

Learning from the Futures

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LEARNING FROM THE FUTURES – 2015 AND BEYOND

Pavel Nováček

The conference “Learning from the Futures” was organized by Palacky University in Olomouc (Department of Development Studies) in cooperation with the Millennium Project, European Support Center of the Club of Rome and Czech, Slovak, U.S. and Hungarian Associations of the Club of Rome. The meeting could become inspiration for another meeting in 2012. Not because of the “end of our days” in December 2012 according to the Mayan calendar, but because in this year we shall celebrate several important milestones in our journey for a more sustainable future:

- 40 years from the first report to the Club of Rome “Limits to Growth”;
- 40 years from the first U.N. environmental conference in Stockholm and establishing of the United Nations Environmental Programme (UNEP);
- 25 years since formulation of “sustainable development” published in Brundtland Report “Our Common Future”;
- 25 years from Montreal Protocol concerning ozone layer depletion;
- 20 years since UN Conference on Environment and Development in Rio de Janeiro
- 20 years from beginning of the Millennium Project and 15 years since publishing first “State of the Future” Report;
- 20 years from Albert Gore’s proposal for the Global Marshall Plan (in his book “Earth in Balance”);
- 15 years from Kyoto protocol concerning greenhouse gas emissions;
- and 10 years from the World Summit on Sustainable Development in Johannesburg.

But perhaps the most important – in 2012 just 3 years will remain until deadline to achieve the Millennium Development Goals in 2015. And I am afraid MDG’s will not be a success story in 2015 at all. Therefore we, people interested and involved in environmentally and future oriented studies, should start to formulate scenarios and proposals about what to do and

where to go next. What can we do by 2015 and especially what we can and should do after 2015?

We are not heads of powerful states or big and influential multinational corporations. But still it is our responsibility to do our best for a better future. Allow me to quote Czech theologian Karel Skalický: “Present day futurologists are endangered by the pitfalls of laxity, alibism and self-satisfaction, which manifest themselves by describing the future rather than thinking about it. Such an attitude is more futurography than futurology. Futurologists, the people dealing with the future, behave in a short-sighted way until they understand futurology more as a futurosophy. However, to deal with it, it is necessary to have courage and a strong motivation, which is not possible without a firm hope. It is necessary to add to the present futurography a futurosophy with a prophetic aspect. The result has then to be something more than a series of scenarios, conclusively futurosophy has to help us discover the sense and the aim of our lives. It has to give us a prospect of the final end of the human story on the Earth.”

30 years ago American futurologist Roy Amary defined future oriented studies in following way: “Future is not possible to predict exactly because future is not predetermined (is not inevitable). And because future is not predetermined we can influence it by our individual choices”.

The following pages discuss different aspects of our common future – from global challenges, issues of sustainability, development of Western Hemisphere (with special focus to Haiti), to “thinking the unthinkable” in Herman Kahn’s words. What we, people involved in NGOs, think tanks and academic institutions can do for a better future by 2015 and beyond? As Thomas Schauer says: “How do scenarios for our future look like? What are future risks and opportunities and how can we outline possible measures which go beyond present cosmetics?”

Learning from the Futures

SCENARIO DEVELOPMENT, EPISTEMOLOGY AND METHODS

Peter Bishop

Introduction

The future is an endless source of fascination for professionals and the general public alike. Ever since the dawn of human consciousness, we have wondered “What happens next?” We have the ability, unique among all species, to imagine states and conditions that are not immediately present. Nevertheless we are not much better at answering the “What’s next?” question today even though strategic foresight has been practiced professionally for more than half a century. What’s the problem? Is the future inherently unknowable? Or are there ways to know the future that are yet to be discovered? While not able to answer these questions definitively, this paper approaches them with a review of how we think about the future, some of the methods we use, and some recommendations for doing as well as we can today.

Epistemology

The future is a vast, complex, confusing set of possibilities to most people, and even to some professionals who make their living predicting it. Is thinking about the future much different from thinking about other difficult topics, like the hidden laws of the physical world or the character of previous civilizations?

No, thinking about the future is no different. It is the same as thinking and knowing about any state or condition that is beyond our senses. The process for all is classic inferential rhetoric that bases conclusions on evidence. Scientists do it all the time; historians do, too. In fact anyone who claims to know anything beyond immediate sensation uses the inferential process almost without thinking about it.

I *know* there are two cats in my house at the moment even though I do not see or hear them. I know that because I did see them a half hour ago, and nothing that I know has changed since then. No one has come or gone from the house. No one has opened a door or a window for them to get out. So there has been no way for them to leave the house.

“But hold on!” you say. You could be wrong. You are not monitoring the doors and windows. Someone could have let the cats out without your knowing it. And my response? Yes, I could be wrong. In fact, every inference we make could be wrong, but we make them anyway. The only two choices are to maintain that I have no knowledge at all of where the cats are or to claim that I know that they are in the house even though that knowledge is uncertain. The Logical Positivists of the early 19th century made the first choice. They dismissed all knowledge that was not a direct sensory observation or derived from sensation by strict mathematical or logical reasoning. In other words, they claimed that uncertain knowledge was no knowledge at all.

Everyone else, from the time of Descartes to the present, makes the second choice. All knowledge is uncertain to varying degrees. Even direct sensation, the gold standard of the Logical Positivists, can be fooled. So we live in a world in which we know many things, some of which are wrong.

The process for deciding whether to accept a claim as true has varied throughout history. In tribal days, the elders were the source of knowledge. In the agricultural empires, it was the rulers or priests. The People of the Book (Jews, Christians and Muslims) looked to the Scripture for ultimate knowledge. The philosophers in ancient Greece and medieval Europe used reason as the basis for knowing. And finally, Renaissance intellectuals, beginning with Galileo’s famous observations of physical motion and heavenly bodies, hit upon observation and empirical evidence as the basis for true knowledge. And thus science, as the preferred way of knowing, was born.

Using observations as the basis for knowledge was actually quite radical at the time. Before then, most intellectuals and proto-scientists agreed with Aristotle that only the heavenly bodies were governed by strict laws. The sub-lunar world was a mess, mostly random and chaotic and ultimately unknowable. But there is a catch to using observations as the source of knowledge. We could still be wrong because evidence goes only part of

the way to supporting inferences. The residual uncertainty has to do with assumptions, what rhetoricians call *warrants*.

A warrant grants permission or trust, as in search warrant or arrest warrant. Both types of warrants give police permission to do something that they ordinarily are not allowed to do —that is, search someone's house or arrest them for no reason. In the same way, a warrant allows a person to base an inference on a piece of evidence. For instance, a pollster surveys a sample of adults in the United States and asks them to rate the President's performance. She finds that 47 % approve of his performance. Can she conclude, as we often do, that 47 % of all adults in the United States would approve of the President's performance if they had been asked? Yes she can, provided she makes some assumptions — namely that the sample is representative of the population, that the question was unbiased, that it was not conducted at a time of day that would tend select people favorable or unfavorable to the President, that the interviewer did not tip off the respondent and a whole host of other less important assumptions. If one grants all those warrants, then one can conclude (know) that 47 % of all adults in the United States approve of the President's performance.

Could that conclusion be wrong? Absolutely; no empirical knowledge is 100% certain. Is the problem with the evidence? It might be. The researchers might have counted the approvals in the sample incorrectly, but that's not usually the problem. The problem is usually with the assumptions. Even samples drawn using the best random sampling procedures are sometimes not representative. You can get 10 heads in a row if you flip long enough. Do we suspect that the sample was not representative? You can if you wish, but people will accept the assumption that it was representative if the sampling procedure is done correctly. They might be wrong, but they have no basis for critiquing the assumption unless they find an error in the procedure. If not, then the conclusion is taken as knowledge.

That is science. What about history, a field much closer to futures studies? Same process. Historians have evidence from past times – writings, photographs, drawings, buildings, artifacts, bones, etc. – and they claim to know about past times based on that evidence. In the process, they also make assumptions – that the report in a newspaper from 1832 is accurate, that the photograph from 1933 was not retouched, that the dating of the soil around a skeleton was done properly. Most of those assumptions are pretty good, and so we believe that we have pretty good knowledge of the past.

And finally, what about the future? Same process – inferences (forecasts), evidence and assumptions. So do we have good knowledge of the future? Of course not. So where's the problem? Futurists use evidence just like historians do – trends, plans, hopes, fears, expectations, etc. Each might point to a particular future, but we are still not sure. Why not? Because the assumptions (the warrants) required to make claims about the future are not as good as the assumptions used to make claims about the past. We can generally assume, barring other information, that people reporting events in the past were trying to be as accurate as they can be. But can we assume with same degree of confidence that trends that have continued to the present will continue through the time horizon? Can we assume that people or organizations that announce plans will actually carry them out? Can we assume that what we expect to happen in the future will actually happen? It might have a greater chance than what we do not expect, but we are surprised too often to be confident that our expectations will almost always come true. So the difference between claims about the past (or about a scientific finding) and claims about the future is not with the evidence. We all use evidence. It is with the assumptions required to use that evidence to support the inference. Assumptions about the future are inherently uncertain, much more so than assumptions about other phenomena. Consequently, claims about the future (predictions) are significantly less certain than most other claims we deal with.

So what is one to do? If our knowledge of the future is so uncertain, might we just ignore it and hope for the best? Many people do, but that is a highly risky strategy. Do you turn away from the windshield on the car when the road is dark and the fog is setting in? No, we look more closely, we strain to see any sign of change ahead — a turn in the road or an obstacle in the road. Just so with uncertain knowledge of the future. We must find a way to *know* the future that may not be as accurate as we know the past, but is better than paying no attention at all.

And that way, of course, is the scenario. Rather than trying to discern *the* future, which is what we do in science and history, we describe a set of futures that could plausibly occur given the evidence we have and given assumptions about how we believe the world works. But since those assumptions are easier to challenge than they are in science or history, each of those challenges has the potential to create an alternative future.

So describing the future as a set of scenarios is inherently reasonable. We do it all the time in our personal lives, but it is not entirely satisfying in

professional work because we have been socialized, in school and at work, to find *the* answer – the right answer to the question or the right solution to the problem. But what if there is no right answer or there are many right answers? Unfortunately, we search in vain for the right answer anyway. The process works in science and history. Why not in futures studies? Because we do not have assumptions about the future (warrants) that are certain enough to distinguish one answer from all the rest. Might some future civilization solve that problem and come up with laws of human behavior that are as solid as the laws of physical science? Perhaps. But we do not have those laws today so we have to do the best we can. Given our present understanding, the best we can do is describe a set of plausible futures. Does it make planning and acting harder when we do not know how the world will be when our plans and actions are supposed to have their intended effect? Of course, but that's the game today – making decisions and taking actions against an uncertain future. We are not completely ignorant. We do know a set of plausible futures (scenarios), which might not even include the future that actually occurs, but at least it is more useful than a single future that has a high probability of not occurring at all.

Scenario methods

So if scenarios are the most useful way of describing the future, how should we go about doing that? Would it were easy to answer that question. Not only is there no single answer for the future, there is no single best technique for developing multiple answers.

One of the foremost forecasters in the United States, J. Scott Armstrong, published his inventory of forecasting techniques in *Principles of Forecasting* (Armstrong 1994). He presented the inventory as a decision tree (Figure 1).

These techniques are *forecasting* techniques, not specifically scenario techniques, but as we shall see, that distinction is not as important as it appears. Any forecasting technique can be used to develop scenarios by adjusting the assumptions.

My colleagues, Andy Hines and Terry Collins, and I published our own review of scenario methods (Bishop 2007). We came up with eight types of scenario development techniques in the literature (Table 1).

Figure 1

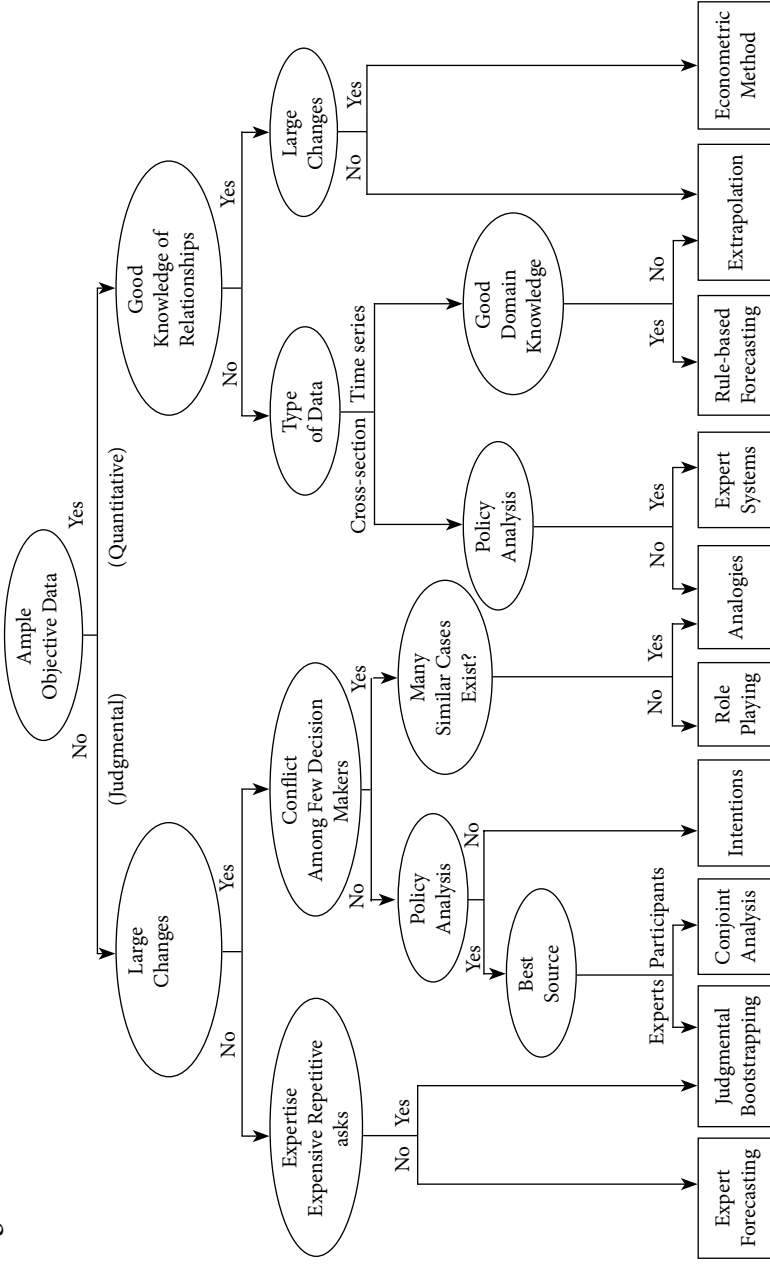


Table 1

Scenario Approaches	Illustrative techniques
Judgment	Genius forecasting, Delphi surveys, Role playing, Visualization
Baseline	Trend extrapolation, Manoa, Systems scenarios, Trend impact analysis
Fixed scenario	SRI, Incasting
Event sequences	Probability trees, Sociovision, Divergence mapping
Backcasting	Horizon mission methodology, Impact of Future Technologies, Future mapping
Dimensions of uncertainty	Morphological analysis, Field anomaly relaxation, Shell/GBN, MORPHOL
Cross-impact analysis	SMIC, PROF-EXPERT, IFS
System modeling	Sensitivity analysis, Dynamic scenarios

Most of these techniques are rarely, if ever used, but the array is quite impressive. And as with Armstrong's techniques, many are standard forecasting techniques, such as trend extrapolation or systems models, which are used to develop scenarios by challenging their assumptions.

The Millennium Project has compiled a long list of forecasting techniques on its CD entitled *Futures Research Methodology* (Glenn and Gordon 2010)

Finally, John Vanston published a taxonomy of forecasters (Figure 2, Vanston 2003).

Vanston's overall dimension of Quantitative to Qualitative techniques maps nicely onto Armstrong's top level dimension of Judgmental and Quantitative techniques. But even more importantly, each of Vanston's forecasters uses a different type of evidence to arrive at and support their forecasts, and each type of evidence requires its own set of assumptions. (Table 2)

Figure 2

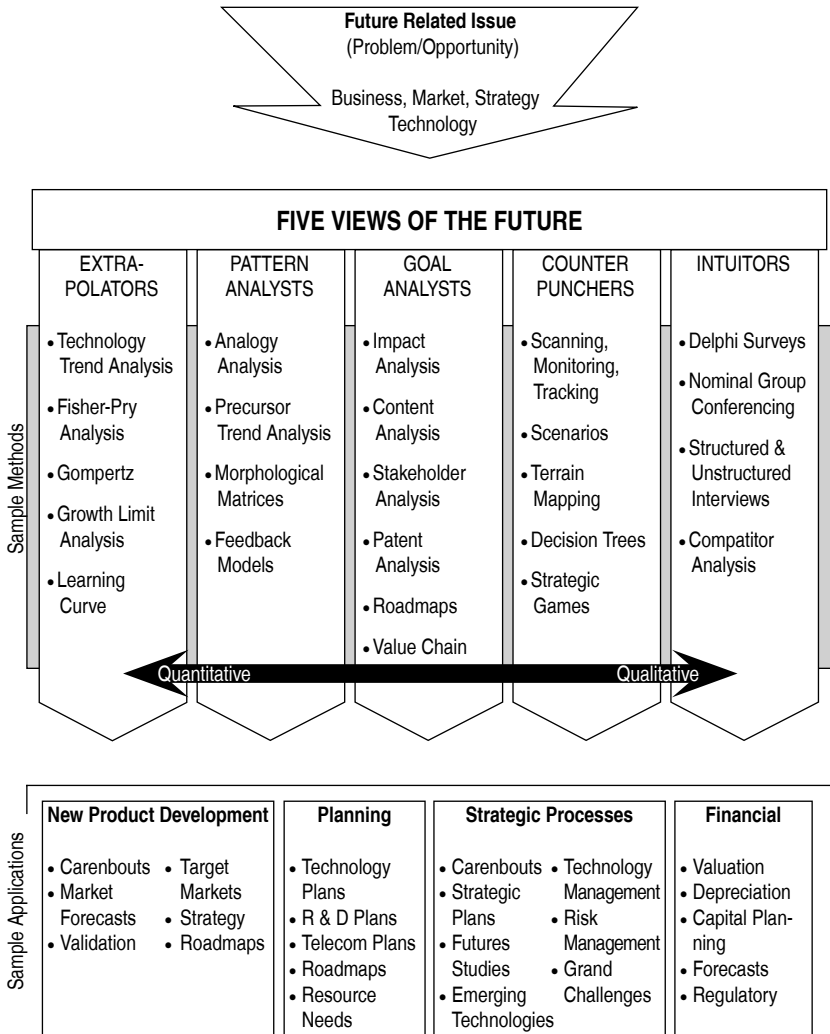


Table 2

Five Views	Evidence used	Assumptions required
Extrapolators	History, Past	The future will be like the past.
Pattern analysts	Cause-effect, Systems models	Future states are a function of past states.
Goal analysts	Stakeholders, Agents	People's intentions and actions shape the future.
Counter-punchers	Uncertainties, Questions	The drivers of the future are currently unknown.
Intuitors	Judgment, Intuition	We intuitively know what will happen.

Of course, each of the assumptions is open to challenge. For instance, Extrapolators believe that the future will be like the past to a great extent. But we also know that truly novel events and conditions do occur, but we do not know when or how. Hence the scenarios – the default assumption that the future will be like the past leads to one future and alternative assumptions lead to alternative futures.

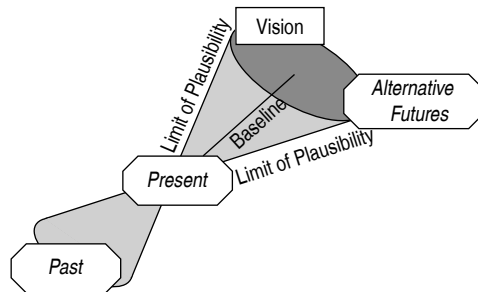
Framework Forecasting

Framework Forecasting is the approach to knowing about the future taught in the Futures Studies program at the University of Houston (Bishop 2005). It's called a framework because it is a general frame for outlining the future, like framing in a house, that does not include all the details.

Framework Forecasting begins with a simple distinction between types of futures based on the cone of plausibility (Figure 3). The cone includes the probable, possible and preferable futures (Amara 1981). Bezold and Hancock suggested adding the plausible future to this list, arguing that one cannot describe all possible futures (Bezold and Hancock 1993).

Amara's probable future is renamed as the Baseline or Expected Future because even the most probable future is not probable in an absolute sense. The probability of it occurring is actually quite small, much less than 50 %. Nevertheless, as the most likely, it would occur if all the default assumptions about the future turn out to be true. In that sense, it is also called the Official or Surprise-free Future. It is a scenario nevertheless, and Framework Forecasting begins with describing the Expected Future.

Figure 3



Source: Charles Taylor, Army War College

The Baseline is itself a scenario and therefore highly uncertain. The rest of the scenarios include what could plausibly happen instead. One cannot possibly describe the infinite number of scenarios in the cross-section of the cone at the time horizon. So we settle on a handful of scenarios that are representative of the major regions. The standard Shell/GBN scenario methods uses two assumptions as dimensions of uncertainty dividing the cross section into four quadrants. The actual future contains many more uncertain assumptions, but it is hard to graphically represent their interaction.

Finally, Amara’s preferable future is represented by the visionary future. In this conception, plans and actions are intended to bend the trajectory of the future toward that region. Strategic planning and change management, however, are technically not part of forecasting so Framework Forecasting does not specifically include those practices in the Framework.

Different types of evidence (elements) point to the Baseline and the Alternative Futures respectively (Table 3).

Table 3

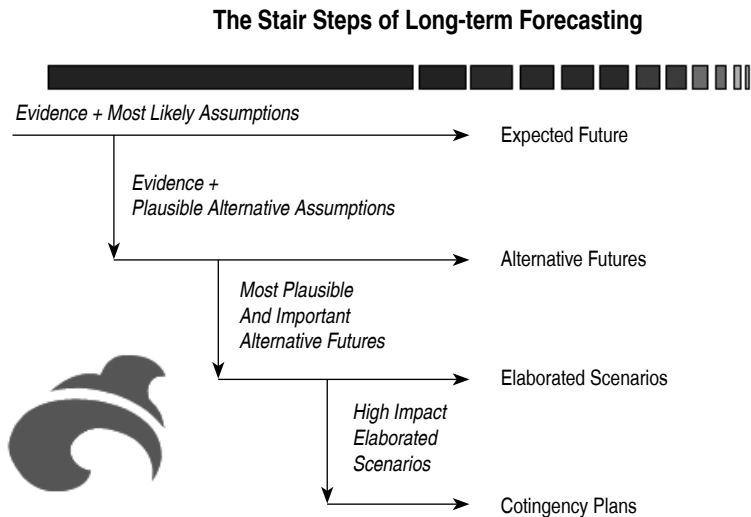
Baseline elements	Alternative futures elements
Constants	Constants/Trend reversals
Trends	Unfulfilled plans
Cycles	Potential events
Plans	Decisions made, Issues resolved
Projections	New ideas, proposals

Each of the Baseline elements is evidence for the Expected Future, and each has assumptions (warrants) required to use them to support that future as the most likely. The Alternative Futures elements challenge the default assumptions of the Baseline and lead to other plausible futures. The more substantial the challenge to the Baseline assumptions, the more plausible the Alternative future. In fact, the most plausible Alternative futures are based on an alternative assumption that as likely to be true as not making the two or more resulting scenarios equally likely. Those are the real cases where the scenario approach to the future is most important because cannot select the most likely and ignore the rest.

Recommendations

So how are we to proceed? Figure 4 depicts a generic, high level process for conducting and using scenario forecasting.

Figure 4



1. **Develop the Expected Future**
 - a. Gather evidence for changes in the future
 - b. Describe the Expected Future based on that evidence
 - c. Identify the assumptions required to use that evidence
2. **Develop Alternative Futures**
 - a. Challenge the assumptions required by the Expected Future
 - b. Gather evidence or reasons that the alternative assumptions may come true
 - c. Describe Alternative Futures based on the most plausible set of alternative assumptions
3. **Elaborate the Alternative Futures into fully Elaborated Scenarios** in order to understand the Alternative Future better and to communicate its significance to stakeholders and audiences.
4. **Develop Contingency Plans for the Elaborated Scenarios** that would have the highest impact on the future of the Enterprise.

