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AGAINST A BIG “TRAGEDY OF THE COMMONS OF ALL OF US”¹

Paper to: Conference on CSR, London Metropolitan University, 3rd – 5th September 2003, London, UK

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Abstract: Corporate social responsibility (CSR) and its impact is a broad and very influential issue, needing more of modern cybernetics and systems theory than usually seem to be applied to CSR in practice. Here CSR is related with a review of the climate change system's impact on the biosphere of the Earth. Both issues are reviewed from the prospective of system thinking as tool for a requisitely holistic understanding of reality and research work. On this basis the global and local aspects of CSR are analysed and a case study of Ansted University is presented, linking CSR with the climate change and informal systems thinking as a good solution.

Key words: Climate Change System, Nature, Space and Environment Protection; Corporate social responsibility; Dialectical System Theory, Requisite holism; System Theory, and Thinking

The Selected Problem and Viewpoint of our Dealing with it in this Contribution

The Corporate social responsibility (CSR) has a rather wide definition of what a company is supposed to care for. This breadth puts the issue of systems thinking in the very center of our consideration. Due to the influential position of corporations both cybernetics and systems theory comes to our mind when thinking about the CSR. Climate change is a case of a real life problem of the humankind of today, which is very hard to solve without systems thinking as a background of the CSR. But, there are different definitions of what authors mean by them, so we will expose our own findings briefly. Besides, the European Union requires systems thinking in several documents, but does not give an exact definition of what is meant.

Definition of the Corporate Social Responsibility

The concept of the CSR is not a very new concept. But the era of globalization and the so called new economy put additional demands for companies to comprehend all the different problems of their employees and their partners in their social and business environments as well as to work with them in solving broader societal problems, including producing and implementing innovative ideas in order to make a contribution to a higher quality of life of the community they belong, too. Their business behaviour is aimed at meeting the needs, attaining revenues and profits, creating jobs, and investing in the future development of the company and of its societal and business environment alike. Thus, the definition of the CSR addresses linking of the societal, social, economic, and business viewpoints into the daily operation of a corporation (or any other organization, for that matter), and doing so on a free-will basis. The concept is being put on stage anew by the European Union Documents such as "Green paper on Promoting a European Framework for CSR" (COM 2001, 366) and the "EU Strategy for Sustainable Development", launched in 2001. From the viewpoint of the firm, working along these lines provides several economic benefits, such as a better image, larger sales, bigger customer loyalty, etc. (see: <http://www.bsr.rg>). For details and application to small and medium sized companies in Slovenia see: Knez-Riedl 2002. For links with the care for



environment see e.g.: Karner, S., Oehme, I., Seebacker, U., eds 2003. For links with corporate governance see e.g. Rozman and Kovac, eds 2003, especially: Potocan and Kajzer 2003. For the role of the corporate culture see e.g. Treven 2000. For an insight how poorly it is included in measurement and assessments of corporate success see e.g. Buble et al 2003.

An Illustration: The Changing Role of Money – Causing Changing Problems Of Social Responsibility

CSR as a practical issue has been with society for quite a long time. Much research has been conducted to understand its origin, impact, and consequences. One of important issues is money system, which is driving force of corporate social (ir)responsibility.

Money – This Homo-sapiens' invention, and innovation has its origin in ancient history. People needed system of money for payment of goods and services, and to replace barter exchange. Eastern cultures have been more advanced as Western. Chinese developed coins and coins like money during the second millennia before Christ, and India followed. First paper money was invented in China, during the first millennium after Christ. Marco Polo, 1254 - 1324 reported on use of paper money after visiting China. First coins known in Western world were produced in Lydia, the kingdom in Western Turkey, for the king to guarantee uniform value. Paper money in Western world was invented much latter, and as we know today, it was in use in the 17th - 19th century. During the XX century money system was a nice assistant of the western civilisation, and very helpful.

From nice assistant to the master money system needed only half a century. By the end of the Second World War 1945, and within five years assisted by US administration, Marshal Plan and development of society money took place of the master of our civilisation.

From master to monster – by beginning of third millennium our civilisation accepted a second role in society after the **master money**, which undertook transformation from master to monster. Today monster money is deciding on right or wrong, dependence or independence, war or peace, values of services and commodities, people, nature, environment, and, sadly, even science achievements. Last hundred years of intensive knowledge gain of our civilisation, were driven by need to develop better and better armaments for Homo sapiens killing. Present wars always result with money system gain of nation, which gain the war. By beginning of the third millennium we (our civilisation) are/is in very bad shape, some nations are success stories as G – 7 countries, but majority has been put at the other edge of reality. The latest impact of the climate change system clarifies the role of CSR and long-term values. All value of monster money system is not sufficient to protect or mitigate impact of the climate change system, and we have to find way for better life or **sustainable future**, but of course not with monster money system, but in sustainability with the Earth biosphere.



The CSR should be rechecked from new angle of putting influence of money system at right place, and mitigating impact of money system on destruction of biosphere – production of: synthetic chemical products; nuclear technologies; GMO; waste; and assisting eco remediation of forest, river basins, coastal waters, deserts, large town areas, transport communications, and land/water/air pollution.

This need lets us see that both cybernetics and systems theory may apply to CSR. Let us take a look at them, therefore.

About the Notion of Cybernetics

In 1943 the first articles were published on the idea of transferring knowledge from biology into the one of engineering aimed to invent and produce machines capable of imitating human mental activities, some of them at least. Cybernetics was originally created on an interdisciplinary basis: they were trying to make a synergy of knowledge of biology and technology to produce novelties, supposed (and frequently able) to become even innovations (= novelties found beneficial / useful and used by their users / consumers). They were using the word system to denote that they were dealing with a complex and complicated feature as a whole rather than one-sidedly. (See: Umpleby, Vallée, in Mulej et al. 2000)

In 1970, on the basis of a contribution by H. von Foerster, the distinction between *the 1st and 2nd order cybernetics* was introduced. The first one was concentrating on the observed object, the second one on the observer and observing as a mutual impact between the observer and the object of observation. This was a revolution in science, because the supposition of a total objectivity of science was given up and replaced with a more realistic one that includes the influential role of the observer. The quite logical next step is an attempt to impact the impacting person, which made room for Umpleby's *cybernetics of conceptual systems*: there is a mutual impact between the ideas and the society, and the cognition is at the same time a biological and a social feature. Cybernetics has no longer to do only with understanding biology and mastering machines on its basis, including automata, but also with thinking of humans, including specifics of individuals rather than observers in general only. (See: ibidem)

Another line of development of cybernetics is much older, and it initially reaches back in 1951 and the work by Robert Vallée. Its modern point is aimed at an explicit synthesis of observation, decision-making and impacting, stressing especially the phase / activity of decision-making. This is the basis for the notion of the 3rd order cybernetics and epistemo-praxiology. (See: ibidem)

Cybernetics, hence, introduced complexity to science, not complicatedness alone any more, by attracting attention to relations, impacts, hence information, which opened human insight into the previously overseen attributes of reality. It helps humans control their own conditions of life a lot more efficiently and, hopefully, more holistically, too.

On such a basis one may conclude: Cybernetics is a science and practice of influencing / controlling / managing features, events, and processes that:



1. Are complex or very complex, i.e. have multiple relations, internally and externally;
2. Are open, i.e. have relations, especially interdependencies, including the ones between different viewpoints;
3. Are dynamic, i.e. able to change, including the observers, decision-makers, and impacting actors;
4. Take inputs as well as produce outputs – impacts by information rather than by material/energy flows only;
5. Support, stabilize, and simplify these flows by feedback loops;
6. Are mentally, explicitly or implicitly modelled from the selected (set or system of) viewpoint/s.

Cybernetics cannot be reduced to feedback loops alone neither to modelling alone, but it rather takes all six attributes mentioned as one synergetic whole. The point of cybernetics is to help optimize the human impact over the human life and its circumstances, conditions, and preconditions.

Thus, cybernetics is one of many specialized disciplines that (1) are needed when dealing with the CSR, and (2) need to be requisitely holistic, and can hardly be so, very often, if left alone rather than acting in interdisciplinary cooperation with other specialized disciplines. – Here, systems thinking becomes necessary to cybernetics, and therefore also to the dealing with the CSR.

About the Notion of the (General) Systems Theory and Systems Thinking

At about the same time as the initial authors of cybernetics, L. v. Bertalanffy (LvB) was working with another group on a new worldview of the General Systems Teaching / Theory (and related methodology supportive of making it happen). One of his crucial sentences says that humankind has a poor chance to survive if we do not think and behave as citizens of the world rather than single countries, and if we do not consider the entire biosphere as one whole. For this reason it is necessary to supplement and/or fight the modern exaggerated (!) specialization, obviously by interdisciplinarity and isomorphisms – since there seems to be no other way toward survival (See: Bertalanffy 1979; Davidson 1983; Elohim 1999; Dyck, Mulej et al. 1998; Ecimovic et al. 2002). – We can conclude from LvB's and other writings as well as from the real life experience that a system is a mental picture of the object, and this mental picture is made by the author / observer / controller / manager of this object from his / her selected viewpoint/s in order to let the attributes of the object that he / she finds the most important ones, be clearly visible, exposed. Thus, the system is not really equal to the object it represents, and the model represents the system (because the system is the limit of one's mental capacity and interest compared to reality with all (!) attributes). Due to this mental capacity, limited for natural reasons, we humans try to control / manage / create the world although we have a very limited insight into its reality; to overcome this natural lack of capacity, we need interdisciplinary creative cooperation of specialists who are mutually different.

In this point in history and in human capacity of today, systems theory disintegrates into a number of them:

- (1) The ones putting system equal to object, which is OK in theoretical mathematics only, but reduced to one single viewpoint / profession / scientific discipline alone, hence fictitiously holistic in LvB sense, in other cases;



- (2) The ones defining system as a mental picture of the object, thus admitting their own specialization, unavoidable lack of holism, and the resulting need for interdisciplinary creative cooperation;
- (3) The ones defining system as a mental picture of the object, thus admitting their own specialization, too, but not interested in inter-disciplinarity, hence working on complicatedness rather than complexity;
- (4) The ones working on systems theory as a theory of holistic thinking, and the ones working on systems theory as a generalization of attributes of systems as complex features.

What is going on, hence?

The word system was introduced into the Systems Theory and Cybernetics in order to denote the intention to refuse one-sidedness and support holism of consideration, but with no exact and unified definition of what holism means (See: Turina, Tintor 2003; Zupan 2003; Bausch, Christakis, eds, 2003; Geyer, Hornung, eds, 2003; Trappl, eds 2002; Rebernik, Mulej, eds 2002 etc.). The Bertalanffian worldwide holism requires too much from specialists, especially from the ones with no training / practice in interdisciplinary creative cooperation. On the other hand, in a Webster's dictionary the word system has sixteen groups of meaning. (Webster 1987) A closer look tells us that all of them have two attributes in common:

- In contents a system always represents a selection of the object's attributes from the author's selected viewpoint, and never the object as a whole.
- In the mathematical, very abstract and exact, formality a system is always a round-off entity, a whole, made of elements / components and of their mutual relations, as well as of the relations with its environment.

Thus, a system is holistic, mathematically, and one-sided, in terms of its contents, at the same time. From several viewpoints, several systems, all with different selections of attributes, and hence of contents, can be introduced and let us see the same (!) object under consideration differently; therefore, we can use the same language, but differ in observations, decisions, and actions.

Obviously, there is a crucial need for a system (in mathematical terms) of systems (in terms of their contents) for observations, decisions, and actions to be requisitely holistic and thus requisitely reliable. But: not all kinds of systems theories provide the theoretical basis for such an orientation of systems thinking (and one must never forget that systems theory was introduced to fight the exaggerated narrow specialization after the end of the period of two world wars and a world-wide economic crisis of 1914-1945; one must neither forget that systems thinking, as a practice of a requisitely holistic thinking has been around for ever, as an intuitive basis of success, and expressed in Yin&Yang of the Ancient China, and in dialectics, i.e. the philosophy of interdependence, of the Ancient Greeks (Delgado, Banathy 1993), as the basic ancient forms of informal systems thinking). Rare systems theories try to cover this today. The Dialectical Systems Theory (Mulej et al. 2000, and earlier, since 1974) does. Hence, it may be an appropriate selection when dealing with the CSR.

About the Notion of the Dialectical Systems Theory



From 1974 on, one can trace the evolution of the Dialectical Systems Theory (DST) by M. Mulej. Dissatisfied with forgetting about interdisciplinarity, as a way closer to the presupposed holism, in contributions about Cybernetics and the General Systems Theory, he coined the notion of the “Dialectical System” and then the “DST”. By definition, the Dialectical System is a system (in mathematical terms) of systems (in terms of their contents), including all essential and only essential viewpoints and therefore systems featuring parts of the same object. They are mutually complementary, therefore interdependent, or in the ancient Greek word, dialectical. To make this notion workable, Mulej created the DST as a methodology of thinking (in observing, decision-making, and impacting) based on the following findings about reality:

1. Humans think, and they do so on the basis of their subjective starting points (mentality, emotions, perception of the objective reality), which can be influenced.
2. The starting points, especially the subjective ones (which select, by observation, the attributes of the objective, i.e. outer reality to be taken in account), influence all the further process of definition of objectives and their attainment, in which many features and attributes are interdependent, rather than simply linearly dependent.
3. The starting points can be influenced, too, e.g. by education and other information processes, especially the subjective ones. But the receivers of those influences tend to react to them differently, if their role is to define objectives, or to attain objectives by partial tasks to be done.
4. In acting according to their roles, humans try to be rather holistic, in order to avoid failures and the resulting troubles.
5. It is impossible for humans to be holistic on the level of LvB’s requirements, but it is an unfortunate other extreme, if one defines one’s own holism very narrowly, e.g. inside one single specialization, thus producing a fictitious holism rather than a realistic one; perhaps one even imagines that a realistic one has been attained, anyway (which is even worse).

These five summaries are reflected in Mulej’s DST as follows (Ecimovic et al. 2002 as the newest edition; etc.):

1. *The law of hierarchy of the following order (succession) and interdependence.* It is not the structure of subordination, but the processes that make results, and it is cooperation, which makes processes happen.
2. *The law of entropy.* There is a permanent natural tendency of everything existing to change into something else, to be destroyed, and to help create something else, both at the same time. It is entropy, which requires humans and other beings to be requisitely holistic and creative rather than one-sided and routinized.
3. *The law of the requisite holism.* There is a permanent need for a dialectical system, once a one-sided system is not holistic enough, and a total – Bertalanffian – one cannot be attained. The decision makers must take responsibility for their selection of what enters the dialectical system, and what is left out (but does not stop existing and influencing, once it is forgotten about, in reality).
4. *The (incidentally ten) guidelines on how to form the subjective starting points of persons active before the definition of objectives* in order to support the requisite holism and creative in this phase of the work process. These persons must be rather broad and synthesis-oriented, being the bosses, heads, CEOs.



5. *The (incidentally ten) guidelines on how to form the subjective starting points of persons active after the definition of objectives* in order to support the requisite holism and creativity in this phase of the work process. They must be rather deep and hence narrowly specialized, analysis-oriented, being responsible for single details, but still understand and support a broader definition of the requisite holism.
6. *The USOMID*, DTS-based applied methodology of creative cooperation, enabling participants of the work process consider and use all the three laws and both dialectical systems of guidelines, with no single word of their theoretical background.

On such a basis, in Mulej's Dialectical Systems Theory, holism tends to be both as close to the definition of holism found in LvB and workable as requisite, and therefore to be a system of four attributes:

- Systemic (attributes of the whole, but not of its single components), complexity.
- Systematics (attributes of the single components, but not of the whole), complicatedness, details.
- Dialectics (attributes of relations making the whole's attributes by causing emergence, resulting in synergy), interdependence.
- Materialistic (attributes of the observer, decision maker, and/or actor, called also realism).

Corporate social responsibility and the Natural Environment

What we briefed above is not only about humans, technology, and society only, but about **everything**, including survival of the planet Earth's inhabitants, including humans. One-sidedness kills, causes extinction, natural and other disasters, in spite of good intentions and specialised, deep, but too narrow insights. (See e.g.: Ecimovic et al. 2002 and references cited there) What we – as humankind – have therefore to think (by authors), is how to incorporate the actual **status of nature**, and actual environment / information of/about the nature including ourselves on one hand, and **our ability / knowledge / experience** present on the other hand, to discover and consider **interdependences**, **interactions** and **co-operation/s** as bases of the complex Earth nature system on all levels of life, and interests / knowledge / life / covering individual, regional, planetary, galactic, cosmic needs, etc. The humankind's present average understanding is at the level of the **anthropocentric** experience, and it includes neither the holistic nor the requisitely holistic understanding.

