

The Climate Change System Introduction

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Abstract

The climate change system is one of the planet Earth internal systems. Interdependence, interaction, and co-operation of all systems within the planet Earth are making the planet Earth existence as reality. The planet Earth as requisitely holistic unit of the Nature – Universe, is one of countless planets, and one of planets within the Milky Way Galaxy System, which is one requisitely holistic unit among countless galaxies of the Nature - Universe. The climate change system is maker, provider, holder and guardian of the living conditions within the Biosphere of the planet Earth. With ceaseless interdependence, interaction and co-operation of all internal and external systems of the Earth is making present possible and observable as it is. Research and scientific observation of the Nature from requisitely holistic systemic viewpoint are opening new horizons for better tomorrow of humanity.

Keywords: Climate change system; Nature-universe; Nature of the planet Earth; Biosphere; Basic environments-water; land and atmosphere; Interdependence; Interaction; Co-operation; System thinking; Systemic operation; Requisitely holism; Living conditions

Introduction

I have concluded my research on the Nature-Universe¹ during 2009 and all my and many colleagues mutual co-operation was presented in our books. For my research I was four times nominated for the Nobel Prize in Physics (2003, 2007, 2010 and 2012). I have commenced research of the climate change in 1980es and after 1990 the climate change system term was used for better understanding. Since 2002, when our first book on the climate change system was published we had the following contributions [1-19].

In this contemporary presentation of the climate change system I am trying to assist the readers to more easily and better understand the following findings:

Life, even survival of us, the modern civilization, depends a lot on conditions provided by the nature in which we all live, and by the climate change system as an essential part of it.

Nature, climate and climate change system are no simple systems (features, entities, and processes), but complex and complicated.

So far humans have not been sufficiently successful in their influencing the climate and climate change system: the dangerous consequences result from too much one-sidedness of humans, and suggest humans to use more systems/holistic thinking.

Most people do not know enough about how usable and useful is system thinking when one deals with many, rather complex, life issues, including climate and climate change system.

This presentation, I hope, will help us all to live better, and we hope to assist humankind to get a path for sustainable future or harmony of our civilization with the Nature.

We humans live on Earth, which is a small, but integral part of the Universe. We are able to live here due to suitable climate and other living conditions. All over the billions of years of the existence of our planet Earth, the climate has kept changing. The impacts causing this changing, in general, result from natural processes and/or human interventions. Both kinds of impacts can cause consequences, which are both good and bad by human criteria. E.g. from a rather one-sided/

narrow/shallow/oversimplifying viewpoint the changes in the human life over the last 2 - 3 centuries are bringing the so called progress: more comfort, a higher standard of living on the basis of the many technological and non-technological innovations. But from a more requisitely holistic/broader/systemic/complexity-facing viewpoint we see that the same changes tend to cause our own extinction. Which is the correct viewpoint? The usual answer would read: the common sense. But the modern experience demonstrates very many destructive consequences of the “common” sense, i.e. the one-sided viewpoint as a usual basis of thinking, decisions making and acting, which is normal with all of us individuals as specialists knowing a small fragment of reality. So, at least since the UN (humankind’s highest political body) has planned for “sustainable (i.e. no short-term and nature-destroying) development”², the humankind of today knows: we should better apply the “uncommon” sense, i.e. the requisite holistic/systemic thinking. Each and every individual human idea, decision, and action may seem to make a small, even negligible impact, but the consequences of all of them together may be tremendous.

In the case of our climate, our human actions tend to cause our own self-destruction, because we tend to lack holism, both in our knowledge, values, emotions, and resulting actions.

It is hard to believe what we, as humankind, know about the world and the universe. Many well-known issues and insights, however, are fragments of the whole, and we have to understand the whole on the basis of fragments without knowing the whole. And what is the whole, where are limits of fragments, and what are issues of a whole? I think the whole is everything, and all other features are issues within/

²Sustainable Development definition would be better as Sustainable Development and Sustainable Future. The Nature do not have DEVELOPMENT, which is humankind term from the tomes of industrial era. The nature have past, present, evolvments and evolution, and interdependences, interaction and co-operation rules and practices of the Nature.

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¹The Nature – Univers is short expression meaning the nature as the whole, general or universe/cosmos as per human understanding.

without inferior and superior systems/wholes/entities making partial or (fictitiously) absolute whole/s.

I think the absolute/only/total whole is what we humans call the Universe.

Now, how to understand our own role as humans within the Universe, when our understanding of the nature, space, and environment is evolving/innovated from fragments, which have never been put together to allow for a holistic insight?