This generic process does not take the place of the more specific techniques described earlier. In fact, any forecasting technique can be used to develop the Expected and Alternative Futures. The Framework process simply identifies the type of evidence that would lead to one or the other. Any more specific forecasting technique can be used to develop the Expected Future if one accepts the most likely assumptions. It can also be used to develop Alternative Futures if plausible alternative assumptions are identified.

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MESSAGES FROM THE FUTURES: HUNGARIAN EXPERIENCE

Erzsébet Nováky, Helga Veigl

“Historia magistra vitae est.” Yes, history as a teacher shows how to live. This well-known proverb is true. But, what is the compass to our actions? Only the history? Not! It is important to make corrections and regulations after the events, but perhaps rather important is to think and act ahead. Futures can be a compass for our activity. If somebody’s thinking way and actions are future oriented, then possible futures regulate his/her actions. It means that we have to learn from the history, but it is possible and it is an obligation to learn from the futures, as well. What can be learnt from the futures and how? This paper gives a possible answer for these questions using Hungarian experience in the field of futures studies.

Introductory thoughts

In 2006 Hungarian futurists celebrated the 30th anniversary of the establishment of the Committee on Futures Research at the Hungarian Academy of Sciences (HAS). Its first president was Géza Kovács university professor, who is also the father of Hungarian institutionalised futures studies. As a celebration we organised the 6th Jubilee Conference of Hungarian Futures Studies, and its first patron was Szilveszter E. Vizi, the then president of the HAS. He requested the Committee on Futures Research to conduct a research on the topic of Hungary 2025, that indicate that this scientific field’s significance is more and more appreciated by the representatives of Hungarian scientists.

We chose a “human” time-scale for the research “Hungary 2025”. We take a look into the present of the next generation: the “present” of the next nearly two decades and of the year 2025 were investigated. Our goal was not making only one accurate forecast (called prediction), but outlining the future possibilities the Hungarian society is facing, exploring hopes and fears appearing within Hungarian society, and the development of future

alternatives for Hungary in 2025. The future present of the next generation is created here in present and in the near future, therefore we have a great responsibility.

From past researches we have had an idea about Hungarians' attitude to the future: the indicator of future orientation refers to the ways of thinking about the future. It has improved since 1995. In 2006 those who think that they can influence their destiny have become the majority. The number of those who fear the future have visibly diminished: in 1995 they were in majority, in 2006 they are only the third of the respondents. In this research we were studying the attitude to the future in more details.

The methodology of the research

The research brought novelty as Hungarian future was outlined knowing experts' studies on future and also the opinion of those non-experts who shall take action in and responsibility of the future decision making processes. The results of these two different approaches were integrated in one system focusing on possible changes. Mapping the changes is a very complex issue, and to cope with it we called for help three main methodological principles: complexity, participativity and alternativity.

According to the principle of complexity we examined 18 topics of reality, and searched for the possibility of change in a wide range. Particular emphasis is placed on the examination of those areas that are changing rapidly and within a relatively short period induce new processes. On the one hand we searched for those changes on which we (could) have a significant impact, and which can be greatly influenced by humans (if we intend to). These include demographic trends, health-care system, nutrition and body culture, mental disorders, education, sustainable households, crime and prevention, societal governance and civil service, or regional development. At these areas the future shaping power of Hungarian people is the most obviously displayed. We also explored those changes on which we have a little influence, but where expected changes are significant, and have a great societal, economic and/or environmental impact on the future of our country – for example, the phenomenon of globalisation, to which mainly we should adapt.

The experts involved in the research were futurists and representatives of other sciences. Their studies of selected areas consist of foreseeing expected changes until 2025 and the positive and negative growth tendencies. The

study focuses on the social and the technical/ technological renewal options and exploring its boundaries, and also on the presentation of hopes and of potential dangers/pitfalls (fear).

Applying the principle of participativity the thinking about the future of the present youth was examined: we selected those whose generation will be determinant and be the decision makers in 2025. We surveyed 1000 high-school students and 500 students of college and university. It revealed their future expectations, hopes and fears in different areas of life, what do they expect as future employees, citizens and civil members of society, how do they imagine their personal life, what their future families look like, how many children do they plan, and what do they do to make their hopes realised and moderate their fears. These are the hopes and fears of non-experts that altogether are the basis of future expectations. The future scenarios are built upon future expectations. Non-experts are not a homogenous group, and their different groups have different images about the future, they have different expectations and they are ready to realise different actions.

According to the principle of alternativity we develop not one future or future image, but future alternatives that differ from each other, and also possible. We created future alternatives in two steps. In the first step alternative scenarios were built based on future attitudes and future expectations explored with methods of participatory futures studies. As a second step experts' hopes and fears were integrated to alternative scenarios. We examined which alternative scenario do support, strengthen or weaken the realisation of each hope or fear of experts. Thus experts' and non-experts' hopes and fears were related to each other.

These complex future alternatives are a result of a series of feedback cycles that offer an adequate basis to strategic thinking and outline the set of decisions and actions of individuals and society too, because future alternatives are formed both by experts' and non experts' hopes and fears and future possibilities and future expectations. In this way this was a real future shaping process.

Experts' hopes and fears

Experts explored hopes and fears in 18 areas, the results are summarised in Table 1.

Table 1: Fears and hopes of experts

The analysed area	Fears	Hopes
Demographic trends, family	Declining births, decreasing population, and average family-size.	Younger generations feel the need to have bigger families and more children.
State of health, physical harmony, quality of life	Increasing burden on health care systems and as a result decreasing quality of health care. New illnesses appear partly due to unhealthy lifestyles and to rising mental problems. The older generations' state of health continues to deteriorate.	The population's state of health ameliorates due to the increasing health-awareness, health-education and the focus on prevention. The amelioration of the health care working environment is in line with special attention to health care employees. The population's state of health reaches EU norms.
Mental health, deviance, mental disorders	The number of outcasts who can't or don't want to integrate is increasing, including the number of those suffering of depression. Many face mental problems and turn towards drugs. There is an increasing number of behavioural problems among children. There is growing fear that narcotics will become a lifestyle.	Communities recognize the importance of preventing deviant attitudes, more and more NGOs aim to improve the situation of the ill and to raising awareness among youngsters. Future oriented psychiatric research and care aims to ameliorate quality of life among the mentally ill is emphasized and supported.

<p>Body culture, physical culture, sports, tourism</p>	<p>The population becomes less interested in sports and healthy living, the rate of overweight and inactive children increases by 25 %, physical wellbeing is placed at the periphery of thinking. The media promotes norms that lack physical activity and thus indirectly contributes to the spread of locomotory disorders.</p>	<p>Health-awareness is increasing among people, sports are becoming more popular. Fields where multi-generation families and small communities can spend quality time shall be created, thus building communities. Physical education becomes a key issue in education. Creative tourism becomes popular.</p>
<p>Nutrition, eating habits</p>	<p>Impoverishment leads to consumption of unhealthy food, especially among disadvantaged groups, large families.</p>	<p>In Hungary, eating habits are improving, bearing more resemblance to the Mediterranean diet. Healthy lifestyle becomes a national movement promoted by the media.</p>
<p>Minorities, drop-outs</p>	<p>Decline in the situation of minorities, particularly gipsy population, fears of immigration strengthens. Functional illiteracy significantly increases as well as the number of unskilled young workers. Increased risk of forming conflict-driven groups among minorities.</p>	<p>Acceptance and cooperation characterizes attitudes towards immigrants especially among youngsters. Minorities living in Hungary become part of our community while keeping their cultural identities and roots without conflicts.</p>
<p>The homeless</p>	<p>Within the framework of existing institutions, it is impossible to (re)integrate the homeless into society. This closed group of increasing size threatens social stability.</p>	<p>Homeless shelters are reorganized rationally. Communities turn to support the homeless since they reorganize that most homeless persons can be reintegrated.</p>

<p>Crime and prevention</p>	<p>Political-economic crime, especially corruption gains momentum. Political terrorism and international crime, international terrorism and national crime become interwoven. IT crime is on the increase, investment fraud is spreading and the property-mafia gains grounds.</p>	<p>Owing to fundamental changes in the legal regulation and to strengthening cooperation with international organizations, corruption declines, environmental consciousness increases, investment fraud drops, IT crime is controlled. NGO and civil control development plays a critical role in curbing crime.</p>
<p>Bio- and gene technology</p>	<p>The hazards of bio- and gene technology applications become visible, the first negative consequences appear. The non-transparent research increases fear among population which is further enhanced by the media.</p>	<p>Efficiency is further increased through biotechnological applications contributing to economic profitability. Due to the widespread use of gene technology productivity increases, ripening periods shorten, production becomes simpler, crop losses are eliminated and farming becomes more sustainable.</p>
<p>Nano-technology</p>	<p>Molecular reorganization presents new hazards. Reduction of sizes affects the deteriorative potentials and thus possibly endangers human health. There is an increasing threat of manipulation.</p>	<p>The interdisciplinary nano science becomes a driving force of the industrial revolution. Developments and applications bring enormous success in medical science.</p>
<p>Digital divide</p>	<p>The divide separating different social classes is deepening, especially along lines of education and location. The despair of those lagging behind threatens with social conflict.</p>	<p>The social divide becomes identified and known to many. The experiences of the past and the recognition of new challenges supports the creation of social harmony.</p>

<p>Training and education</p>	<p>Changes bring new challenges to the educational system creating instability in the sector. Mobile and distance-learning appear only in isolated regions, traditional educational methods dominate the field. Unsuccessful adaptation reduces the quality of education and the respect for educators. Illiteracy increases in society.</p>	<p>Developing efficient educational methods is in the focus of attention. Individually shaped learning techniques appear due to IT development and growing access to mobile networks. New learning methods – e-learning, community learning, distance learning – are becoming more important complementing institutional education.</p>
<p>E-governance</p>	<p>The spread of e-government further increases the fear caused by the digital divide. Majority of the Hungarian population (especially the unskilled and the minorities) cannot profit from the new opportunities and thus are left out from certain social processes.</p>	<p>The now grown-up “digital generation” form the world of digital natives who can navigate in the e-world with ease. Society responds positively to digital administration and uses it actively which results in more efficient handling of official tasks.</p>
<p>Globalization</p>	<p>Globalization bears the possibility of uniformisation yet avoided. Fears appear on the medium level: the new world of globalisation collides with society on this level. The self-destructive character of globalisation, apparent in its actual state, can take shape. It reverses the social activity of the rich and poor. The biggest problem in the near future concerning globalisation is the problem of natural resources. There is also a lack of actors taking efficiently part in solving global problems.</p>	<p>Actors capable of regulating the global world appear and strengthen. Nations together find the institutional framework of international police, international courts, their democratic control and accept their global regulations and decisions. Regulations that could never be accepted at local levels due to the interest-conflict (such as the decisions concerning the cohabitation of minorities within a nation-state) are introduced at global level.</p>

Environment	Non-renewable energy resources are on the decline, the state of the environment deteriorates at a shocking pace. Natural disasters become more and more violent and frequent. There are no universal actors for universal solutions.	The environment-awareness of society increases, sustainability is in the focus of education already at an early age. Consumption habits are harmonized with environmental capacities. Technical developments contribute greatly to the creation of environmental-friendly applications.
Regional development	The developments are unbalanced, regional aspects are neglected in the process of planning macro-strategies and thus regional inequalities increase and centralization intensifies. Villages are abandoned as a consequence. Due to the appearance of new types of restructuring problems new crisis areas emerge. Cultural traditions and values are being lost.	The territorial structure of the country is expected to become functionally differentiated and the important nodes are going to be modified. The situation of the border regions will improve due to “open” European borders. The role of Budapest changes acquiring new international dimensions. Local communities and civil organizations gain control in the development of smaller regions and villages.
Sustainable households	Consumers can become addicted to the shopping and entertainment culture, thus consumer society expands without control. The opponents of consumerism turn violent and mall-vandalism appears.	In the future sustainable households and new consumer habits develop. The concept of sustainability becomes a guideline in designing consumer and living spaces. The new eco- and bio-fashion such as eco-design becomes popular and widespread. Younger generations will wish to “return to nature”.

Economy	Without essential changes in the economy, Hungary will slip back to the level of the most underdeveloped countries in the EU. Instead of monetary stability, financial markets will follow inflation cycles. The economy will be characterised by outdated import structure, resource- and energy-dependence, enduring deficit, high inflation and unemployment rate. We will become more and more dependent on foreign capital. In order to keep up the direct investment flow, we need to give even more allowances to foreign investors.	Regarding the important macro indexes and the structure of the national economy, we will catch up with the EU 15 average. A long-term national modernization strategy will be defined and reached through the cooperation of economic, political and social stakeholders. Positive effects of this modernization process will be visible at the micro level as well, with proper motivation small enterprises will be able to design new business tools and models, improve production indicators and innovation.
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Non-experts' opinion

In this research we examined two groups as non-experts: high school students at their last year who are about to decide on their career, and graduate and undergraduate students planning their professional life. Their answers show a generation that is aware of its possibilities, but who does not live with them because of commodity or it is used more often to their own prosperity, and not to preserve values or to reach a global progress.

79 % of high school students and 91 % of undergraduate and graduate students are certain about having a family in their life, and only 3 % and 2 % of them certainly refuse that. Female students clearly prefer setting up a family sooner than males. Undergraduate and graduate students think that families would have a central role in 2025: multigenerational families would live together in the green belt with peaceful living conditions, considering also career that ensures the welfare of the family. They are certain about the negative consequences resulting from aging society, namely that the support of elder people would be a critical societal problem. They are already afraid of the health-damages caused by stress.

The ratio of those who wish to live abroad is considerably higher among high-school students. Only half of the high-school students who live in

Budapest would stay in the capital, and two-third of those who live in larger settlements would neither go to Budapest or to a small town to live, but most of those who live in small villages would move to a bigger place or uncertain of the answer. Thus we can say that small villages have the less power to keep young people. Most of the students would like to live in garden house; a few prefer some inner-city apartment, condominium or farm. Only a very few prefer blockhouses. More than a half think to go abroad to study until 2025, and half of high-school students not only presume, but also would like very much this to happen. Learning languages is a very important goal. They marked English and other popular languages, so they do not really think that popularity of languages would change. Many high-school students think and more of them would really like to learn more professions and acquiring more degrees up to 2025.

The 92 % of high school students and 96 % in higher education would like to work in 2025, and 2–2 % in both groups would not like to work, the others are uncertain. According to the answers of high school students a robotised work environment is probable, even though they do not prefer that. In contrast, they prefer more the household to be more automatic, than it is considered probable by them. We conclude from that, although worried that robots would take their jobs, they wish to reduce their obligatory tasks – such as housework –, with the less arduous effort conducted. Many want four-day working weeks, but they also know that it is less likely. This indicates that primarily the job is not the activity carried out as member of the society, an activity, which gives the possibility to grow intellectually, and what they are devoted to, but considered as a necessary bother, which is part of life. Therefore they desire to consume more with less work, which is natural in today's society, but completely unrealistic in the current arrangements and processes. We should do something to make a revaluation of this topic.

Learning at schools instead of home via Internet; belonging to online communities and to groups fitting their hobbies and profession, using contraceptive pill by men, accepting people of other ethnic in the personal environment, knowing more religions/ideas of spirituality are all issues that divisive to high-school students. If these issues are amplified in their lives, that can lead to pressure within society, because these issues have in common to have a significant impact on traditional social patterns. The speech control of articles of personal use, automation of household work, the rapid proliferation of alternative therapies, virtual administration in

bureaucracy, as well as having more foreign friends they want at the same extent as appears likely to them; demitting notes and coins is not preferred, nor likely with the same proportion.

Defining the sex of their children, the marriage to same-sex couples and adoption for same-sex couples are mainly rejected by high-school students, even though they think they are likely to occur. The marginalisation of the traditional foods by GM products seems likely to high-school students, but the majority totally reject that. The same can be said about the topic of the state that stores much more personal data than today. Most of them are sure about, but completely reject at the same time that participating in health care system and in education would have a fee. These responses indicate that they are less tolerant on issues that carry uncertain future and output, and there is little information about it. This definitely shows a little sceptical and critical generation, for whom personal freedom, traditions, respect for the traditional solutions are very important, however, they are uninformed and judge based on little information.

A certain part of high-school students would like to happen more than they think it would really happen the healing with gene therapy and nanotechnology. It is interesting that comparing these two innovative methods they prefer gene therapy. Healing with nano robots was asked referring to their personal life and not generally, so it is possible that this preference is due to the fact that it is more difficult to let a new technology into their personal sphere than into the life around us in general. A group of college and university students think that energy management, climate research, medicine and bio- and nanotechnology will have a major impact on the future, while information and communication technology, for example, is not favoured, which in turn could be a foundation for the spread and use of new technologies. As society, also students are divided about the issue of euthanasia. With the increase of the size of their home settlement the possibility of future adoption or at least indifference of euthanasia is increasing. Today there are many debates on the decriminalisation of soft drugs, and also the answers are very different: although the average is mostly negative, it gained the preference of a well-defined group. It has a clear link to smoking: those who expect to smoke in the future stand out for the decriminalisation of soft drugs.

They want less than they expect to replace the traditional commerce with online trading; Hungary to become a desirable destination for foreign immigrants similar to Western European countries; to the EU offices take

care of bureaucratic issues; or a second nuclear power plant to be built in Hungary. Half of the high school students are indifferent to the question whether the European Parliament elections are such important events as domestic parliamentary ones. The opinion of college and university students is more determined as they would prefer to avoid that and this is considered unlikely. Both groups of non-experts agree that that they do not really want to be only two parties to choose from Hungary in 2025, and accordingly many of them would like to formation of new parties until then. The majority of students at college and university think that they would not commit any violation (fraud, embezzlement and corruption), except that every second of them would download copyrighted material, and also think that would lie sometimes.

It is important to note that we received relatively less responses from high-school students to the questions about organic production and about the legalisation of euthanasia. This indicates that they do not know exactly what these terms mean, or if they know, they do not relate to them positively or negatively, because they have no opinion, as they do not fall into their focus, and therefore they did not marked them. In both cases, it is instructive, because they are important and much-debated topics of the future, to which young people should listen more, and they should have express opinion on the subject. It is therefore particularly surprising that healing with gene therapy was the question marked by the most of the students. For those the current status is quite appropriate they would not like technical development and a simplification of the bureaucracy, which shows a tendency. Those who hope changes were overestimating the probability of all changes comparing them to the average. Similar is the case with those who are afraid of the future. This suggests that the emotional content – and not its positive or negative direction – affect their vision.

We can say in general about high-school students that those who prefer change have rather a hedonistic lifestyle, while those who reject change are more likely to stay at home, and have less passion. The difference between the accepting and refusing change lies in judging the rules. The former prefer to accept the rules while the latter, if possible, rather shirk from those. The only relevant social indicator, which in this case could have affect, is the income, because who rather refused to change, have lower income status. Those who reject change are less likely to go abroad to work, and they would rather set up their existence in Hungary, contrary to those who are accepting or preferring change.

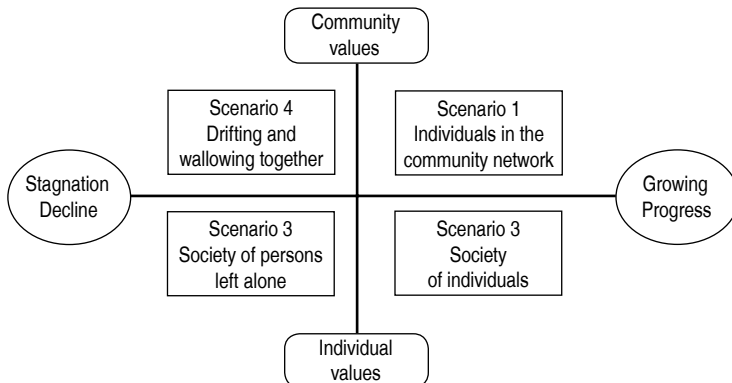
We can see that the generation that would determine the present in 2025 have many perceivable fears and hopes that could be decisive for the future.

Alternative scenarios and complex future alternatives

The alternative scenarios are based on the attitude to the future of young Hungarians. The high school, college and university students do not have a standard thinking, but they can be clustered in more or less homogenous groups. High-school students have seven groups: Rational, Open, Good-guy, Conscious, Drifters, Fearful and Purposeless; while college and university students are grouped in five: Life-planning engineers, Treasury optimistic, Sure-footed plaintiffs, Croakers and Drifters; and the main characteristics of their attitude to the future are displayed. The hopes and fears, the world view and the actions for the future (undertaken or planned) are all characteristics of each group, but differ between the groups. The different thinking of groups were organised into scenarios.

The values are the most differentiating aspect of our youth (perceiving values of the community and individuals), and thus also their contribution and preparation to the growth or decline of society. Hence we chose as critical and unstable factors for creating scenarios the values and the societal progress. Along these two factors we defined four alternative scenarios for Hungary 2025 (Figure 1).

Figure 1: Alternative scenarios



In Scenario 1, “Individuals in the community network” community values are dominant, which is typical to Rational, Open, Good-guy high-school students, and to Life-planning engineers, Treasury optimistic college and university students. Nearly half of those who answered to the survey think and act in a way that induces the progress and growth of society.

For the quarter of young respondents (Conscious of high-school students and Sure-footed plains of college and university students) the explicitly individualistic way of thinking appears, that is dominated by individual values and interests. The so-minded young people – as they like to work – could bring progress and enrichment at the individual level which would also appear in the development of society as a whole. If this approach and the associated action becomes dominant, then the young people thinking this way could form a society that is selfish, but have a positive effect for the development of the whole society. This is described in Scenario 2, “Society of individualists”.

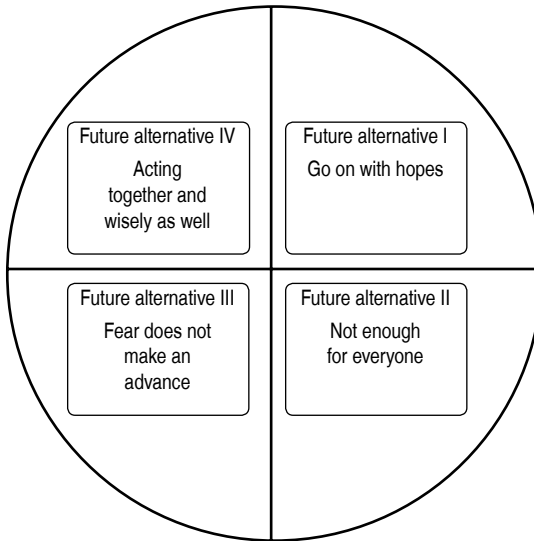
A significant percentage of young people do dread of the future, another part of them do not find their place in the world. Among the 18 year old high-school students there are altogether 15% who are Drifter or Fearful, and 21% are Croaker and 14% are Drifter among college and university students. The economic domination of powerful multinational companies may raise their fear and specific reaction. It is possible that they would become the majority, and implement Scenario 3, in which their individual fears cause the decline of society, or in best case, the stagnation. The title of the scenario refers to the possible feeling of individuals: “Society of individuals left behind”.

Scenario 4, “Drifting and wallowing together (without goals)”, describes Hungary where the majority are drifters or irresponsible idlers. Nearly one-fifth of the surveyed high-school students, the Purposeless pass into indifferent community games, and merge into irresponsible “wallowing”. Can we not be excluded that due to the deterioration of the status of the whole world this way of thinking is spread in Hungarian as well. The majority will not see the sense to seek to shape their fate to good, but neither to dread or dare. We were happy that among college and university students there were no purposeless.

Depending on which group of young people would be decisive in Hungarian society that enhances different features of the scenarios. With this different societal contexts are prepared, in which the experts’ hopes and fears are

realised. Of course some combination of these is also possible, but these are the four main characteristics for the alternative futures of Hungary 2025 (Figure 2).

Figure 2: Future alternatives



If Scenario 1 would unfold, there is a great chance that many hopes of experts would be realised. The decrease of Hungarian population is expected to slow and social harmony and balance prevails in the country. Minorities are widely accepted, and cooperation is built together with them. The formation of deviant behaviour could be prevented. Creative places are created to give space to small communities to spend their time (community building), and they find the adequate actors for their decisions. The environmental awareness increases, differences decrease and we gradually get closer to the average standards and norms of the European Union. So we can call the Future alternative 1 “Go on with hopes”.

With the realisation of Scenario 2 both hopes and fears have the possibility to happen. In this future alternative the division of society continues, societal inequities are getting stronger. The increase of Hungarian population is

uncertain as the spread of healthy lifestyle. It is unsure whether the status of natural environment would improve, and there are no any tools to avoid the drawbacks of globalisation. If individualists reveal that they should change their thinking and acting, then this future alternative can contribute to an overall societal progress. Until is not happening, Future Alternative 2 remains “Not enough for everyone”.