It is also about how to **incorporate new** experience / knowledge / understanding of larger systems' / entities' laws, which exit and the knowledge of which will result from research / understanding and evolvments in future. The Bertalanffian thinking (requiring total holism) is relatively new; the Dialectical Systems Theory, which offers many more possibilities, is even a little newer; and both of them together with many more theories, established or under establishment worldwide, are making the current mental environment for humankind to better understand systems' / entities' and nature's reality, including human behaviour, etc.

The levels of the present **knowledge of humankind** (Newton, Einstein, Stephen Hawking, etc.) and of the **average human understanding** of the life reality are very far apart from each other. This sad fact applies also to the present state of the holistic thinking / system thinking /



understanding of nature, which will – in order to be understood by humans – go on consuming much more time / energy / matter / information in decades to come. But let us think correctly and take into consideration the permanent evolution of nature, including the one of the humankind's brain ability to think / understand / experience our own past, present and future.

Many **basic laws** of the natural systems / entities are partly still **uncovered**, and it will take more time / efforts for humankind to uncover them. Influence of environment and importance of information (and creation of information), once discovered, will allow for a better understanding of the **requisite holism**. In our natural environment (the Solar system and planetary environment of the Earth), hypothetically, humankind has learned to know a big number of basic laws, such as the Mendel's laws in genetics, Mendeleev's law (Periodic law) in chemistry, Einstein's Theory of Relativity (physics), thinking on physics by Stephen Hawking etc. They discover **parts of the whole**, which are smaller than the above stated environment (Solar system/Earth), and because of specific information at origin of the matter (establishment of the Solar system) their findings are correct to a certain extent. Now, if using **system thinking, analysis, and synthesis** we may put together findings in the level of the requisite holism for the present presentation – what the Earth is at present. Consequently we now have a level of our understanding / knowledge / experience, which may be much different within another environment (another galaxy or star and planetary system).

Mathematically exact presentations are **limited** by environment (number of attributes and symbols) and at present are not making easy definitions for complex systems. It is due to difficulties concerning **definitions of information**, for which we do not have mathematical symbols and we neither have them for environment. Mathematics at Earth level is correct to a certain extent, as long as we think within the classical knowledge. But when we come to **complex issues** and questions of information and environment definitions, we need more research for understanding to allow us to make a – requisitely realistic – mathematical definition of reality.

We think the answer could be within understanding of systems, matter, energy, information, environment, and their evolvment, within the classical knowledge of the present human civilisation. Definitely the system theory, requisite holism, system thinking and understanding of complexity of nature would help us (*hypothetical* thinking by authors).

Corporate social responsibility – back to Bertalanffy (LvB)

By the Dialectical Systems Theory

LvB gave his impetus to creation and application of systems theory as a person of many interests and fields in which he contributed seminal achievements to science/s (see: LvB Conference 2001). He did so when his capacities allowed him to perceive that the **unavoidable and exaggerated narrow specialization** was too reductionist and hence causing humankind to make a crucial oversight – the oversight of the **whole**, when dealing with parts of the planet Earth and issues of the human life and other natural processes (Davidson, 1983, and later). LvB warned, that humans must **take in account the entire biosphere**, not a single e.g. meadow only, **and behave as citizens of the entire world**, not of single countries only – for



humankind to survive. The two World Wars and the World-wide economic crisis between them (in 1914-1945) happened in his lifetime, so he knew what he was talking about.

But there were not many to embrace his warning fully. We do not mean that we people are bad or so, we are just no Gods, but humans and hence capable, as individuals, of mastering a *small part* of the entire humankind's knowledge only. And as specialists, who in their education are offered very little opportunity to think and work on an **interdisciplinary basis**, most humans are hardly able to reach beyond the unavoidable limits of our rather narrow area of expertise and life experience. – We can see this limitation even inside the systems science community: most conferences are made of symposia per specialised areas of expertise rather than linking mutually different specialists around some shared topics, even less so beyond them. And the few conferences that are trying to give life to more interdisciplinarity – have small attendance and receive rather few responses in professional press. Not to speak of the general press that serves as the major opinion maker for most humans.

This is no blaming or distress. It is rather an impetus for us, who try to carry on the LvB's seminal work (See: Bertalanffy, 1986), to do something to help ourselves, and our fellow humans help our planet Earth to survive. (See: Ecimovic et al., 2002, many other texts about sustainable development as the common denominator of the current and long-term crisis of humankind and other nature on Earth, if the basis of human thinking does not become more systemic)

The lesson from which we can start is reaching far back in history, and revealing that most readers of LvB seem to have made a serious **oversight** when learning from him about his General Systems Theory. As Davidson (1983 and later, including forthcoming) finds, many readers of LvB see him as the author of the theory of similarities called **isomorphisms**. They certainly express and expose an important attribute: isomorphisms enable the transfer of attributes from one specialised field of science into another specialised field of science, such as from biology to electronic or other engineering and from there to medicine in order to produce means that help people survive or cure diseases, overcome disabilities, etc. But such readers, frequently, fail to see or to find important, at least, the fact that a fruitful, innovative, transfer of knowledge takes place in **interdisciplinary teams** made of people sharing **ethics of interdependence**.

LvB exposed interdependence much more than most of his readers have found crucial, as much as we were able to detect. Namely, LvB required humans to see the entire biosphere as one organization full of mutually supporting and mutually fighting interdependences. With narrow specialists, as we all unavoidably are, interdependence is crucial to complement our specializations. Over the last few years, even politicians find and express this fact, and journalists keep quoting these parts of their speeches quite a lot. The reason behind the scene is clear: **without interdisciplinary creative cooperation of mutually different and equally influential and regarded specialists there is hardly a chance for the requisite holism to be attained**, as soon as one works on complex problems (and very few problems – as open and



important issues the solutions of which are not known – do not qualify as complex ones, at least not in the modern life).

Holism has never been attainable, if the word is taken completely literally like it is put in dictionaries: in them it includes *every attribute, all attributes, and nothing (!) is left aside*. All (!) professions (which tend to be one hundred thousand, according to data from international fairs on education issues) would have to be included. And this cannot be done. That's why Mulej and Kajzer introduced the **law of requisite holism** (Mulej, Kajzer, 1998; Rebernik, Mulej, 2000; Potocan, Mulej, Kajzer, 2002; Mulej et al, 2000; Mulej, 2000; Mulej, Zenko, 2002; etc.). It expresses the experience that one has the unavoidable habit to **select** the **(dialectical) system of viewpoints** to be considered, and to leave the others aside, or to reduce even more. Reductionism is both unavoidable and dangerous; what remains is the issue of how far one goes in applying the Einstein's thought:

*Let us simplify as much as we can,
but no more.*

Very / too many terrible consequence of too narrow / reductionist selections made by the decisive persons' in the form of their (dialectical) system/s of viewpoints surfaced in the form of the two World Wars and the worldwide economic crisis between them (1914-1945). Then, the LvB's General Systems Theory showed up and received quite a good acceptance. As we saw, and as we reminded above, it was soon reduced (by others, not by LvB) from the worldview and science of **holism attained by interdisciplinarity** to a science of similarities, allowing specialists to remain inside their ivory towers of their own and separated disciplines. Not much co-operation resulted. And this did not happen for the first time in history.

As far back in history as the ancient China of four thousand years ago, one can find the principle of **yin and yang** as a basically systemic concept (Delgado, Banathy, 1993). Later on, but still in ancient times of the antique Greece, one can find **dialectics** (ibidem), a basically systemic concept, too. We can find dialectics renewed in the 19th century (ibidem). – This does not mean, that the systems **theory** is more than about fifty years old, but it does mean, that systems **thinking** – as a practice of holistic thinking leading to **success** – is an **ancient human experience**. (Note: Yin and yang, as well as dialectics, denote interdependence.) If we consider the issue of the CSR from the briefed (dialectical) system of viewpoints, we may conclude that it may benefit from using several systems theories in its practical implementation.

Corporate Social Responsibility – Linking the Hard-Systemic and Soft-Systemic Versions of Modern Systems Theories

Soon after the establishment of the General Systems Theory, there were other systems theories emerging and establishing them-selves, too. Jackson (1991) lets us know that there have been two big waves in the systems theory formation process. He groups the ones from 1940s to early 1970s as traditional, the newer ones as modern. The difference is basically two-fold:



- 1) The **traditional** ones aim at *generality* of their theoretical findings and keep to a *functional, hard-systemic*, very reliable dependence of a process outcome / output on the process input. That's what they used to see prevail in the (natural) sciences.
- 2) The **modern** ones aim at solving rather *specific* issues on the basis of the principles of systems thinking, at further elaboration and development of those principles. And they keep to *either a hard-systemic or a soft-systemic theory*, expecting a probabilistic rather than reliable dependence of the process outcome on the process input.

The switch to the modern systems theories does not mean that there is anything wrong with findings of the traditional systems theory, except the *exaggerated generalization, positivism* (= limitation to plain facts with no explanation, comment, individual interpretation, conclusions) and *functionalism* (= tendency to discover only the visible utility of findings and found attributes). In other words, the traditional systems theory/ies is/are not so very generally valid as it/they used to be supposed to be.

Earlier, we briefly mentioned the issue of the *selected viewpoint*, and earlier the issue of the *unavoidable specialization*, along with which *holism* is also *unavoidable* for those who do not want to be in danger of making too serious oversights. Why are we now coming back to them?

If the point of systems theory is to *describe* entities as systems / wholes, this is easy to accept and understand as long as we stay within the very simplified picture of reality, which the abstraction in the *theoretical mathematics* offers us and makes us forget about the *real life complexity* (for good reasons that we do not oppose here, but we wish rather to concentrate on the other part/viewpoint of the story). So what?

- 1) We know that *system* is defined as an **ordered set**, i.e. an entity made of a set of elements / components / parts and a set of their relations / interdependencies, on mathematical formal terms.
- 2) We also know the real-life experience, that there are *too many real attributes* with almost every entity for a person to grasp, perceive, understand, and master all of them, especially in real time.
- 3) This fact causes unavoidable **specialization** which has helped – by *reduction* of the really given amount of attributes of the entity under consideration to an amount, which one *selects* into the role of the essential ones while leaving others aside. The selection depends on the *selected viewpoints* (and is found so natural that very few authors of systems theory discuss it, thus letting their audience oversee the crucial consequences of this selection).
- 4) In this way, one namely creates a *mental entity*, which is **not equal** to the *real entity* – in terms of its *contents*, but still may be called a whole / entity / system in terms of the *mathematical formal* definition. From now on, the mental entity **replaces** the real entity as information used in the further process of investigation, thinking, decision-making, and acting.²

² In German, perception is expressed as »Wahrnehmung«, which means: by perception we take the observed object as real, and we do so inside our selected (dialectical system of) viewpoints, of course. (See: Tomsic, 1959, etc.)



5) The practical consequences include the fact that one **works** on a *reduced basis*, while one **thinks** that one works on a holistic basis. Reductionism is especially important in the case of the GST. We demonstrated here to some extent, what had LvB had in mind and what has later on happened instead of his wonderful and crucial intentions.

6) It is namely the *generality* of **bases** of consideration and **scopes** of consideration what LvB had in mind (if we may remind you). And it is our understanding that LvB implied that *interdisciplinarity* is unavoidable, because he explicitly attacked *overspecialization* and warned against *oversight* of interdependences³. Explicitly, of course, he spoke of isomorphisms rather than interdisciplinarity.⁴

7) This means **survival of reductionism under the name of GST as a science and worldview, which came into being to fight reductionism and to promote holism.**

Thus, we *may not be satisfied with the GST as practiced today*, once we are investigating ways to help humankind solve the problems of today!

The GST as of today does not provide for holism,
which it has been promising and established for!
Its followers make their own – reductionist definition of holism.

Now, once we make such a strong conclusion, what is actually holism? We found no publications about it, hence it is deemed self-explanatory like the issue of viewpoint and its selection is, one may conclude. Let us deal with it a bit (which brings us to the **theory of systems thinking**)! The issue of the CSR is obviously in need of it.

The Seven Basic Groups of Terms of Systems Thinking: A Suggestion

The basic few terms belonging to the concept of systems thinking, may in a summary include the **left** column, and fight the **right** column, in *Fig. 1*. (See: Mulej et al., 2000):

Systems / Systemic / Holistic Thinking	<i>Non-systemic, Traditional Thinking</i>
Interdependence/s, Relation/s, Openness, Interconnectedness	Independence, One-way-Dependence, Closeness
Complexity (plus complicatedness)	Simplicity, or Complicatedness
Attractor/s	No influential force/s, but isolation
Emergence	No process of making new attributes
Synergy, System, Synthesis	No new attributes resulting from relations between elements
Whole, holism, big picture	Parts and partial attributes only
Networking, Interaction, Interplay	No mutual influences

³ Interestingly enough, interdependence is not included in the above list of basic term explicitly, but it is so implicitly by the terms relation and feedback.

⁴ If you take ISSS45 (2001) as a fresh case of an old tradition of dealing with the GST on a systems-scientific basis, you can easily see, that there are many very interesting contributions, but hardly any interdisciplinarity. The authors' endeavors at holism are limited inside their own viewpoints and professions, there are very few coauthored papers and even less papers co-written by authors of different specializations.



Fig. 1.: The Basic Seven Groups of Terms of Systems / Systemic / Holistic
Versus Non-systemic Thinking

It is **hence**, if we take a case of mutual relations between humans, *democracy* which makes room for (requisitely) creative and holistic thinking, decision making, and action (if it is not a formality, in which it is only defined, who are the individuals / groups in power and hence entitled to meet their own narrow interests rather than to serve as managers of networking, which targets holism). Democracy, hence, must be a *normal social relation everywhere, not only in politics*. Most commanding characters / persons and narrow specialists have never had much **education / feeling / appreciation for systems thinking**.⁵ Very few around the globe had and/or have courses in systems theory.

Conclusion: CSR needs the (dialectical) systems thinking to do its job well. The CSR, as defined at the beginning of this contribution, is a very complex issue and has very broad and long-term consequences. But it is still up to humans to decide what will it address. In a best-case scenario, it would cover everything, on terms of LvB, in a usual scenario it tends to cover too little (otherwise the European Union would not have to pass documents elaborating it and requiring its implementation). A middle way between the two extremes would be an acceptable one, if coming close enough to the requisite holism as defined by the Dialectical Systems theory, and made also possible by it, methodologically.

Now let us see the case study of Ansted University.

Ansted University has played it roles as an institution in promoting social responsibility

There are a lot of areas and aspects that we can keep on discussing on the issue of Social Responsibilities. However, personally I (Sir Prof. Dr. Roger Haw) believe that action oriented is more importance than just describing or analysing the scenario on paper.

The management of Ansted University believes and also put in practice in share with others, listens to understand, respect all life, reject violence, preserve the planet and rediscover solidarity. Promoting social responsibility education through peace is one of the Ansted University goals. The culture of peace should be cultivated in individuals, families, organizations, corporations, institutions and all nations in this world.

Culture is about how we live our lives; how we think, speak and behave. When we do all these with positive values, then we live a culture of peace. It brings benefit to the self and others. However, Peace is not only the absence of conflict, but requires a positive, dynamic, participatory process where dialogue is encouraged and conflicts are solved in a spirit of mutual understanding and co-operation.

⁵ If they had enough education to practice systems thinking, they would most probably be democratic, e.g. able to listen to and hear and accept views of their opponents as complementary rather than dangerous.



1. Sharing our time and material resources in spirit of generosity to put an end to exclusion, injustice and political and economic oppression. 2. Defending freedom of expression and cultural diversity, giving preference always to dialogue and listening without engaging in fanaticism, defamation and rejection of others. 3. Respect the life and dignity of each human being without discrimination or prejudice. 4. Practise active non-violence, rejecting in all its forms; physical, sexual, psychological, economic and social, in particular towards the most deprived and vulnerable such as children and adolescents. 5. Promote consumer behaviour that is responsible and development practices that respect all forms of life and preserve the balance of nature on the planet. 6. Contribute to the development of our community, with the full participation of unisex and respect for democratic principles, in order to create together new forms of solidarity.

An example, what we have done at Ansted University besides to fund some money to an approved company by Ansted University management, we do provide wise advise, directions from the Ansted expert team in the area of academic, technical knowhow and business knowledge to help the company management to gain the maximum success level. It is important to cultivate a young and potential profit making company to grow together with the university with a condition in return each year the company has to spare some fund aside to support the university foundation project activities. By doing so, gradually this approach will help the university to have a long-term additional financial resource support through many of this incubation project concept. Of course the company management funded by the university must allowed the university management to participate in their project decision, operation and management in various aspect which will be stipulated in the official agreement and supplementary agreement from time to time.

This company “Best Team Industrial service” is the first company accepted Ansted University incubation project concept which is established in Malaysia on 28th July 2003 because of the Ansted University Founding members and the various Board members had an idea to provide an “institutional social responsibility grant” amounting to US\$ 30,000.00 to fund a new set up company in Malaysia as their business start-up capital for a group of young, dynamic and dedicated team to support the project in order to start the ball rolling. In addition, a few other volunteer of Ansted faculty members are also providing their expert knowledge and business guidance to assist the company.