The present human civilization is following a path to destruction, because it is built on the unrealistic premise of unlimited resources – profit at any cost – without accountability and responsibility to humankind of the current and the next generations. Many hard issues of today could have been less hard, if the thinking process had not taken the paradigm of the narrow-minded profit motivation alone, as the single priority in the active and demanding role of the “developed world”, followed by the “developing world”.

The natural evolution, which has only one direction – the dynamic multidimensional evolution ahead, does not include its own payment system, profit, financial institutions, and all other innovation of great importance for our civilization of today. The nature has its own absolute knowledge, energy, matter, ability and possibility to construct systems/entities according to the existing information, matter, and energy of its own. The question is “Why is there a planetary system like the Solar System?” and the answer is “I do not know, but I think that it is a result of the nature need for “continuum”³, the available natural information, energy and matter”.

Does this mean that we have to abandon the existing economic system aimed at profit? It may be impossible to do in the short run. At present we need economy as a social sub-system, and with development of the inter-human relations into a globalized unit, we may find ourselves within a social order with an equitable and just economic system. The point is not in profit as a quantity, but in human attitudes behind the style of economy it represents, especially the one-sidedness of thinking, decisions making and acting. Why?

What happens is that profit kills profit: the external economic theory teaches us to consider the cost that we cause e.g. by pouring toxins in a swamp – an avoided cost. But it is actually a shared cost that we all cover by taxes, health problems and resulting medical costs, etc. This is a case of “the tragedy of the commons”. The side-consequences, in the case of human impacts ruining the climate conditions as preconditions of our survival, tend to become the central consequences. But they are still considered uncertain, as long as the common sense is the narrow rather than requisitely holistic thinking, decision-making, and acting.

What is certain, hence, is that the time has come for our civilization to make a decision about our future (sustainable future or harmony with the nature), including our own very near future. That decision, I believe, will take us forward to a sustainable future, if a requisitely holistic thinking comes to complement the usual narrow specialists’ thinking. It should help us see that we are not independent, but interdependent, i.e. needing each other and needed by each other, because we all are specialists. And we all live on the same planet Earth, which we cannot produce. But we can kill/ruin it.

Black/white, shallow/deep, good/bad, positive/negative, primitive/civilized, and many more coupled terms could be put together and enable us humans to see the origin of interdependences, interactions

and co-operation of the natural systems. What was first “hen or egg”, “innovation or routine”? The answer is obvious, but rarely taken into account: they are interdependent, as soon as we consider the natural dynamics, not only a moment (which does not exist on its own anyway). So are specialized professionals, needing creative interdisciplinary co-operation as their/our shared way out of the blind alley of a too narrow thinking and action.

People, values and knowledge have been making an epic song of our civilization, which has been going on since humans have existed. And so has other nature, including climate and climate change system. We people are a part of nature, although this has been admitted less over the last three centuries than ever before. The climate and climate change system reflect this interdependence, interaction and co-operation, which we may never forget about in order not to suffer another “tragedy of the commons”.

Past we may learn, present we may understand, but future we cannot predict – it is unpredictable. Our past and present has put us in the position of being no-where and having questionable possibilities for long term survival. Our target at hand should be sustainable development and Sustainable future of our civilization or harmony of humankind with the Nature. This noble goal should be at home at local communities all over the Earth, where we humans are at home.

Discussion

The Climate Change System, as maker, provider, holder and guardian of living conditions within the biosphere of the planet Earth, has a more important role than was perceived in the past. In particular, all creatures, plankton, microbes, plants and animals of the biosphere has a very important role interdepending, interacting and co-operating in creating conditions, to which they have to adapt in order to live. Many species, even larger ones, are now extinct, due to changed environmental qualities, because of changes within the climate change system.

Worldwide researchers and scientist, complex problem solving, case study research, education, and many other activities of Homo Sapiens individuals and society today has to take into account the climate change system affairs, which have 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 maker, provider, holder 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, which are allowing living.

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 nature and biosphere.

Riskassessment research was not well developed during the industrial revolution and following times, and issues like: intensive agriculture; synthetic chemical production; money democracies: corporate social responsibility, nuclear technologies, have put for an irresponsibly long

⁴The Climate Change System as scientific description of very complex system running environmental conditions within biosphere of the Earth has been introduced by Prof Dr Timi Ecimovic in join book on System Thinking and Climate Change System, ISBN 961-236-380-3, 2002.

³Continuum is one of basic qualities of the nature.