Fears of experts would mainly realise with the occurrence of Scenario 3. The number of Hungarians would decrease more, as the health of Hungarians too, due to the spread of activities free of movements. Societal differences grow that risks societal stability itself. The natural environment suffers more damages, cultural habits and values are getting lost. The temptation to get characteristics of the European Union and reach its level is no more existing, thus our approach to EU-level is slowing. Societal gaps are deepening, we exploit our natural environment more and more, and fear from globalisation is a general feeling. The Future alternative 3 is where “Fear does not make an advance”.

Future alternative 4 “Acting together and wisely as well” is based on Scenario 4. It shows that power of community could bring individual and social outcomes only with reasonable thinking and acting that are based on reality.

What can we learn from complex future alternatives?

Messages from the Futures

1. Complex future alternatives developed in this way are sufficiently imaginative, but feasible, because:
 - a. They explicitly formulate the hopes and fears of experts and non experts;
 - b. They are incorporated into each other, and “confront” experts’ forecasts and opinion of non-experts;
 - c. Future possibilities and future expectations related to each other ensures that they do not stick too much into the present realities, and neither to be lost in the world of desires and fantasy.
2. Which future alternative would be realised, is up to experts and non-experts as well, because:
 - a. Experts are able to objectively and scientifically explore the future alternatives that are possible, cause fear or give hopes;

- b. With this they offer guidance (compass) for non-experts that shows what to do to make their hopes come true and what not to do to avoid their fears.
3. Families and education both have a great responsibility, because:
 - a. The family has the capacity to teach honour and to strengthen community values;
 - b. Education has the possibility to reinforce these attitudes.
4. If we have scientifically developed complex future alternatives, then:
 - a. We can carefully select where to go in the future;
 - b. Clearly see the target and the direction;
 - c. We can take into account the probable consequences of our decisions;
 - d. We can explore the interconnections of our different actions;
 - e. We can validate longer term aspects within our decisions;
 - f. We can give a preference to community values instead of individual ones.
5. The future oriented thinking and the acting power that is stronger than today could give a basis to the elaboration of a strategy that enhances societal progress and prosperity.

We not only believe, but also this research has demonstrated that the social regeneration has been present in Hungary, and with collaboration we can make wonders in our country. Our society and economy – with conscious social cooperation and with responsible action – could be lead to a plausible and preferable pathway.

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BUILDING THE ETHICAL BASIS FOR GLOBAL CLIMATE CHANGE ACTION: AN ISSUE FOR SCIENCE, RELIGION AND/OR NEGOTIATION?

Miroslav Polzer

Introduction

The organizers of the Club of Rome conference “*Learning from the Futures*”¹ held in Olomouc/Czech Republic on September 7 and 8, 2010 have introduced the conference subject with some very interesting questions:

- How can we learn from the future – not knowing how it will look like?
- What are possible futures and how can we outline scenarios and pathways which might lead to desirable or undesirable futures?
- How can we derive from possible futures lessons for the present?
- What are the risks and opportunities the world is facing today and how could possible measures look like which go beyond present cosmetics?

It is this broad, future oriented and systemic approach – characteristic for Club of Rome – combined with the fact that there have been some outstanding future studies and global change studies experts gathered in Olomouc that made the Olomouc conference such a perfect venue for a preparatory meeting for the workshop “*Worst Case Climate Change Scenarios and their Ethical Implications*” which is going to be organized by Austrian Science and Research Liaison Office (ASO) Ljubljana – Centre for Social Innovation Vienna www.zsi.at in cooperation with Slovenian Association, Croatian Association and European Support Centre of the Club of Rome www.clubofrome.at/, UNESCO Ethics in Science and Technology Division <http://www.unesco.org/new/en/social-and-human-sciences/themes/ethics-of-science-and-technology/science-and-technology/climate-change/>, Millennium Project <http://www.millennium-project.org/>, Slovenian Academy of Sciences and Arts www.sazu.si, Academic Council on the United Nations System www.acuns.org, and other partners March 2 and 3 2011 in Bled/Slovenia.

¹ <http://www.clubofrome.at/2010/futures/>

The Planned Workshop “Worst Case Climate Change Scenarios and their Ethical Implications” in Bled/Slovenia March 2011

The key issue of the planned workshop is the question of what the systemic/functional role of ethics in mitigation and adaptation related to climate change in the context of global socio-economic systems is and how to find the best ways of engaging science, religion and policy making in a coherent way and how to develop very concrete conceptual frameworks, tools and principles to deal with ethical issues related to climate change.

Following exploratory questions have been formulated during the early preparatory process of the workshop and discussed at the meeting in Olomouc:

- Systems approach: Ethics as a key element of the failure of the global socio-economic system(s) with regard to Climate Change?
- Critical reflection of the role of ethics or religions (social teaching, moral values, etc.) respectively as some kind of “operating system” of global society/societies (in analogy to operating systems (i.e. system software) of computers) and the need for an update of the ethics operating system of global society in light of climate change.
- What is the role of ethics/religion in climate change mitigation and adaptation of each individual “global citizen” (e.g. promotion of “low carbon life styles”) and as guidance for the behaviour of negotiators of the global climate change framework of action in United Nations fora like e.g. UNFCCC (e.g. the “climate justice” and “global citizenship ethics” approach as articulated by Earth Charter)?
- What kind of new dimensions of societal responsibility in light of uncertainty emerge from worst case climate change deliberations?
- Can there be developed in an innovative, consensual and negotiation based way a global common ethical basis for coherent and effective global climate change action based on scientific findings regarding socio-ecological necessities which would be compatible with various mainstream religious values and norms?
- What role for civil society, religious communities, business sector? How can they participate in a coordinated and coherent way in global climate change action (e.g. in campaigning for “climate justice” or for standard setting on “human duties in the context of global challenges”)?

- Has Article 29, paragraph 1 of Universal Declaration on Human Rights “Everyone has duties to the community in which alone the free and full development of his personality is possible“ the potential to serve as a consensual point of departure and orientation for innovative approaches of global community to building the ethical basis of global climate change action?
- What is the role of intercultural dialogue (e.g. UN Alliance of Civilizations)?
- What role can science play in building the ethical basis for global climate change action? How do science and religion interact on these issues? What is the state of the art in (comparative) sociological studies and humanities with regard to ethics/religion and climate change? How can be developed scientific capacities in this field (e.g. in South East Europe, European Union etc.)?

As a very relevant previous event addressing the topic of catastrophic climate change scenarios on which the Bled workshop should build upon is the workshop “*Anthropogenic Climate Destabilization: A Worst-case Scenario*” organized by Foundation for the Future September 2008 in Washington.²

The colleagues of UNESCO Ethics in Science and Technology Division – which is co-organizer of the Bled workshop – have provided additional input for the preparatory meeting in the format of a background paper “*New Adventures in Foresight: The Ethics of Extreme Scenarios*” which has been discussed with the coorganizers of the Bled workshop and some additional participants of the Olomouc conference which expressed interest to contribute to preparation of the Bled workshop. Here are some excerpts from this draft background paper which sheds light on the question why to focus on worst case scenarios and what role foresight processes can play:³

² http://www.futurefoundation.org/documents/HUM_ExecSum_ClimateDestabilization.pdf

³ John Crowley, Romi Sondip Mukherjee, *New Adventures in Foresight: The Ethics of Extreme Scenarios* – Concept paper for an international conference, unpublished draft paper, Paris, September 2010

Imagining the “worst”

In addition to the fairly familiar technical challenges summarized in the previous section, the conference will need to explore imagination, its limits and its implications. Climate change confronts us with the challenge of imagining the unimaginable. Having done so, we also need to examine what ethical tools exist or need to be forged in order to act in “the void” or rather develop an “ethics of uncertainty”. In a more general sense, the conference might function as a pataphysical experiment whereby experts will be asked to imagine an anti-scientific realm beyond metaphysics that examines the laws which preside over exceptions - an attempt to elucidate an imaginary cosmos which could potentially become very real through developing a “science of imaginary solutions” that could potentially provide the grounds for practical action.

What foresight?

Hence the urgency of forging a “foresight of uncertainty” and a “strategy of the exception”. Foresight and scenario-building are among the only tools available to us to envisage such uncertainty and exception, but in this context, normative methods of foresight analysis have to be pushed even further in their examination of:

- I. key drivers*
- II. societal needs*
- III. knowledge formation*
- IV. shifting ethical and scientific paradigms*
- V. the limits of human and technological response*
- VI. societal mega-trends and their influence on extreme scenarios (and conversely mega-trends of climate and their influence on societies)*
- VII. geographic and regional shifts*
- VIII. criteria of vulnerability*
- IX. security*
- X. human, non-human and natural actors*
- XI. “disruption”*
- XII. globalization*

At the same time as the extremes need to be better mapped, their ethical significance needs to be better understood. In particular, the question of their weighting, and of the possibly perverse consequences of the fascination they understandably exert, needs to be explicitly addressed.

UNESCO – The Key Player Regarding Ethics and Climate Change within the United Nations System

Regarding the topic “Ethical Implications of Climate Change” very valuable work has been carried out by World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) which in its report “*The Ethical Implications of Global Climate Change*”, presented to UNESCO Executive Committee and UNESCO General Conference in 2009 and published in 2010. In this report COMEST identifies the challenges related to integration of ethical considerations in global climate change policies as follows:⁴

“...ethical concerns are in fact rarely made explicit in discussions about climate change, and therefore are not adequately scrutinized or debated. Climate change discussions predominantly take place on a factual and technical level, i.e. they focus on the causes, the impacts and the effects of climate change, or on technical policy issues regarding responses to its challenges. ...

...there seems to be a tendency to move directly from concerns about climate change to climate change action, without self-consciously and critically reflecting on the aims, the nature, the extent and the justification of these actions. Thus, the ethics already embedded in concerns about and responses to global climate change are shifted to the background, and effectively taken off the agenda of matters that need to be seriously considered.

...Policies that actively take into account such [ethical] implications, at international, regional and national levels, are undoubtedly more likely to succeed in developing a sound understanding of climate change with which to mitigate its threat and adapt to its effects. The first step in this regard is to articulate clearly the ethical implications and moral basis of possible responses to global climate change. This requires grappling with the extreme complexity of global climate change as a concrete phenomenon unfolding in time and moving beyond conventional conceptual frameworks and decision making strategies that marginalize the ethical nexus of the problem.”

One of the recommendations of the COMEST report quoted above has been to start a process of consultations regarding the desirability of a “*Universal Declaration of Ethical Principles related to Climate Change*”:⁵

⁴ United Nations Educational, Scientific and Cultural Organization, *The Ethical Implications of Global Climate Change - Report by the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST)*, Paris 2010, page 7 and 8

⁵ United Nations Educational, Scientific and Cultural Organization - World Commission on the Ethics of Scientific Knowledge and Technology, *Recommendation on the desirability of*

“In view of the nature and extent of the scientific, social and human challenges of global climate change, which necessitate adoption of policies at the global level to address the pressing needs of the most vulnerable in the face of major uncertainties and the exigencies of international cooperation, it is urgent to determine universal ethical principles to guide responses to such challenges.”

After a series of regional consultations (one of them in May 2010 in Belgrade) COMEST at its Extraordinary Session from 28 to 30 June 2010 concluded that there is a significant body of internationally recognized ethical principles that bear directly on climate change or could be adapted to apply to it but, many of these principles require further elaboration on the basis of extensive consultation. Therefore, preparation of a draft declaration of ethical principles in relation to climate change has been regarded not to be feasible for submission to the 36th General Conference. In order to achieve a broad consensus, COMEST will continue to conduct a systematic review, including consultation with Member States, of ethical principles identified as requiring further elaboration in relation to climate change and UNESCO Executive Board shall reassess at its 189th session the desirability of preparing a declaration of ethical principles in relation to climate change.

An area in which the Bled workshop could perhaps follow-up on the work of COMEST report on Ethical Implications of Global Climate Change in a very specific way would be the issue of “*Foreknowledge and the Duty to Act on it*” as discussed by COMEST in Chapter V. A (see some quotations below) and the issue of conceptualizing the role of individual global citizens, civil society organizations (including religious communities) as “agents” in climate change governance and the necessity of action to overcome “*Institutional Inadequacy that make it difficult to respond to Global Climate Change*” as highlighted in chapter II.C of COMEST report.⁶

preparing a declaration of ethical principles in relation to climate change, Meeting in Paris in Extraordinary Session from 28 to 30 June 2010

⁶ United Nations Educational, Scientific and Cultural Organization, The Ethical Implications of Global Climate Change – Report by the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), Paris 2010, page 27 & 15.

Chapter V. A: The link between foreknowledge and the duty to act on it
Broadly speaking, three principal duties are readily recognized in various forms:

- the duty to actively pursue knowledge of the impact of human action on the global climate system, as well as the impact of climate change on human activities, in particular those of people most vulnerable to climate change;*
- the duty to share that knowledge when it is available;*
- the duty to act appropriately and in a timely fashion when that knowledge is available.*

However, the identification of these duties immediately raises the question who should ultimately take responsibility for generating knowledge, what kind of experts and which institutions should be involved, and through what processes.

Moreover, even if such knowledge is adequately generated, the issue of its mass dissemination remains problematic. A standard method for engaging these questions is to take a critical view of the current organization of science in the world, and to ask whether the typical research activities taking place, and the structures through which research is promoted, funded, published, and further disseminated, are optimally geared to enable humankind to understand, prevent, mitigate or adapt to climate change.

Chapter II. C Ethical challenges related to the main characteristics of global climate change

- the fragmentation of agency that makes it difficult to respond to global climate change;*
- institutional inadequacy that makes it difficult to respond to global climate change.*

Integrating Ethics in Global Climate Change Governance and Research

The work of COMEST quoted above and the fact that climate change negotiations locked in an market economy conceptual framework without ethics as a systems variable have failed in Copenhagen and Cancun show that “Building the Ethical Basis for Global Climate Action” is an indispensable prerequisite for effective global climate change action.

Therefore building the knowledge base for a systemic understanding of human behavior (and its ethical determinants) as key driver of climate

change and education, religion, mass media etc. as levers to influence it is needed.

Preparatory talks for the Bled workshop held with representatives of Global Humanitarian Forum⁷ in Geneva in November 2009 showed that some very concrete and high level initiatives of discussing with politicians, religious leaders and business sector the demand for innovative approaches to ethics in global climate change action (see for instance the publication “*Key Points on Climate Justice*”⁸ which has been presented and discussed at global inter-religious gathering “Parliament of the World’s Religions” December 3–9 2009 in Melbourne/Australia www.parliamentofreligions.org/) are already in an advanced stage of implementation. At talks with representatives of Intergovernmental Panel on Climate Change IPCC in Geneva we learned also about the Windsor 2009 conference “*Many Heavens, One Earth; Faith Commitments for a Living Planet*” www.windsor2009.org/ where UN Secretary General Ban Ki-moon with his presence and his speech supported the idea of regarding religious communities as important partners for global climate change action. Another relevant initiative is the ethics/religion and climate change initiative of Bahai International Community which has been launched in September 2009 in the presence of IPCC chair Mr. Pachauri <http://news.bahai.org/story/729> in New York.

As a consequence of these mainstreaming trends, the need to assess ethical dimensions of climate change and policy including human rights as key issues to be considered in all Working Group reports has been highlighted by several stakeholders (governments and organizations) in the consultation process for 5th Assessment Report of IPCC.⁹ Socio-economic aspects (including “ethical dimension”) of climate change are thus going to be addressed in IPCC 5th Assessment Report in a much more prominent way than in previous assessment reports:¹⁰

⁷ Global Humanitarian Forum has ceased existence due to financial problems in spring 2010,

⁸ Downloadable at http://www.globethics.net/c/document_library/get_file?p_l_id=14538&folderId=1083692&name=DLFE-1351.pdf

⁹ POLICY RELEVANT SCIENTIFIC TECHNICAL TOPICS TO BE ADDRESSED IN THE IPCC AR5 – Summary of comments from Governments and Organizations, IPCC AR5 Scoping Meeting Venice, Italy, 13–17 July 2009, page 2, www.ipcc.ch/scoping_meeting_ar5/documents/doc03.pdf

¹⁰ CHAIRMAN’S VISION PAPER, IPCC AR5 Scoping Meeting Venice, Italy, 13–17 July 2009, page 4, www.ipcc.ch/scoping_meeting_ar5/documents/doc02.pdf

Other key challenges include the humanitarian aspects of climate change, wherein the relationship between climate change and its effects on human society in various parts of the world present a crucially important subject for assessment, and ethical dimensions of climate change, which emanate from the disparities between responsibility for climate change and the diverse nature and magnitude of impacts. For these and other issues, new scientific knowledge will be critical for advancing the assessment beyond the level that was possible in previous IPCC reports.

An important global research program in the field of global social sciences and climate change is the “International Human Dimensions Programme on Global Environmental Change” www.ihdp.unu.edu/. IHDP has great potentials to be among the most competent global networks of researchers, scientific institutes and research programs for addressing the ethical dimension of climate change from a systems analysis social science research perspective.¹¹

...it has become clear that addressing large scale environmental issues, and fostering sustainable development will require a concerted effort on the part of researchers who focus on human behavior. The International Human Dimensions Programme on Global Environmental Change was developed to this end.

Although IHDP in its Strategic Plan www.ihdp.unu.edu/file/public/WebStratPlan?menu=84 and the outline of IHDP Open meeting 2009 in general acknowledges the importance of ethical dimensions of global environmental change like values, beliefs, etc. (see quotation below)¹², there couldn't be found a specific IHDP research initiative or program on ethics and climate change on internet.¹³

¹¹ www.ihdp.unu.edu/article/IHDP_Profile?menu=1

¹² *Conference book of IHDP Open meeting 2009, page 15, www.openmeeting2009.org/pdf_files/Conf%20Book_WEB.pdf*

¹³ Note: the inquiry has been carried out January 2010

The role of perceptions and values

All societal dynamics relating to the environment involve the relationship between the observed and the perceived. These two do not always match very closely. Psychological, cultural and social factors influence perception and decision making individually as well as in groups. Such factors may also be a basis for mapping the environmental ethics of groups, as well as for a better understanding of how a group will react to different kinds of social or environmental changes. Other, related issues have to do with how socioenvironmental issues are communicated, and how people learn to perceive them. These are of central importance in improving the worldwide understanding of global change, its implications and its consequences.

In terms of “status-quo analysis” or “gap-analysis” for the planning of the Bled workshop we can say that there is a growing public awareness among religious communities, policy makers and scientific community that innovative approaches regarding cooperation of science, religion and policy making towards “Building the Ethical Basis for Global Climate Action” are needed.

But on the side of research there is a huge gap existing and there is an urgent need for more and better coordinated research worldwide on the role of ethics in the context of climate change governance challenges on local, communitarian, regional, national, and global level!

In this context also the concept of social innovation seems to me very important, because the whole idea of approaching ethics with a global perspective, a systems approach and a creative/engineering approach is a social innovation:¹⁴

¹⁴ Michele Lee Moore & Frances Westley, Surmountable Chasms: The Role of Cross Scale Interactions in Social Innovation, Working Paper No. 001, March 2009, page 6, http://www.sig.uwaterloo.ca/documents/Michele-LeeMoore_VOOct2809.pdf

To meet the complex challenges of the world today, responses will need to be equally complex. Urgent calls for innovative solutions have become increasingly frequent as people begin to recognize both the need to change fundamental patterns of human relationships with each other and their environment, and the catastrophic ramifications of inaction and ill-informed decisions. Yet, progressing from the stage of identifying that need to a stage of action is often stalled, largely due to the incapacity to move innovations and knowledge between disciplines, 'thought worlds' and contexts, and an inability to mobilize action across the boundaries and scales that define a social system.

Earth Charter as a Leading Global Civil Society Initiative

In the context of preparation of the Bled workshop, the author of the present paper has participated in the conference “*Ethical Framework for a Sustainable World Earth Charter + 10*”, Ahmedabad/India, November 2010, where he presented the paper *Global Citizenship Ethics for Effective Global Governance – From Ideas to Action in the Workshop “Global Challenges and Global Governance”*.

The Earth Charter is a global civil society document on ethical principles related to sustainable development which has its origins in the work of “The World Commission on Environment and Development” (known as “the Brundtland Commission”) which launched in 1987 the “Our Common Future” Report with a call for a “new charter” to set “new norms” to guide the transition to sustainable development. In 1994, Maurice Strong (Secretary-General of the Rio Summit) and Mikhail Gorbachev, working through organizations they each founded (Earth Council and Green Cross International respectively), launched an initiative (with the support from the Dutch Government) to develop an Earth Charter as a civil society initiative (although it has to be noted that it had started as a United Nations initiative).¹⁵

¹⁵ <http://www.earthcharterinaction.org/content/pages/History.html>

The Earth Charter is a declaration of fundamental ethical principles for building a just, sustainable and peaceful global society in the 21st century. It seeks to inspire in all people a new sense of global interdependence and shared responsibility for the well-being of the whole human family, the greater community of life, and future generations. It is a vision of hope and a call to action.

The Earth Charter is centrally concerned with the transition to sustainable ways of living and sustainable human development. Ecological integrity is one major theme. However, the Earth Charter recognizes that the goals of ecological protection, the eradication of poverty, equitable economic development, respect for human rights, democracy, and peace are interdependent and indivisible. It provides, therefore, a new, inclusive, integrated ethical framework to guide the transition to a sustainable future. The drafting of the Earth Charter involved the most inclusive and participatory process ever associated with the creation of an international declaration. This process is the primary source of its legitimacy as a guiding ethical framework. The legitimacy of the document has been further enhanced by its endorsement by over 4,500 organizations, including many governments and international organizations.

In the light of this legitimacy, an increasing number of international lawyers recognize that the Earth Charter is acquiring the status of a soft law document. Soft law documents like the Universal Declaration of Human Rights are considered to be morally, but not legally, binding on state governments that agree to endorse and adopt them, and they often form the basis for the development of hard law.¹⁶

One of the goals of EC+10 Ahmedabad conference and especially the workshop “Global Challenges and Global Governance” has been to find ways for Earth Charter (and thus a set of ethical principles which global civil society (including religious communities) has agreed upon) to be systematically included in global governance:¹⁷

¹⁶ <http://www.earthcharterinaction.org/content/pages/What-is-the-Earth-Charter%3F.html>

¹⁷ http://www.earthcharterplus10.org/workshopthemes_Global_Challenges.html

“One of the main goals of the Earth Charter Initiative is to achieve recognition of the Earth Charter by the United Nations General Assembly and to demonstrate the relevance of the Earth Charter’s values and principles to global governance. The next best opportunity to achieve this recognition appears to be during RIO+20, which will occur in 2012.”

Suggestion of concrete steps towards this aim have been proposed by the author of the present article:

- Thematic Debate on Ethics and Global Governance in UN General Assembly¹⁸
- Linking Earth Charter with UN normative framework via standard setting work related to Article 29 of Universal Declaration on Human Rights (towards Global Citizenship Ethics and “Human duties in the context of global challenges”)
- “Global Civil Society Compact” event at Rio +20 conference (in analogy to UN Global Compact for the business sector; possible content: self regulation and verifiability based quality standards of civil society organizations regarding financial transparency; modest, merit based remuneration; operationalisation of ethical principles of global civil society activism – establishing civil society activism quality labels)
- “Global Citizenship Philanthropy Initiative” with Indian billionaires as first phase promoters
- Setting up a “Global Forum on Philanthropy and Research/Education Funding”
- “Global Challenges Song World Cup” initiative for the promotion of “Global Citizenship and Future Orientation” in cooperation with UNESCO Associated Schools project network, using music as a means for global community building and global empathy/solidarity generation in the context of Education for Sustainable Development.

Some of these suggestions have been taken up very positively at the above mentioned Earth Charter conference but also later on at the WINGS Forum 2010 (Worldwide Initiatives for Grantmaker Support” http://www.wingsweb.org/programmes/wingsforum_main.cfm) and the Annual

¹⁸ similar to UN GA Thematic debate on Climate Change of February 2008 <http://www.un.org/ga/president/62/ThematicDebates/themclimatechange.shtml>

conference of Global University Network for Innovation in Barcelona
<http://www.guni-rmies.net/conference2010/>.

Especially the initiative to establish a “Global Forum on Philanthropy and Research/Education Funding” has seen a very strong dynamic towards implementation with the United Nations Conference on Sustainable Development 2012 being the milestone event at towards which most of the momentum is directed in order to achieve there a real cultural shift towards a new global ethics of global social responsibility of each global citizen which appears to be the missing link for the time being for effective global governance in addressing climate change.