A corporation should not forget their social obligations to society, especially to help those young and dynamic individuals have the desired goal to start their own business after working for people for so many years arm with the feasible business plan, innovative ideas, wise knowledge in the field, with the dedicated and committed character intend to excel their potential in the today business arena. After an individual or a company attaining an acceptable success rate, they should not forget to take some fund out to help other deserving people come up in life as well. Although it is not a compulsory task to do for any corporations or individuals but how nice the world would be if it had caring individuals and corporations as well as government bodies.

People should continue to work hard and improve their living standard besides fostering cooperation among all races throughout the world to ensure peace, harmony and stability. I am sure hardly can we find this source of financial support from an education institution in the world nowadays without asking for return when they fund a business project. Financial



institutions, venture capitalists and moneylender companies should also consider to play their role as well rather than purely focusing on how to making money aspect. Participating and funding a start-up company the risk is always there. However, after thoroughly evaluating the proposal submitted by the candidates, if they project is feasible we shall help the dynamic team to grow in the business. It is also part of the Social Responsibility – which is to help further the mission of Ansted University in terms of teaching, research & development and its relations with the global community. Ansted University does not invite application but only based on the recommendation by the Ansted University family members. The benefits to be obtained are concerned with enhancing the reputation of the university and achieving a positive effect in the world community.

Education and educating people are ways to bring about change and this is central to the purpose of the university and its faculty members, and the principal reason for my involvement.

From my perspective, one of the main aspects of human society is that of citizenship of our global community and that citizenship implies a sense of social responsibility and a putting back into the community at least as much as is taken out. Education and educating people is one way to bring about change and this is central to the purpose of the university and its faculty members, and the principal reason for my involvement.

Corporations play an important role in society nowadays. No matter how big or how small the size of a company in any part of the world, it will involve human beings within the firm responsible for making organizational activity happen but the effects of that activity will be felt by society at large. Therefore, the firm has a social responsibility for the effect of its actions and the way in which these are achieved. It is apparent however that any actions, which an organization undertakes will have an effect not just upon itself but also upon the external environment within which that organization resides. In considering the effect of the organization upon its external environment it must be recognized that this environment includes both the business environment in which the firm is operating, the local societal environment in which the organization is located and the wider global environment. This effect of the organization can take many forms, such as:

- The utilization of natural resources as a part of its production processes
- The effects of competition between itself and other organizations in the same market
- The enrichment of a local community through the creation of employment opportunities
- Transformation of the landscape due to raw material extraction or waste product storage
- The distribution of wealth created within the firm to the owners of that firm (via dividends) and the workers of that firm (through wages) and the effect of this upon the welfare of individuals

The objectives for Ansted University to participate the project are threefold:

- Social responsibility has many meaning and many implications for individuals, organizations, society and the broader environment. One objective therefore is to engage in a scholarly debate about the meaning and implications of this concept with as wide a set of people as possible throughout the world.
- Part of the reputation of a university is established through its research and contribution to the global community. In particular a university has an obligation to make its position



known on important issues of principle such as our concern with cultural and personal values. A second objective therefore is to establish Ansted's position with respect to both research and social values.

- Absolutely central to any university is the quality of its teaching and the way, through this, that it equips its students with the skills and abilities to take their place in the leadership of the global community. Exposure to scholarly debate, particularly when originating from within their own university, is vital to this aim. Indeed it has been clearly demonstrated that a research active scholarly community is also a vibrant teaching and learning community. The third objective therefore is to enhance the quality of the learning experience for our students and our university future corporate partners.

It can be seen from these examples that an organization can have a very significant effect upon its external environment and can actually change that environment through its activities. It can also be seen that these different effects can in some circumstances be viewed as beneficial and in other circumstances be viewed as detrimental to the environment. Indeed the same actions can be viewed, as beneficial by some people and detrimental by others.

On behalf of the management of Ansted Service Center, Malaysia and Ansted University Incorporated, BVI of UK, I would like to congratulate the management of Best Team Industrial Service for being supported by Ansted group in the area of initial business start up capital funding up to US\$ 30,000.00 only. The BTIS has appointed Roger Haw as the Honorary Chairman for this company to overseeing the company activities. An award will be given to this company, if the said company is able to meet the Ansted's requirements and expectation as we shall hold the 2nd International CSR Conference in Malaysia 2004. Prof. Dr. Roger Haw has been assigned by the university to handle this case personally and shall give the proper guideline to the team accordingly.⁶

And now let us take a look at the climate change system, in order to see the entire environment in which the CSR is playing its role.

The Climate Change System - has been taken of, because it was similar presentation as in 2002.

Conclusions

The present status of the biosphere, nature, space and the environment, as well as the scientific and research knowledge at the disposal of humankind and our social system are driving our civilization in a dead alley. Individual, regional, national and international interests do not permit humankind to take a new approach to survival by their social, financial, political, and bureaucratic pressures, war philosophy, and lack of tolerance between people.

We, the people of the Earth, have to recognize the need for action towards the establishment of a world constitution, a world parliament, and a world government as a possibility for our survival, with

⁶ This section of the paper was prepared, written, initiated and announced by Roger Haw, founding member of Ansted University and Ansted Foundation on 25th July 2003. Organisations and institutions are welcome to use this article in their work and information activities. Please credit the author, the university and provide a copy.



responsibility to co-ordinate social issues, and to harmonize the needs of the entire humankind, and the nature, space, and environment capabilities, needs, and possibilities.

The present practice on the Earth such as:

The destruction of nearly all waters with synthetic chemicals, bio and air (rain-induced) pollution,
The destruction of air by the land, sea, and air traffic,
The destruction by the results of war actions,
The destruction of the ozone layer,
Destruction of the soil fertility by the agriculture practice, including producing deserts,
Global warming, and of course
The explosive reproduction of humankind,

Such practice cannot be dealt with by simply taking national interests into account and meet them in mutual isolation. They should be a major responsibility of the world government.

The climate change system, which is maker, holder and guardian of the living conditions within the biosphere, needs special scientific research, and world governing action.

Nature, space, and environment protection, which should take care of the biosphere, need special scientific research and world governing action, too.

Both groups of topics are two global systems and reacting to the human one-sidedness by causing global entropy tendencies, which require a global level of the requisite holism in humankind's dealing with them.

The necessary scientific and applied research to cope with the above issues cannot be provided on the basis of our civilization's current scientific and research capacities, due to the engagement of scientists with war and the demands of bureaucracy. Therefore, a new approach is needed for a redirection of scientific work towards the needed knowledge and values capable of saving the nature, science, and the environment including the climate change system.

Scientific work, as a basic source of knowledge, needs special co-ordination at worldwide level and should be an integral part of the world governance.

We need independent scientist, who work because of their scientific thinking, and acting ability, and not because of need for daily, monthly, or annual salary given to them by country administration (democratic financial societal system,), or marketing/profit oriented economy.

The money system today has become a master of its own, a monster who rules the entire civilization. It would be nice to put it back, in the frame where it belongs – the servant of humankind. Now, profit is killing profit by causing side-effects having crucial impacts, including humankind's cost covered by company taxes.

To be able to understand the need for world governance, humans should understand the systems within which we exist, and systems we consist of and that we create. It is important due to the known fact that any system in nature will remain as it is, as long as all systems and relations within it are in a similar mode. Together they make a living system that is trying to be a viable system. If and when any major or minor part of the system moves, changes, and the whole system will commence to move, change. It is not possible to predict in which direction the system will move, change. This is what is happening with the climate change system.



The climate change system ultimately would change living conditions within the biosphere and geography of the Earth so much that our civilization will cease to exist. Therefore we are

RECOMMENDING

One planet, one government is our first recommendation. Of course, The Planet Earth Constitution is first and The Planet Earth Parliament and Government follow in line, after ratification of The Planet Earth Constitution.

Secondly we recommend a new approach to the *social order*, which has to reflect the present experience, and the establishment of a *new contract for humankind* living on the planet Earth. The goal is to prevent explosion of humankind reproduction, enforce ethics and tolerance amongst peoples of the Earth also enforce (a globally holistic!) law and order, and with skilful governing allow the coming generations to live on the planet Earth.

Thirdly we recommend *redirections of scientific work* from war armaments, too narrowly market-oriented and synthetic chemicals technologies, etc., to discovering viable global systems of nature, space, the environment and cosmos, as essential elements of knowledge needed for survival.

References: please see at last volume of this digital book “Anthology 2 – 2001 – 2014.

2.

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EKOLOŠKA POLJOPRIVREDA

Prezentaciju Ekološke poljoprivrede na Okruglom stolu sajma EKO BIS u Sanskom Mostu, Bosna i Hercegovina, dana 10. oktobra 2003 u 13.00 su pripremili slijedeći stručnjaci:

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Abstrakt

Ekološka poljoprivreda je odgovor odgovornih ljudi na prekomjerna zagadjivanja iz klasične ali integralne poljoprivrede u prirodi, prostoru i okolišu, koja danas predstavljaju veliki dio problema okoliša kako na globalnom tako i na lokalnom prostoru.

Ekološka poljoprivreda, organska, biološka, održiva, permakultura i još nekoliko drugih naziva, ali izraza pokrivaju isti sadržaj, sistem, rad, i poloprivredu, koja ne upotrebljava sintetičke kemijske proizvode, u stocarstvu radi tako, da ne muči domaće životinje i sa svojim djelovanjem ne doprinosi zgađivanju zemlje, vode i zraka, bilo na lokalnom ili globalnom prostoru. Takovu poljoprivredu omogućavaju standardi i sistem kontrole, koje je izradilo i privelo korištenju udruženje ekoloških poljoprivrednih proizvođača IFOAM.

IFOAM – International Federation of Organic Agriculture Movements www.ifoam.org predstavljala sadržaje ekološke poljoprivrede na nacionalnih, regionalnih kao i na globalnom prostoru, a u Evropi danas je to područje čovjekove djelatnosti pokriveno sa birokratskim propisima Evropske zajednice. Praktično u svim zemljama Evropske zajednice ekološka poljoprivreda ima veliki napredak uz pomoć podpore državnih uprava i uprave Evropske zajednice. U Italiji, koja je među zadnjima primjenila ekološku poljoprivredu sa podporom države i «Evrope» je tijekom godine dana od nekoliko sto proizvođača dosla na više hiljada ekoloških seljaka odnosno gazdinstva..

Ključne riječi

Ekološka, organska, biološka, održiva poljoprivreda, sintetička kemijska jedinjenja, sistem klimatskih promijena, ozonski omotač, efekat staklenika, zagadjjenja, zaštita prirode, prostora i okoliša, kao i zemlje, vode i zraka

Prezentacija

Mislimo da je opravdano nazvati našu civilizaciju «poljoprivrednom civilizacijom». Prapočetak civilizacije je bio prelazak Homo sapiensa od nomada na poljoprivrednika, odnosno ljude sa stalnim mjestom domovanja. Osim tehnologije ubijanja (lov i ratovanja) najvažnija tehnologija prazajednice je bila poljoprivreda. Poljoprivredi se trebaju zahvaliti i prve velike narodne zajednice – Stari Egipat, Babilonija, Perzija, Kina i druge, koje su sa stabilnim izvorom hrane dostigle napredak a poneka isto tako i propast. Recimo Babilon, koji je u svoje vrijeme bio najnaprednija zajednica na svijetu, a kasnije je pod pritiskom potrebe za hranom, korištenjem pogrešne tehnologije poljoprivredne proizvodnje – posljedičnim zaslanjivanjem poljoprivrednih površina – uništio vlastite poljoprivredne površine (danas to radimo sa pesticidima), doveo je sam sebe do propada, i tako je Babilon ostao samo u historiji naše



civilizacije. Nekada na lokalnom prostoru (Babilonije) danas na globalnom prostoru Zemlje - historija se ponavlja.

Bogate su one zemlje koje imaju bogate seljake - je filozofija razmišljanja uspješnih zajednica. Tako možemo i veći dio današnjih globalnih kao i lokalnih problema vidjeti na pravi način. Povećavanjem gradskih zajednica na račun poljoprivrednih započnu i problemi zaštite prirode, prostora i okoliša. Razvojem globalne civilizacije zadnjih dvjesto godina sa nuklearnim tehnologijama, upotrebom sintetičkih kemijskih jedinjenja, genetskim modifikacijama, zadovoljavanjem energetskih potreba poljoprivredno neproizvodnog dijela civilizacije (mega gradovi i gradovi, industrija, transport), razvojem birokracije – koja treba sredstva za vlastiti (ne)rad, koji je po količini proizvedene hrane NULA, pogrešnim usmjeravanjem naučnog i aplikativnih istraživanja u tehnologije ratovanja, pogrešnim korištenjem novca, koji je danas od asistenta čovjeka postao njegov gospodar ili od sluge je postao gospodar odnosno monster, i posebno sa djelovanjem CFC-a (klor-fluor ugljikovodika) odnosno klora na raspad ozona u ozonskom zaštitnom plaštu, kao i zadovoljavanje energetskih potreba i povećavanjem količine plinova staklenika u atmosferi, koji povećavaju efekat staklenika i posljedičnog globalnog (lokalnog) zagrijavanja biosfere, aktivirali smo sistem klimatskih promijena, koji danas predstavlja direktnu opasnost za opstoj naše civilizacije.

Direktne štete od djelovanja klimatskih promijena (orkanski vjetrovi, poplave, suše, promijena uvijeta života - temperatura, vlaga- na lokalnim prostorima i posljedični propad biljnih, životinjskih i jednostaničnih bića, erozija, dezertifikacija itd.) danas postaju najveća opasnost za državne proračune. Ove godine štete u Sloveniji, koje se mogu pripisati djelovanju sistema klimatskih promijena, državni proračun za 2003 godinu ne može pokriti. Mislimo, da će i filozofija državnih proračuna doživjeti isto tako velike promijene, kao i sadašnji stil života naše civilizacije.

Da se vratimo našoj ekološkoj poljoprivredi, koja nastaje u obliku koji danas poznajemo u Evropi godine 1972 osnivanjem IFOAM-a. Stariji oblik istog sadržaja oblikovao je dr. Steiner početkom dvadesetog stoljeća kao biodinamička poljoprivreda, koja i danas postoji u nekim zemljama – Njemacka, Austrija, Slovenija itd. IFOAM je prvi ustanovio zajednička pravila za ekološku poljoprivredu i sistem kontrole ekološke poljoprivredne proizvodnje sa nadzorom i inspekcijom. Današnji trenutak u Evropi je posljedica razvoje ekološke poljoprivredne proizvodnje i kontrole po standardima IFOAMA, kao i suradnje uprave Evropske zajednice.

Ekološka poljoprivreda postaje sve veći izvor poljoprivrednih proizvoda u zemljama Evropske zajednice. Na prvom mjestu se nalazi Danska, a ostale joj slijede. Kako u Evropi tako i na ostalim prostorima Zemlje, sve veći je dio poljoprivredne proizvodnje dolazi iz ekološke.

Pogledajmo na kratko, koji su to problemi, kojima rješavanje doprinosi ekološka poljoprivreda. Prije svega to je zdrava prehrana seljaka proizvođača i njegove porodice. Zatim je to makrobiotska prehrana lokalne zajednice, koja dobiva preskrbu od proizvođača ekološke poljoprivredne proizvodnje. Slijedi zaštita podzemnih voda, zaštita proizvodnih površina od zagađivanja, povratak na lokalnu poljoprivredu i posljedično smanjivanje transporta i zagađivanja iz transporta. Sigurno je i sama socijalna zajednica stabilnija ukoliko ima uredjene seljačke porodice i dobrobiti, koje proizilaze iz te činjenice, itd. Mislimo da ekološka poljoprivreda doprinosi rješavanju problema zaštite prirode, prostora i okoliša, kao i socijalnih, etičkih i ostalih problema današnjega društva na lokalnom kao i globalnom prostoru.



Kako omogućiti prijelaz na ekološku poljoprivredu. Mislimo da je dobro ustanoviti centar za unapređivanje ekološke poljoprivrede, koji bi radio na upoznavanju ekološke poljoprivrede na lokalnom prostoru, i koji može biti sa statusom nevladine organizacije. Centar bi upoznao sadašnje stanje ekološke poljoprivrede u Evropi, tehnologije, sisteme unapređivanja i upravne postupke. Ta iskustva bi prenosio na lokalne proizvođače i suradjivao kod organizacije nadzora i inspekcije ekološke poljoprivredne proizvodnje. Ta bi morala imati neovisan status, kako u nadzoru tako i kod inspekcije. Isto tako je potrebno imati suradnju lokalna i regionalna uprave, koja bi suradjivala kod svih pitanja unapređivanja ekološke poljoprivredne proizvodnje.

