synthesis of integral theory, spiral dynamics, corporate transformation and action inquiry. *Leadership & Organization Development Journal*, Vol. 26, No. 2, p. 86 -105.
- Capra, Fritjof, (1996). *The web of life*, Anchor Books, Doubleday, New York.
- Deneubourg, J.-L., Aron, S., Goss, S., & Pasteels, J. M. (1990). *The self-organizing exploratory pattern of the argentine ant*. Springer Netherlands.
- Diamond, Louise, (2014). Twelve simple rules of systems thinking for complex global issues. (Online) Available: http://www.visionarylead.org/vl/louise_diamond.htm.
- Donkers, Harry, (2012). Local food systems for global future, Sustainable food security, a paradigm for local and regional food systems. Paper presented at: Agriculture in an urbanizing society, International conference on multifunctional agriculture and urban-rural relations, Wageningen.
- Donkers, Harry, (2013). Governance for local and regional food systems. *Journal of Rural and Community Development*, Vol. 8, No. 1, p. 178-208.
- Donkers, Harry & Jonkers, Lout, (2003). Raamwerk voor innovatiemanagement in ketens en netwerken, in: A. Poorthuis, et al, *Ketens en netwerken, een zoektocht naar samenhang*, Lemma, p. 93-107.

- Edwards, M. (2010). *Organizational transformation for sustainability: An integral metatheory*. Routledge, New York.
- Elias, Norbert, (1982). *Problemen van betrokkenheid en distantie*. Meulenhof, Amsterdam.
- Gescinska, Alicja, (2011). *De verovering van de vrijheid, Van luie mensen, de dingen die voorbijgaan*. Lemniscaat, Rotterdam. pp. 219.
- Gramsci, A. (1971). *Selections from the prison notebooks*. International Publishers.
- Gray, John, (2009). *False dawn, The disillusion of global capitalism*. Granta Books, London, pp. 272.
- Haines, Stephen, (2011). *Systems thinking: The new frontier*.
- Hawken, Paul, (1993). *Ecology of commerce: A declaration of sustainability*. Harper Business, New York.
- Hennig, Erhard, (1997). *The Secrets of Fertile Soils: Humus as the Guardian of the Fundamentals of Natural Life*. OLV Organischer Landbau Verlag Kurt Walter Lau, pp. 204.
- Holland, John H. (1995). *Hidden order, How adaptation builds complexity*. Helix Books, Perseus Books, pp.185.
- Hubbard, Douglas W. (2010). *How to measure anything, Finding the value of 'intangibles' in business*. John Wiley & Sons Inc. New Jersey.
- IUCN, UNEP & WWF, (1991). *Caring for the earth: a strategy for sustainable living*.
- Kneer, Georg & Nassehi, Armin, (1993). *Niklas Luhmanns Theorie sozialer Systeme: eine Einführung*. Wilhelm Fink Verlag, München.
- Korten, David C. (2010). *Agenda for a new economy, From phantom wealth to real wealth*.
- Luhmann, N. (1990). *The autopoiesis of Social Systems*, pp. 1-20, in: N. Luhmann, *Essays on Self-Reference*, Oxford: Columbia University Press.
- Margulis, Lynn, (1998). *Symbiotic planet: A new look at evolution*. Basic Books.
- Maturana H. R., & Varela, F. J. (1989). *De boom der kennis. Hoe wij de wereld door onze eigen waarneming creëren*. Amsterdam: Uitgeverij Contact.
- Miller, James Grier, (1978). *Living systems*. New York: McGraw-Hill.
- Nussbaum, Martha C. (1994). *The Therapy of Desire: Theory and Practice in Hellenistic Ethics*. Martin Classical Lectures, new series, Vol. 2. Princeton, NJ: Princeton University Press, 1994.
- Nussbaum, Martha C. (2000). *Women and Human Development: The Capabilities Approach*. Cambridge University Press.
- Pavlina, Steve, (2014). *List of values*. (Online) Available: (<http://www.stevepavlina.com/articles/list-of-values.htm>).
- Pasari, Jae R., Levi, Taal, Zavaleta, Erika S., & Tilman, David, (2013). *Several scales of biodiversity affect ecosystem multifunctionality*. *Proceedings of the National Academy of Sciences of the SA*, Vol. 10, No. 25.
- Pearce, W. B., & Cronen, V. (1980). *Communication, action, and meaning: The creation of social realities*. New York: Praeger.
- Piore, Michael J., & Sabel, Charles F. (1984). *The second industrial divide, Possibilities for prosperity*. Basic Books, Inc. Publishers, New York, pp. 355.
- Reddy, Naraginti, (2006). *Classification of values*. Ezine Articles, (Online) Available: <http://ezinearticles.com/?Classification-of-Values&id=382621>.
- deSantis, Mario, (1998). *Living systems: Principles of organization and building sustainable human communities*. (Online) Available: <http://www.ftlcomm.com/ensign/desantisArticles/desantis8/desantis8.html>.
- Seidl, David, (2004). *Luhmann's theory of autopoietic social systems*. *Münchener betriebswirtschaftliche Beiträge, Munich Business Research # 2004-2*. (Online) Available: http://www.zfog.bwl.uni-muenchen.de/files/mitarbeiter/paper2004_2.pdf.
- Schwartz, Shalom H. (2006). *Basic Human Values: Theory, Measurement, and Applications*. The Hebrew University of Jerusalem, Appeared in *Revue française de sociologie*, 47/4.
- Sloterdijk, Peter, (2013). *In the world interior of capital: Towards a philosophical theory of globalization*. Polity Press, Cambridge.
- Smith, Adam, (1776). *An Inquiry into the nature and causes of the wealth of nations*, Chicago.
- Stikker, Allerd, (1986). *Tao, Teilhard en westers denken*. Bres, Amsterdam. pp. 181.
- Swaab, Dick, (2011). *Wij zijn ons brein, Van baarmoeder tot Alzheimer*. Uitgeverij Contact, Amsterdam – Antwerpen. pp. 480.
- Taborga, Jorge, (2012). *Leadership stage development and its effect on transformational change*. *Integral Leadership Review*, Vol 12, No. 4.
- Taylor, Charles, (1989). *Sources of the self: The making of the modern identity*. Harvard University Press.
- TEEB, (2010). *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB*.
- Waal, Frans de, (2013). *The bonobo and the atheist, In search of humanism among the primates*. Norton & Company Ltd., New York.
- Westbroek, Peter, (2013). *De ontdekking van de aarde, Het grote verhaal van een kleine planeet*. Uitgeverij Balans, Amsterdam, pp. 336.
- Wilber, K. (1996). *A brief history of everything*. Shambhalla.