COMMUNICATING THE ETHICAL IMPLICATIONS OF THE WORST CASE CLIMATE CHANGE SCENARIOS THROUGH RELIGIOUS BODIES

Michael Platzer

The people most vulnerable to the direct effects of global climate change are those living in geographical regions prone to flooding, such as low lying islands, large river deltas, certain coastal areas whose homes, businesses, farms and livelihoods may be destroyed. Equally vulnerable are those people living in arid or semi-arid regions who will be victims of drought as well as those living in the Arctic or fragile mountain regions who will also lose their livelihoods with the change of climate.

The poorest, the elderly, and children are most vulnerable to extreme weather events. This has been shown most dramatically in floods in Pakistan this year.

But who is most responsible for these calamities? For the most part, they are the result of actions of the populations in the prosperous industrial (and the rapidly industrializing) consumerist countries which have caused the rise of carbon dioxide in atmosphere and the deterioration of the environment. Thus the effects of climate fall disproportionately on the most vulnerable while the rich literally sit high and dry. Moreover, the developed world has the scientific knowledge and the necessary resources to halt the deterioration of the Earth's climate and to mitigate the worst consequences of their selfish acts.

Most religions have principles which call for charity, justice, assistance to the weak and the poor, stewardship of the Earth, cause no harm to others, as well as to respect all creatures (including animals). Billions of people remain religious in this turbulent and insecure world. Religious institutions continue to enjoy the confidence of the majority of the Earth's population in contrast to political institutions and even the media.

Religious bodies have the capacity to influence human behaviour and even governments. Through sermons, religious radio, television, magazines, newspapers, as well as appropriate school materials persons can change their own Earth polluting actions. Through a careful analysis of religious scripture, the moral responsibility to avoid apocalyptic scenarios as well as human solidarity can be underlined.

The Universal Declaration of Human Rights has Article 29 which says “Everyone has duties to the community”. Many UN documents have called upon Member States to help countries who are suffering environmental catastrophes and to aid the poorest of the poor. At the same time, the concept of “global citizenship” has been conceived particularly in relation to climate change and humanitarian assistance.

The World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) on Ethical Implications of Global Climate Change has produced an excellent document on the relevant international agreed ethical principles: right to life; right to a standard of living adequate for health and well-being; right to share in the benefits of scientific progress; safeguard the interests of future generations; duty to act appropriately and timely fashion when knowledge is available; collective responsibilities for past and present damage to the Earth’s environment; and the duty to mitigate and reverse green house gas emissions. All these ethical principles derive from fundamental religious values: the sanctity of human life and respect for God’s creation.

Worthwhile work has already been done by individual theologians, diverse religious communities, as well as ecumenical bodies. The Global Humanitarian Forum and World Council of Churches has published a valuable book, “Climate Justice”. M.S Northcott has written a book “A Moral Climate: The Ethics of Global Warming” (Maryknoll, NY: Orbis books, 2007)

Nonetheless, it was felt at the international conference held at the Palacky University in Olomouc, Czech Republic that a regional working group composed of religious representatives, ethics professors, and climate change scientists should meet in mid 2011 to define concrete actions religious organizations might take in Central and South Eastern Europe. Such a meeting might also provide specific ideas to feed into the work of COMEST subcommittee and into the Rio 2012 process.

Sustainable Future or Business as Usual?

SUSTAINABLE FUTURE – THE ROLE OF INFORMATION TECHNOLOGY

Thomas Schauer

1 Cyberworld or Pandora-Scenario?

Information Technologies and Substitution

Thanks to new information technologies, real products and services could be replaced by virtual ones. The virtual economy could be primarily a service economy which makes it possible to decouple economic growth from resource consumption. Many real activities could be transferred to virtual worlds and resource consumption in the real world would decrease. Data highways could replace motorways, virtual meetings could replace physical meetings.

But will this concept work? If we considered a switch from a physical administration to a virtual one (or even a “self administration” by users or customers), a minority of the target group which was reluctant to enter the digital age might force us to maintain part of the physical infrastructure and thus reduce efficiency gains. And is the technology as environmentally friendly as it seems?

The Option of Addition

Does the information economy really replace the industrial one? It is helpful to have a look at the earlier transition: The industrial society has replaced the agricultural society mainly with respect to the workforce. People moved from agricultural work to work in industry. In the year 1900 there were only 38% of the workforce active in agriculture in Germany compared to 62% in 1800. But on the material level, the industrial society added to the agricultural one. Via a positive feedback even more agricultural products could be produced than before. In 1840 Justus von Liebig had published his findings about the application of chemistry in agriculture which resulted

in the broad use of fertiliser. The increase of the food production was significant.

The information society will again involve a shift of the workforce - this time from the industrial to the service sector. At the level of production, the information society might however add to the industrial society and, via positive feedback by IT, industrial production will probably increase. This addition might bring us closer to an ecological disaster. When the transformation from the agricultural society to the industrial one took place, the magnitude of the positive feedback was restricted. The number of humans multiplied, the share of energy-consuming meat products in the diaries increased, people tended towards overweight. But nevertheless the overall food consumption of the population was limited. In the case of information technology and its positive feedback on industrial production, there might be less restriction (as long as resources are available). The consumers' hunger for products seems difficult to be saturated.

Diverging Scenarios

It is possible to derive different scenarios from the substitution and from the addition effect:

In a "Cyberworld Scenario", we might deeply immerse in virtual worlds, leaving the physical reality partly behind us. Videoconferences could actually replace business travel and thanks to IT, offices could operate today without using paper. A pattern of development according to the substitution hypothesis would thus be possible. And of course we could do so in our free time as well as in our professional life.

On the other hand, industrial production, being enhanced by information technology (such as robotics), could continue to increase. From the perspective of nature, such a development might be labelled as "Pandora Scenario". New technologies open the box again and again, boosting resource consumption and pollution, always adding on top of the already existing burden.

Both the Cyberworld Scenario and the Pandora Scenario are overstated. The prognosis of totally dematerialised lifestyles is as unrealistic as the assumption of endless growth of industrial production. Nonetheless the scenarios are useful to outline the two directions in which we could move. If we look at present global trends, it is more probable that development will go in the direction of addition.

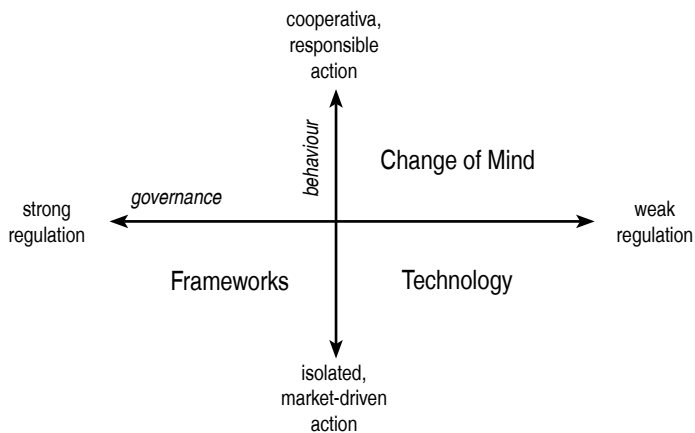
2 Assessing Strategies for Sustainable Development

Various strategies for an environmentally friendly information society are proposed:

- The “Technology Strategy”: Technology will increase resource efficiency and thus resolve the problems.
- The “Change of Mind” Strategy: Measures which increase the environmental consciousness of the population will enable sustainability.
- The “Frameworks Strategy”: New laws and taxes, which reward environmentally friendly behaviour might be essential for ecological improvement.

These strategies have different prerequisites for success, and also different assumptions on the surroundings: The orientation of people and the legal settings (See figure 1).

Fig. 1: Strategies for Sustainable Development



2.1 The Technology Strategy

Solving problems just by providing the adequate technologies is a seducing option. With a technology based solution, no new laws are needed, and if the population continued to act in a market driven manner, this solution would work as well. But will it really do so?

Homo Virtualis is also Homo Mobilis

People are today mobile as they have never been before, and there seems to be a close relationship between communication and travel behaviour. There was already in the pre-Internet age a correlation between the number of messages sent by people, beginning with letters and later including phone calls, and the number of kilometres travelled. The development was in parallel. Did people in the past forecast that because of telephone calls, which bridge distances easily, they would travel less, and that television would replace holiday trips because they could see foreign countries comfortably from their home? E-mail and videoconferences, runs the argumentation today, will result in a replacement of motorways for cars by information highways. But we use the new technologies to increase our communication activity, while at the same time travel statistics show that street and air traffic continues to grow. Telework has gained importance in the recent years. Teleworkers appreciate an increase of flexibility and freedom, and enterprises have the advantage of saving costs. But it is not clear, what long-term ecological impact telework will have. People might move to remote beautiful sites and commute once per week 100 km instead of 5 times 10 km.

Goods Travel Around the Globe

The influence of e-commerce on transportation is still unclear. There is the option that transportation further increases because products from remote regions become accessible more easily. Shopbots help us to find cheap products independent of the location and if transportation is affordable, people will order them also from distant locations.

Paper Use Did Not End

The story of the paperless office is a further example of the very slow realisation of potential environmental benefits of the information technologies. The introduction of computers failed to enable paperless work. Later, there had been the hope that Internet and e-mail which make the transportation of files very comfortable would lead to a breakthrough. Today we have all prerequisites for paperless work, but the new tools are not yet sufficiently applied. Of course we substitute much paper by files, but the overall information flow explodes and thus paper use may not decrease

even though its relative share in information storage compared to electronic media gets smaller.

Thus, the technology option does not seem to work straightforward, and behavioural as well as framework aspects have to be taken into account.

2.2 The “Change of Mind” Strategy

Quite obviously the addition effect and the information technology related resource consumption have a behavioural component. Approaches only relying on the technology will fail. They are necessary but not sufficient for success.

The supporters of a “Change of Mind” strategy argue that the transition to a sustainable information society needs a change of awareness which leads to new lifestyles among consumers. They suppose that people will see the need to maintain ecosystems as they become aware of the problems ahead. Therefore no strict laws will be necessary for the reduction of resource consumption and the demand for environmentally friendly products will influence the markets adequately and make them supply the consumers with improved products. The argumentation is preferred by “idealistic” individuals who are convinced that others are also ready to practice environmentally friendly behaviour in a situation in which this is not yet economically profitable.

We are presently not on a sustainable pathway and we need a change of behaviour both of companies and of citizens. At present there are efforts being made in many areas but there is not much success. If we use the “cascade model” (information changes awareness, awareness changes behaviour), there are three different possible reasons why environmental information does not influence the audience adequately:

Not Enough Environmental Information?

This is usually not the case. A Google search revealed in January 2011 more than 18 million hits for “sustainable development”. All major and minor environmental problems are addressed. This information should be sufficient to start essential steps towards sustainable development. Apart from some specific topics and areas (i.e. some product-specific information and the situation in developing countries) there is quite a lot information available.

Information Fails to Reach the People?

This explanation supposes that environmental information is not taken up because it cannot compete with the large amount of information about different topics with respect to quality and attractivity, or that environmental information is not visible in a flood of information which can hardly be managed today. In fact the world wide available information has grown to an incredible extent. Who will consume all this information? When Schopenhauer published “The World as Will and Idea”, he asked the reader in the preface to read the two volumes twice. This would be the prerequisite for understanding the presented ideas, he argued. Such a proposal is an unreasonable demand today, we don’t even read books once any more, we only look through the pages. And the printed information is only a part of the total amount.

It is evident that environmental information has problems to be competitive against this background of information overflow. However, as the following section shows, the key problem is neither lack of information, nor information which is not presented in a sufficiently attractive way...

Eco-Schizophrenia

Surveys demonstrated that in almost all countries people have an increased environmental awareness and know which behaviour is favourable for the environment – and which behaviour is not. But they do not apply it – a phenomenon which can be entitled as eco-schizophrenia. There is an obvious contradiction between the environmental awareness and actual behaviour not only of individuals but also of companies. Obviously there is a very long way from environmental awareness to environmentally friendly behaviour. A company which decides to invest in environmental performance has an economic disadvantage, either a short term first-mover disadvantage (which can later turn into an advantage if standards are set adequately), or a permanent one if the legislation will not require the new standards and the consumer does not reward the initiative. On a high level of consumption people re-discover non-material values, but they don’t decrease consumption. As in the case of low-income pensioners (one of the few sustainably living groups of the population in Western societies), ecological progress often has only a weak correlation to environmental awareness or to post-materialistic attitudes. It is often supported more by economic or even sometimes by safety aspects (the reduction of air traffic

in the second half of 2001) than by environmental considerations. The environmentally friendly person whom we meet when we do a survey is the same person who consumes already few hours later without thinking of the environmental consequences – eco-schizophrenia is widespread.

2.3 The Frameworks Strategy

The supporters of the Frameworks Strategy argue that presently global frameworks support only economically oriented behaviour at the expense of social and ecological aspects. Even people with a higher environmental awareness would not choose the ecological options. They continue to purchase just the cheapest products. Therefore the frameworks must be changed in a way that rewards environmentally friendly behaviour by making it also economically attractive. This means the introduction of new laws for the environment and of ecological taxes on products which are not environmentally friendly. The strategy is supported by “realistic” individuals who suppose that people follow mainly economic incentives.

The “Democratic Brake”

As a consequence of the insufficiency of the consciousness strategy there are calls for new frameworks including tax laws which change the price system and make environmentally friendly behaviour also economically advantageous or more comfortable. The development in the past has shown that there is in fact the possibility to direct people and business. In Germany, taxes and social security contributions changed. For a long time, labour was charged more and more. As a result, labour productivity increased much more than resource productivity. Theoretically it should be possible to reverse this trend, but the way back is much more difficult. Measures which aim at the reduction of energy and material consumption face opposition by the consumers and this opposition can change voting, leading to a high risk to the government which initiates the changes or even to parties which are not part of a government. Discussions prior to the 1998 elections of the German Parliament provided an instructive example. The party Bündnis 90/Die Grünen (The Greens) agreed on a draft for a programme which was presented in October 1997. In this draft an increase of fuel prices was planned in case they would win the elections. Attention of the media to this draft was relatively low. But when in the second draft in December 1997 an increase of the price to 2.55 Euro until 2008 was envisaged, it was

discussed intensively and contributed essentially to the loss of support by the voters. According to polls the party had a share of 12% before the discussion about the fuel prices, but got only around 7% of the votes in the elections. Therefore a change in frameworks will be without success if it is not accompanied and supported by a consciousness change of the majority of the population.

3 Conclusion

A sustainable information society will not be achieved automatically.

- The Technology Strategy will not provide the solution for the problems ahead. Technology consumes some resources itself and if it was applied in an inappropriate environment, it might even have adverse effects.
- The Change of Mind Strategy will fail as long as malicious behaviour is rather rewarded than punished, the phenomenon of eco-schizophrenia will prevent progress towards sustainability.
- The Frameworks Strategy will not be successful because over-ambitious measures for sustainability are risky for politicians. There is a “democratic brake”.

Information Technology will be necessary but not sufficient for sustainability. A strategy for a sustainable information society needs to include both the Change of Mind and the Frameworks Strategy (and of course the technology itself). As outlined, all the strategies have specific disadvantages, a combined approach is therefore necessary. In such an approach, the components would not only have effects for specifically achieving sustainable development, each component might also decrease the influence of the obstacles which the other component faces. Frameworks would decrease eco-schizophrenia – changing the rules of the prisoners’ dilemma, and measures of the consciousness approach would help to decrease the “democratic brake” which is the obstacle for the frameworks approach. The challenge in the future will be to develop combined tools that address the “problematique” (the complex set of problems as the Club of Rome calls it) and form a comprehensive approach for solving the problems.

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2010–2030: FROM SUSTAINABLE DEVELOPMENT TO SUSTAINABLE RETREAT

Juraj Mesik

For many of us growing up in late 1960-ies and 1970-ies, what means progress and what is going to be our future appeared to be very clear. After 1961 when Yuriy Gagarin flew to the space we were looking towards magical Year 2000 in remote future, expecting that by then people will be colonizing not only Moon, but also Mars and Venus. The years following 1967 when Christian Barnard successfully transplanted human heart from a person to another one, it appeared quite reasonable to expect, that we all will be living up to 150 if not 200 years of age or more, being able to replace our damaged or aging organs by fresh transplants. We would indeed conquer space as well as time, breaching the limits given us by the Nature.

We did not. We did not at all. We did many other things, but not these most important and expected by majority. The point here is not that we were young and naïve – we only fully absorbed, as children do so well, the spirit of the times. We simply embraced linear techno-optimism, which proved to be pure techno-fantasy. Our way of thinking and dreaming did not change much since then.

There indeed were sober voices then, as they are today. They pointed to real challenges in front of us. In 1956 American geologist Marion King Hubbert predicted U.S. oil production will peak around 1970 and decline ever after. Ridiculed as he was at the time, his analysis proved to be right on top. In 1972 Club of Rome published now legendary study “Limits to Growth” predicting whole range of difficulties and challenges to be faced by our industrial and consumer societies shortly after year 2000 as a consequence of overexploitation of resources and environmental pollution. 1973 Oil Crisis seemed to confirm Club of Rome warnings and for a while it looked like world politicians are going to paid attention.

As many other warnings in the history, these too fell to deaf ears. We had chance to avoid many unintended consequences would we choose to act

soon. We – our political leaders and ourselves – chose to ignore them, some of pure ignorance, many out of expectation that technologies of the future will take care of all future problems. In different words, we chose to pass exhausted natural resources, polluted environment, economy in exorbitant debts and socially polarized human societies onto shoulders of our children and grandchildren. We only managed to give a name to our prescription for future generations: they are supposed to implement “sustainable development” – development satisfying the needs of present generations without undermining the life standards of those after us.

Sustainable development became official answer, blessed and embraced by respectable global forums of academics, businesses, politicians, citizens. We fall in prolonged love affair with the expression and gave it a lot of meaning. One of the most absurd derivative is idea of “sustainable growth”, colossal mathematical absurdity loudly trumpeted by the most official documents of global significance – take the most recent European Union’s “Europe 2020 Strategy” as a shining example. For those who do not yet see the expression is oxymoron, I strongly recommend professor’s Albert Bartlett’s famous lecture on Arithmetic, Population, and Energy.

There are many possible futures ahead of humankind, but there is a number of planetary limits, seriously narrowing down the scope of realistic options we and our children will have in the following two decades. Maybe in much longer. Maybe for ever – if ever is dimension we are allowed to use and be still taken seriously. Allow me to discuss just very few of them, belonging among the most significant or urgent for the fate of human societies in near to medium term future: climate change, peak oil and overexploitation of natural resources in general, population growth, economy based on debt and accelerating social polarization.

Global warming is scientifically proven fact – just like the Earth is turning around the Sun and not vice versa, or evolution, or carcinogenic effect of smoking cigarettes, to mention just few things, which too were subject to vitriolic ideological opposition in the past, as climate change is today. Actually, in the United States of America very many people still oppose the fact of evolution, just as they oppose the fact of anthropogenic climate change. Ideology often trumps the science. Sometimes it does so with devastating effects – by far not only to scientists.

While we know very well there were many and huge changes of the climate without human interference, there is very little room for doubts about

humans being the main culprit in current fast growth of global temperatures. From paleo-climatology we know with high level of certainty, that there were times in geological past of our planet, when global temperatures were much higher than today, Earth's poles were covered by jungles and marshes inhabited by crocodiles. We also know, that just 20.000 years ago – a short blimp in the Earth's history – northern Europe and Canada were covered by miles-thick ice sheets and herds of mammoths grazed on unforgiving tundra on the bottom of the North Sea and around the very place where we sit today. None of these climates were influenced by humans – we did not exist as species 50 million years ago and we were too few and too weak to influence climate 20.000 years ago. That changed with emergence of agriculture some 10.000 years ago and on much larger scale with discovery of fossil fuels and steam and later internal combustion engines.

The key questions to be answered are how fast the warming will progress, and how high will the temperature go.

Analysis of Antarctic ice cores and other data tell us disturbing fact, that transitions from ice ages to interglacial periods were always extremely fast, initiated by minor changes in Earth's energy intake from the Sun and then self-propelled by powerful positive feedbacks caused by release of CO₂ from warming waters of the world oceans and changing albedo of the Earth surface due to the melting of continental ice sheets. Due to the rapid melting of Laurentide and European ice sheets, sea levels were raising at the speed of 1 meter in 20–25 years over many centuries of rapid warming just some 15.000 years ago. When the great melting stopped and continental ice sheets, except for Antarctic and Greenland, ceased to exist, the sea levels were 110 meters above where they were only few thousand years earlier.

We also know, that when the last time CO₂ concentration in the Earth's atmosphere were at the level of today's concentration – 360 to 400 ppm of CO₂ in Pliocene – sea levels were 25 meters higher than today.

Can the sea levels start to growth by the speeds they did just 15.000 years ago? Can they raise by meters, not inches, over a century? We are not able to exclude such possibility. It happened in the past, it can happen in the future. Arctic sea ice is melting at speeds that were not expected by the best climate change models – summer ice sea coverage decreased by 40% in the first decade of 21st century compare to the ice extend in the very last decades of previous century. A look at the sea ice volume is even more sobering: Arctic Ocean sea volume decreased by staggering 70% at the same time.

It took Roald Amundsen full 3 years to navigate North-Western Passage just 100 years ago. In recent years yachts do it in a matter of few summer weeks. How powerful will be effect of reduced albedo effect from Arctic Ocean largely ice free in the summers of near future remains to be seen. Will Greenland ice sheet remain steady in such condition? Will it start melt and drift to the sea in accelerated rate? It may, but we do not know for sure.

If there is anything International Panel on Climate Change deserves to be criticized, then it is for giving people and world' politician's impression, that ocean levels will raise by approximately 30 to 60 centimeters by 2100. IPCC did poor job in not communicating loud and clear, that this calculation did not include melting of Greenland and Antarctic ice sheets, but considers only thermal expansion of water.

If there is a "Climategate", then this is it!

We can only speculate about consequences of eventual fast melting of Greenland and West Antarctica. Wealthy – as well as not so wealthy – Floridans would lose their sea front condos and the state of Florida may well lose half of its size. But Floridans, even impoverished, will have chance to move elsewhere in the vast territory of the United States. Where will tens of millions of Bangladeshis move? What shall they eat, when their fields are taken by the raising sea? Where will move people from Lagos and Niger Delta in overpopulated Nigeria? Up north – to face their Muslim co-citizen pushed southward by expanding Sahara? Where will move citizen of Cairo and Nile delta, for millennia breadbasket of successive Egypt civilizations? What about people inhabiting number of other coastal megacities and farm lands? Where will they move? What will they eat?

It appears our main strategy for facing these questions is not asking them. Denial may work for a while. It may also fail – and it may fail much faster than we think. Another one is centuries old fate of modern humans in technology and eternal progress. In this case in geo-engineering possibilities. Shall we have resource and energy to apply them at scale that would have influence on climate? And if so, would we have knowledge and wisdom to apply them in a way, which does not make more harm?

My second point today is peak oil. There are many other resource limitations we do or shall face very soon, but oil is fundamental one. Out of humankind's total primary energy sources, oil represents 34%, followed by 25% coal, 21% natural gas, 13% renewable resources – most of which is biomass – and 6.5% nuclear. Oil is crucial not only because of its share of

total, but also because of its convenience, low price, stored form, high energy density – 2 to 6 times higher than coal – and absolutely dominant position in transportation sector, key precondition for our global markets. Oil is also base material for many products of chemical industry, plastics and so on.

Lack or high price of oil at the world market would have very serious economic consequences triggering deep and long recessions. Is there a realistic and imminent threat of oil scarcity and significant price increase? It appears there is.

Oil is a non-renewable resource – we all know there will be a lack of it sometimes in the future. As with climate change, the question is how soon and how deep will its supplies go. As already mentioned, back in 1956 King Hubbert correctly predicted a peak in U.S. oil production for 1970. Later in the 1970s, King Hubbert's suggested peak of global oil production to happen around year 2000. He based his calculations among many other things on the basic fact, that oil companies can only drill oil that they discovered. Given huge investment costs and technical challenges, it usually takes around 40 years from new oil field discovery to its full utilization. New oil discoveries globally peaked in the decade of 1960 and, despite all technological progress, dropped by 80–90% since then. Not a single supergiant oil field was discovered for around 30 years now. It appears King's prediction of peak oil production around year 2000 was almost exact: global oil production reached 85 million barrels per day in 2004 and is keeping around that figure last six years. Not even price nearing 150 USD per barrel in 2008 was sufficient to push production upward. Peak oil theory predicts production will start to decline in the near future and dynamics of the decline will be fast. How fast is a crucial question open to debate. Some recent studies suggest global oil production will drop by 10 million barrels per day by 2015. Sir Richard Branson too expects "oil crunch" by 2015 and predicts it could "leave the world's economy in an even worse state than the credit crunch (of 2008) did".