Ekološka poljoprivreda i turizam - mislimo da je ekološka poljoprivreda kao način života, izvanredna prednost za razvoj lokalne turističke ponude u obliku seljačkog turizma i korištenja kapaciteta noćenja i bivanja unutar ponude ekološkog seljačkog turizma. To se potpuno uklapa u image Une smaragda tog dijela Bosne.

Ekološka poljoprivreda kao način života je odgovor, kako možemo pomoći rješavanju održivosti seljaka i svih prednosti, koje proizilaze iz tog sadržaja na prostorima Une. Tako možemo postići sukladnost lokalnih prostora kantona i pojedinih zajednica sa najvišim ciljevima politike Evrope - zaštite prirode, prostora i okoliša, kojima se moramo itako prilagoditi u budućnosti.

Preporučujemo sudionicima okruglog stola, da prihvate zaključak o ustanavljanju «Centra za unapređivanje ekološke poljoprivrede» kantona sa sjedištima u svim lokalnim zajednicama. Osnovni moto akcije bi bilo «EKOLOŠKA POLJOPRIVREDA KAO NAČIN ŽIVOTA», koja bi omogućila napredak lokalnih zajednica na području Une.

U zaključku predajemo organizatoru deset knjižica «Ekološka poljoprivreda» T. Ećimović i ostalih, iz založbe Zadružnog saveza Dalmacije 1994 godine, koje mogu pomoći kod upoznavanja osnovnih standarda ekološke poljoprivredne proizvodnje i kasnijega razvoja ekološke poljoprivrede na prostorima Une.

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EKORERMEDIJACIJE – UNI S LJUBAVLJU – JEDNA, JEDINA, JEDINSTVENA

Članak »Ekoremedijacije – Uni s ljubavlju – jedna, jedina, jedinstvena» je pripremljen za Okrugli stol na temu «Podsticanje mjera i aktivnosti na zaštiti vodnih resursa Une i njenih pritoka u Bosanskoj Krupi, Bosna i Hercegovina, 23. 07. 2003 u 11.00 sati. Članak je nastao u suradnji slijedećih stručnjaka:

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kao prilog boljega sutra.

Kratak sadržaj:

Ekoremedijacije su prirodni postupci prilagođeni potrebama spriječavanja i liječenja prirode unutar zaštite prirode, prostora i okoliša. Danas ekoremedijacije omogućavaju rad na zaštiti prirode, prostora i okoliša bez korištenja visokih tehnologija a sa postizanjem istih ili boljih rezultata rada.

Gornji tok Une, kao primjer lijepote, koju je priroda napravila, zaslužuje najbolje što se može napraviti, sa namjerom, da se zaštititi.



Ključne riječi: ekoremedijacija, zaštita prirode, prostora i okoliša, integralna zaštita, prirodni procesi, sistem klimatskih promjena, suodvisnost, sudjelovanje i suradnja.

Ekoremedijacije

Sistem klimatskih promjena, koji stvara, omogućava i čuva uvijete života, te tako održava uvijete za život unutar biosfere Zemlje, i ljudima na prostorima gornjeg toka rijeke Une nalaže nove izazove. Prije svega moramo prihvatiti promijene lokalne klime i sve ostalo što prati te. Zaradi povećanih opterećenja prirode i rezultata klimatskih promjena možemo doživjeti poplave, orkanske vjetrove, tople zime, suha ljeta, povećanu aktivnost zemljotresa, jače šumske požare, odrone i klizanja zemlje i kamenja, kao i brojne druge promjene, koje su bile manje prisutne još krajem devetnaestog stoljeća. Mislimo, da se moramo naučiti živjeti u novim uvjetima klimatskih promjena. Ocjenjujemo, da je djelovanje sistema klimatskih promjena najveći izazov naše civilizacije u dvadesetiprvom stoljeću.

Zaradi novih izazova u prirodi, neke od navika civilizacije, koje su bile uzrok destabilizacije sistema klimatskih promjena, zahtijevati će od nas novi način rješavanja i to od zagađenja zraka, vode i kopna do lokalnih slabih navika – deponija smeća, poljoprivrede sa korištenjem pesticida, šumarstva bez zaštite šuma, korištenja vodenih resursa bez integralne zaštite istih, zagađenja iz urbanih sredina, zagađenja iz transporta, energetike, industrije i drugih.

Na putu zaštite prirode, prostora i okoliša visoke tehnologije su dosada dokazale mogućnosti kratkoročnih rješavanja problema ali i nesposobnost dugoročnih rezultata. Za ozbiljan rad moramo aktivirati sve lokalne resurse, a prvi među njima je lokalni čovjek. Najveća snaga je znanje lokalnog čovjeka, koji u suodvisnosti, sudjelovanju i suradnji rješava pitanja obstoja na prostorima koje je dobio od svojih predaka i koje će predati svojim potomcima.

Biosfera kao sastavni dio Zemlje uspostavila je brojne sisteme, koji predstavljaju današnju prirodu, prostor i okoliš. Zato je potrebno sa znanjem uvidjeti djelovanje takovih sistema i na toj osnovi se prihvaćati rješavanja starih te novih problema zaštite prirode, prostora i okoliša, a to su ekoremedijacije.

Moramo biti svjesni djelovanja brojnih sistema, koji zajedno predstavljaju okoliš u kojem živimo. Naime samo tako možemo razumjeti i promijene koje nastaju bilo zaradi djelovanja nas samih ili zaradi djelovanja drugih prirodnih sistema.

Ekoremedijacije koriste prirodne sisteme kao i njihove suodvisnosti, sudjelovanja i suradnje za sprječavanje i rješavanje situacija, koje su štetne za nas i prirodu.

Poznajmo tri osnovna sistema biosfere: zrak – atmosfera koja se nalazi iznad površine Zemlje, koje ukupno meri 510.1 milijona kvadratnih kilometara, od toga pokriva voda 70.7 %, a kopno 29.3 %.

Ukupne vode Zemlje dijelimo na slane i slatke. Slane vode – mora i oceani predstavljaju 97.5 %, a svježije ili slatke vode je samo 2.5 %. Od tih 2.5 % svježije vode 68.7 % je vezano u ledenicima sjevernog i južnog pola kao i u planinama, podzemne vode predstavljaju 30.1 %, u permafrostu se nalazi 0.8 %. Sve površinske i atmosferske vode predstavljaju samo 0.4 %.



Od 0.4 % površinskih i atmosferskih voda u jezerima se nalazi 67.4 %, vlage u zemljištima je za 12.2 %, atmosferske vode 9.5 %, močvare 8.5 %, rijeke 1.6 % i živa bića – biotska voda 0.8 %.

Biotske vode nalazimo u većini životinja i biljaka između 60 i 90 %, sa iznimkama recimo sjeme biljaka može imati samo 6.5 % a vodene alge imaju vode od 95 do 98 %. Kod nas ljudi nalazimo kod tri dana starog embrija 97 %, tri mjeseca star fetus 91 %, novorođenče 70 – 75 %, omladina i odrasli ljudi 60 – 65 % i kod starijih ljudi 50 – 55 %. Tako izgleda distribucija vode u prirodi.

Vrlo je jasno, da je mali dio vode onaj dio, koji ljudi i priroda koristimo. Mislimo, da je vrijednost tog dijela toliko veća, koliko manji dio predstavlja. Tu se nalazi uzrok naše zabrinutosti i potrebe po integralnoj zaštiti rijeka i rijeke Une, kao jedne, jedine i jedinstvene naše Une.

Osnovni ekoremedijacijski pristup bi bio cijelovita zaštita gornjeg slivnog područja rijeke Une. Osim gradova, naselja sela i zaseoka na tim prostorima nalazimo intenzivnu poljoprivredu, brojne industrije, energetske proizvodnje, distribuciju i potrošnju, transport itd, a iz pogleda prirode imamo veliki broj raznih eko sistema. Osim opterećenja iz naziva sistema klimatskih promjena, imamo i mnoštvo problema, koje je uzrokovao i uzrokuje čovjek.

Atmosferska voda, koje dio su i vode rijeke Une, predstavlja sistem kruženja vode unutar biosfere. Njihova količina se mijenja s obzirom na prosječnu temperaturu na površini zemlje. Tako sa dolaskom klimatskih promjena povećava se ta temperatura i očekujemo veće promijene i kod kruženja vode u prirodi. Te promijene su već danas prisutne i očitavaju se u promijenama pojavljivanja i količine kiša odnosno padavina, poslijedičnim sušama odnosno poplavama itd.

Kada govorimo o kvaliteti površinskih voda moramo priznati, da smo u stoljeću industrijalizacije «uspjeli» opteretiti površinske vode do te mjere, da praktično nemamo čistih površinskih voda. Postavlja se samo pitanje do koje mjere su zagađene. Standardi za kvalitetu vode (EU i drugi) navode minimalne dopuštene količine određenih zagađenja, koje su dozvoljene za upotrebu vode, i u osnovi određuju minimum dozvoljenog zagađenja. Kod toga nismo zaboravili, da je većina zagađenja po porijeklu iz sintetičke kemijske proizvodnje, što znači po porijeklu od nas ljudi.

Kada govorimo o zaštiti prirode, prostora i okoliša uz korištenje sistemskog razmišljanja, onda imaju svi sistemi sve mogućnosti suodvisnosti, sudjelovanja i suradnje, isto tako kao i dijelovi sistema ili podsistemi kao na primjer: čovjekov okoliš i prirodni okoliš; podsistem zagađenja vode u čovjekovom okolišu i odvođenje zagađenih voda u prirodni okoliš (rijeke, jezera itd), itd. Razni sistemi direktno surađuju kod određivanja kvalitete vode odnosno kod smanjivanja kvalitete vode u prirodi. Cilj ljudi, koji žive uz Unu bi trebao biti, održati kvalitetu vode u rijeci Uni.

Sa ekoremedijacijama omogućavamo prirodne procese u vodenom okolišu, koji održavaju kvalitetu vode. Tako osim kvalitete vode pomažemo i za očuvanje sadržaja života u vodenom okolišu, što zajedno jeste živa voda. Korištenjem ekoremedijacij štitiimo dotoke, smanjujemo



mogućnosti većih zagađivanja, i omogućavamo prevenciju i zaštitu i ljudi i prirode. Rad se usmjerava na slijedeće sadržaje:

turizam – hoteli, auto kampovi, naselja, restorani i gostione, agrarni turizam,
šport - adrenalinski športovi, sportski objekti (stadioni, igrališta golfa, trkačke staze itd.),
naselja – odlagališta smeća, pročišćavanje otpadnih voda, ponovna upotreba vode poslije pročišćavanja za održavanje čistoće naselja, zelenih površina, protiv-požarna zaštita, navodnjavanje itd.,
transport – pročišćavanje voda iz autocesta, aerodroma i naselja,
poljoprivreda – zaštita,
posebna područja – zaštita izvorišta, potoka, rijeka i jezera; parkova prirode, odlagališta smeća, protoka vode, itd.

Posebnog značaja za područje rijeke Une je integralna zaštita cijelog slivnog područja, koja zahtijeva suradnju ljudi, a to znači da govorimo o međunarodnoj suradnji, jer dio slivnog područja se nalazi u susjednoj zemlji Republici Hrvatskoj. Mislimo, da je cilj moguć, rezultati su ovisni od suradnje ljudi.

Suodvisnost, sudjelovanje i suradnja koji omogućavaju prirodi obstanak mogu pomoći i ljudima da obstanu.

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4.



War Invalids in Bosnia and Herzegovina – case study Eko Riba Krusnica (2003)

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The Abstract:

Bosnia and Herzegovina after war is experiencing much more social problems as international community is ready to accept. We would like to mention war invalids and demobilised soldiers.

With assistance of UN FAO the project for hatchery at natural beauty River Krusnica a tributary of maybe one of nicest European Rivers - Upper Una River Basin is undergoing development as non-profit, war invalids venture.

Key words: war invalids; nature, space and environment protection; eco remediation; post war society

The Presentation:

Former republic of Yugoslavia – Bosnia and Herzegovina is today independent nation but only as paper would accept it, in reality it is two entities Federation of Bosnia and Herzegovina, and Republic Srpska joint venture, introduced by USA administration and help of Dayton agreement.

Post war society is experiencing new challenges of modern world, with specific content of national, cultural and natural burden, demanding more from the citizens as they may put in. International community in 1995 has been willing to assist, but now day's problems of Bosnia and Herzegovina are far down on the schedule of international aids. Kosovo, Afghanistan, and now Iraq are over taking importance.

War in Bosnia and Herzegovina took 200.000 + people and total number of injured soldiers, citizens and invalids will never be established properly. Today society is experiencing grave problems of demobilised soldiers and war invalids, as well as citizens with post war psycho problems.



The citizens, who have been invalidated during war, are citizens with less ability due to actual disability and resulting psycho status. It is obvious that they need assistance, but present government is not in position to assist adequately, due to actual problems of governing at hands and lack of financial means.

The Fishery Enhancement Project at Krusnica River introduced by UN FAO is an good case of the viable activity targeted at war invalids in the region.

Bosnia and Herzegovina:

In 1991 the Former Republic of Yugoslavia - Bosnia and Herzegovina had a population of 4.377.033 (males 2.183.795 and females 2.193.238), and area of 51.197 square kilometres, with 1.207.098 households, density per square kilometre 85.5 persons (SY F BiH – page 54). The Federation of Bosnia and Herzegovina is now one of two political entities in the country (Republic Srpska is the second one). BH had a permanent population of 2.823.000 in 2001, and has a present population of 2.307.000. The difference of 516.000 is refugees. The Federation of Bosnia and Herzegovina (BH) were established under the Dayton Agreement in December 1995.

BH has ten cantons and Bosanska Krupa municipality is a part of Una – Sana canton. Cantons are federal units with administrative responsibility for governing all affairs of the population.

Due to the lack of joint national government, which is mainly because of the inability of national groups (Bosnians, Serbs and Croats) to agree, many important international and national issues are pending realisation.

The Una – Sana Canton:

The Una – Sana canton was established on 27th May 1995. It has its own Constitution, and elects its legislative, executive and judicial bodies. The canton consists of eight municipalities: Bihac, Bosanska Krupa, Bosanski Petrovac, Buzim, Cazin Kljuc, Sanski Most and Velika Kladusa. The capital of the canton is Bihac. Total area of the canton is 4.841 square kilometres and it has a population of 305.000. The canton is situated in the north – west part of the federation, and has a border with Croatia.

The economic base comes from the geo-political position, including the Una and Sana Rivers with multipurpose use waters, agriculture, forest and mineral resources, and natural heritage suitable for development of tourism.

The cultural heritage includes Neolithic, Venetian, Illyrian and Roman cultures as ancient parts and a Slavic-Turkish mixture as modern parts.

The economy includes agriculture and food industries, printing, metal processing, power production and supply, mining, construction and building, textile and leather production, chemical, rubber and packing material activities, transport and communications, trade, catering, tourism and other activities.



The Upper Una River Basin has a tradition of nature, space and environmental protection of the extraordinary natural beauty. The municipality of Bosanska Krupa is an integral part of the Upper Una River Basin area.

Municipality of Bosanska Krupa:

The present population has been estimated in June 30th 2001 (information from the Chamber of Commerce) as follows:

	Total	0 – 14	15 – 64	over 64 years
Bosanska Krupa	29.211	7.669	18.842	2.700
Una – Sana canton	305.049	75.565	199.349	30.135

According to municipality sources, total population is 32.442 inhabitants, with population density at 58 per sq. km. Total households number 8.398 families, and average family size is 3.86 persons. The age structure of the population is: 10 % over 64; 49 % 18 – 64; 4 % 14 – 18; 15 % 7 – 14; and 22 % 0 – 7 years.

Employment reflects the situation in the canton, where only 15.7 % were employed and unemployment stood at 46.6 % (ILO standards December 2001). According to the municipality sources, 7 % of the population are employed, 5 % are farmers and 88 % are supported population.

The municipality was on the front line of the war, and was the third most damaged township in the federation, with 90 % of its buildings heavily damaged during 3 years of warfare.

Bosanska Krupa lies in the Northwest of the Federation, and is in the eastern part of Una – Sana canton. In total it covers 556 sq. km. The town itself is situated on the banks of the Una and Krusnica rivers, and was established in the 12th century.

The area of Bosanska Krupa municipality is mostly hilly with a wide flat area around Una and Krusnica Rivers.

The climate is continental with an average annual temperature of 11°C (max 37°C and min –18 °C). Average annual rainfall is 1.248 m.

Since the war, the power supply system has been reconstructed in about 80 % of the municipality. Some villages on Grmec Mountain are still without electricity.

The water supply system is currently under reconstruction and a tap water supply is available to families around the township area. Some smaller rural communities have their own water supply systems. The sewerage system has been badly maintained, and needs reconstruction to prevent pollution of the Una River.

A new landfill site has been constructed, and satisfies needs of the municipality. Illegal dumping still takes place near the Una River.