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 planet Earth biosphere will be. Science and people/s need to understand interdependences, interactions and co-operation within the environment, and of all matter, energy, and information to allow for sustainable development and sustainable future of our civilization. They should use systems thinking, e.g. the Dialectical Systems Theory to do this job requisitely holistically and therefore successfully.

It is common that individuals and society by practice are using nature, environment and biosphere as commodity free of charge. But, today this is more complex, regarding the nature quality, due to the climate change system. Major impact of the climate change system at society such as sudden floods, strong winds, frost, and other changes within the local nature, may produce large damages, loss of property and human lives. The risk is more complex, and could cause large losses by life, health and property damages. My recommendation is to

- Apply systems thinking, e.g. the Dialectical Systems Theory linking human work and its creativity with holism of thinking, decision making, and action, and with innovation;
- Make clear relationship with the Nature, which will respond to better relationship.

I think it is advisable to learn from this presentation on limits and possibilities of the climate change system, to make clear vision of changes, which may affect human society, biosphere and the planet Earth. I will concentrate on some basic features of the climate change system in order to support the two suggestions.

Interdependencies, interactions and co-operation in nature and the climate change system

The water/land/air environments are the bases of life on the planet Earth. Not many researchers and public 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.

Human kind system or our global society in general has forgotten that we are just one of social creatures within the life realms of the Earth's biosphere. The living conditions are same for all of us.

From the natural viewpoint the climate change system - alias the climate, the climate change - is a set / system / 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 Earth Planetary System. Observing the climate, and taking it into consideration when humans have had to make decisions - these have been two very separated issues, especially in the recent centuries, in which the industrial life has become the dominant pattern and has caused a narrow professional specialization to reign and prevail.

There are two main sources of the climate change: the natural ones and the ones caused by humans. We humans should understand both of them in order to accept the natural ones and to possibly prevent their important impact on us, by way of floods, droughts, pollution of the atmosphere and of our water resources etc. But we should also attempt to achieve a better understand of, and ability to cope with, the serious impacts of our own action, and we should try to prevent them.

Systems (as complex entities rather than mental pictures of them) can be formally grouped into sets 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 System, 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, plants, animals, living creatures, and/or artificial, man-made systems such as townships, cars, aircrafts, rockets etc.

Of course, the existence of the above artificial and natural systems gives rise to a need for differentiating between natural and social sciences, neither of which includes all human activities as an integral part of nature. We should, therefore, think, not of artificial and natural systems, but all of them as natural systems, since they are the 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 I will use the terms artificial and natural systems.

Systems thinking - a way toward the requisitely holistic human understanding of and impacting over the nature

System theory, thinking, analysis, and synthesis are the best technique available today to enable humans to understand complex problems, which is what both macro and micro systems are. There is no simple system, and there is no system of which we may say that humans know everything about it. This can be expressed more adequately when using system thinking, which could make the difference between the scientific thinking of today and that 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. The proof for this is our relationship with the 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 and governances, profit-based democracies, local, national, international and United Nations' bureaucracies, totalitarian rulers, lack of respect between individuals and social groups on the planet, 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 had better answer before its breakdown occurs. I think optimistically that tomorrow will enable our civilization to understand nature, space, the environment, climate change system, Universe/Cosmos, and other systems. As a result this will open large portals to a sustainable development and sustainable future for all of humans living on the planet Earth.

The current understanding of climate change system is constrained by anthropocentric and other views. This is not the case when we use systems theory, thinking, analysis and synthesis, which could make us understand better the interdependences, interactions, co-operations and mono-, multi-, inter-, and supra-disciplinary issues, all of them an integral part of the inferior and superior systems, within the system of the planet Earth, and, beyond it, the Solar System, the Milky Way Galaxy System, and the Universe/Cosmos System.

Nature does not repeat itself, but it always goes in only one direction - multidimensional forward, by way of dynamic evolvement and evolution.

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, destined to rule nature, space and the environment of the biosphere. When it comes to the point of joint action based on “mutual interest” and survival of our civilization, many excuses are readily found, such as national interest, national security, national citizens’ wellbeing, etc. But all of them are empty phrases defending/protecting individual and collective rulers, and national elites. I believe in the role of leadership, but I believe also in a moderate life style, which allows long life, peace, and stability, because the Nature requires it.