Spikes in the oil prices contributed to the most of economic recessions over the previous 40 years, and made them worse and longer. Recessions then decreased demand for oil and pushed prices back down. In the post-peak-oil world, oil prices will have only limited space to go down, as illustrated recent years: in 2008 the price went up to almost 150 USD per barrel, then, as a consequence of recession, dropped for a brief moment down to 30 USD, but quickly returned to above 80 USD, where they hang recently, despite sluggish recovery of economy. In other words, despite recession and

very slow growth, current oil prices are 3 times higher that they were just 6 years ago, when global oil production reached its peak at 85 million barrels per day. Triple price, against free market theory, did not lead to increased production.

The future with limited and expensive oil supply may well be repetition of similar cascading patterns: sharp increase in oil prices triggers recession leading to the fall in the price of oil – just to return up again, just one step above the previous level.

Limits to physical production of oil given by geological and investment limitations are only part of the peak oil story and its consequences. While oil companies do not seem to be able to extract more than 85 million barrels of oil per day, oil consumption in oil producing countries is growing fast. Most of the key oil exporting countries are not exactly liberal democracies and subsidized fuel prices are important way for their governments to keep popular support. With subsidized low fuel prices there are no market incentives for saving fuels and domestic oil consumption in oil producing countries is rapidly growing. Would this trend continue alongside with the trend of decreasing oil production, zero barrels of oil could be theoretically available at the world market by 2040. Obviously, oil producing countries may need to import some goods – for instance food. They would be able to buy them by selling oil on global markets, but also by using barter arrangements with partners of their choice.

And then there is one more factor that makes our oil situation even more challenging and urgent. For each unit of oil drilled, processed and delivered to the markets, people need to invest some amount of energy in drilling, processing and transporting oil. Net energy, or energy return on energy invested known as EROEI, is ratio of energy gained and energy invested in the process. 150 years ago, when the first oil was produced in Pennsylvania and Texas, for one barrel of energy invested people got 200 barrels of oil. In 1930 to get 100 barrels of oil, it took 1 barrel of oil energy. In 1970 the ratio had dropped to about 30 : 1. Now that ratio has fallen to about 10 : 1. To get oil from deep offshore location simply is not only extremely expensive in financial term. It is also extremely expensive in energy terms.

All said so far taken into consideration a picture is emerging: a picture of challenge, which may easily shake the grounds of industrial civilization. To put the challenge in perspective, to replace global energy of oil, people would need to build and operate 200 Three Gorges dams, or 2,600 nuclear

power plants, or 5,200 coal plants, or 1,642,500 large wind turbines, or 4,562,500,000 solar panels. Or to combine of all these and add significant increase in energy efficiency across all fields of life and economy. Indeed, theoretically it is possible. But is it really achievable in financial crisis conditions? Shall we have enough mineral resources, such as uranium or rare elements used in modern renewable energy technologies? And is it doable within short time of the next ten – twenty years, before lack of oil suppresses industrial production and trade across the board and globe?

Here we get to the third point key this lecture. Staggering growth of world economy over the last 50 years was fuelled not only by abundant and cheap oil. All around the developed world, with very few exceptions, it was also fuelled by consumption financed by public, business as well as individual debt. All ten largest world economies but one – Chinese – reached public debts of more than 60% of their GDP and public expenditures deficits in many reached record levels in the most recent years. Total debt of the United States of America during the Great Depression of 1930-ies reached 255% of the GDP. In 2009 it reached 350% of the GDP and continues to increase fast. Such debt cannot be sustained on a long term – it cannot continue to grow much longer and, very likely, will never be paid back to creditors. American Federal Reserve Bank continues to “print money” and do quantitative easing. As long as there are countries willing to sell their real goods – oil, raw materials and consumer products – in exchange for U.S. government obligations and notes, the system continues to work. But only as long as they are willing to attribute value to printed paper.

There is no painless way out of these debts. Obvious way for governments to get out of debts is to dilute them in inflation. But the social cost of inflation is high as with the value of government debt, also value of people’s savings – say their retirement plans - go quickly down. Moreover, at some point some exporters of the real goods inevitably discover that “emperor is naked” and the trust to US dollar as global reserve currency may abruptly disappear. Unfortunately that may happen to any other major fiat currency.

Our globalized interconnected economy cannot work without oil. And it cannot work without massive financial flows. The system is enormously complex with too many fragile points in long and curvy supply and value chains. This extreme and growing complexity makes global economy extremely vulnerable. Instability of a major currency or failures of major banks to provide credit are among vulnerabilities that can knock it out easily and fast. As Joseph Tainter’s work illustrate, complexity of societies

– alongside with resource depletion, climate changes and other factors – played important role in collapses of many civilizations in the past. Our civilization is not inherently immune to such risk – one could argue, that our extreme level of complexity makes us actually extremely vulnerable.

While fast economic growth over the previous half a century led to improvements in quality of life of many people, it was also accompanied with widespread social polarization. In the United States of America, 1% of the richest owned 34% of all wealth in 2007. Top 10% owned 72% of wealth. On the other side of deep social divide are bottom 50% of U.S. population owning 2.5% of the wealth. Top 1% of Americans and bottom 50% live in very different and rather separated worlds. How politically stable can be democracy based on such sharp social divides? How much more social polarization it can sustain, if continual and deepening economic crisis and population aging pushes more and more youth, working age people and pensioners from perceived middle class to the poverty and underclass?

Many people are reasonably aware of extreme and deep poverty persisting in developing and transforming countries, including whole of Africa and population giants such as India, China, Bangladesh, Pakistan, Mexico and others. While some of them went through fast GDP and GDP per capita growth over the last two decades, this growth in many was accompanied by growing social polarization. While Indians, Chinese, Mexicans, Brazilians, Russians and other developing and transforming countries nationals are now among the richest billionaires of the world, hundreds of millions of their citizen are barely surviving (and many dying of hunger, cold or violence). Gini index statistics across the world show, that the lowest social inequality is maintained across European Union, in Canada and Australia. In some of the European countries income inequality was actually decreasing over the last two decades. However, in BRICs countries as well as in the USA, income inequality is actually growing despite the economic growth. This does not seem to be conducive to development and strengthening liberal democracies in them.

We would have better chance to weather all the crisis mentioned earlier would they be upon us separately. Unfortunately, they all will hit our civilization at approximately the same time. John Beddington, chief scientific advisor to the British government, described in 2008 confluence of the key climatic, energy, natural resources, population and financial and economic trends as “the perfect storm”. He situated the perfect storm to the year 2030.

May it be in 2015? 2020? And, more importantly, can we prevent it, or reduced its potentially devastating consequences on our societies?

Fundamental preconditions for rational response to these threats – and for sustainable development, or at least “sustainable retreat” articulated by John Lovelock are following:

1. broad awareness about their existence and severity;
2. political will to address them;
3. appropriate institutional mechanisms at global, continental, national & local levels;
4. available technologies & social tools/policies.

Where is humankind with all these preconditions today, in 2010? Popular awareness is very limited. One does not need to go to American Red States to see, that most of the voters in all democracies live in the state of innocent ignorance or denial, breeding continuation of the business as usual. As flagrantly described by author John Greer, even where basic awareness does exist, collective psyche is dominated by two key myths: myth of progress and myth of apocalypse – both of them are in their effect immobilizing.

Without strong public demand, be it from ignorance, or from unfunded believes in myths, politicians have no incentives to act. Moreover, our four or five years election cycle do not provide politicians with proper frame for responding to events and crisis that lurk behind the horizon – or appear to be far in future. Financial, economic, and jobs crisis does not help too. Lester Brown’s “Plan B” inspired by Franklin Delano Roosevelt’s response to Pearl Harbor attack – American all out mobilization of 1942 – is therefore very unlikely to happen. As the nature’s dominant predators, people are wired to respond to the fast threats coming from other people. We are just not good in responding to slow and abstract threats without human face.

To make things worse, we also miss sufficient global mechanisms to respond to global threats. Recent failure at the Copenhagen conference on climate change illustrates this weakness beyond any doubt. Copenhagen can well be described as a tragedy of global commons in direct TV broadcast, although it hardly attracted even a split of attention given by people to Olympic Games or soccer championship. It does not come as a surprise at all then, that, as Jeffrey Sachs wrote recently: “Every major goal that international bodies have established for global environmental policy as of 2010 has been postponed, ignored or defeated”. And there are crucial challenges, which

were not yet even recognized and critical goals, which were not yet defined by international bodies.

Not only global mechanisms are weak and insufficient, the same is true about regional as well. Even the European Union, the very best continental structure planet has, is dominated by perceived national interests of member states and their blocks, with decisions being the lowest common denominator and result of political horse trading.

This leaves humankind with the national and local institutions, mostly relevant only for adaptation, not mitigation of the trends. Governments of Sweden or Canada or Tanzania can do a lot to help their people to adapt to low energy future or climate change, but have no power to mitigate them. Not even governments in Brussels, Washington or Beijing have individually power and resources for mitigation, even would they have necessary political will and, in case of democracies, consensus of majorities.

Do we have at least technologies that could put us on trajectory needed to avoid the perfect storm we are heading towards right now? Many technologies and political tools do indeed exist, but unfortunately they seem to be quite unlikely applied at needed global scale and in time.

Starting with climate change challenge, global CO₂ taxation and/or phasing out coal extraction and burning as proposed by James Hansen, could dramatically and in short time reduce our CO₂ emissions and slow down warming, although probably not to reverse it. 390 ppm of CO₂ already in the atmosphere will remain there for many decades – we shall harvest, what we planted by burning in two hundred years fossil fuels accumulated over hundreds of millions years. Yet, we can argue, that 3 degrees Celsius warmer planet is better option, than planet warmer 4, 5, or 6 degrees. Tools are here - what is missing is political will to use them.

Another suitable political tool could be shortening work hours and thus reducing economic activity and eventually our consumption of energy and materials. Already today, Europeans work much shorter hours than people in the United States of America, without any negative influence on their standards of living and quality of life. The difference is staggering 500 hours per year between average American working 1800 hours per year and average Swedish or Dutch, working around 1300 hours. Germans and French work less than 1400 hours per year, or, if you please, annually 50 days less. Those who believe average Germans or French have worse lives than average Americans just need to travel a bit in both continents. Four

day work week is quite common arrangement in France and New Economy Foundation suggests 21 hour workweek. Does it sound like too extravagant to your ears? Well - really extravagant may be idea of people working only 15 hours a week. This does not come from a hippie, but from John Maynard Keynes himself – he predicted such work time at the beginning of 21st century back in 1930. Obviously, Keynes calculated only what people really need for a good quality life, not all the gadgets businesses need us to buy and consume today.

Let us look at technologies as those are more likely to be promoted as solution by business lobbies and politicians and better accepted by populations. There is enormous energy saving potential in all sectors of economy and life in all major energy consuming countries. There is almost endless list of technological solutions. It does not make much sense to list them here, so just three examples. Upgrading all residential buildings in Europe to at least low energy standards (and better to passive house standards), could save up to one third of total energy consumption in Europe. No technological breakthroughs needed, no special materials, just common mineral wool (or cellulose wool, or sheep wool), energy efficient triple glass windows and few other features. Again, all what is needed is political will to enforce such standards, and money – which is where financial crisis comes as a major hurdle.

Another technology with great promise to address both energy security and climate change are solar and wind energy. Grandiose ideas such as European DESERTEC or American Grand Solar Plan do exist and calculations clearly show, that amount of solar energy in Sahara desert or South-West of the United States, if transformed into electricity, could easily supply with electricity whole EU or USA. There exist seemingly credible plans suggesting that even Germany, much less endowed by renewable energy resources than United States or Saharan countries, could be fully powered by renewable energy, wind and solar in particular, by 2050. There are just few preconditions to be met for these plans to become reality: political will, massive financial resources to invest not only to solar or wind farms, but also to long distance electricity grids and massive energy storage, and availability of large amounts of rare materials used in photovoltaic cells as well as modern large wind turbines. It could work. But will it at necessary scale and speed to compensate for decrease in oil and reduce greenhouse gas emissions?

And then there is unfulfilled if not controversial promise of nuclear energy. Both James Hansen and James Lovelock mentioned earlier believe nuclear energy is the best possible option we may have to deal with dual threat of climate change and energy scarcity. While Lovelock reminds us, that nuclear energy is proven, safe and reliable source of energy, his opponents and big part of public have doubts about nuclear reactors safety, cost of nuclear energy, limited supply of uranium to fuel expansion of nuclear energy and unsolved issue of nuclear waste. Hansen's answer to some of these concerns are fast breeder reactors. However only very few of them operate in France, Russia and Japan, while two new Russian fast breeders are to be built in China. There are open questions about reliability of this technology, in particular related to materials able to withhold corrosive effects of liquid sodium used in fast breeders. The cost matters too. And while spent nuclear fuel burned by classical reactors contains impressively huge amount of unspent energy that can be utilized by fast breeders, plutonium at the end of process presents formidable challenge and nuclear proliferation risk.

With all political, social, economic and technological challenges to ride safely through the “perfect storm” ahead of industrial civilization, its gradual decline and serial collapse may appears more likely than convenient and painless “sustainable development” as understood by media and general population. Too many favorable preconditions have to be meet and to many possible tipping points avoided by overly complex human society in order to avoid very rough and possibly catastrophic developments in the next few decades. Recent peak oil study prepared for German military describes the possible worst case scenario in these words: “Investment will decline and debt service will be challenged, leading to a crash in financial markets, accompanied by a loss of trust in currencies and a break-up of value and supply chains – because trade is no longer possible. This would in turn lead to the collapse of economies, mass unemployment, government defaults and infrastructure breakdowns, ultimately followed by famines and total system collapse.” Yet, this study did not even take in consideration influence of global warming and possibility of abrupt climate change.

In his famous equation Paul Ehrlich suggest that:

$$I(\text{mpact}) = P(\text{opulation}) \cdot A(\text{ffluence}) \cdot T(\text{echnology})$$

It is quite likely, that as a consequences of discussed global trends, global population stops growing and will start to decrease before 2025, probably at the peak below 7.5 billion people. Consumption will decrease too as

a consequence of scarcity of oil, other mineral resources, water and food. Still, the way of decline of our civilization may vary vastly as there is huge practical difference between managed “sustainable” retreat and chaotic, violent collapse.

We also need to remember, that remaining available technologies will retain very high destructive potential for people as well as for environment. As human species we started to change Earth climate with bronze axes, fire and first agriculture more than five thousand years ago long before oil, coal and uranium. That means one important thing: regardless how challenging our future is going to be, policies we choose to apply will remain critically important. Jared Diamond’s “Collapse” as well as many other books are full of examples to illustrate this statement.

With all the gloom of this lecture, which is just screaming to be denied, the really fundamental existential question is the one, which is not anthropocentric only: Did we, at 390 ppm of CO₂, crossed tipping point unleashing positive feedbacks leading towards “runaway syndrome” described by James Hansen – that means Earth with atmosphere not conducive to life of larger mammals or advanced forms of life as such – or did we not? And if not – as we all hope for – how far we are from such point and how much time do we have to avoid getting there?

THE FOUR INVISIBLE HORSEMEN OF THE APOCALYPSE AND POETIC THOUGHT

(Long-Term Issues Behind the “Global Problematique”)

Andrew Oerke

The four visible horsemen of the apocalypse are as busy as ever. The environmental degradation of the planet and the pressure of population and technology on its resources are luring them in. Many are devoting their lives to try to stop them.

But who among us is trying to stop the Four Invisible Horsemen of the Apocalypse, any one of which could obliterate the entire species? No one pays attention to them because they are not only invisible, they are nameless. Though nameless, the four invisible horsemen can be described.

Horseman Number One.

Problem: In *The Adventure of Ideas* the English philosopher Alfred North Whitehead talks about the assumptions that are so basic to a culture, they are unrecognized. He maintains that it is the faulty, unrecognized factors that can destroy a culture precisely because they are invisible so cannot be dealt with. It may be that no civilization has understood its deepest assumptions well enough to be able to self-correct and ward off collapse. What if certain types of cultural organization themselves, expressed in ever more rigid bureaucracies, were fatal flaws. What if our reliance on rational, quantitative, linear thought might vitiate a society whose cohesion is based largely on values that inspire individuals to be willing to sacrifice personal rewards for the common good? What if the organizational principles that create what we call civilized society are principles that are time-sensitive like living bodies and are doomed to grow and die? And what might all this have to do with authority, autocracy, democracy, etc.

The problem posed by Whitehead's insight is that before the computer, such unrecognized assumptions, if they were fatal, could be delayed or even "mutated" because of human error and inconsistency. As Emerson remarked, "A foolish consistency is the hobgoblin of little minds." With the computer we no longer have the luxury of making fortunate mistakes, or of delaying the inevitable. If we have fatally flawed but unrecognized assumptions, and they are fed into the computer, the computer will be relentless, remorseless and extremely fast. Worse, we almost always uncritically believe what it spits out is fact.

Remedy: "Out of the box" has become such a cliché that this critical insight has now crawled into the box and shut the lid on itself. People must be educated at all levels, especially at the upper intellectual levels, to see how deep and powerfully systemic a paradigm can be. A paradigm usually has wide social assent, making it almost impossible to recognize. Nor do we want to see it, because we live by it. We must learn to question everything radically, not to tear it down, but to understand it and to improve it or replace it with something better. Creative writing ought to be required by every curriculum in institutions of higher education. Poetic thinking and creativity, whether in language, music, art, architecture, science or management, requires that every sentence, every measure, every inch, every stratagem be discovered or created out of the box. Otherwise the poem degenerates into verse; the painting becomes a pale pastiche, etc. If the human spirit becomes enslaved by the computer, it will be because we have unwittingly enslaved ourselves, and the entire species may disappear from the Earth with not a bang but a whimper. None of the four visible horsemen of the apocalypse – War, Plague, Pestilence and Famine – horrible as they are, would necessarily mean the extinction of the species. Any one of the four invisible horsemen of the apocalypse could, and probably would, wipe out the entire of humanity. We must radically re-think the basic assumptions that have created what we call "civilization" itself, or figure out how it can perpetually renew and re-create itself.

Horsemen Number Two

Problem: In *A Study of History*, the great English historian Arnold Toynbee explores the history of history; that is, the history of civilization. He identifies a number of cultures and describes their rise and fall through the "mechanism" of challenge and response. The civilizations he studies,

that have been on Earth for just a blink in the eye of Time as measured by millennia, seem to exhibit a birth, growth, and death phase, in other words a morphology. Near the end of his life, during a lecture in the States, he dropped a line that is still ringing in this writer's ears: "Of course, now there is only Western technological civilization." He did not mean that there were no other competing or vestigial or marginal civilizations, he meant that Western technological civilization was overwhelming all the others. After working in nearly one hundred countries and having visited eighty others, this writer would find it hard to dispute him. Technology is becoming so powerful it is absorbing everything in its way.

The problem is, if we are going to be left with only one civilization, and all civilizations are morphological, that is, it is in the nature of a civilization to die; then the whole human species may lose its motive force. Again, on the rump of this horseman's steed is stamped the word: Technology, powerfully irresistible, and moving at the speed of light. In the past, if one civilization fell, there were others to take its place.

Remedy: In this case, the first response must be to honor, respect and save as much as possible of the competing, variant, vestigial and marginal cultures and languages as possible. Each different culture or language may contain the germ of an idea or a structure that could re-invigorate, re-invent and indeed save the dominant Western technological culture. This remedy-response is already unconsciously being pursued by anthropologists, archeologists and museums. It must be pursued more vigorously, and we must be more conscious of how and why we pursue it. Everything may be at stake.

Second, again it is an issue of how to think outside and beyond the paradigm in which one finds oneself. "Civilization" itself is a paradigm that few as yet have been able to step outside of to view it for what it is. It must be looked at as not just an interesting subject of study for specialists, but as a huge, deep, complicated system of ideas, values and attributes that shape what we are, in a decisive manner. If we cannot see what we are, we are unlikely to be able to control the forces that drive us, that make us what we are.

Third, we must do everything we can do to encourage creativity. Creativity may be the one thing that could empower us to modify or mutate our forms of organization and governance in such a way that we could move from a social form that is doomed to wear out, to one that can re-invent and renew itself indefinitely. There are many ways in which we can do this, so

many ways there is no need to go into them in detail here. Above all, it is a profound commitment to social creativity that is needed.

Horseman Number Three

Problem: Horseman number three does have a name, sort of. His name is “Language,” though that name is misleading. The name should really be: a restrictive understanding of language.

Language like civilization has been around for just a brief moment in the long life of the planet. Why should we think it has evolved to be a complete instrument that accurately describes and communicates what we refer to as “reality.” The only major evolutionary shift or mutation in the development of language that we know a lot about occurred in England, starting after 1066, and lasting for several hundred years. When the Normans conquered England, which was then controlled by a Norwegian king, the Normans who had been Vikings a few centuries before they settled in Normandy, outlawed “English” and relied on French for the court and governance, and Latin for Church and its affairs. The peasants kept on speaking English anyway, and with no grammarians or teachers to enforce standards, the peasants changed the highly inflected Germanic language of Anglo Saxon into what we call Old English, which is based on syntax, in other words, word order: subject-verb-object. This amazing simplification has made English easy to learn and use, and flexible in its ability to borrow from other languages, the latter facility making its orthography somewhat puzzling. George Bernard Shaw famously and plausibly spelled fish “goti.” Now, however, we will not see language evolve much further than its present stage. For one thing, the major languages have been restricted and controlled in a number of ways, by teachers and grammarians, by large institutions, and by the mass media that needs standardized communications. Slang and neologisms continue to refresh language but the basic structure of languages is not likely to evolve further in the context of widespread institutional standardization.

The second factor mitigating against the further evolution of language is the devastating rate of extinction of existing languages. When European first came to the Western Hemisphere there were two thousand some languages in use. Now there are only six hundred. This alarming extinction of languages is proceeding apace all over the globe. It is alarming because each language is a cognitive window on reality and could contain a secret that might be a crucial piece of knowledge we will never be able to recover.

The greatest danger inherent in our use of language comes from Western civilization’s almost exclusive reliance on rational language embodied in what we call “reason” and “logic”. Before Plato, the poetic use of language was as important, if not more important, than the rational use of language. Of course, both aspects of language are important, but Western technological culture has heavily emphasized reason and logic, and has relegated the poetic use of language to such a minor role it barely survives at all. This comes at a time when many serious people worry about the disintegration of values in society, or the increasing need to revive value systems in a technological construct that by its very nature is value-neutral or indeed value-empty.

When one considers that all the values that have been able to give civilizations cohesion came through the medium of poetry, it gives one pause (poetry being the code name for creative thought, action and expression). Buddha, Lao Tzu, Confucius, Zoroaster, Moses, David, Jesus, Mohammed, the writers of the sacred Hindu texts, etc. all delivered their messages in poetic form. This is no accident. The great cohesive and inspirational values that have come from these poets include the cohesive concepts of goodness, truth, and beauty, love, compassion, mercy, and equality, among others. These insights came out of poetry because poetry has greater resources than prose. In addition to its prosaic and logical function, poetry uses high-frequency sound, rhythm, imagery, symbolism, and extra-logical strategies such as paradox, asymmetrical combinations, synesthesia, etc. to access and deliver insights and knowledge in a manner that speaks penetratingly and memorably to the heart as well as the mind. In this sense, poetry is ideas that have been authenticated by emotion and justified by experience. It is language transcending itself.

Poetry is also highly participatory and democratic. It packages its knowledge in a space that must be entered into by the reader or listener. It comes in a proverb (the poor man’s poem), a parable, a story or koan that makes one think outside the box.

And poetry compresses. As Hemingway, who wrote prose like poetry, put it: “I compress and compress until I get an explosion.” Perhaps the greatest poem of the 20th century was Einstein’s $E = mc^2$. This short poem took a vast complexity and reduced it to a great simplicity. It could see the not-complex in the complex.

More than anything else, we are what we say. If we arrive at the point where we can no longer use language creatively, using all its resources to

inspire a belief in values that spontaneously, rather than forcibly, engender social cohesion, the species may well lose not only its poetry but its reason for living, reason by itself may not be a sufficient “reason” for sustaining a culture.