The education system is recovering. The 9 primary schools have 3.643 pupils and 150 teachers. Secondary schools are 2, with 1.165 pupils and 43 teachers.

Health care is reasonable with 19 doctors, 6 dentists and 87 nurses in one medical centre, plus a maternity hospital and 4 health stations.

Bosanska Krupa town is 34 kilometres from Bihac, and roads are reasonable. Postal and phone services are sufficient within the township, but rural communities have communication difficulties. Local radio Bosanska Krupa is the principal source of information.

In the 8th year after the end of the war there are two important social issues – those of war invalids and demobilised soldiers.

Demobilised soldiers do not have financial support, and due to low level of economy and service activities the job opportunities are low. Most of the municipality's efforts are put in function for supporting of this large group of citizens.

The war invalids:

In total Bosanska Krupa has 752 war invalids with following distribution:

Grade	% of invalidity	persons
I and II	100	32
III	90	23
IV	80	59
V	70	52
VI	60	80
VII	50	91
VIII	40	128
IX	30	136
X	20	151

By disability distribution is as follows:

2 blind persons

- 7 paraplegics

1 without both legs

8 without one arm

5 without one forearm

4 without one leg

26 without one leg below of knee

4 without one hand

4 without one foot

50 with heavy damaged legs but not amputated

641 with body damages



The war invalids receive financial support per month as follows (for easy calculation 2 KM is equal to 1 EUR):

Group	allowance
I and II	560.- KM
III	370.- KM
IV	350.- KM
V	307.- KM
Others	50.- KM

When replacement of an artificial part is needed, 412.- KM can be received.

The families each killed soldier has received 540.- KM.

Other benefits include free hospital services and medical supplies. Altogether, the war invalids are a seriously disadvantaged part of society, which hopes for a better tomorrow when government reaches a better status.

Establishment of a Fish Hatchery on Krusnica River:

Consideration of the Krusnica River fish Hatchery Project was the main purpose of the UN FAO mission to Bosanska Krupa, with formulation of the Project, analysis of viability, the role of war invalids and environmental impact all being considered.

During the short, 10-day stay in the Federation of Bosnia and Herzegovina, international consultants, together with national consultants had 40 + meetings and visited 8 aquaculture production sites, 2 fish processing units, 2 river springs (Krusnica and Buna), inspected River Krusnica (by boat and car), Upper River Una, and special sport fishing resort Klokot, looked at the fish population at River Krusnica and Una River, University Sarajevo – Faculties and Institute of Veterinary, Fishery, Natural Sciences, DNA, Biotechnical Faculty Bihac, and many other institutions. Discussions were held with the Minister of Agriculture of the Federation, with Canton government, the Mayor of Bosanska Krupa, the Embassy of Norway, UNDP Sarajevo, and many others. Beside the 40 + meetings a number of individual discussions were held with relevant people.

The mission was active with the following:

Establishment of the EKO RIBA KRUSNICA d.o.o.- Fisherman Association of Bosanska Krupa. The War Invalids Association of Bosanska Krupa and Canton Chamber of Commerce were involved in the operation. By means of democratic elections within the associations a short-list of 18 war invalids was established from candidates for posts as Eko Riba Krusnica staff, and the first Director and production manager were elected. EKO RIBA KRUSNICA d.o. o. is a non-profit, war invalids organization. It will have both a Management Board and an Advisory Board (with rights to appoint external financial controllers or auditors), and will start up within 30 days after 14th April 2003.

The proposed start time for project implementation was set at June 2003.



The proposed site of the hatchery near the spring of River Krusnica was inspected and approved. The pre agreement to purchase the site has been secured.

Eko Riba Krusnica will have a hatchery for production of local breeds of brown trout, Danube salmon and grayling for both restocking and commercial activities.

The salaries of employees have been elaborated according to present rates in Bosanska Krupa.

Non-farming activities could include development of a special sport fishing resort on the River Krusnica; integrated water management of the River Krusnica; protection of nature, space and environment of the Upper River Una Basin (including River Krusnica as a tributary of the River Una) in the form of eco remediation, integrated water management and other related activities.

The feasibility of the project has been checked, and profits will be reinvested or distributed to the War Invalid Association in Bosanska Krupa.

Eko Riba Krusnica will have concession on waters of the River Krusnica (The Municipality of Bosanska Krupa will grant the concession) for all purposes.

The Municipality of Bosanska Krupa will grant all necessary permits and licences free of charge (10.000 + KM value).

The hatchery site was visited and agreed upon, and office facilities within the municipality will be a part of the project.

The proposed budget was checked, and a new proposal for an increased amount was drafted, together with a proposal for increase in the duration of the project from 18 months to 30 months.

Research and applied research activities related to production of the hatchery, restocking of open waters, eco remediation, integrated water management; monitoring etc. could be established in co-operation with the University of Sarajevo and Bihac, related institutes and faculties.

The Technical Advisory Committee for the project will be established from representatives of municipality, Biotechnology Faculty Bihac, University of Sarajevo – Veterinary, Fisheries, DNA and Natural & Mathematic Sciences Faculties.

Direct agreement will be made for co-operation of the veterinary and fisheries professional services from the University of Sarajevo. They will grant disease-free status of the hatchery and certification for sales of fish.

Conclusions:

The Project to build a fish hatchery on the Krusnica River under the Eko Riba Krusnica d.o.o., non-profit, war invalids organization is feasible and has a good possibility of success. The



project is in line with policy of Federation of Bosnia and Herzegovina and was fully supported by federation, canton and municipality governments.

The present time table could be adjusted to a longer implementation period of 30 months, and funds could be increased by about 250.000 US\$ or approx. 50 %, due to increased distance of the spring water supply system from the new site, and introduction of the production at the hatchery of three species (brown trout, Danube salmon and grayling).

Direct beneficiaries would be 8 war invalids as employees of Eko Riba Krusnica, the War Invalid Association of Bosanska Krupa as possible profit receptor, nature of Upper River Una Basin as receptor of good quality restocking fish, and Una Canton Fishermen's Association together with local associations as users of open waters. With non-farming activities, the number of directly employed invalids and other possible beneficiaries could be significantly increased.

We think it is one of many possibilities to assist citizens, who need assistance!

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5.

The Earth and the Climate Change System

2003

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The Abstract:

Any research, applied research or reality of life of Homo sapiens and human society of the Earth, today has to take into account the climate change system affairs, which has a main role for



changes within biosphere, which are most risky issues of end of the XX and beginning of the XXI centuries.

The Climate Change System as provider and guardian of living conditions within the biosphere has a more important role as humans were thinking in the past. For the Earth's biosphere it has the main important role of making and guarding living conditions, to which the living creatures have to adjust for living.

Number of extinctions of species, smaller and larger alike, are due to changed environmental qualities, because of changes within the climate change system.

The Earth's biosphere is made of interdependences, interactions and co-operation of matter, energy, and information within the time frame, and has three bases – Water, Land and Air.

To be ready for changes and mitigations due to the climate change system Homo sapiens has to learn more about basics of the biosphere.

The research of biosphere was not well developed during industrial revolution, and issues like: intensive agriculture; synthetic chemical production; money democracies: corporate social responsibility, nuclear technologies, have put for an irresponsibly long time harming substances into the underground, surface and sea ocean waters, lands and air.

Today there is the question when and how harmful impact to living creatures of the Earth will be. Science and people/s need to understand interdependences, interactions and co-operation of all matter, energy, and information to allow for sustainable future of our civilization.

The key words:

The climate change system, interdependences, interactions and co-operation, system thinking, systems, nature, space and environment protection, pollution, sustainability, sustainable future.

The Presentation:

The water, land, and air environments are the bases of life on the planet Earth. Not many researchers are familiar with interdependences, interactions and co-operation needed for survival of living creatures. Latest research on system thinking and the climate change system has important impact on knowledge of the nature for humans to better understand their environmental impacts.

Our intention is to inform researchers to benefit from use of system theory, thinking, analysis and synthesis as tools for daily work.

From the natural viewpoint the climate change system alias the climate, the climate change – is a set, system, and complex entity of conditions within the living space of the biosphere. Actually the living space is the biosphere itself, which is a tiny part of the planet Earth system. Watching the climate, and taking it into consideration when humans have been making their decisions – these



have been two very separated issues, especially in the recent centuries in which the industrial life has been taking the lead and has caused a narrow professional specialization to reign and prevail.

There are two main sources of the climate change: the natural and the ones caused by humans. We humans should understand both of them in order to accept the natural ones and to possibly prevent, and mitigate their tough impact over ourselves, such as floods, droughts, air and water pollution etc. But we should better understand and cope with our own tough impacts and prevent them, too.

The systems (as complex entities rather than mental pictures of them) could be formally set according to their size as follows:

MACRO / MEGA / SUPERIOR / SENIOR / VERY BIG etc., systems such as the Universe, the biggest system known to humans, the Milky Way Galaxy, the Solar System, the planet Earth system etc., and

MICRO / INFERIOR / JUNIOR / SUB etc. systems that are smaller and are either natural such as Homo sapiens / plant / animal / living creature/s, and or artificial / human-made systems such as a township / car / aircraft / rocket, etc.

Of course, the above artificial and natural systems cause a need for differentiation of sciences to natural and social sciences, of which none includes all human activities as an integral part of the nature. We think there are no artificial and natural systems, but all of them are natural as long as they are results of living creatures' activity. But we know it may take a long time for many to understand such a philosophy. For the time being let us use the terms artificial and natural systems.

The system theory, thinking, analysis, and synthesis are the best assistants available today for humans to understand complex problems, which both the macro and micro systems are. There is no simple system, and there is no system we may say that humans know everything about. This could be stated more rightfully when one uses system thinking, which could make the difference between the scientific thinking of today and of tomorrow.

The challenges to us humans of today are much more complex than ever before, because we have reached a sort of a critical peak of our ability to understand the present time. The proof for this is our relationship with nature, space and environment, which is going to become unfriendly to humans, and not a good friend, as it should be. Our civilization's anthropocentric philosophy, its present social order, its religious approaches/governances, profit-based democracies, local, national, international and United Nations' bureaucracies, totalitarian rulers, lack of tolerance between different people/s on the Earth, policies (from antique times until today) of divide and rule, bread and games, ruling by information monopoly – are organizational techniques, which need restructuring/transition/new approach for a better tomorrow. Whether our civilization will have a better tomorrow or not is a question, which we better answer before its breakdown will happen. We think optimistically, that tomorrow will enable our civilization to understand nature, space and environment/climate change, cosmos, and other systems. As a result this will open large doors to sustainable future for all of humans living on the planet Earth.



The current understanding of the climate change is limited by anthropocentric and other views, which is less the case, when using systems theory, thinking, analysis and synthesis, which could make us better understand the interdependences / interactions / mono/multi/inter/ and supra-disciplinary issues, all of them as an integral part of the inferior and superior systems, within the system of the planet Earth, and further on the Solar System, the Milky Way, and the Universe.

The Nature does not repeat itself, but it always goes in only one direction - dynamic evolvement ahead. Its direction is not known.

We humans, with all our beliefs, religions, natural, social and technical achievements, technologies, techniques, governances, local communities, families and relationships, sooner or later think we are Gods, which have to rule the nature, space and environment of the biosphere. When it comes to the point of joint action, “mutual interest” and survival of our civilization, many excuses are handy such as national interest / national security / national citizens’ well being, etc. But all of them are empty phrases defending/protecting individual/collective rulers, and national elites. We believe into the role of leadership, but we believe also into the moderate life style, which allows long life, peace, and stability, because Nature requires it.

How the today does understands of the climate change results from the anthropogenic influences, we may explain best with rule of international bureaucracies, who have sufficient monetary resources to pay scientists to speak and write as they wish. Redirection of scientific research, applied research, and theoretical work is hardly possible, as long as one-sided businesspersons, (their) politicians and bureaucracies are handling resources: they learned how to rule, but not how to make a holistic rather than narrow-minded progress in sciences and technologies of the planet Earth systems. How to explain the fantastic development of armaments, chemical synthetic products, 800 million motor vehicles, and many more explosive engines, such as aircrafts, ships, boats and agricultural machines motors, marketing and profit-making oriented products, transport system, promotion of “globalization” as a tool for making money, while scientists are not paid to do their basic research work, and must neglect the research needed for understanding issues of the biosphere system, which is threatening our civilization with responses of the climate change system and the whole Biosphere to human actions?

**The pending big “tragedy of the commons” of all of us
is overseen, that’s how.**

The climate change system is a macro system of the nature made of many interdependences and superior/inferior natural systems, and the climate change system is responding not only to our civilization’s activities, but also to rules of other systems in nature. If we do not understand the climate change system, it is so due to the improperly directed research. This has nothing to do with the common humans, but with the one-sidedness of the present social order, profit-based democracies, especially in nations of the G 7 countries leading our civilization, and international bureaucracies. They lack holism and make room for one-sidedness of human actions.

Let’s us take the case of CFC’s, the ozone depleting synthetic chemical products, which were produced because of the market-oriented research and production aimed at profit rather than benefit, and caused the climate system to react with its change, which may respond with a total destruction of our civilization: we have to learn how to manage ourselves. It is true that humans did not know of the side-effects of CFC’s, but now we do: there is no reason to



continue with the previous practice, such as the genetically modified organism's techniques, war technologies, uncontrolled development and use of new synthetic chemical products, and explosive motors, which are at present the most dangerous activities of our civilization, not to mention information techniques and energy transmissions influencing magnetic fields and basics of the Earth equilibrium.

From energy and gases to planetary explorations, that's how the origin of the Earth from birth until present can be summarized.

The climate/the climate change are a system of the biosphere, which is responsible for the maintenance of living conditions. As a natural system it is inferior to Biosphere, planet Earth, Sun and Solar System, the Milky Way System, and the Universe. Later on we shall look into separate systems. The climate change system has many inferior systems like: atmosphere, seas/oceans, terrestrial, and other areas related to biosphere, and all the mentioned systems have inferior systems, which all together make a holistic biosphere system. All mentioned should be understood as moving/interdependent/interacting/dialectical and dynamic systems, which always evolve. The moving direction is only dynamic evolvement ahead. To an uninterested walking person the nature may look like chaos, but as the late Prof. Dr. Helmut Metzner wrote in "Chaos to Bios", that nature may look like chaos to us humans, but also our achievements may look to nature like chaos, and not like order, as we believe. It is holistic knowledge and ethics, which has to decide on right or wrong.

The climate change system is a very complex system, which is interrelated with a number of superior and inferior systems, and the main purpose of the climate change system is to maintain the energy equilibrium, mean temperature, moisture/water cycle system, composition of troposphere, atmosphere and ocean's currents. Many more subsystems will be explained later on.

Definitely the climate change system cannot be explained/understood/researched with the knowledge of one or two of the presently known scientific disciplines, but the scientific research approach should be holistic, supradisciplinary, multidisciplinary, and done by a team of scientists working for a common goal on an interdisciplinary basis. It is obvious that scientists need techniques of the system theory, thinking, analysis and synthesis, and complex problem solving to work successfully on the explorations of nature.

Supradisciplinarity in terms of our research, from the natural sciences point of view, is a precondition for the individual to be able to understand the complex problems of the complex systems. The supradisciplinary work/research is above the classical scientific disciplines, at least from the viewpoint of understanding the needs of research/work/action aimed at system functioning in regular conditions and otherwise, interrelated with the system itself, and its inferior and superior systems.

The main purpose of the climate change system is the maintenance of the living conditions within the biosphere, and is calling for explanation of life. From our research in natural sciences and other findings we think that the life could be explained by the hypothesis in the following equation:

$$\text{Energy (E) x Matter (M) x Information (I) + Time (T) = Life (L)}$$

$$E \times M \times I + T = L$$



The life should be understood here as life appearance on the planet Earth, which has a unique composition/place/physics/geography/biology and is permanently evolving its own nature, space, and environment quality, reflecting the present status of the system and its superior and inferior systems' qualities. An integral part of the evolvement in the biosphere is information, which is interdependent with energy and matter in defining the essence of a specific living creature and feature. Basic information connected with life itself is in their gene structures, which are composed by four amino acids in different combinations to systems, specific of every species for which it has been simultaneously (by evolution) composed. The first life information has evolved simultaneously by evolvement of the first life structure, and the later evolvements have been a reflection of the evolution.

The living conditions are not a set, but rather a system/entity of the biosphere environment qualities, and are preconditions for life to appear. The theory of evolution, the Gaia theory, the system theory, the known past and present, and status of the biosphere are proving the above hypothesis to be correct.

The origin of the climate system and the climate change system are dynamics of the planet Earth – its appearance and existence, as a part of the Solar System's appearance and existence, and as a result of the Universe's dynamics.

The climate change system rules over the life status on the planet Earth, not by command, but by interrelations, interactions and consequences of the system dynamics. Here we may comment on the role of humankind/present civilization in the climate change system, which may be described as triggering the system dynamics by our activities. We shall comment on this later on.