How does the today’s understanding of the climate change system result from the anthropogenic influences? This can best be explained by reference to the role 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 are hardly possible, as long as one-sided, blinkered business people, and their politicians and bureaucracies, allocate resources. These people have learned how to rule, but not how to make holistic rather than narrow-minded progress in the sciences and technologies of planet Earth systems. How else can one explain the phenomenal development of armaments, chemical synthetic products, up to 1000 million and more combustion engines, such as motors for vehicles, aircrafts, ships, boats and agricultural machines? How else can one explain profit-maximizing manufacturing, distribution and marketing systems and promotion of “globalization” as a tool for making money, while scientists are not paid to do their basic research and must neglect the research needed for a better understanding of the issues of the biosphere system. Yet, our civilization is threatened by the responses of the climate change system and the whole biosphere to human actions.

Society is failing to advert to the pending “tragedy of commons”.

The climate change system is a macro system of nature, made up of many interdependences, interactions, co-operations and superior/inferior natural systems. It responds 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 improperly directed research. This has nothing to do with the ordinary humans, but with the one-sidedness of the present social order, with profit-based democracies, especially in nations of the G 7/25 countries, that “lead” our civilization, and with international bureaucracies. They lack holism and facilitate the impact of one-sided human actions.

Let us discuss 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. These caused the climate change system to react, i.e. to change, in a way that may result with a total destruction of our civilization. That being the case, we have to learn how to manage ourselves.

It is true that humans did not previously know of the side-effects of CFC’s. But now we do: there is no justification for continuing with previous practice, such as the technique of genetically modified organisms, war technologies, uncontrolled development and use of new synthetic chemical products, combustion engines, nano technologies, and explosive devices which are at present the most dangerous activities of our civilization, not to mention large particle accelerators, quantum technology, information techniques, and energy transmissions influencing magnetic fields and basics of the Earth’s equilibrium.

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

Climate/climate change and climate change system is a system

of the biosphere, which is responsible for the maintenance of living conditions. As a natural system it is inferior to the Biosphere system, the planet Earth system, Sun and Solar System, the Milky Way System, and the Universe system. The climate change system has many inferior systems like: atmosphere, seas/oceans, terrestrial, and other areas related to biosphere. All the systems mentioned have inferior systems, and together they comprise a requisite holistic biosphere system. All mentioned should be understood as moving, interdependent, interacting, co-operating dialectical and dynamic systems, which always evolve. The direction of movement is exclusively multidimensional dynamic evolvement ahead. To an uninterested pedestrian the nature may look like chaos, but as the late Prof. Dr. Helmut Metzner wrote in “Chaos to Bios”, 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. Only holistic knowledge and ethics can enable us to decide between right and wrong.

Climate change as a complex system requires interdisciplinary approach for humans to understand it requisitely holistically as it is. 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, the moisture/water cycle system, the composition of the troposphere, atmosphere and ocean’s currents, etc.

It is definitely that 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, interdisciplinary, 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 system theory, thinking, analysis and synthesis, and complex problem solving to work successfully on the explorations of nature.

Interdisciplinary approach in context of my/our research, from the natural sciences point of view, is a precondition for the individual to be able to understand the complex problems of complex systems. Interdisciplinary work/research reaches beyond the classical scientific disciplines, at least from the viewpoint of understanding the needs of research/work/action aimed at the functioning of a system in regular conditions and otherwise, and of interdependence, interaction, co-operation as interrelations within 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 of the planet Earth, as it does at any of countless planets within the Universe.

The life should be understood here as it manifests itself 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 qualities of its superior and inferior systems. An integral part of the evolvement of the biosphere is information, which is in a state of interdependence, interaction and co-operation with information, energy, and matter in defining the essence of a specific living creature and feature. Basic information regarding life itself is in their gene structures⁵, which exhibit four amino acids in different combinations according to the systems that is specific to every species representative for which it has been composed simultaneously (by evolution). The first genetic code or life information evolved simultaneously by evolvement of the first life structure, and the later evolvements have

⁵The nature language is genetic code and allows Nature to have living creatures.

been a reflection of the first one evolution some 4.8 billion year ago. All this was and is evolving within environment/biosphere, and by rules of interdependences, interaction and co-operation.

Living conditions are not a given set, but rather a system or entity of the biosphere environmental 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 all support the correctness of the above hypothesis.

The origin of the climate and the climate change system lies in the dynamics of the Earth system – 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, interdependences, interactions, co-operation and consequences of the system dynamics. Here I refer in passing to the role of humankind present civilization in the climate change system, which may be said to trigger the system dynamics by its activities.

In conclusion I wish to global community of humankind peace, respect, reson, morality, wisdom, sustainable development and sustainable future.

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