A descriptive consistency may not be sufficient to sustain humanity at this complex stage in our evolution.

Horseman Number Four

Problem. You can call it the Id, Survival of the Fittest, or Original Sin, there is something deep in our DNA that is combative and aggressive as well as cooperative. When we were clubbing, stabbing, and shooting each other one at a time, it was tragic but not catastrophic. Again, the brand on the horse’s behind says technology. Technology has so increased the power of the instruments of aggression, they are now capable of destroying not just individuals but whole nations and races. We have survived for millennia by being the fittest through aggression. Aggression is deep in our genes, so how to change the DNA in the few years we have left before we blow huge chunks of each other to smithereens?

Remedy: Of course we cannot re-design our DNA in a few years or even in the scope of generations. But we have two possible remedies. One is not social engineering, which has largely failed, but psychic engineering. The second remedy brings us back again to creativity and creative expression, that has the power to penetrate paradigms and transform behavior.

One, psychic engineering. Just as we engineer natural physical forces, we could do the same with our psychic energy. We transform floods through the use of dams into irrigation for agriculture. The killing power of plasma, as in lightning, we have learned to channel into safe and useful electricity.

In this respect, athletics shows the way. It gives a constructive outlet for aggression and channels it into team play and cooperation, healthful exercise, physical and mental control and discipline, and the ability to win or lose with grace and courtesy.

What we need is a great deal more competition for the things we need to survive our present crises. The Nobel Prize for Peace is an example of what could be done. We need thousands of such prizes: for conflict resolution, for environmental breakthroughs and programs for poverty alleviation, for creativity of all sorts, and especially for civilized discourse that will take

the hatred out of politics. We need to "trick" ourselves into channeling our aggressive tendencies into our cooperative impulses. We should saturate our institutions, educational, corporate and governmental, with opportunities for people and governments to compete against each other for goals that will benefit the common weal. Private foundations are in a perfect position to initiate a campaign of constructive competition for the common goals of humanity, and to publicize the competition in a non-manipulative format. This would be especially effective in the fields of environmental work, conflict resolution, and poverty alleviation. We also need to admit that what has been embedded in our genes for millennia is not going to change readily. One only has to look at the aggression and acrimony that dominate political discourse all over the globe. While claiming to be saving the planet, most voices are busy blaming everybody but themselves. We do this even though this is not the kind of strategy that creates the cooperation that we claim to be fostering.

Two: There is something deep inside us that needs to change, and we must look at the strategies that have been successful at creating radical change in individuals. This needs to be a look unprejudiced by existing paradigms. It is clear there are many techniques and programs that are able to make profound changes in the psyche. These include systems and techniques employed by the military, by governments, by the media, by cults, institutions and religions. The problem with these techniques is they can cut both ways. They can transform and enlighten, but they can also be used for brainwashing. Again this writer returns to what may be the small shrew-like mammal that survived while the largely "successful" dinosaur failed.

That small mammal is poetry, not verse as such, but poetic thinking and acting. Poetic expression is a transformational technique that is not invasive. It is penetrating, powerful, and memorable, but it is also democratically participatory. It presents ideas, emotions and paradigms but only in the sense in which the listener has to deeply engage and is free to accept or reject the offering. In this sense poetic speech respects the freedom of choice on the part of the listener. As with any other technique, it can be abused. It does, however, require one thing that cannot be abused: that both speaker and listener, both writer and reader, think outside the box and must communicate at the deepest levels. More than anything else, these are the qualities we need. We can no longer apply linear thought to solve non-linear problems.

The remedies we have discussed will require first of all recognition of the above-mentioned dangers and of the remedies for solving them. When we spend trillions on technology and not enough on books of poetry to support even one poet, we can reckon that it will require a sea-change in our value systems. The problem with these invisible but deadly “riders in the sky” is that we may not be able to see them until we are desperate. By then it may be too late.

One World – One Future?

GLOBAL CHALLENGES WE FACE IN 21ST CENTURY

Jerome C. Glenn

Although the future has been getting better for most of the world over the past 20 years, the global recession has lowered the State of the Future Index (see Infobox 2) for the next 10 years. Half the world appears vulnerable to social instability and violence due to increasing and potentially prolonged unemployment from the recession as well as several longer-term issues: decreasing water, food, and energy supplies per person; the cumulative effects of climate change; and increasing migrations due to political, environmental, and economic conditions.

After 13 years of the Millennium Project's global futures research, it is increasingly clear that the world has the resources to address its challenges.

Infobox 1: 15 Principal Global Challenges according to Millennium Project

1. How can sustainable development be achieved for all while addressing global climate change?
2. How can everyone have sufficient clean water without conflict?
3. How can population growth and resources be brought into balance?
4. How can genuine democracy emerge from authoritarian regimes?
5. How can policymaking be made more sensitive to global long-term perspectives?
6. How can the global convergence of information and communications technologies work for everyone?
7. How can ethical market economies be encouraged to help reduce gap between rich and poor?
8. How can the threat of new and reemerging diseases and immune microorganisms be reduced?
9. How can the capacity to decide be improved as the nature of work and institutions change?
10. How can shared values and new security strategies reduce ethnic conflicts, terrorism, and the use of weapons of mass destruction?

11. How can the changing status of women help improve the human condition?
12. How can transnational organized crime networks be stopped from becoming more powerful and sophisticated global enterprises?
13. How can growing energy demands be met safely and efficiently?
14. How can scientific and technological breakthroughs be accelerated to improve the human condition?
15. How can ethical considerations become more routinely incorporated into global decisions?

According to the IMF, the World Bank, and OECD, the world economy should begin to grow again, but at a slower pace than during the past several years. If it is true that more complex systems tend to be more resilient than less complex ones, and that the world has increased in complexity since the Great Depression, the ability for the global economy to recover should be better today than in the past.

Meanwhile, the vast majority of the world is living in peace, conflicts actually decreased over the past decade, cross-cultural dialogues are flourishing, and intra-state conflicts are increasingly being settled by international interventions. By mid-2009 there were 15 conflicts with 1,000 or more deaths per year—one more than in 2008. These occurred in Africa (4), Asia (4), the Americas (2), and the Middle East (4), with 1 conflict classified as worldwide anti-extremism. A pending unknown is whether Iran and North Korea will trigger a nuclear arms race. Another more distant specter, but possibly even a greater threat, is that of single individuals acting alone to create and deploy weapons of mass destruction, such as new diseases for biological weapons or super viruses to bring down the Internet.

The world spends over 1.5 trillion USD on the military; the largest spender is the U.S., followed by China and France. SIPRI estimated that some 8,100 nuclear warheads are operational in the U.S., Russia, China, the United Kingdom, France, India, Pakistan, and Israel. This is down from 20,000 in 2002 and 65,000 in 1985. Although the number of nuclear weapons is 300 fewer today than a year earlier, around 2,000 of them were still “on high alert” – ready to be launched within minutes.

The International Atomic Energy Agency reports that between 1993 and the end of 2009, the Illicit Trafficking Database recorded 1,784 nuclear trafficking incidents (222 during 2009). There are approximately 1,700 tons of highly enriched uranium, and 500 tons of separated plutonium that could produce nuclear weapons, all needing continued protection.

In the meantime, the world is beginning to wake up to the enormity of the threat of transnational organized crime. The UN Office on Drugs and Crime has called on all states to develop coherent national strategies to counter international organized crime as a whole. Transnational organized crime continues to expand in the absence of a comprehensive, integrated global counter-strategy. Its global income is estimated to be about \$3 trillion, which is twice all the military budgets of the world combined.

Best estimates for counterfeiting and intellectual property piracy is about 300 billion to 1 trillion USD, global drug trade is 386 billion USD, trade in environmental goods is 63 billion USD, human trafficking and prostitution is 141 billion USD, and weapons trade is 12 billion USD. These figures do not include extortion or organized crime's part of the 1 trillion USD in bribes that the World Bank estimates is paid annually or its part of the the estimated 1.5–6.5 trillion USD in laundered money.

Freedom House's 2009 survey found that democracy and freedom have declined for the third year in a row, and press freedoms declined for the seventh year in a row. It estimates that only 17% of the world's population lives in 70 countries with a free press, while 42% lives in 64 countries that have no free press. The number of countries rated "free" declined by one from the previous year's survey. Nevertheless, over the past three decades democracy grew rapidly: countries rated "free" increased from 47 to 89 (representing 46% of the world's population); those "partly free" increased from 56 to 62; and those "not free" decreased from 55 to 42 (representing 34% of world's population).

Water tables are falling on every continent; 1 in 10 of the world's major rivers fails to reach the sea for part of each year; agricultural land is becoming brackish; and urbanization is increasing water demands on aging water infrastructures. Since 1990, an additional 1.3 billion people gained access to improved drinking water and 500 million got better sanitation, yet 900 million still lack clean water and 2.6 billion lack adequate sanitation. Half the world's population lives in countries where aquifers are being depleted faster than they can be replenished. The majority of fresh water is used by agriculture, and most of that is used for livestock production. We could increase vegetarian diets and grow pure meat, rather than growing and killing animals to reduce water drain. According to FAO, raising animals for meat emits about 18% of all greenhouse gas emissions, which is more than produced by all the cars in the world. FAO also estimates that water

for agriculture needs to increase 60% to feed an additional 2 billion people by 2030.

Some 90% of developing countries' wastewater is discharged untreated directly into rivers, lakes, or oceans, contributing to the rapid expansion of deoxygenated dead zones. Diarrheal disease (children under 15) has a greater impact than HIV, malaria, and tuberculosis combined.

Although government and business leaders are beginning to respond more seriously to the global environmental situation, it continues to get worse. Each day, the oceans absorb 30 million tons of CO₂, increasing their acidity. The number of dead zones—areas with too little oxygen to support life—has doubled every decade since the 1960s. The oceans are warming about 50% faster than the IPCC reported in 2007. The amount of ice flowing out of Greenland during the summer of 2008 was nearly three times more than that lost during the previous year. Arctic summer ice could be gone by 2030, as could many of the major Himalayan, European, and Andean glaciers. Over 36 million hectares of primary forest are lost every year. Human consumption is 30% larger than nature's capacity to regenerate, and demand on the planet has more than doubled over the past 45 years. This growth continues as, for example, more cars are expected to be produced in China in 2009 than in the U.S. or Japan.

Politicians are arguing that a ceiling of 450 ppm CO₂ is the best agreement possible, but our atmosphere has 390 ppm of CO₂ now, and glaciers are already melting, polar caps are thinning, insects are migrating, disease patterns have been altering, and temperatures have been rising. We should reduce atmospheric CO₂ to 350 ppm to avoid hitting a point of no return for global warming.

Climate change could be accelerated by dangerous feedbacks:

- Melting ice and snow on tundra reflects less light and absorbs more heat, releasing more methane, increasing global warming, and melting more tundra.
- Warming oceans release methane hydrates from the seabed to the air, warming the atmosphere, melting more ice and warming the water, and releasing more methane hydrates.
- The use of methane hydrates or otherwise disturbing deeper sea beds releases more methane into the atmosphere and accelerates global warming.
- Antarctic melting reflects less light, absorbs more heat, and increases melting.

Scientific and technological progress continues to accelerate. IBM has promised a computer at 20,000 trillion calculations per second by 2011, which is estimated to be the speed of the human brain. Genetic code is being written to create new life forms such as plants that emit hydrogen instead of oxygen. Synthetic chromosomes have been created from laboratory chemicals. Nanomedicine may one day rebuild damaged cells atom-by-atom, and nanotech robots moving through arteries may destroy plaque, pathogens, and cancer. Just as the world was surprised by the impact of the Internet, so too the world may well be surprised by the coming impacts of nano-synthetic biology in prolonging life. Even though the global economy is slowing, global R&D for 2009 is expected to be 3.2% higher than last year. Yet the risks from acceleration and globalization of S&T are enormous. We need a global collective intelligence system to track S&T advances, forecast consequences, and document a range of views so that politicians and the public can understand the potential consequences of new S&T and have antidotes prepared in advance for highly negative impacts despite their low probability.

World energy demand could nearly double by 2030, with China and India accounting for over half of the increase. China uses more coal than the U.S., EU, and Japan combined. Without major policy and technological changes, fossil fuels will meet 80% of primary energy demand by 2030. If so, then large-scale carbon capture, storage, and/or reuse should become a top priority to reduce global climate change. For the first time, during 2008 the majority of the increase in U.S. and EU electrical production came from renewable sources instead of fossil or nuclear sources. New investment in renewable energy reached \$120 billion in 2008, up 16% over the previous year despite the credit crunch. Japan claimed it will have a solar power satellite system wirelessly transmitting energy to its electric grids on Earth by 2030.

Exxon has invested 600 million USD in biofuel production from algae. The total global renewable energy investment for 2010 is estimated at 200 billion USD, up nearly 50% from 2009, and is expected to continue to increase.

In March 2009 an asteroid missed Earth by 77,000 kilometers, 80% closer to the planet than our moon is. If it had hit Earth, it would have wiped out all life on 800 square kilometers. No one knew it was coming. The time between its discovery and close approach was very short. Few people knew the global financial crisis was coming; fewer still forecast its breadth and depth. We need global, national, and local systems for resilience—the capacities

to anticipate, respond, and recover from disasters while identifying future technological and social innovations and opportunities. The acceleration of change reduces the time from recognizing the need to make a decision to completing all the steps to make the right decision. The number and intricacy of choices seem to be growing beyond leaders' abilities to analyze and make decisions. For example, do we have the right to clone ourselves, or to rewrite genetic codes to create thousands of new life forms, or to genetically change ourselves and future generations into new species? Some experts speculate that the world is heading for a "singularity"—a time in which technological change is so fast and significant that we today are incapable of conceiving what life might be like beyond the year 2025.

We are the first generation to act via Internet with like-minded individuals around the world. We have the ability to connect the right ideas to resources and people to help address global and local challenges. This is a unique time in human history. Mobile phones, the Internet, international trade, language translation, and jet planes are giving birth to an interdependent humanity that can create and implement global strategies to improve the prospects for humanity.

Nearly 30% of humanity is connected to the Internet. There are more people using the Internet in China than the total population of the U.S. Mobile phones are becoming handheld computers.

With an increasingly educated world and the majority of humanity connected to the Internet over the next 20 years, new forms of political power may emerge, growing beyond the control of traditional hierarchical structures.

Over 40 million tons of e-waste is added to the environment every year from phones, printers, televisions, computers, radios, etc., polluting groundwater. This is expected to dramatically increase as the information economy grows around the world.

The world's population is 7 billion. It is expected to grow to 9.2 billion by 2050, but it could shrink by 2100, creating a world with many elderly people. Nearly all the population increases will be in developing countries; hence, today's first world will be tomorrow's elderly world. Today, 18 countries have falling populations, which could increase to 44 countries by 2050. The vast majority of them will be in Europe. Scientific and medical breakthroughs over the next 50 years are likely to change these forecasts, giving people longer and more productive lives than most would believe possible today.

Meanwhile, nearly a billion people are undernourished, lack safe water, and have the highest birth rates. Without substantial policy and technological changes, there could be 3 billion people by 2025 without adequate water due to climate change, population growth, and increasing demand for water per capita. The implications for migration and conflict are enormous.

Infectious diseases are the second leading cause of death worldwide. About half the people in the world are at risk of several endemic diseases. More than 42 million people are living with HIV/AIDS, and 74% of these infected people live in sub-Saharan Africa. For the first time in 40 years, WHO declared a pandemic: the H1N1 influenza (swine flu) rapidly infected 60,000 people in nearly half the countries of the world, resulting in 263 deaths between April and June 2009. Over the past 40 years, 39 new infectious diseases have been discovered. In the last five years, more than 1,100 epidemics have been verified, and we face 20 drug-resistant “superbugs,” including deadly skin infections (MRSA). Old diseases have reappeared. Massive urbanization, increased encroachment on animal territory, and concentrated livestock production could trigger new pandemics. Climate change is altering insect and disease patterns. New kinds of diseases may accidentally come from future synthetic biology laboratories unless new international regulations for laboratories are created and enforced.

Major development assistance grew to \$119.8 billion in 2008. The worldwide trend of poverty reduction continues, but at a slower rate due to the global recession and higher food, fuel, and commodity prices. Although remittance flows to poorer countries have more than doubled since 2002, they are likely to fall substantially in 2010. About 1 billion people live on just \$1.25 a day. As humanity and its technology become a continuum, simultaneous knowing or just-in-time knowledge seems inevitable, making more people in the knowledge-oriented world more successful.

Women have been making slow but steady increases in political and economic decision making around the world. The ratio of women in national parliaments has increased from 13.8% in 2000 to 18.4% in 2009. Women account for over 40% of the world’s workforce but earn less than 25% of the wages and own only 1% of the assets. WHO reports that after diseases and hunger, violence against women is the greatest cause of death among women.

Men attacking women is the largest war today, as measured by death and casualties per year. About one third of women suffer gender-based violence

during their lives, and one in five have been a victim of rape or attempted rape, especially during armed conflicts. About 2.5 million people from 127 different countries are being trafficked around the world, out of which approximately 70% are women and girls and up to 50% are minors.

Progress in more ethical decisionmaking may also have been making slow but steady progress. Over 5,000 businesses in 130 countries have joined the UN's Global Compact to use global ethics in decisionmaking. The International Criminal Court has successfully tried political leaders. News media, blogs, mobile phone cameras, ethics commissions, and NGOs are increasingly exposing unethical decisions and corrupt practices. Corporate social responsibility programs, ethical marketing, and social investing are increasing. Global ethics also are emerging around the world through the evolution of ISO standards and international treaties that are defining the norms of civilization.

Yet each year over \$1 trillion is paid in bribes, most of the annual 50 million tons of e-waste is dumped in developing countries, and 12–27 million people are slaves today. Refugees, internally displaced people, and asylum seekers dropped by 700,000 in 2008 to 42 million, but increased in 2009 due to 2 million displaced people in northwestern Pakistan and others in Sri Lanka and Somalia. Too many greedy and deceitful decisions led to a world recession and demonstrated the international interdependence of economics and ethics.

Today's 15 Global Challenges cannot be addressed by governments, corporations, NGOs, universities, and intergovernmental bodies acting alone; hence, transinstitutional decisionmaking has to be developed and common platforms have to be created for transinstitutional strategic decisionmaking and implementation.

Infobox 2: State of the Future Index

How will the world recession change the future over the next 10 years compared with what it would have been like? State of the Future Index (SOFI) is a technique that combines 30 variables that indicate the overall outlook for the next 10 years.

There are some variables which:

- Promise to continue to change for the better (although many at a slower rate than in the past).
- Have changed for the better in the past but may reverse direction.
- Have worsened in the past but may change to improving in the future.
- Grew steadily worse in the past and will grow worse in the future.

The variable that improved in the past two decades and estimated to continue to improve despite pressures of the recession (although many at a slower rate than in the past) are:

- Literacy rate, adult total (percent of people aged 15 and above)
- School enrollment, secondary (% gross)
- Countries having or thought to have plans for nuclear weapons (number)
- GDP per unit of energy use (constant 2000 PPP \$ per kg of oil equivalent)
- Number of Major Armed Conflicts (number of deaths >1,000)
- Population growth (annual %)
- Physicians (per 1,000 people)
- Internet Users (per 1,000 pop)
- Infant Mortality (deaths per 1,000 births)
- Life Expectancy at Birth (years) (but possibly leveling off)
- Women in Parliaments (percent of all members)

The variables that improved in the past two decades with some risk of future reversal are:

- Improved water source (% of population with access)
- Poverty headcount ratio at \$1.25 a day (PPP) (% of population) low and mid income countries
- R&D Expenditures (% of national budget)
- Clean Energy (percent of total energy supply)
- Food availability (cal/cap)
- Population in Countries that are Free (percent of total global population)
- GDP per capita (constant 2000 US\$)
- Number of Refugees (per 100,000 total population)

The variables that got worse over the past two decades but may reverse trend toward the better are:

- People Voting in Elections (% population of voting age)
- Forest Lands (% of all land area)
- Prevalence of HIV (% of population 15-49) (post 1998)

And the last, the variables that got worse over the past two decades and will continue to worsen are:

- Levels of Corruption (15 largest countries)
- CO₂ emissions (global)
- Unemployment, total (% of total labor force)
- People killed or injured in terrorist attacks (number)
- Global Surface Temperature Anomalies
- Total debt service (% of GNI) low and middle income countries

A review of the trends gives following “report card for humanity”:

Where we are winning:

1. Improved water source (% of population with access)
2. Literacy rate, adult total (% of people ages 15 and above)
3. School enrollment, secondary (% gross)
4. Poverty headcount ratio at 1.25 USD a day (PPP) (% of population in least developed countries)
5. Population growth (annual %) (A drop is seen as good for some countries, bad for others)
6. GDP per capita (constant 2000 USD)
7. Physicians (per 1,000 people)
8. Internet users (per 100 people)
9. Mortality rate, infant (per 1,000 live births)
10. Life expectancy at birth, total (years)
11. Proportion of seats held by women in national parliaments (%)
12. GDP per unit of energy use (constant 2005 PPP USD per kg of oil equivalent)
13. Number of Major Armed Conflicts (number of deaths higher than 1,000)
14. Food availability (cal/cap)

Where we are losing:

1. CO₂ emissions (kt)
2. Global Surface Temperature Anomalies
3. People Voting in Elections (% population of voting age – 15 largest countries)
4. Unemployment, total (% of total labor force)
5. Fossil fuel energy consumption (% of total)
6. Levels of Corruption (15 largest countries)
7. People killed or injured in terrorist attacks (number)
8. Refugee population by country or territory of asylum

(Source: Theodore J. Gordon in: Glenn, Gordon, Florescu: 2010 State of the Future)

RIO PROCESS: PRE-HISTORY – HISTORY – PRESENT – FUTURE

Mikuláš Huba

Introduction

This article is dealing with recent efforts in the field of the global environment, sustainability and development paradigm shift which use to be called the Rio-process, for the most important international event in this field, the United Nations Conference on Environment and Development which was held in Rio de Janeiro, 1992. In the second part we try to indicate briefly the next development related mainly to the Rio + 20 process. Let us sub-divide this development into several periods (pre-history, recent history, present and future).

Pre-history

The first period which we call pre-history is characterised by such milestones like Silent Spring, the first “ecological bestseller” written by Rachel Carlson (1963), the establishment of Club of Rome in 1969, and publishing of its first report Limits to Growth in 1972.

Other relevant bestsellers of the 1970-ties were The Turning Point, The Third Wave, Future Shock, To Have or to Be?, Small is Beautiful, Gaia – A New Look at Life on Earth, Global 2000 – The Report to the President, etc. (see e.g. Huba, Novacek, 1995).

But activities of United Nations, including UN Conference on Human Environment, Stockholm, 1972 are relevant, too.

Recent history 1987–2000

Recent history in our understanding started when the UN General Assembly (GA) adopted *UN Commission on Environment and Development Report (Our Common Future, or “Brundtland Report”)* in 1987, and continued in 1989 by the GA decision to organise the UN Conference on Environment and Development in Rio de Janeiro three years later.

UN Summits (expectations vs. reality)

The 1990-ties came into the history not only of UN, but also of all humankind by the un-precedent set of huge UN conferences called summits. Nearly 50,000 people went to Beijing to set new standards for the advancement of women. Approximately the same number of participants converged on Rio de Janeiro to find a better balance between environmental protection and economic development at the Earth Summit. Some 30,000 people journeyed to Istanbul to seek solutions to urban problems at the Habitat II Conference.

What is the reason of it?

The series of large-scale UN conferences held in the 1990-ties seemed to some people like an extravagant talk-fest. But most of the world’s leaders and policy-makers have viewed these events as a worthwhile investment – and even a watershed – in shaping our global future.

But, in reality, these global conferences have made a long-term impact by:

- mobilizing national and local governments and non-governmental organizations (NGOs) to take action on a major global problems;
- establishing international standards and guidelines for both global and national policy;
- serving as a forum where new proposals can be debated and consensus sought;
- setting in motion a process whereby governments make commitments and report back regularly to the United Nations.

Breaking new ground

Conferences have played a key role in guiding the work of the UN since its inception. In fact, the world body was born when delegates from 50 nations met in San Francisco in April 1945 for the United Nations Conference on International Organization. The recent high-profile conferences on

development issues, which have continued a series that began in the 1970s, have broken new ground in many areas:

By involving Presidents, Prime Ministers and other heads of State - as pioneered at the 1990 World Summit for Children - these events have put long-term, difficult problems like poverty and environmental degradation at the top of the global agenda. These problems would not have the political urgency to grab front-page headlines and command the attention of world leaders. The participation of thousands of NGOs, citizens, academics and businesspeople, in both the official and unofficial meetings, has turned these conferences into true “global forums”. The UN has encouraged this, knowing that the support of a wide spectrum of society is needed to implement the policies being discussed.