The planet Earth appeared around 4, 5 billion years ago (4.500.000.000). At that time the planet was something like energy and gases with temperature around 7.000 degrees Celsius. Within millions of years the planet was cooling down, and the firm matter was formed within two hundred million years. The oldest rocks on the Earth have been dated at 4.3 billion years ago (4.300.000.000).

The planet Earth is an inferior system to the Solar System, the Milky Way, and the Universe. Please see the Drawing no. 1 in the Atlas at the end of the presentation.

The Universe is the macro, largest, most complex of all the systems humankind may research and explore, and it consists of all matter and all light and other forms of radiation and energy. It consists of everything that exists anywhere in space and time. The universe includes the Earth, everything on the Earth and within it, and everything in the Solar System. Our Solar System contains nine major planets along with thousands of comets and minor planets called asteroids. It also contains the Sun, the star around which the planets revolve.

If we estimate the total existing information of the Universe as 100 units present now, our civilization's knowledge may stay between one and two units. We have to explore and research much more as we have until the present time. Of course, we should not forget the system dynamics and evolvements, which both reach beyond our present knowledge of the Universe. Understanding the holistic nature of the Universe, we have to understand that the Universe



dynamics are present in countless forms, transitions, expansions, big and small bangs, appearances and disappearances, and all countless happenings/evolvments.

Second to the Universe is the Milky Way System, which is a limited part of the Universe within which we humans exist. It is our first exploration target and a system about which we have to learn as much as possible. The Milky Way consist of about 100.000 billion and more stars as systems of whatever form, and a countless number of planets, micro planets or asteroids, and all other forms of energy, light, matter, and particles of any kind.

The composition of the Earth, as a planet inside our Solar System, is “unique” because of the information, matter and energy at its birth. All forms existing at the moment of appearance are included within our Earth System, and so are many more other forms of the Universe such as light, particles, rays and matter that over the time from the appearance until present collided with the Earth. Major influences on the Earth dynamics come from the permanent energy flux from the Sun, and from collisions with asteroids, which arrive from the outer space. It is important to have this knowledge, which may assist when researching and exploring the climate change system, because the first outside effect on the climate change system is coming from the outer space as asteroids and other dangerous collisions, which have been changing and may change the equilibrium of Earth System as well as the climate change system.

From the past we may learn about a number of occasions on which the Earth climate change system has been reacting with dramatic changes of the living conditions. They were recorded as Glacial or Ice periods, which were results of the downward direction of changes of mean land and ocean temperatures. Of course, we should not forget that land mass and salt water mass react to the change of mean temperature according to their abilities, which are different. Land mass reacts faster, than the salt water mass. Consequently, the life on the terrestrial part of the Earth (totalling to 30 % of Earth surface) has been affected more than the marine life, during ice periods.

Interdependences of the life, climate change system, and biosphere are dynamic factors for the evolution of the life forms, and resulting environmental conditions. The primordial Earth, some 4.5 billion years ago, was lifeless and unrecognizable by our civilization standards. The air was oxygen free and many subsystems of the climate change system known today did not exist. The climate change system itself was evolving according to the components and relations of the system as it does even today.

The rise of the life on the Earth mirrored conditions of the primordial surface, and its physical and other contents. It took Earth something like 0.7 billion years to evolve the life. The first evidence of the life is dated 3.8 billion years ago. From microbial life of primordial time to final evolving of the complex biosphere around 1.2 billion years ago there was the time period within which the biosphere evolved. The first biosphere energy transition from the anaerobic to the aerobic energy production by microbial life was responsible for the change of the atmosphere from the oxygen free to the oxygen reach one. The oxygen content was around 40 % and with time it has been diminishing to 21 % as it was at the end of the XIX century. Please see the Drawing no. 3 in the Atlas at the end of the presentation.

The oxygen content was the major improvement of life conditions, which made the difference from the primordial time to the time of biosphere, from 1.2 billion years ago till the present



time. The concentration of the oxygen in the breathing air of life creatures should not come below 8 % that is somehow a minimum needed for survival. At present in some heavily human-populated areas of big cities, the concentration of the oxygen could come down as much as just above 10 %, and we are recommending monitoring of oxygen concentration as a precondition for survival of humans in the fragile and heavy polluted environments (big cities). Please see the Drawing no. 4 in the Atlas at the end of the presentation.

Our civilization's first settlements were built some 12.000 years ago, as a result of social life improvement of pre-antique humans. First settlements in Europe were built on swampy areas, for security, and population was up to 10.000 people. It was a result of the changed conditions within the biosphere that evolved after the last ice period, which was ending some 60.000 – 16.000 years ago. Since then the climate change system conditions on the Earth were almost at the quality of the present time. Of course, changes have existed but not as extreme ones, as the ones coming up now. The difference between today and 200 years ago is due to the extreme input of our civilization's output into biosphere such as: waste and side-effects of nuclear technologies, synthetic chemicals, human population explosion and its consequences, and destruction of biosphere due to the ways of covering the needs of humans. In short, and we shall work out the above-mentioned later on, those are reasons/impacts, which cause the triggering effects of our civilization on the climate change, as consequences.

The climate change system is a natural complex entity/system. It consists of several subsystems and is a subsystem, too, of systems such as the Earth, the Solar System, the Milky Way and the Universe. It is very old and has been changing all the time, offering rather stable conditions to the life forms. In the current climate change system much more extreme changes have been taking place, over the centuries of industrialization and post-industrialization than ever before since the end of last ice age. We humans are not the only cause of this dangerous processes, but though an essential one, especially if our decisions and actions are based on a lack of systemic/holistic thinking.

The climate change system as an integral part of the Earth biosphere is somehow between its inferior and superior systems; all of them together with the climate change system itself have a number of mutual interdependences/interactions, and co-operations.

As we have mentioned before, the Universe contains all matter and energy, particles, rays, information, and everything. To the Earth's climate change system the Universe may have a dramatic influence, in the case of catastrophic changes affecting the Solar System, and in the case of the Earth's collisions with space body/bodies influencing the Earth's existence. It happened and may/can happen again. There is e.g. the hypothesis that a collision of Earth with a cosmic meteorite some 65 million years ago caused Dinosaurs to get extinct.

The most superior system is the Universe - please see the Drawing no. 1 in Atlas at the end of the presentation, featuring interdependences, interactions and co-operation between the Universe, the Milky Way, and the Solar System, which is the largest system known to us humans. The probability of a destructive interaction of the Earth with the Universe System is very small. Because there is a countless number of star systems and other forms within the Universe, the Earth has a little chance to experience major destruction caused by the Universe System activities. Of course the Earth system is just a very small part of it.



The Solar system is a very large system, from our civilization's point of view, but a very small one from the galactic point of view, and even much smaller from the Universe point of view. The Sun and its nine planets are one small sub-system of the Milky Way Galaxy. Actually the Milky Way Galaxy has hundreds thousands of billions of star systems, and our Solar system is just one of them.

The Sun is the central star of the Solar System, and has 99.8 percent of the Solar Systems mass. It is the center of its system, and source of all energy and matter within it. Of course it is an inferior system to the Milky Way Galaxy, which is over 100.000 billion times bigger in mass as the Solar System. The Solar System revolves around the center of the Milky Way Galaxy at a speed of around 250 kilometers per second.

For our Earth planetary system the Sun is the source of everything from birth of the planet onward, and we exist because the Sun is providing us energy, warmth, light, and all other important inputs / physical and other components and interdependent matters. Our planet system is completely dependent on the Sun. Our present is mirroring physical, geographical and biological etc. statuses at which we are at this very moment.

Of course the influence from the Solar System is not caused only by the Sun, but also by a number of interdependent, interacting and co-operating relations with neighboring planets, planet-like bodies of different size, Moon and other forms of energy, matter, and natural powers. The most sunward planet is Venus and the outer planet is Mars. Together with Mercury they are presenting terrestrial planets of the Solar System. The other four planets Jupiter, Saturn, Uranus, and Neptune are gaseous gigantic planets of the outer part of our Solar System. The last planet is Pluto, but it is not always the last one, because of its oval shaped orbit, which places it sometimes before Neptune, but most of time it is the most distant one from the Sun.

The Solar System is stable, and changes in its system qualities are reflecting/influencing its whole system. The most important parts of the Solar System are the energy flow from the Sun to the planets, and the quality of each planetary system. Not only composition of each planet, but also its distance from the Sun is the deciding factor for the quality of the Solar System. The life stream of light and warmth from the Sun is making possible the life on the Earth. Both the quality of the Sun System and unique composition/distance from Sun of the Earth are interdependent, interacting, and co-operating parts of the life support system on the Earth.

Understanding of many unknown powers of nature, like magnetic, energy, matter transformations, rays and particles role etc., the movements (like a top, orbital, galactic, and of the Universe), the Solar System, the Sun and planets including our planet the Earth are important, and are putting together characteristics, interdependences, interactions and co-operations of the whole system.

The Sun has a diameter that is 109 times bigger than the one of the Earth, and 400 times larger than the one of our Moon. All nine planets and all other forms within the Solar System are orbiting around the Sun. The Sun and all planets are moving like a top and all together are orbiting within the Milky Way Galaxy. All this movement should be more researched to allow us to understand the basic powers resulting in interdependences, interactions, and co-operation among parts of the Solar System. The Solar System as well as all other systems function



according to their given systems⁷ / entities of parameters, and our civilization is given the chance of exploring, researching and understanding our existence.

The birth of the planet Earth could be placed around 4.5 billion years ago. At that time the Sun provided the energy and matter for shaping its subsystems, planetary systems and other bodies. The Earth appeared as a gaseous mass which, by rotation like a top and orbiting around the Sun for a few hundred millions years, commenced shaping the planet. The composition at its birth, its distance from the Sun, and its interdependences, interactions and co-operations within the Solar System have been making the Earth for 4.5 billion years.

The Earth planetary system is very robust. At present we are having an inner core of 1.500 miles in diameter composed of iron and heavy metals, an outer core of 1.400 miles, a lower mantle of 1.400 miles, and an upper mantle of 400 miles and the crust of 2 – 45 miles in diameter. Please see the Drawing no. 2 in Atlas at the end of the presentation.

On the top of the crust, there are permanent dynamic changes caused by the natural powers by which the Earth's surface was/is shaped. And the atmosphere is covering, protecting and completing the biosphere of the planet up to 650 miles or 1.000 kilometers, where the Exosphere is ending into the outer space. The main subsystems of the Earth are: its planetary body, its Moon, and its atmosphere. Its planetary body has got 8.000 miles or 13.000 kilometers in diameter.

The Earth is the fifth planet by diameter, the largest one is Jupiter with an eleven times larger diameter, and the smallest one is Pluto with around one fifth of the Earth's diameter.

The surface of the Earth together with its atmosphere is making its biosphere, where we live and where the life has been a part of its system for more than 3.8 billion years. At that time in history the first appearance of the microbial life could be placed.

Among the life supporting components of the Earth, oxygen is most important element. It forms:

- Two inorganic oxides - water and carbon dioxide, which are the life supporting molecules, and
- Atmosphere with oxygen molecules in the breathing air, and
- The ozone layer as the protection against UV rays.

After setting such a support within the system of the biosphere the appearance of life on Earth was just a matter of time.

The outer supporting part of the Earth is the flow of light and warmth from the Sun, which is enabled by the Earth's adequate distance from the Sun, actually, and supports life on Earth rather than prevents it, which is the case on the Earth's neighboring planets Venus and Mars.

⁷ We say »system« rather than »set«, because in the systems theory a system consists of two sets, mathematically: the set of its elements, and the set of relations between them (and with its environment) resulting in synergetic attributes that the entire system has, but its elements alone do not. Hence, speaking of a set would mean the traditional oversight of relations and their crucial importance.



The unique composition of the planet Earth and its distance from the Sun are two major qualities that have evolved with evolution of the Solar System and are making the basic possibility for the life to appear on the Earth at present.

The Earth crust surface, at present, is made of a terrestrial part, which is covering around 30 percent of the surface, and of ocean/sea waters cover taking the remaining 70 percent of the surface. The ratio between oceans and lands was changing with dynamic changes of the Earth surface evolutions. The first appearance of the water on the Earth was the deciding factor for the formation of its surface and atmosphere. After cooling down the atmosphere was thick and much lower than now. The primordial atmosphere was oxygen free. A big change was the appearance of the first life forms they were anaerobic microbial organisms living without oxygen. They were gaining the necessary hydrogen for their synthesis of different organic carbon compounds from dissolved inorganic compounds of carbon. It took hundreds of millions of years for them to change the primordial Earth from its anaerobic to its aerobic stage. Their significant contribution was the sink of carbon dioxide, when their dead cells did reach the bottom of the oceans, where they have been transformed into numerous carbon compounds. We see them today as fossil fuels. It was the time of the first energy transformation, actually those organisms transformed sugar molecules to gain two units of energy per molecule.

In the next generation microbes were able to split water molecules with assistance of the light from the Sun, and used the released hydrogen to reduce the carbon dioxide molecules. By this photosynthesis a rich biomass was produced. The end product of this reaction was the molecular oxygen, but its appearance was poisonous for the existing life creatures. It changed the life entirely, and the new generation of microbes was able to use oxygen as its oxidation of biomass by respiration. It was the first energy transition on the Earth, because with such a transformation of the sugar molecule they gained 36 energy units or eighteen times more than the anaerobic microbes.

The carbon dioxide was a part of water due to its solubility, and oxygen that was not soluble in water, became an integral part of the atmosphere. The concentration of the oxygen in the atmosphere was increasing and changing, and settled at 21 %, with 78 % of nitrogen, and the remaining 1 % was made of carbon dioxide, methane, and some other gaseous elements. With appearance of oxygen in the atmosphere, with influence from the Sun radiation – please see the Drawing no. 5 and 6 in Atlas at the end of the presentation – the oxygen molecule was split down to the elementary oxygen, which in the upper layers of atmosphere made the three-valence oxygen molecule ozone – please see the Drawing no. 9 in Atlas at the end of the presentation. With time the ozone formed an UV impermeable screen or ozone protection layer against those rays from the Sun, which have been responsible for decomposition of the dioxide molecules – the UV rays. The biosphere on the Earth responded with evolution of life, its intensification and transition from water to the Earth's terrestrial parts. The bacterial life moved on the terrestrial part of the surface, formed on the crust top a carbon rich layer, which eventually became what we today call soil. The Earth system evolved to the stage when complex life forms were able to appear. It was some 700 hundred millions years ago, and land mammals appeared some 350 million years ago. The human predecessors are dated some 8 million years ago, and Homo sapiens, our predecessor, some 100.000 years ago.



So here we are – we have the Universe, the Milky Way, the Solar System, the Planet Earth System, and the life on the surface of its terrestrial and aquatic part as well as within its atmosphere. With the existing input/output effects from superior systems, especially the Solar System, with evolved parts of the Earth system, etc., the climate change system became the holder/guardian of living conditions within the biosphere.

The described facts, though, do not mean that there is no impact of us humans over the climate change system. We do have an impact, and its contents depend a lot on our own thinking and behavior. Our one-sidedness is quite natural and equally dangerous at the same time, potentially leading to our own extinction. We should better add something to it, which is called holistic / systemic thinking. It is briefed in the Fig. 1 as follows:

Fig. 1: The Basic Seven Groups of Terms of Systems / Systemic / Holistic versus Non-systemic Thinking

Systems / Systemic / Holistic Thinking	Non systemic, Traditional Thinking
Interdependence/s, Relation/s, Openness, Interconnectedness	Independence, One-way-Dependence, Closeness
Complexity (plus complicatedness)	Simplicity, or Complicatedness
Attractor/s	No influential force/s, but isolation
Emergence	No process of making new attributes
Synergy, System, Synthesis	No new attributes resulting from relations between elements
Whole, holism, big picture	Parts and partial attributes only
Networking, Interaction, Interplay	No mutual influences

The climate change system is an integral part of the Earth biosphere. It has no clear-cut borders with other systems in the nature, like we humans are used to think and see. The climate change system is rather a part and complex natural system that actively takes / uses / puts / gives inputs / influences / impacts, receives outputs / influences / impacts from all inferior and superior systems, and reflects the present ones – as living conditions at the very moment of observation. Observer can go back in the history of evolvments, but cannot go in the future, due to countless possibilities involved.