To ensure effective follow-up, a series of special sessions of the UN General Assembly is being held to assess implementation of each Conference’s action plan at the five-year mark, and to set future priorities.

Recognizing the valuable role that these major meetings play, the UN has decided to hold several conferences on key socio-economic issues in the next two years. These include a Millennium Summit in September 2000 and global conferences on financing for development and on the world’s least developed countries.

The cost to the United Nations of the recent mega-conferences in 1990s has been quite modest, ranging between \$1.7 million and \$3.4 million per conference. An exception was the Earth Summit, whose extraordinarily complex agenda required specialized staffing and more extensive preparations, costing the UN some \$10 million.

As a rule, the UN covers only the costs of providing interpreters and other staff needed to service the meetings of the conference and preparatory negotiations, and the Secretariat office that organizes the event. (For more details see: UN DPI/1825/Rev.7, June 1999).

What are the results?

The most relevant example:

The United Nations Conference on Environment and Development (Earth Summit, June 1992, Rio de Janeiro) gathered 114 heads of State, who adopted Agenda 21, a global blueprint for sustainable development that has become the basis for many national plans. Over 1,800 cities and

towns worldwide have since created their own “local Agenda 21”. The summit motivated some 150 countries to set up national advisory councils to promote dialogue concerning sustainable development policies between government officials, businesspeople, environmentalists and others. It also led to four new international treaties, on climate change, biological diversity, desertification and high-seas fishing and three declarations, including Rio declaration (“substitution” to the Earth Charter) and Agenda 21.

The most challenging paragraphs of the Agenda 21 with the integrative and/or cross-sectoral character (first 10 “items”):

- Preamble
- Introduction
- Combating Poverty
- Changing Consumption Patterns
- Demographic Dynamics and Sustainability
- Protection and Promotion of Human Health
- Promoting Sustainable Human Settlement Development
- Integrating Environment and Development in Decision-Making
- Protection of the Atmosphere
- Integrated Approach to the Planning and Management of Land Resources

Setting up the UN Commission on Sustainable Development to monitor the implementation of the Rio agreements and to serve as a continuing forum for negotiating global environment and development policy.

The Earth Summit (UNCED) was not only organisational, but also intellectual top of all process of UN summits.

On the other hand, in June 1997, a special session of the UN General Assembly to assess implementation of Agenda 21 found that, despite progress in many areas, the global environment continues to deteriorate. Government leaders, including over 50 heads of State, agreed to further action – notably on fresh water, energy and transport – but few concrete commitments were made.

Other relevant examples:

World Conference on Human Rights (1993, Vienna) reaffirmed international commitment to all human rights and to strengthening the mechanisms for monitoring and promoting human rights worldwide. This UN conference led to the appointment of the first High Commissioner for Human Rights, to improve the ability of the UN to act quickly and efficiently to prevent rights violations and promote fundamental freedoms. World Conference

on Human Rights stimulated the inclusion of human rights as an integral element in UN peacekeeping missions, and declared the link between democracy, development and human rights.

World Summit for Social Development (1995, Copenhagen) brought together 117 heads of State who committed their governments to eradicating poverty “as an ethical, social, political and economic imperative”. Since the Summit, a number of countries have set specific target dates for reducing poverty, and many have launched poverty assessment studies to plan long-term strategies. They focused attention on the negative side of economic globalization: growing gaps between rich and poor, shrinking social safety nets, and increasing insecurity about jobs and social services in both developed and developing countries. The post-summit process integrated the decisions of other conferences into a comprehensive and holistic plan for meeting basic human needs, reducing economic and social inequalities, and providing sustainable livelihoods.

International Conference on Population and Development (September 1994, Cairo) built consensus for integrating family planning programs into a new comprehensive approach to reproductive health services, and won international recognition that educating and empowering women is the most effective way to reduce population growth rates and promote sustainable development. This conference adopted a plan of action which sets specific resource targets for international population assistance, to enable countries to make reproductive health and family planning accessible to all by no later than 2015. It led to increase of funding for population-related activities and also reaffirmed the global consensus that voluntary family planning decisions are a basic human right of all couples and individuals.

Fourth World Conference on Women (1995, Beijing) agreed on a five-year action plan to enhance the social, economic and political empowerment of women, improve their health, advance their education and promote their marital and sexual rights. The action plan set time-specific targets, committing nations to carry out concrete actions in such areas as health, education and legal reforms. The conference activated some 130 countries to announce new initiatives to carry out their action plans, including a \$ 1.6 billion program to fight violence against women, and the formation of a President’s Council on Women in the USA. Fourth World Conference on Women added a new urgency to providing women with greater legal protection.

Second United Nations Conference on Human Settlements (Habitat II, 1996, Istanbul) adopted a global plan and declaration setting out policy guidelines and government commitments to improving living conditions in urban and rural settlements, and to the “full and progressive realization of the right to adequate housing”. The Habitat II Conference involved mayors and other local officials in the formal proceedings and recognized their key role as partners in implementing the Habitat action plan. The Conference also promoted information-sharing via presentation over 500 “best practices” for improving the living environment – initiatives by government authorities and grass-roots groups in over 90 countries that have proven effective in solving pressing housing and community problems.

Present – new generation of activities

Let us start this period with the **UN Millennium Summit, 2000**, which was the largest gathering of heads of state and government ever recorded when it took place in New York between 6 and 8 September 2000. Discussions focused on the role of the UN in the twenty-first century.

At the Summit’s close, over 150 world leaders adopted the UN Millennium Declaration, a commitment to the principles and objectives that would make up the international community’s agenda in the new era.

The Declaration advanced six principles previously articulated in the Secretary General’s report:

- freedom,
- equity and solidarity,
- tolerance,
- non-violence,
- respect for nature,
- shared responsibility.

The central challenge for policy-makers was to make globalisation a positive force for all world’s people. To meet this challenge, eight specific objectives to be met by 2015 were detailed. Subsequently termed Millennium Development Goals (MDGs), there were made pledges to:

- eradicate extreme poverty;
- achieve primary education for all;
- promote gender equality and women’s empowerment;
- reduce child mortality;
- improve maternal health;

- stop and reverse the spread of HIV/AIDS, malaria, and other diseases;
- ensure environmental sustainability;
- solidify a global partnership for development.

The UN's Millennium Campaign to raise awareness and build the political will necessary to achieve the goals was launched in 2002, the same year that industrialized countries, including the United States renewed the 0.7% target at the Monterrey Conference on Financing for Development. An independent advisory to the Secretary General on the MDGs, the Millennium Project was also established that year.

The next important step in the process was the UN Conference on Sustainable Development (2002, Johannesburg), characteristic “determinants” of which were:

- Crisis of implementation, and
- Crisis of confidence.

In the Johannesburg Declaration on Sustainable Development delegates declared among other:

The Challenges we Face

We recognize that poverty eradication, changing consumption and production patterns, and protecting and managing the natural resource base for economic and social development are overarching objectives of, and essential requirements for sustainable development.

The deep fault line that divides human society between the rich and the poor and the ever-increasing gap between the developed and developing worlds pose a major threat to global prosperity, security and stability.

The global environment continues to suffer. Loss of biodiversity continues, fish stocks continue to be depleted, desertification claims more and more fertile land, the adverse effects of climate change are already evident, natural disasters are more frequent and more devastating and developing countries more vulnerable, and air, water and marine pollution continue to rob millions of a decent life.

Globalization has added a new dimension to these challenges. The rapid integration of markets, mobility of capital and significant increases in investment flows around the world has opened new challenges and opportunities for the pursuit of sustainable development. But the benefits and costs of globalization are unevenly distributed, with developing countries facing special difficulties in meeting this challenge.

Our Commitment to Sustainable Development

We are determined to ensure that our rich diversity, which is our collective strength, will be used for constructive partnership for change and for the achievement of the common goal of sustainable development.

Recognizing the importance of building human solidarity, we urge the promotion of dialogue and cooperation among the world's civilizations and peoples, irrespective of race, disabilities, religion, language, culture and tradition.

We reaffirm our pledge to place particular focus on, and give priority attention to, the fight against the worldwide conditions that pose severe threats to the sustainable development of our people. Among these conditions are: chronic hunger; malnutrition; foreign occupation; armed conflicts; illicit drug problems; organized crime; corruption; natural disasters; illicit arms trafficking; trafficking in persons; terrorism; intolerance and incitement to racial, ethnic, religious and other hatreds; xenophobia; and endemic, communicable and chronic diseases, in particular HIV/AIDS, malaria and tuberculosis.

We are committed to ensure that women's empowerment and emancipation, and gender equality are integrated in all activities encompassed within Agenda 21 and the Millennium Development Goals.

Development Goals and the Johannesburg Plan of Implementation

In this regard, to contribute to the achievement of our development goals and targets, we urge developed countries that have not done so to make concrete efforts towards the internationally agreed levels of Official Development Assistance.

We welcome and support the emergence of stronger regional groupings and alliances, such as the New Partnership for Africa's Development (NEPAD), to promote regional cooperation, improved international co-operation and promote sustainable development.

We reaffirm the vital role of the indigenous peoples in sustainable development.

We recognize sustainable development requires a long-term perspective and broad-based participation in policy formulation, decision-making and implementation at all levels. As social partners we will continue to work

for stable partnerships with all major groups respecting the independent, important roles of each of these.

We undertake to strengthen and improve governance at all levels, for the effective implementation of Agenda 21, the Millennium Development Goals and the Johannesburg Plan of Implementation.

To achieve our goals of sustainable development, we need more effective, democratic and accountable international and multilateral institutions.

We are in agreement that this must be an inclusive process, involving all the major groups and governments that participated in the historic "Johannesburg Summit".

In the Global People's Forum Civil Society Declaration "A Sustainable World Is Possible" representatives of the civil society from all world declared inter alia:

We, the delegates to the Global People's Forum, representing the people of the world, meeting at Nasrec, Johannesburg, from 24 August to 3 September 2002, hereby submit the following declaration which pronounces our convictions, commitment and call for renewed action towards the attainment of the ideals of sustainable development. We are the major social groups named in Agenda 21 including women, youth, labour, indigenous peoples, farmers, NGOs, and others including disabled people, the elderly, faith-based organizations, peoples of African descent, social movements, people under foreign occupation and other under-represented groups.

Ten years after the Rio Summit, there is visible lack of progress in the implementation processes from all of us and in particular our Governments. This can be exemplified by the growing gap between the North and the South, and the growing social-economic disparity between the rich and the poor, with particular impact on the people of African continent and the ongoing degradation of natural resources.

The vision that drew us to Rio and to Johannesburg continues to guide our efforts, values and convictions. The Earth and all its integrated, diverse and interdependent life support systems must be sustained, and its regenerative powers guaranteed for the present and all future generations. We believe that civil society organisations have got a vital role to play in the advancement of the ideals of sustainable development. Organizations of civil society have a central role to play in the translation of the Rio Principles and Agenda 21

into concrete programs, projects and implementation strategies for sustainable development.

Core issues:

Social

1. Equality. Reaffirmation the equality of all people, with special attention to historically disadvantaged groups.

2. Human rights. Demand that International conventions, including ILO conventions, UN conventions on economic, social, political, civil and cultural rights must be respected and enforced by all states, including the rich and powerful. Support to the right of access to information and the right to freedom of choice. We believe those to be cornerstones of sustainable development and life itself.

Economic

1. Fair trade. Support to **fair trade** because the current 'free trade' system is far from free and not fair. Fair trade reaffirms the principle of Common but Differentiated Responsibility. Fair trade also reinforces and supports the right of developing countries to protect their own industries and natural resources against outside externalities including currency fluctuations and such as imposed by the WTO and other global institutions.

2. Redistribution. The resources of the world can still be and should be shared among all the people of the planet without creating pockets of wealth amidst seas of poverty and hunger. It is a principle, which obliges the rich countries to reducing their excessive consumption of the world resources and to sharing their incomes in the interests of the present and future generations.

3. Corporate accountability. Legally binding global rules and obligations to regulate corporations especially Multi-nationals, must be developed and implemented, especially in critical areas of economic, social and environmental concerns.

4. Debt eradication. We believe that multinationals and governments who have benefited from the exploitation of the human and natural resources in under-developed and developing countries are morally bound to repay the economic, social and ecological debt that has been accumulated as a result.

5. Anti-privatization. Natural resources and basic services must be held in the public domain for the common good of all people. These include the provision of water and sanitation, health care, education and housing. If sectors are

considered for privatization for reasons of efficiency then we must adopt a humanitarian privatization approach.

Political

1. Transparency.

2. Sovereignty. We believe that the right to self-determination, respect for human rights and the principles of human and environmental security and justice should be the root of all political, economic and environmental agreements and interventions.

3. Participation. People must be involved in the design of plans and strategies for their development and engagement in decision-making processes at the local, national, regional and international levels on social, economic and physical planning as well as resource mobilization and allocation.

4. Militarism. Current spending on wars further provokes conflicts and decreases the chances of sustainable development. The massive spending on armament and war must be diverted to sustainable development initiatives and attacks to gain access to resources must be declared as a crime on humanity.

Environment

1. Environmental sustainability. All communities and peoples must have control over biological resources as well as their rights to direct all development, including in agriculture and aquaculture, towards models that are ecologically and socio-culturally sensitive, and which conserve or enhance biodiversity and biodiversity-based livelihoods. Natural resource management is central to sustainable development. Traditional and indigenous knowledge systems developed over the ages should be recognized as legitimate.

2. Genetic engineering. The use of genetic engineering until the specified uses are proven safe will have to be rejected. We believe in accordance with the Precautionary Principle that, governments must ensure a GE free environment in our countries and in farming systems and support our efforts to raise awareness amongst farmers and consumers about real and potential impact of GE to the environment and to human health.

3. Marine, inland fisheries and coasts. Current systems of unequal ownership, access to and use of marine and coastal resources should be transformed into systems based on sustainable and equitable use with direct benefit to the local communities at risk according to clear timelines for the conversion.

4. *Renewable energy*: *Fossil fuel continues to contribute towards climate change, which is felt most heavily by poor people. We call for the phasing out of the fossil fuel industry and the promotion of the use of renewable forms of energy according to clear timelines for the conversion. We call for the phasing out of nuclear reactors.*"

To important processes running under UN umbrella belongs **United Nations Decade of Education for Sustainable Development**

The goal of the UN Decade of Education for Sustainable Development (2005–2014, DESD), for which UNESCO is the lead agency, is to integrate the principles, values, and practices of sustainable development into all aspects of education and learning. This educational effort will encourage changes in behaviour that will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations. The mission of DESD, as outlined by UNESCO is: *Sustainable development is seeking to meet the needs of the present without compromising those of future generations. We have to learn our way out of current social and environmental problems and learn to live sustainably. Education for sustainable development (ESD) aims to help people to develop the attitudes, skills and knowledge to make informed decisions for the benefit of themselves and others, now and in the future, and to act upon these decisions.*

DESD seeks to integrate the principles, values, and practices of sustainable development into all aspects of education and learning, in order to address the social, economic, cultural and environmental problems we face in the 21st century.

Millennium Summit + 10, officially called United Nations High-level Plenary Meeting on the Millennium Development Goals (MDG Summit) (September 2010, New York), is the newest of big UN activities.

What is the MDG Summit 2010?

Following on a proposal by the UN Secretary-General, the General Assembly has decided to convene an MDG summit (High-level Plenary Meeting) on 20–22 September, with the primary objective to accelerate progress towards all the Millennium Development Goals (MDGs) by 2015, taking into account the progress made towards the internationally agreed development goals (A/RES/64/184). The summit is expected to undertake a comprehensive review of successes, best practices and lessons learned,

obstacles and gaps, challenges and opportunities, “leading to concrete strategies for action”. The President of the General Assembly has appointed two ‘co-facilitators’ to lead the inter-governmental negotiating process: the Ambassadors of Senegal and Denmark to the United Nations in New York.

In addition to the official preparatory process, a number of related events and reports will feed into government deliberations leading to the September summit.

Of particular relevance to civil society organizations are the Hearings of the General Assembly – a part of the official process – that were convened from 14–15 June 2010 in New York.

Why is the summit being convened?

The MDGs incorporate key goals and targets of the broader development agenda, agreed upon by world leaders and other stakeholders at different UN Summits and conferences. Thus, the MDGs are not about extreme poverty only, but also include goals and targets for education, maternal health, child mortality, public health, environmental sustainability and biodiversity. By linking the MDGs to the internationally agreed development agenda (IADA), world leaders and development partners have recognized the synergies among various development goals and targets, and the need for an integrated approach for achieving them.

Ten years on from the original adoption of the MDGs at the 2000 Millennium Summit, and despite remarkable progress in some countries, collectively we are falling short in their achievement. The consequence of these shortfalls, further aggravated by the combined effects of the global food, climate, energy and economic crises, is that improvements in the lives of the poorest are happening at an unacceptably slow pace and in some countries, hard fought gains are being eroded. At the current pace, several of the eight MDGs and associated targets are likely to be missed in many countries. The challenges are most severe in the least developed countries (LDCs), land-locked developing countries (LLDCs) and some small island developing states (SIDS).

If the MDGs are to be achieved by 2015, not only the level of financial investment has to be increased but also innovative programs and policies aimed at overall development and economic and social transformation must be rapidly scaled up and replicated. The MDGs are achievable, but

there is clearly an urgency to address challenges, acknowledge failures and come together to overcome the obstacles to their achievement. This will require the embrace of pioneering ideas and political will on the part of governments and their development partners.

How can I contribute to the review process?

In addition to engaging governments at the national and local levels, there will be a number of ways to input at the international level.

The simple fact is that 189 world leaders made an historic promise at the United Nations Millennium Summit in 2000 when they signed onto the Millennium Declaration and agreed to meet the Millennium Development Goals by 2015. It's up to citizens to make sure leaders follow through on these commitments.

One way to get involved – either individually or through organization – is through the “United Nations Millennium Campaign” (<http://www.endpoverty2015.org>). The Millennium Campaign supports people from around the world to take action in support of the Millennium Development Goals.

Future

RIO + 20 process

May 17, 2010 UN opened negotiations on the road back to Rio, where, in 1992 countries agreed on the landmark Agenda 21, the blueprint for sustainable development (SD). In 2012, countries will meet again in Rio de Janeiro to determine the next steps for achieving sustainable development – to manage and protect the ecosystems and bring about a more prosperous future for everyone. The first meeting of the Preparatory Committee for the 2012 UN Conference on SD was held in New York, May 17–19, 2010.

Objectives

The overall objective of the 2012 Conference is to *secure renewed political commitment for SD assessing the progress to date and the remaining gaps in the implementation of the outcomes of the major summits on SD and addressing new and emerging challenges.*

The focus will be on a green economy in the context of SD and poverty eradication. It will also tackle the institutional framework for SD.

Aims

1. Securing the renewed political commitment to sustainable development.
2. Assessing the progress and implementation gaps in meeting already agreed commitments.
3. Addressing new and emerging challenges.

Themes

1. Green economy within the context of sustainable development and poverty eradication.
2. Institutional framework for sustainable development.

The preparatory process started in a difficult situation because the world is facing unprecedented crises:

- climate change;
- food crisis;
- lack of water and energy supplies;
- financial and economic uncertainty;
- unemployment;
- unsustainable consumption patterns;
- disappearing species;
- over-fishing;
- missing sanitation, etc.

According to UN Under-Secretary for ECOSOC Sha Zukang *our stopgap solutions in response to this crisis, with short-term time frames and sector-based approaches, can no longer suffice in tackling the multiple crises. Only SD, with its inherent emphasis on interlinkages to address social, economic and environmental challenges in a balanced and integrated manner, can provide long-term and durable solutions to the crisis.* Although all countries are vulnerable to this crisis, they differ widely in their ability to cope with the risks and shocks inherent in them.

In general, the trends are mixed. While progress has been made on the economic field and in the fight against poverty in some regions, many countries are not on track for achieving the key Millennium Development

Goals, and most of the environmental indicators have continued to deteriorate.

On the social front, it is observed that progress is uneven across countries and regions in terms of poverty reduction and health indicators improvement.

The statement of developing countries towards the green economy approach is not very positive. By many of them green economy neither did nor offers a new way to address the disparity among nations. One speaker called it “green neo-capitalism”.

Stakeholders forum

Forum for a Sustainable Future is an international multi-stakeholder organization supporting the increased involvement of stakeholders in international and national governance processes. It is the lead organization in the development and facilitating of multi-stakeholder processes for sustainable development.

After the Brazilian President suggested to the UN General Assembly that there should be a Rio + 20 Conference, Stakeholder Forum has been organising discussions, meetings and other events in support of this idea.

Key questions:

- Should “green economy” be the key focus at Rio + 20?
- How much attention should Rio + 20 pay to “environmental governance”?
- What are the “equity” and “poverty eradication” challenges for a green economy?
- Should “poverty eradication” be made binding commitment at Rio+20?
- Should Rio + 20 address the so-called post Kyoto agreement?
- Should “climate sustainability” become a Rio+20 issue?

Some ideas:

Uchita de Zoysa said, that the train to SD from Rio’92 had been dismantled since Rio and different compartments were placed on different tracks: climate change, biodiversity conservation, poverty eradication, economic prosperity, etc.

What is evident 20 years since Rio and 40 years since the beginning the global debate on environmental crisis and sustainability? Evident is that situation is even worse than 20 or 40 years before.

Chee Yoke-Link of the Third World Network said, that rich countries are continuing to run away from their obligations and responsibilities to the South. As a result there are growing disparities and unsustainable practices. The focus needs to be on working towards a new economic global system, one in which the ideas of a green economy are at the centre.

Leida Rijnhour (ANPED) stressed, that it is necessary to reassess our economy and reshape it in a way, that is sustainable, but she supports a term closer to green and fair economy. New economy has to be based on equity and real values that fit with the carrying capacity of our planet and social needs. The central goal should not be about greening our greed but about expanding our thinking to adoption of sustainable lifestyles respectful and responsible to global equity.

Conclusions

Four periods which we dealt with in this article reflect the development during last almost five decades, coming from emerging new revolutionary ideas of “ecological revolution” and paradigm shift at the break of 1960’s and 1970’s. It includes also the period since 1972 till 1987 which can be called “constitutional period”, when fundamentals of institutional care for the environment were built and the concept of sustainable development was accepted/adopted by United Nations. The next period in 1990’s is typical for the set of huge UN high-level conferences (summits) which generated basic documents and started almost all relevant processes in this field. The link between this period and the present period represents the UN Millennium Summit in 2000, which formulated ambitious aims in the spirit of summits in the 1990’s, but at the same time it tries to summarize existing achievements and to integrate results of previous summits. During the last decade the UN continued in this way. The evidence of it is e.g. the World Summit on Sustainable Development, 2002, without ambitions to adopt any new aims and visionary documents, but with the central idea to confirm results from Rio and to improve their implementation.

The last period (called Future) is characterised by the effort to revitalise all positives coming from previous decades and to find new outcomes.

Despite the enormous effort of last decades there are few reasons for the optimism.

The energy created at Rio Earth Summit in 1992 was not enough to achieve the aims and objectives of this milestone event, and in fact our planet and its people are in a far more critical scenario today than they were 20 years ago. Historically human societies have collapsed when the use of resources and the carrying capacity exceeded what the Earth was able to support. We have not learned from these examples and some warn that we have already passed the point of no return (see e.g. discussions in the frame of the Copenhagen “Climate Summit” in 2009). It is well agreed upon that the future will see great insecurities but as humans it is our nature to rise the challenge when our survival depends on it.

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POST-COMMUNIST TRANSFORMATION – LESSON LEARNED FROM THE CZECH EXAMPLE

Václav Žák

The question of an appropriate theory of transformation suitable for post-communist countries was seen as more and more important immediately after the change during first years of nineties. Washington consensus, recommended by the IMF, was at least in circles of former dissidents accepted with hesitation, because they knew how long it took to establish regulation of capital markets in the West. Now, an attempt to artificially create thousands of joint-stock companies based on voucher privatization, without any regulation of capital markets, very weak regulation of banks, without own capital, with prohibitively high interest rates was considered very risky. It was soon proven that to build capitalism without capital is a task for wizards. Let us remark, that we were astonished how superficially even journals like *The Economist* covered the situation here.

It took two or three years and the hesitation was replaced by certainty. Enterprises not privatized as joint-venture with a western partner started to be leached by so called new owners in an incredible speed. As one of the architects of the reform forecasted, a “wild East” emerged.