The difference between the human's traditional thinking and the system thinking could be described as follows, when concerned with the climate change: when observers look at our civilization's achievement from the viewpoint of building and construction heritage, it looks nice, everything is in order, the arcs are arcs, lines are in a geometric order, and the whole construction follows a certain tradition/style/architect's mind work. Of course not as a total rule, because e.g. the great architect from Catalonia, Gaudi, has demonstrated his innovative approach to churches and other constructions. Also our houses, exterior and interior arrangements, agricultural activities, communications, roads/railways etc., are following a certain order, which does not look like the virgin nature. To us humans from this civilization the virgin nature looks like chaos, and we are not in position to see that it sees us vice versa. It is also difficult to comment whether the distance between nature and the human life style is now big or small, but it is obvious that we humans have made many different interventions /



innovations, which are not a natural way of acting. So, for the conventional thinking chaos of nature is chaos, and our life style is all right. On other hand the system theory/thinking may allow us humans to see the natural chaos as order and the human's order as a sort of chaos. When not only scientists, but also common people in the local communities will have this ability, we shall have much more of a natural habitat as we do now.

When we apply the above findings to the climate change system, we may understand “chaos” as interdependences/interactions/co-operation of many different systems of nature resulting from parts of the very complex climate change system. Of course we should not forget that this thinking is the thinking of human beings, and it has all good and bad attributes, which we humans have.

The climate change system is a composition of a permanent evolution of the natural systems, which support the biosphere as the space for living creatures within nature. We have seen dependences of the climate change on its superior systems, and let us first list the influences, which may occur from them to the biosphere.

All changes/evolvments of the Sun System have an absolute impact on the biosphere. They have a strong impact on the Earth, and most probably grave consequences when changes at the Sun System evolve. More scientific research should be directed towards understanding of effects from the Sun on evolvments of our biosphere. As the major provider of warmth and light the Sun has a strong influence on our biosphere.

The Moon/Earth equilibrium has also a high ranking.

The meteorites from the Universe, the Milky Way and the Solar System as well as other forms of matter/energy/particles/rays and the forms/powers/systems not yet known to us humans have influenced and will influence our biosphere. Fortunately, their impacts are not so frequent.

The planet Earth's attributes studied by physics/geography/biology have a most important position. Due to permanent evolvment, interactions, interdependences, co-operation, etc., the powers of nature have created our biosphere, and keep creating it. We humans can see its past and present. We can understand dynamics of some of the mentioned systems/powers, but not of all of them. Our knowledge at present is lacking system thinking, as a possibility to better understand the systems inter/dependencies and dynamics.

The inner core of the Earth has some 1.500 miles in diameter and is moving like a top with a different speed as other parts of the planet do. Any change in the revolutions and directions of the movements could have a strong impact on the Earth system. More research is needed, to understand this subsystem, and its interdependences, interactions and co-operations with other subsystems.

The rest of the Earth – outer core, lower mantle, upper mantle and crust totaling some 3.200 – 3.250 miles in diameter have a number of common interactions, which influence the biosphere. Earth's permanent changing under its surface is broken into numerous crust plates, which are in constant motion with respect to each other because of the powerful internal forces. Volcanic activities and earthquakes are products of large-scale crust plate collisions or separations. Both activities have complex impact on our biosphere, from the local direct disastrous impacts by



lava, ashes and land movements, to the even tougher impacts in cases of strong eruptions and large inputs of ashes into our atmosphere. They result in impacts on the biosphere as a whole.

The natural powers such as gravitation, magnetic force, electricity, etc., circular movements like a top and joint movement within the space of the Solar System, the Milky Way, and the Universe are extremely important and not yet fully understood by our civilization.

The climate change system – it is provider, maker, holder, and guardian of living conditions within our biosphere is composed of a large number of systems, which interact/co-operate and evolve into the present condition at the place of observation, all at same time. Thinking globally, the climate change system could be observed in some of patterns or expressions or variations, which show up in different values of the temperature, moisture, and currents.

The biosphere is composed of terrestrial, aquatic and atmospheric subsystems. Their characteristics are basically the frames, within which the climate change system has the role of the holder/guardian of living conditions.

Very well-known geographical facts of the Earth, such as latitude, longitude, and altitude are qualities decisive for warmth and light, which are reflected in the quality of local environment. On the other hand the distribution of this quality depends on the basic characteristic of land or aquatic environment. Of course when differences meet, at bordering environments, their quality is more complex. And it is not so simple, when taking into account complex interdependences/interaction/co-operation of all different systems together, which have something to do with the climate change system.

From the selected viewpoint, the most important inferior system of our biosphere is life on the planet Earth. As soon as the primordial Earth was ready to host life, it appeared. In ocean waters the anaerobic bacterial life was the first to influence all later evolvments. Due to the exceptional reaches of ocean waters full of inorganic compounds the first bacterial cells had an excellent living environment. The ocean waters protected them from UV rays and the temperature of waters was suitable. The light and warmth from the Sun were at a lower radiation as today. All phases of the anaerobic life lasted from its commencement on for around 3.8 billion years ago until the appearance of oxygen in the atmosphere around 2 billion years ago (please see the Drawing no. 3 in Atlas at the end of the presentation). The bacteria have changed the Earth's biosphere from an oxygen-free to an oxygen-rich one, from an environment unprotected against UV rays, to environment with ozone layer as UV protection zone. Sterile terrestrial lands changed to lands rich with life. After the change from the anaerobic to the aerobic life the biosphere changed, and many complex life forms evolved (please see the Drawing no. 4 in Atlas at the end of the presentation). The water cycle, the oxygen cycles, the carbon dioxide cycles, the sulfur cycle, and waste of organic compounds together with life itself have been an integral part of the biosphere's environment. The basic influence was transferring the fragile environments to life-friendly environments, and resulted in protection of the Earth surface against erosion and consequences such as destruction of lands, ocean water currents, and air movements that have been established as regular or temporary. The biosphere was evolving and became the space for life and living creature. Physical, geographical, chemical, biological and systemic interdependences/interactions and co-operation provided a possibility for an environment supportive of evolvement of life. Today, we may find at the same time within the Earth biosphere primordial conditions as well as any later



evolvments, which followed them in time. Our present biosphere has a countless number of biological sub-systems, which are along with their synergies, ensuring the life continuity in the present and many other possible and changed environments.

The terrestrial lands, from the frozen Arctic/Antarctic environments to the tropic conditions, are home of a large number of different living creatures, which all together make a comfortable living as long as they follow the system interdependence/interactions and co-operation. All ethological differences are a part of the maintenance of environmental matter exchange, in which numberless biosphere sub-systems evolved for the life to continue. The changes/evolvments are consequences of interdependences/interactions and co-operation of all systems involved. The same apply to the evolvment of the aquatic and atmospheric environments. The biological system is a moderator of living conditions within the biosphere.

The Sun is energy – light and warmth provider. The planet Earth protection systems are ozone protection zone in the Stratosphere (15 – 24 kilometers) and the green-house effect (the natural parts of which are carbon dioxide, methane and nitrogen oxide). Both protection systems are filtering/transporting radian energy to the surface of the Earth and back to the outer space. The geography of the Earth at present has around 30 % of terrestrial and 70 % of water areas (oceans/seas). The energy equilibrium is a result of inputs and outputs of energy – please see the Drawings no. 6 and 7 in Atlas at the end of the presentation. Changes within inputs and outputs are interfering with energy balance, and their consequences are cooling or warming. But due to the complex system characteristics of the Earth such as: changes in the atmosphere, changes at the terrestrial part, changes at the oceans/seas waters, changes within the biology of the surface, and anthropogenic inputs, the reaction of warming or cooling has different patterns. The air movements and oceans/seas currents have an additional influence adding to this complexity.

The energy balance is a most important life supporting system, and the changes within it are very destructive for the biology of our biosphere. Changes result in extinctions of animals, plants and bacteria, and appearances of new forms of the life. Drastic changes are known as glacier or ice periods; in the past the Earth experienced a number of them. On the Drawing no. 3 in Atlas at the end of the presentation, please see glacial times painted blue.

The water cycle - please see the Drawing no. 20 in Atlas at the end of the presentation - makes the difference between the planet Earth and the other terrestrial planets Mars, Venus, and Mercury. It is a part of the biosphere and has been provided at the birth of the Earth. The water cycle is a sub-system of the biosphere, which provides the basis of quantity/quality of the biosphere environment. After birth of the Earth, as soon as it had become cool enough, water appeared in liquid, ice, and gas forms; the water cycle commenced its permanent action / evolvments. As an environment it has excellent transport and interaction abilities, which probably together with other sub-systems: cloud formation and movements, lightening and natural electricity, assisted the birth of life. Life appeared in aquatic environment, and it took almost two billions years for life to move from the aquatic environment into terrestrial lands. 97.3 % of the Earth water is there in oceans/seas, 2.1 % in glaciers, 0.6 % in aquifers, and insignificant quantities are lakes, rivers, soil moisture, and the biological life. Yet the water is a needed quality of biosphere, which has been a precondition for life. Most living creatures have between 75 and 95 % and more of water content within their bodies. The water is the main transport system within cells, tissues and body itself. The water is the main environment for



chemical processes in nature. The water is the main architect of nature, when carving mountains, lakes, rivers, and shaping the Earth surface.

Life and water,
Water and life,
Life,
Water.

From the book “Slovenia Yesterday, Today and Tomorrow, Water Management Challenge to Slovenians in the Third Millennium”, by Ecimovic/Jan/Vrhovsek, Ljubljana, Slovenia, 1998 (in Slovene).

Water movements/currents of oceans and seas – please see the Drawing No. 21 in Atlas at the end of the presentation – result from the temperature and salinity difference, trade winds and interdependences/interactions and co-operation of other Earth systems – gravitation, Earth movement, air movement, energy balance, Moon and Sun gravitation, etc. Large oceans currents are seen in the drawing No. 21.

Air and water are permanently interdependent, interacting and co-operating when the water changes from liquid to water vapor, which is transported by air. When temperature changes in the processes, assisted by the air particles (physical or biological), the water vapor changes into ice and liquid form and comes down to the surface as precipitation.

The mountains are water towers of the terrestrial surface, and the forest is the primary filter of water and its transporter to the underground. Rivers take water to lower altitudes and with their biological system they are secondary filters/conditioners of water. The river waters are the main transporter of mineral components from mountains and higher altitudes to lower altitudes and finally to the seas.

When waters from higher altitudes do not find their way to lower altitudes, lakes show up, and with their biological life they form the lake waters systems. Of course, lakes can have river water input and river water output, but the lake water body is placed under the level of water outtake. Lakes are the water storages at higher altitudes.

Swamps, swamp-forests and swampy areas are best biological filters of water, and they usually are placed at lower altitudes and as estuaries. At all locations where water (fresh or salty) and land meet there are the biologically richest regions. The planet Earth matter exchange is possible due to water's active transporter role, and the activity of environment with biological richness, which helps our health by purifying the terrestrial surface waters.

The underground waters transport water under the Earth's surface and provide water in water springs. There are large underground waters at deeper levels of terrestrial and ocean/seas bottom levels, which are there because of the Earth crust movements. They are underground lakes of waters rich with minerals and usually sterile.

The terrestrial surface water movement result for both the altitude and gravitation, and water has the golden ability to move downward (gravitation), and it has a leveled surface when staying.



The terrestrial, biological and atmospheric waters are less than one percent of total waters on the Earth, but due to water cycle they are an important sub-system of biosphere.

Between the Earth body and outer space reaching up to 1.000 kilometers there is a large environment of gasses, rays, particles and nature powers called atmosphere. The first ten to fifteen kilometers is the troposphere, the lower part of the atmosphere. It is the weather-impacting region where the air movement is most frequent. It is here that clouds form and move and one can find living creatures, from birds to microbial life forms. Troposphere ends into stratosphere reaching 15 – 50 kilometers from the Earth's surface, including the ozone protection band (15 – 24 kilometers). Mesosphere (50 – 85 kilometers) and thermosphere (85 – 400 kilometers) end into exosphere, which ends into outer space at the altitude of around 1.000 kilometers. Please see the Drawing No. 8 in Atlas at the end of the presentation.

Atmosphere is a gaseous cover of the Earth surface and it is an integral part of the biosphere and of the whole Planet Earth System. It takes/transport/rebounds/transforms the band of the Earth for the Sun's rays of light and warmth, as well as for any rays/particles/outer space bodies/nature powers meeting the Earth as a whole.

Two main gases make 99 % of the atmosphere: nitrogen 78 %, and oxygen 21 %. As everything in the nature their distribution, movement, and content change within limited possibilities. The remaining one percent is made of the natural presence of carbon dioxide, methane, water vapor, nitrogen oxides, argon etc. The oxygen is present as dioxide, ozone, carbon dioxide, and water vapor. As a contribution from our civilization additional contents of gases have been put into atmosphere such as: additional carbon dioxide, additional methane, nitrous oxide, chlorofluorocarbons CFCs, hydro fluorocarbons HFCs, per-fluorinated carbons PFCs as green-house gases. As photo chemically important gases there are carbon monoxide, oxides of nitrogen and non-methane volatile organic compounds NMVOCs, which indirectly contribute to the green-house effect.

The catalytic ozone destruction cycle in stratosphere – please see the Drawings 10, 11, 12 and 13 in Atlas at the end of the presentation – show some of common reactions in the atmosphere.

The atmosphere as the largest part of biosphere has an important role of making life possible due to oxygen concentration, which is the life-supporting gas amongst the atmosphere gases. Secondly it is the area of water vapor transport, cloud formation, and the main transporter of the water cycle, important from the biology point of view.

The air movement in the multidimensional space has regular and irregular patterns, and at present during the climate change system movement the extreme air movements are recorded. For the biosphere, the air movement is of great importance as a transporter of life forms, moisture supplier, and local weather maker. On the other hand it is antagonistic to the human constructions, which are usually demolished if they are constructed at lower standards of the wind/tornado/typhoon strength, when it occurs.

The carbon cycle was probably the most important cycle during the primordial Earth times, because it caused the crust formation and carbon cycle deposition at ocean/seas bottom and



land surface. It is a direct in/output of biology, and partly of the biosphere chemistry processes. Please see the Drawing no. 22 in Atlas at the end of the presentation.

Carbon is a constructing element of the biosphere. A very fast (less than 1 year) exchange of carbon is within plant life. It is today the second carbon exchange, which takes the first place when thinking of the very fast carbon exchange. Fast (1 – 10 years) carbon exchange comes from soil and oceans/seas surface. Slow (10 – 100 years) is exchange of carbon within the forest systems. Very slow (more than 100 year) carbon exchange is important in the biosphere as deposition of carbon by microbial life and Calcium carbonate sediments/rocks. Due to the relatively slow processes within the carbon cycle in nature, and the relatively fast input of carbon from our civilization into our biosphere, we have a situation, which the existing processes in the biosphere are not able to compensate. It is one of the reasons for the global warming.

The sulphur cycle has been a less important cycle in the nature during the time when our civilization did not exist. It has its important role within nature, but our civilization causes damages in nature by increased quantities of sulphur (acid rain) that became fast a damaging factor. Sulphur is an essential element for the life to exist on Earth. Please see the Drawing no. 23 in Atlas at the end of the presentation.

Be it any inferior or a superior system of biosphere, planet Earth, Solar System or Universe, and our civilization is a small system, but an integral part of the whole. Today we are discussing our problems of nature, space and environment protection (protection against whom?), but even the great Greek philosopher Plato more than 2.000 years ago stated:

“When there was still forest growing in the mountains of Attica, the rich soil received water and stored it, so that the absorbed mass slowly became distributed from the heights, feeding fountains. But now the fatty and rich soil has been washed away and just the meager framework of the landscape is still present – comparable to the skeleton of the body attacked by illness”.

They have not been properly named “important and unimportant systems”; they all are systems and interacting/interdependent and co-operating to produce the results present in the Biosphere now. But we humans did not follow the nature’s instructions that we should think of interdependences, interactions, and co-operations enough, so far. The Dialectical System Theory may offer a more promising possibility/tool than the General Systems Theory; that we have discussed in our book “System Thinking and Climate Change System”.

The climate change system as an integral part of the Earth Biosphere’, has a bigger influence on our civilization as we humans of our civilization think and believe. In absolute terms the climate change as holder and guardian of the living conditions is making our life possible. But we humans are mostly trying to do our best in our modern relations to nature and each other not to appreciate this fact, but to harm the climate change system as much as we can, yet fortunately not as much as we think we may.

There is a theory of the anthropocentric interference with the climate change system, which is trying to explain reasons for the climate change caused by our civilization over the last 200 years, 1800 – 2000, and we would like to discuss it and to assess feasibility of such a theory.



The philosophy about this issue was written many centuries ago when the story of David and Goliath appeared. But by our standards we humans are not viewing our David-like abilities and impacts as a general practice, and we do not know what we are, what is our natural system, which systems are we interacting/interrelating and co-operating with, and where do we belong. What we do understand is how to make money out of our civilization and how to use the nature's richness for it. What are our impacts and what could be their consequences, most of us humans do not care. What about the living of our civilization on the Earth, we have to recognize the biosphere's capacities for our, human, species to be successful rather than harm ourselves. It is not only competition but also and mostly co-operation, which is making our species live. As long as we shall live on the present paradigm, which could be seen as "the ostrich head", rather than take the long-term responsibilities for our civilization's impact on our own biosphere, so long we shall be increasing the difference/distance between our civilization and our nature/our biosphere.

It is *not the planet Earth* that is the home of our civilization, but *the biosphere*, which is a tiny part of the planet Earth. Vulnerability of the two are two, not even comparable issues.

What is the present status of our civilization like, do we see our civilization requisitely holistically – as a system, and what are interdependences/interactions and co-operation needed for a sustainable future of our civilization, are the issues of "to be or not to be" and important only for our civilization's well-being.

If we accept that the origin of our ancestor, the *Homo sapiens* has been dated some 100.000 years ago and her first settlements some 12.000 years ago (the first settlements in Eurasia), and great cultures (China, India, Mesopotamia, Egypt, Persia) 7.000 – 3.000 years ago, we may discuss *from where* we are. But *what* we are, from the point of view of the natural sciences – biology of the biosphere and planet Earth, this issue is not included into any old script or our predecessors' philosophy. Religions – the permanent supporters of our civilization are our predecessors' innovations, but they have never discussed the origin of the civilization. Their focus has always been on human being and how to get from people as much as possible. Existence, economics, and ideology have always been interdependent. Warriors, kings, rulers, democrats from the past (such as the ancient Greeks some 2.500 years ago) and present, religious / spiritual leaders, politicians and many others, who have been self-appointed, elected or appointed, were products of their time and ruled as they ruled. The tribe stories – on and by people, chiefs, and spiritual leaders – describe what we are, but do not discuss what are we doing for our living, and what is our civilization's impact on the biosphere.

If we accept that we humans are an integral part of the planet Earth biosphere – nature, and the peak of the life tree on the planet Earth, from the natural sciences point of view, and take system theory as our thinking tool, we may say that we belong to the planet Earth biosphere as interdependent part/content/living creature.

Thus, our civilization is *one of the many life systems* inside the planet Earth biosphere and we may say that we are one of the planet Earth civilizations. And which are other civilizations? From our research we may point to many living creatures and large civilization, which are outnumbering *Homo sapiens* by the number of their members many times. Among the largest populations are microbial species, etc. It is known that survival is based upon availability of



food, water, air, and space, but what has never been considered, is the impact of the species on the food/water/air/space availability. In the nature many species are known, which have a short lifetime, as individuals / individual representatives of their species, but as species they have been within the biosphere for very long time. The classical case are microbial cultures – parasites, which destroy their host and themselves, but not as species, but as a present culture invading the host. This is a life story, one among many others. And the nature has taken care of matter transition within the kingdom of life. It is a permanent system of matter transition from “ashes to ashes”, not used for ruling the humans but symbolizing the cycling of matter within the biology of the biosphere.

Let us see ourselves in this context. First scattered settlements were where the food, water, air, and space were abundant, and settlements flourished. When settlements had joined, the cultures/nations were established. And as long as the food, water, air, and space were abundant the culture was in good shape, but when food, water, air or space became restricted, the culture went down. So finally our civilization became our and global ruler of the planet Earth. After a few millennia, food has still been abundant (in 1960's), and water was abundant (in 1960's), and air is abundant (at the beginning of third millennium), and space looks like being abundant. But at the end of second millennium the food was no more abundant, the water was no more abundant, the air was no more abundant and only space still looked like abundant, which in fact is neither so any more. Is the end of our civilization approaching us?

From the natural sciences point of view: yes, it is. But, any culture in the biology of the biosphere has its time of birth, childhood, adulthood, old ages, and history, anyway.

The novelty to be attained – and to be made innovation – could be the ability of the current Homo Sapiens to think, understand, and learn, how to *requisitely holistically* manage our own civilization affairs, e.g. to all humans food, water, air, and space for living. This task can be done better, if the systems thinking could be used.

The climate change system is an integral part of the Earth's biosphere and it has a multi-complex purpose of putting together, hold, and guard basic conditions of the life: temperature, water cycle, air-sea-ocean movements, protection, management and regulation / control of the biology of the biosphere.

The climate change system is one of sub-systems of the biosphere. Which parts of the biosphere system could be affected by impact of our civilization is a question, which we shall try to indicate an answer to, now.

Biology of the biosphere has many successful systems, which are in different stages of life. The most successful and the best evolved is the rain forest. Of course the geography, i.e. longitude, latitude and altitude of the environment and space impact the conditions and possibilities for evolvement and management of life. Second to these conditions is availability of water, which in many cases is closely connected with evolvement of the biological system. In many cases the biology of bordering regions between two different environments land/see, fresh water/land etc., include very successful systems like mangroves, corals, coastal sea and ocean waters etc. But the bigger portion of the biosphere is made of oceans and seas (around 70 % of the earth surface are oceans/seas and 97.3 % of all water on the Earth is in the oceans and seas) and they are less researched and more difficult to know in details.



A general biology knowledge may indicate that the best biological systems on the terrestrial surface are the forests, the second are grasslands, third come the biotopes specialized according to local conditions – swamps, bush lands, makia/gariga (Mediterranean), mountains, the Sub-arctic, Arctic and Antarctic regions, rivers and lakes, deserts, etc. In coastal waters of oceans and seas there are corals, mangroves, and many more as biological systems belonging to successful stories.

All natural systems are composed of physical, geographical and biological characteristics, which make a basis for their composition, while the climate change system provides the conditions (water, air, temperature) to provide/guard their evolvments. We may explore the past and see the present of these systems, but we cannot see future evolvments, due to many possibilities and influences to come.

Water and food are very interdependent, when we discuss the food production of our civilization. Water is a basic precondition for food production. Due to changes in the biosphere our civilization was replacing water available for food production naturally with water from other sources – rivers, lakes, artificial accumulations, etc. Actually, by doing so, the food producing environments have become very similar to the artificial systems, and have been moving fast out of the biosphere patterns.

Due to increased demand for food, new areas have been put into exploitation, which have not been used before. The artificial food producing systems entered a long-term use (reactions in the biosphere are taking time as long as they need, since nature always has enough time, or nature does not care for time, etc.). The reaction was very much limiting the production ability, and our civilization was forced to innovate technologies for food production and protection (not to forget the profit / money gaining reasons) of the food production systems. Many pesticides were invented and then innovated. One-sidedness of the purpose of innovation has been resulting in damages within the biosphere that have gone far beyond our ability to understand them, when we commenced to use pesticides. Today the synthetic chemical compounds should better not enter the natural systems, because of their long-term damaging effect on the different parts of nature systems such as water pollution, desertification and loss of productivity of agricultural lands, etc.

At present we face a large intoxication of the biosphere with pesticides. It is a consequence of lack of consideration of both complexity and complicatedness of our (only!) biosphere.

Due to an exaggerated growth of the needs of our civilization (drinking water, industrial consumption of water, etc.), and demand for agriculture and food production, the water sources in the nature are becoming insufficient. Many innovations were used for solving this problem, of which many have had an impact on the biosphere systems. Let us mention here the exaggerated use of fresh river/lakes waters, resulting in the destruction of underground deposits and lakes of water, and combined with a lack of understanding the physics of the underground water deposits systems, etc.

At present we face large deficit of fresh water sources, and quality of present sources is questionable, due to pollution by synthetic chemical compounds and their long-term effect. Recently, also the influence of hormones and hormone-like substances are becoming more and



more important. Today we do not have clean fresh water supply, but fresh water supply, of water quality within the limits of allowed level of intoxication by synthetic chemical compounds and other pollutants. From water supply viewpoint our future does not look nice.

Our civilization's settlements of near past and present (over-concentration of people and self-creation of the fragile environment – mega cities etc.) has caused the pollution of all waters in such regions, including areas as far as such polluted waters travel. Actually, the pollution has been a combined effect of pollution from city life (countless toxic substances – natural and synthetic chemical products, etc.) ending in the waters from individual kitchen outflows and sinks, toilets and sewage systems, and from the “natural” rivers flows. Secondly, the usual agriculture intoxicates lands and underground waters and further waters connected with intoxicated lands and underground waters. Finally all this is ending into coastal sea and ocean waters, which are in different stages of pollution/intoxication.

Our civilization has used rivers as sewage transport system. To achieve the combined effects of the protection of human settlements, citizen's properties, and civilization's achievements against the natural river waters floods huge hydro constructions were introduced. Actually, by our civilization's standards, we have straightened the natural river flows, and by doing this, we destroyed the natural/biological river waters “filtering” systems. We achieved a fast take off of the river waters, and only this, because we did not protect civilization settlements and achievements against floods. In the long-term the floods are still there, but with a much more damaging effect. A majority of the rivers need eco remediation of their natural abilities for hosting life and other qualities destroyed by our civilization.

A further topic with a comparable destiny tackles estuaries and coastal waters, which in many cases were reconstructed into businesses, settlements, and tourist resorts with no / poor natural/biosphere characteristics. They are opening new frontiers for pollution of coastal waters and as a consequence the oceans/seas waters.

Today it is a larger share of human population of our civilization than ever lives on littoral coastal lands. The pollution of coastal waters is taking place, and soon we shall be able to read results of our continuous action damaging the quality of sea and ocean waters.

The data briefed here make us conclude that many individuals and organizations need to learn and apply system/holistic thinking. Both the past and present experiences of our civilization's impact on a large number of natural systems are calling for more effective nature, space, and environment protection.

In reality, we need diffusion of holistic thinking for a broader impact towards better and more suitable way of thinking, decision-making and action, in order to attain our civilization's long-term responsibility and preserve our nature of our Earth rather than to suffer a global tragedy of the commons.

The climate change system operates under preconditions given by the dynamic evolvement of physics, geography, and biology of the Earth and its environment. The humans, with their life practice over the last 300 years of industrial and post-industrial civilization, have been proving their ability to influence constructively and destructively their natural environment, and are going beyond the border of a sustainable life and its long-term influence on the biosphere of the



planet Earth. Our findings exposed in our book “System Thinking and Climate Change System” so far demonstrate that the human impacts on the planet Earth’s biosphere system are both individual and organizational, and their consequences are individual, local, organizational, regional, national, international, continental, global, and perhaps even universal. Therefore the selected problem is how to attain a better and more systemic long-term responsibility of humans. The selected viewpoint considers the potential political measures toward this responsibility.

The climate change system as an integral part of the Earth biosphere is not its creator, but its holder and guardian of the living conditions. Humans have to find a new path towards sustainability or sustainable future, which will make mutual relationship of this civilization and the planet Earth in the newly evolved conditions.

Knowledge, sciences, research and applied research, society, and all governing, economic, national, international institutions/subjects, etc. need to accept a broader view at the given evolvments in our biosphere, and to respond adequately to their new challenges.

The present pollution on the global scale (nuclear technologies, CFCs and similar substances, pesticides, genetic modifications, hormones-like substances from our civilization’s synthetic chemical production, technologies impact – explosive engines and others, transport equipment, war equipment, PCBs with impact on gene structure, etc.) reflects samples of our civilization’s short-term thinking and action. What we need for our sustainable future is our long-term responsibility for our civilization’s impact within the biosphere.

Here we have to distinguish the impacts of the ruler of our civilization – profit motive – from the understanding of it and the actual damages done by by-products caused by the lack of knowledge and holism. In many cases of global pollution the profit motive of our civilization was the main reason for large pollution – PCBs, CFCs, pesticides, etc.– which were and are produced, promoted, and marketed as improvements, but have resulted in damages within our own living space or environment. Global warming, ozone band destruction are cases - please see the Drawing No. 14; 15; 16; 17; 18; and 19 in Atlas at the end of the presentation – of a lack of any responsibility, and long-term responsibility of our civilization. Cases include the population’s explosive reproduction, and pollution of the atmosphere.

We need research and understanding aimed at long-term responsibility of our civilization in order to stop the irresponsible behavior of the present rulers, the humans and our civilization’s products such as the one-sided profit system, which causes a failure of understanding of the long-term responsibility, and hence causes irresponsibility.

The present status of the biosphere, nature, space and the environment, as well as the scientific and research knowledge at the disposal of humankind and our social system are driving our civilization in a dead alley. Individual, regional, national and international interests do not permit humankind to take a new approach to survival by their social, financial, political, and bureaucratic pressures, war philosophy, and lack of tolerance between people.

We, the people of the Earth, have to recognize the need for action towards the establishment of a world constitution, a world parliament, and a world government as a possibility for our



survival, with responsibility to co-ordinate social issues, and to harmonize the needs of the entire humankind, and the nature, space, and environment capabilities, needs, and possibilities.

The present practice on the Earth such as:

- The destruction of nearly all waters with synthetic chemicals, bio and air (rain-induced) pollution,
- The destruction of air by the land, sea, and air traffic,
- The destruction by the results of war actions,
- The destruction of the ozone layer,
- Destruction of the soil fertility by the agriculture practice, including producing deserts,
- Global warming, and of course
- The explosive reproduction of humankind,

Such practice cannot be dealt with by simply taking national interests into account and meet them in mutual isolation. They should be a major responsibility of the world government.

The climate change system, which is holder and guardian of the living conditions within the biosphere, needs special scientific research, and world governing action. Nature, space, and environment protection, which should take care of the biosphere, need special scientific research and world governing action, too. Both groups of topics are two global systems and reacting to the human one-sidedness by causing global entropy tendencies, which require a global level of the requisite holism in humankind's dealing with them.

The necessary scientific and applied research to cope with the above issues cannot be provided on the basis of our civilization's current scientific and research capacities, due to the engagement of scientists with war and the demands of bureaucracy. Therefore, a new approach is needed for a redirection of scientific work towards the needed knowledge and values capable of saving the nature, science, and the environment including the climate change system.

Scientific work, as a basic source of knowledge, needs special co-ordination at worldwide level and should be an integral part of the world governance. We need independent scientist, who work because of their scientific thinking/acting ability, and not because of need for daily/monthly/annual salary given to them by bureaucracy (democratic financial societal system), or marketing/profit oriented economy. The money system today has become a master of its own, a monster who rules the entire civilization. It would be nice to put it back, in the frame where it belongs – the servant of humankind. Now, profit is killing profit by causing side-effects having crucial impacts, including humankind's cost covered by company taxes.

To be able to understand the need for world governance, humans should understand the systems within which we exist, and systems we consist of and that we create. It is important due to the known fact that any system in nature will remain as it is, as long as all systems and relations within it are in a similar mode. Together they make a living system that is trying to be a viable system. If and when any major or minor part of the system moves, changes, and the whole system will commence to move, change. It is not possible to predict in which direction the system will move, change. This is what is happening with the climate change system.



The climate change system ultimately would change living conditions within the biosphere and geography of the Earth so much that our civilization will end. Therefore we are

RECOMMENDING

One planet, one government is our first recommendation. Of course, The Planet Earth Constitution is first and The Planet Earth Parliament and Government follow in line, after ratification of The Planet Earth Constitution.

Secondly we recommend a new approach to the *social order*, which has to reflect the present experience, and the establishment of a *new contract for humankind* living on the planet Earth. The goal is to prevent explosion of humankind reproduction, enforce ethics and tolerance amongst peoples of the Earth, and enforce (a globally holistic!) law and order, and with skillful governing allow the coming generations to live on the planet Earth.

Thirdly we recommend *redirections of scientific work* from war armaments, too narrowly market-oriented and synthetic chemicals technologies, etc., to discovering viable global systems of nature, space, the environment and cosmos, as essential elements of knowledge needed for survival.⁸

Reference:

Dr. Timi Ecimovic, Prof. Emeritus Dr. Matjaz Mulej and Dr. Rashmi Mayur (2002): *System Thinking and Climate Change System*. SEM Institute for Climate Change, Korte 124., SI 6310 Izola – Isola, Slovenia, www.institut-climatechange.si, Korte, Slovenia. ISBN 961-236-360-3.

The Atlas – please see our home page www.institut-climatechange.si or our hard copy of the book “System Thinking and Climate Change System”, or our CD version of the book or at Volume 2 of this digital book.

⁸ The scientists who contributed to this thinking by their work or ideas are as follows: Dr. Rashmi Mayur, Mumbai, India; the late Prof. Dr. Dr. Helmut Metzner, Tuebingen, Germany; Prof. Dr. George Pethes, Budapest, Hungary; Prof. Dr. Slavko Kulic, Zagreb, Croatia; Prof. Dr. Marjan Vezjak, Vrhnika, Slovenia; Dr. Elmar A. Stuhler, Freising, Germany; Richard Bartak, CSM, Prague, Czech Republic; Prof. Dr. Micheal O Suilleabhain, Cork, Ireland; Dr. Marion Hersch, Glasgow, Scotland; Dr. Glen Martin, USA; Prof. Dr. Nina Dorofejeva, Ukraine; Prof. Philip Isely, Lakewood, USA; Yogi Shanti Swaroop, India; Prof. Dr. Elohim Jimenez Lopez, Mexico, and Mautendorf, Austria; and many others past and present members of the SEM Institute for Climate Change.