At that time I started to study economic theory. Main stream theory could of course forecast, what will happen, when backward enterprises will start to compete on an open market. They will go bankrupt. But even that did not work. The bankruptcy law was very complicated, no judge understood it properly and the fear the whole economy could go bankrupt so widespread, that the process was braked by political means. Of course, dying companies caused high level of secondary indebtedness that led to failure of many new start-ups, because they did not get payment for their services and state was unable to enforce discipline.

Friedrich von Hayek was our favorite author in sixties. I read Milton Friedman, many basic textbooks, Mancur Olson, James Buchanan, Karl

Polanyi and many other authors, but I was not content. As last the Nobel Prize in economy for Professor Douglass C. North caused me to read his book *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, 1990. And for the first time I found a theoretical framework that had explanatory power enabling to grasp what we saw happening not only in our country.

According to North the theory of institutions is a theory of human behavior plus theory of transaction costs. The first thing to note is the concept of an institution. For North, institutions are RULES. Institution is “any form of constraint devised to shape human interaction. They limit the opportunity set of individuals; reduce uncertainty by providing structure to everyday life.”

What we usually consider to be an institution, let us say the Ministry of Finance, are for North organizations, i.e. groups bound by some common purpose (PLAYERS). There is, of course, a dynamic dependence: institutions shape the development of organizations, and they influence the development of institutions (dynamic dependence).

There are two types of rules: formal and informal. Formal rules are texts, like laws, by-laws etc. It is usually easy to change them after a political change. Informal rules are based on values, customs, beliefs etc. that are common in the society or at least to some groups within it and to change them is much more difficult. North uses it to explain why path dependency is so crucial concept in analysis of social changes. Just one example: if only experience with market under communism was an experience with the black market, it is hardly imaginable that after the change people will start to behave as conscious citizens willingly paying taxes and making just transparent and honest transactions.

Transaction costs concepts takes into account non-trivial structure of a transaction in modern economy. Very briefly, transaction costs are sum of the costs of measurement and costs of enforcement. Because modern society is based on contracts, it is necessary to have information about possible future partners. To get them might be costly, in some cases even impossible. How can a bank measure entrepreneurial abilities of an applicant for credit in the society where no one was allowed to be an entrepreneur?

And enforcement presupposes well-ordered legal structure and non-corrupt and effective judiciary. Of course to acquire such structure and administer

it is very difficult and lengthy process because pressure from politics and business creates very strong bias towards those with power and wealth.

North points out how important are property rights. He defines them as “the rights individuals appropriate over their own labor and the goods and services they possess.” Appropriation is a function of legal rules, organizational forms, enforcement, and norms of behavior – the institutional framework.

From the point of view of a transitional economy is not so important that efficiency of property rights influence incentives in the society. Much more important is that if property rights are not well defined, if measurement costs are high and the third-party enforcement inefficient, than *profit from non-cooperative behavior can be higher than profit from keeping contracts*.

It is a key conclusion that was confirmed not only by experience of the Czech Republic in nineties. The situation was the same in all post-communist countries. But it was the same in western countries let say 130 years ago when joint-stock and limited company emerged and new projects used credits, not savings for starting a business. It is almost incredible, but it seemed that West forgot disorder from which market economy in its shape after the Second World War emerged.

Now, it has no sense to describe the Wild East way with switched-off lights so called emerging markets had to go through. It was well described in many books and articles. The question is: could be any lessons learned from experience of post-communist countries for both local political players and international institutions that could serve them as a blueprint for better management of their country?

I would say – with necessary cautiousness – that yes. Why? Firstly, last twenty years lead to much better understanding that economy is not a self-sufficient system and therefore to rely on set of rules like the Washington Consensus is not enough. Economy is vitally dependent on legal framework that is again set by political institutions. Secondly, the technology made progress that created completely new set of opportunities unthinkable twenty years ago. Thirdly, there are states that can serve as best available models.

From the point of the theory of institutions are the basic tasks clear: 1) we need to define ownership rights as close to the actual state as possible; 2) we need to lower transaction costs.

Let us start with costs of measurement. It is clear that “transparency” of an agent would be maximal if it would be possible to monitor all his financial activities. But it is impossible if payment in cash is a common way of paying for goods and services in economy. But what if a mobile phone is at the same time an electronic purse? And all payments can be done only through mobile devices or cards? Is it clear that it presupposes bank accounts for all citizens in the country, complete overview of financial transaction, no tax evasion etc?

I know it seems to be a crazy idea. But let us consider the present situation: corruption is spread like cancer in many countries where the half or more of the GDP is produced in the black economy, substantial part of citizens is living outside any legal system and it is almost impossible for them to join into it. Without technology and completely new approaches is impossible to move forward fast.

Let us continue. The state expenditure should be completely transparent. The system of state treasury is a must. Salaries of civil servants and other employees should be publicly accessible. All public orders should be fully published under slogan “public money does not withstand confidentiality”. E-state should be created with utmost speed: land register, registers of physical and legal persons, register of debtors etc. are basic precondition for any reasonable function of the civil service. Basic communication with administration should be possible via internet. An applicant should fill a form, let say a request to buy a piece of land, and within few days his request should be settled up without necessity to hunt for additional certificates from the civil service. This will eradicate or diminish almost to zero the rent-seeking behavior of civil servants.

To be able to fill data into these registers it will be necessary to make an inventory of ownership and decide how to solve the current state where we can expect substantial differences to the booked state at present registers. The recommendation would be to use this opportunity to make a land reform and to try to legalize the actual state. The simplicity and certainty in defining ownership rights should be one of the most important actions at the beginning of the reform.

Hernando de Soto in his book *The Mystery of Capital* describes that to obtain a legally recognized title to property in Haiti takes over 11 years and 111 bureaucratic steps involving 32 separate offices and countless forms to be

filed.¹⁹ The conclusions of his book fully comply with theory of institutions. The key problem really is how to crush the shadow economy. New revision of ownership rights would allow majority of citizens to get behind de Soto's glass wall separating legal and extra-legal relations in society.

Enforcement is more difficult to establish. To have efficient and non-corrupt judiciary is very difficult task. Therefore is necessary to focus on measurement costs, because if these will be low, the necessity to enforce contracts will diminish. This is the easiest way how to lower transaction costs.

What I mentioned so far is just a subset of much more challenging action plan that would be needed to improve the state of affairs in failed states like Haiti. I can mention very good media campaign the new government would need to explain changes and to teach people how to deal with new entitlements they will acquire; building of the social system with emphasis on education; persuasion of international agencies about necessity to protect the economy of Haiti before free entry of international capital; about suspending competition because project like mobile purse have a realistic chance to be financed only by a company that will have for some years monopolistic position etc.

It is clear that it would be very difficult to put any of proposed remedies through political process. Given rather stormy history of Haiti it is clear that to find political support for such a project would be very demanding task. What I can say is that present disaster could turn in great advantage if the reconstruction would be managed like a New Deal with new rules rather than recreation of the past system. But only a contest in the political arena will determine the institutional framework – and therefore future of Haiti.

I wanted in my contribution to show that lessons learned in post-communist countries show that reliance on mainstream economic wisdom formulated in the Washington Consensus is insufficient and that information technologies can shorten implementation of postulates the theory of institutions demands for creation of conditions an effective economy needs.

¹⁹ In Belgium, when a company would like to build a factory, it needs two stamps: one from local government, the second from the Union of disabled persons. In the Czech Republic it would need around 40 stamps and many months spent to collect them.

Views from the Americas

THE FUTURE OF THE WESTERN HEMISPHERE

Anitra Thorhaug

For 20,000 years the Western Hemisphere has been sustainable to man's existence. The various factors include:

- 1) high population growth from 886 million in 2005 to almost 1.2 billion in 2055, growth especially in northern Central America and the Andes;
- 2) industrialization with too intense energy needs based chiefly on fossil fuels;
- 3) high biodiversity threatened by the fuel needs of these same indigenous growing populations;
- 4) unsustainable fisheries catches as well as most agricultural nations not getting maximal yields, seriously threatens the sustainability.

The U.S. Association of the Club of Rome (USACOR) has a multiyear study in a series of committees which has found the critical problems and sets of solutions to get on the pathway to sustainability. We think of this as a hurricane tracking system which reaches out to the citizens in the hemisphere so that all can participate in the potential knowledge of what may come to prepare and modify their actions. We are presently attempting to reach the major stakeholder groups who could affect critical action in the critical problems found.

The Western Hemisphere, presently divided into 38 nations has always had an abundance of biological, mineral, and physical resources including extensive water spaces, fisheries and other oceanic and animal resources, as well as vibrant groups of peoples, and many individual cultures, speaking nearly 1000 languages. Originally, it was geologically attached to Europe and Africa. Then populated by peoples from Asia about 20,000 years ago over land bridges in the north Pacific.

The hemispheric resources have always been shared among many nations, which for thousands of years were tribal. An example: the large schools of migratory oceanic fish which proceed without boundaries between the nations. Some of the other shared resources are flows of air, clouds

with water, river water, ocean currents, and animals. No one nation can solve the future sustainability problem by itself; rather, all nations depend on cooperation with the others since so many resources are shared. It is important to observe, the indigenous trading nations shared resources throughout the hemisphere for millennia.

Most of the hemisphere's 38 nations are governed by constitutional democratic governments created from 235 to 150 years ago throughout the hemisphere due to influences from the European colonization which started about 1000 with Icelandic-Greenlandic incursions to gather resources, and accelerated with the Spanish colonization, making much territory in the hemisphere under European colonization for 300 years until the late 1700's to the early 1800's . Many of the governing constitutions reflect European governing theory mixed with several other elements including tribal council and Icelandic democratic theory.

The intra-Hemispheric peace in the last 100 years (there have been no intra-hemispheric wars except very small excursions on border disputes with Peru-Ecuador and then Paraguay-Bolivia conflict in the 1930's) has led to a stability which has enhanced hemispheric trade, increased sharing of resources, and strengthened relations between nations, while relieving the nations of the suffering and costs of war and large standing armies (Costa Rico has no army). Relative balances of human populations with food, water, and other natural materials including energy have been our good fortune to enjoy for centuries, indeed twenty or more millennia. No large scale famine has resulted since Borlaug's green revolution in the 1940's.

The critical question is: Will the Western Hemisphere's citizens modify their lives and governments to continue enjoyment of these resources as the population expands vigorously or will an imbalance with the hemispheric resources continue over the next fifty years?

Clearly a roadmap to create such a sustainable future with continuing resources is necessary.

For the first time, we are presenting a future analysis of the next 45–50 years of the Western Hemisphere and its nations. While the USA Club of Rome has had previous member authors present global or national future analyses, this one is hemispheric. It is our hope that this beginning will bear fruit to modify and examine many trends of individual, local, national, and private sector actions which are not sustainable and need modification. This study is thus a beginning, not the ultimate answer.

Our analysis in quantitative form uses the International Futures Model (Hughes, 1995, 2005) for each nation, summed into four regions, then summed into the whole of the Western Hemisphere. The 50 year future of the Western Hemisphere (2005–2055), using the projections of Barry Hughes' model information has been perused, substantial information added from various disciplines such as water, fisheries, environment, poverty, language-art and culture and we have found critical problems in each of the following domains of information addressed then by committees composed of wise, experienced field practitioners in the following fields:

- 1) Population;
- 2) Food and drinking water;
- 3) Health;
- 4) Environment;
- 5) Energy;
- 6) Legal issues;
- 7) Economic issues;
- 8) Poverty alleviation;
- 9) Social issues;
- 10) Language, culture and art issues;
- 11) Education;
- 12) Governance;
- 13) Security issues;
- 14) Technology issues;
- 15) Religious issues.

These committees have engaged in debate and research was undertaken to find wise solution sets to these critical problems. Solutions to the critical problems which this model illuminates have been examined by each committee of experts.

Rapidly changing major processes are occurring simultaneously and rapidly. There are critical and accelerating sets of non-sustainable problems unique to the highly industrialized as well as to the agricultural nations which are likely to become problems of even greater urgency than at present. These include extremely high population growth in some of the nations with highest poverty rates, resource depletion chiefly by the industrialized citizens, problems from depleting fossil energy and its environmental by-products, fish, agricultural soil, forests, and clean drinking water. The chopping of forests for cooking and high population rates are the major simultaneous events in the rural poverty group. There are other problems in the poor rural

(or semi-urban) groups which include population growth up to 131% in the 50 years, child mortality rates up to 117 deaths/1000 births, high levels of maternal deaths, lack of education (especially for girls), sequestration of carbon, biodiversity etc. Loss of capacity of governance loomed high throughout with corruption, air and water pollution due to weak administrations, criminal groups operating outside government control and particularly difficult corruption of groups working internationally (illegal substances, sex and child trade, arms, banking and other fraud and illegal activities outside of governance jurisdictions).

The model clearly indicates two separate but interrelated, sets of forward moving processes.

First, the highly industrialized existence and heavy production-oriented culture characterized by the large industrial urban centers scattered from Vancouver and Fairbanks to Santiago and Buenos Aires. In this portion of the Hemisphere, a fossil-fuel based economy powers hundreds of millions of urban inhabitants whose lives demand a great variety of material resources and demand infrastructure support systems including high-performing resource levels of medical, transport, energy, agriculture, water and services.

Second, a rural existence, which frequently is composed of indigenous mountainous citizens (the original hemispheric inhabitants) in poverty (less than \$ 2/day/person) with minimum demand on most resources (except forests, soil, and water) and very little demand for infrastructure services.

This population in poverty will have extremely high population growth – up to 131% in 50 years in Northern Central America and the Andes from Southern Ecuador south to Paraguay plus Haiti. This rural life is characterized by very little access to services and infrastructure resulting in very high infant mortality, low education levels, almost no access to capital, and poor infrastructure access (clean drinking water, sewerage facilities, etc). It is highly likely in this next 50 years that the two sets of life-styles will robustly conflict over resources and governance opportunities.

We clearly see the beginnings of this conflicting interaction occurring in 2010 in several ongoing processes:

- 1) migration from the poor nations into the richer;
- 2) internal migration to the cities for employment;
- 3) civil disobedience of the citizens living on less than \$ 2/day in specific nations;
- 4) civil demands in both a national and international setting developing from Chiapas, Mexico to Bolivia.

We view this interaction between the two groups, competing for resource usage and changing in their attitudes toward civil processes, regardless of nation, as one of the large challenges of the hemisphere's next 50 years.

The study has delineated sets of solutions for all these critical problems which if initiated now, rather than later when the crises appear, will lead to sustainable paths for the nations and peoples who choose to follow them.

AWARENESS of being a part of the hemisphere is lacking. Awareness of all citizens' actions reverberating to create the hemisphere's future is one of the primary prerequisites for the changes if we are all to come for all together to create a sustainable path for the mutual future of all. Many other recommendations have been made by the committees and listed in the Recommendations section. The problems will for the first time be presented directly to stakeholders whose actions are having an effect on the hemisphere (such as woodchoppers and their resource managers in North Central American, Andean, and Amazonian forests; cement mining concerns; fishermen and their resource managers throughout the hemisphere, energy production units, etc.; local drinking administrators; coal mining companies), and of immense importance to national governments and their ministries, international government and local government when relevant (as in the case of local drinking water managers). Awareness of Good Government well functioning for the benefit of citizens is key.

It is our hope that these techniques can be used as a "hurricane monitoring system" is used. A predictive model, into which frequent input of data reveals patterns, trends, and directions of slightly future events. The ears of almost all citizens of the Greater Caribbean Basin and East US coast are glued to the information from this weather system during at least July to September each year. Not many could invent or operate the hurricane tracking system. All benefit from its information, which saves lives, property and prevents suffering and loss.

(Based on the book "The Future of the Western Hemisphere" edited by Anitra Thorhaug, Andrew Oerke, Nancy Nicholson, Roberta W.Gibbs and Dana Raphael with 34 authors.)

HAITI AT A CROSSROAD AND ELEMENTS OF SUSTAINABLE RECOVERY

Pierre C. Armand

Haiti has been a failed state for decades. When the earthquake with a magnitude of 7.3 struck this already very poor country on January 12, 2010, the disastrous situation turned catastrophic. The country had no means to support its reconstruction. Fortunately Port-au-Prince, the capital turned into a global village and people from every corner of the world poured their hearts and their purses for emergency reliefs.

The United Nations, China, Israel, Brazil, the United States, Canada, France, and Germany, not to forget Caritas in Olomouc in the Czech Republic, among the countries that rushed to the rescue effort. Haiti did not have the capability to sustain its own recovery as Chile did after the February 27 earthquake, which registered a magnitude of 8.8.

On the one hand, the disaster brought Haiti further down than when Professor Novacek and I were considering a Marshall Plan for the country. Such a plan was conceived as a global partnership for the development of Haiti. The earthquake liquidated any hope that socioeconomic recovery was on the horizon. On the other hand, this shock on the population of Haiti had the potential to change the dead end course this country was speeding towards without any hope toward sustainable development. In order to save the country from reemerging as a permanent dependent country, real change needs to occur. Our attempt in this presentation is to offer a paradigm through which the country can not only move toward long term sustainable recovery, but also use a theoretical framework that can lead and maintain the country on the path of economic growth.

Recovery from the earthquake

Haiti is a Caribbean country that shares the colonial Hispaniola with the Dominican Republic, and occupies the Western part of the island. This country of 27,500 square kilometers is about the size of the state of Maryland

in the U.S.A. It is very mountainous and has inherited from its colonial past a very complex social structure expressed in the proverb: "Behind every mountain, they are more and more mountains."

Prior to the earthquake, Haiti's population of almost 10 million had been living on \$1 to \$2 per day with the highest illiteracy rate and highest infant mortality rate. Barely 1% of the population reaches higher education. Most of the educated continue to grow the ranks of the professionals in the U.S.A., Canada, and France. Independent in 1804 as the first black republic, internal conflicts and political/ethnic struggles have kept the country among the least developed nations of the world. In addition, Haiti had to pay 90 million french francs as a debt of independence from 1825 to 1947, leaving little resources for development programs. This is the country that was faced with a tremendous disaster on January 12, 2010 and had to cope with the aftermath.

It is a known fact that the expected recovery will be very slow, and that this is an attempt to recommend what should be done, if the present government would seek the means to respond to the needs. William Siembieda, a specialist in the field of disaster reliefs, shows evidence in various cases of recovery from other disasters, has printed out some positive outcomes that could be applied in the immediate, intermediate, and long term.

A new government in Haiti should apply elements of sustainable recovery. Most of them can improve the conditions of the more than 1.5 million Haitians that are still living under tents in inhuman conditions.

- a) We know that the international community assisted in conducting physical, economic, and social damage assessments, but not much has been done to improve the physical and psychological conditions of the people.
- b) Use what people know how to do best. It is obvious a lot of decent low cost housing could have been built, which would have created jobs for the mass of the unemployed. By so doing, one would give the affected a sense of power over their destinies. (It should be noted that USAID did create some cleaning jobs.)
- c) The victims know their neighborhood and their neighborhood conditions as well as the resulting physical problems. They know the routines and could even work in cooperative efforts to deal with the disaster. Rather they were kept away from the solutions.

- d) Instead of giving the people responsibilities and involving them right away, the decisions were made without them.
- e) Instead of focusing so much on loss, government officials and the international community should have focused on the most immediate needs. To date, more than a million people are still living under tents in unhealthy conditions.
- f) We are certain that by creating human capital through training, it would have helped the people not only in dealing with the disaster, as stakeholders, but in a long run as a means of living.
- g) The victims could not rely on their government for strong leadership; they had to depend on spontaneous leadership that has in many cases replaced the lack of governance.
- h) Unfortunately the business sector was totally absent, when the initiative to create jobs should have been mostly its efforts.
- i) Commitment should have been to gather people from all works of life to make mitigation planning an integral part of recovery actions.

It must be also understood that recovery from a major disaster event is a non-linear, complex, and sometimes messy process. Haiti is located in the path of hurricanes and may once again be subject to other earthquakes. It is important to think and to familiarize everyone in the country on the general theories of short, medium, and long term recovery. This is important for the country to plan for sustainable development as part of their reconstruction process. Recovery needs to be about discovering the future and requires establishing (or reestablishing) important relationships within the environmental system. It needs to be about looking to the community as a whole to reassert itself as it picks up the pieces. The absence of a theory based on learning for the future both in disaster response and disaster management, may affect the sustainable development of the country. One of the concepts to be learned from past experience in Haiti is that global partnership is a way to working on many scales, from local and holistic recovery to embracing social economic relationships and social management. Complexity analysis and human ecology can be used to ensure that the country will always be able to recover should disaster strike again in the future.

Vision for a new Haiti

With almost 300,000 deaths, 400,000 wounded, 1500,000 without a home, 600,000 displaced, over 300,000 commercial buildings destroyed, and 14 billion U.S. dollars disappearing in unhealthy air in 35 seconds, Haiti now has a date with a new future. In fact the catastrophe has opened to two distinct avenues for the country. The envisioned global partnership for the development of Haiti that was prepared in 2004 in our previous study, is in the process of forging a new future for Haiti. The Reconstruction Commission headed by former President Clinton and the Prime minister of Haiti, collected billions of U.S. dollars to launch the recovery from the earthquake and establish a plan for sustainable development of the country. Feasibility studies are underway toward this endeavor. It is expected that resources will be made available to forge a new destiny for Haiti. Mr. Sarkozy and the French Government have come to the decision to reimburse to Haiti 17.5 billion U.S. dollars, the equivalent amount to the 90 million french francs that was paid in the past.

These funds alone and the heavy hands of the Reconstruction Commission are not sufficient to place Haiti on the path from a life of misery to decent living conditions and sustained economic growth over the years. The country, to achieve these ends, must resolve the major problem of being a failed state with deficient and corrupt governance. It is in this perspective that we are bound to consider the basic premises and the theoretical paradigm that seems to be so indispensable to provide the shocks and lay the grounds to guarantee economic growth over the years to come.

The premises

There are three major premises of concern that can provide the scenarios for the future of Haiti. If we can learn from the future and plan accordingly, we can deduct from the past, and can determine how these premises have been able to establish pathways that can also lead Haiti toward sustainable socioeconomic development.

1. The governance and political premise

The hope for a more prosperous future for the Haitian people lies in building a more effective and resilient state. Without the measures needed to repair the state's weaknesses, it will be difficult to formulate development strategies

and even harder to implement them. Economic development is a political choice. It takes the vision of a leader with efficient, sound governance, the best possible strategic plan, and the mobilization of the people in the affairs of the country to develop a sustainable socioeconomic development process.

It is usually stated “It is by the head, one leads the fish”. When the head is spoiled or contaminated, the rest of the body is also contaminated. This is the reason that Haiti has never been able to achieve a level of economic development. Our government has been corrupt, incompetent, and so avid to perpetuate themselves in office at the expense of the people that they have never launched any program to pull Haiti out of its miseries. We can count some rare instances to this effect.

In conclusion, for the country to ever really engage in the process of reconstruction and sustainable development, it must reclaim integrity, competence, a sense of vision for a better tomorrow, as well as strategic planning in the use of our human, natural, and technical resources. We hope the international community could use the global partnership effort to assist in building a functional state.

2. The cultural premise

Cultural factors have proven in the past to be as important in the development process. History has shown that the “the protestant ethics” in the United States, “the team work and the pride in quality,” in Japan, “the Communes, Kibbutz, and Mochav,” in Israel, “a sense of discipline,” in Singapore, to mention a few, contributed immensely in the making of the rapid and sustainable development of these countries.

Haiti must mobilize and motivate its citizens, those within the country and its Diaspora. The country has survived as a nation, in the face of all the miseries, through their reciprocal independent community activities (or “kombit”) that has sustained life. They must mobilize for all kinds of work: clearing the land, collecting the harvest, and engaging in some communal infrastructural works from generations to generations, especially in the rural areas.

This is the historical and cultural heritage from slavery. As the first country to abolish slavery as an economic order, the African cultural background and the resistance from the major powers of the time in the fight for freedom,

the natural beauty of the country until it became an environmental disaster must be exploited. Many aspects of the cultural life of Haiti can be packaged in a way to make the new Haiti a touristic novelty for the sophisticated traveler. One can plainly see that New Orleans' culture as a state of spirit in its French background is very similar to Haiti's culture. Despite the damage that hurricane Katrina has done, it is on its way to recovery. With the best use of the resources coming to the country, we can evoke today what the future promises for Haiti. With the use of all our human resources (a fairly young population) Haiti can launch a "big leap" toward development requiring a sense of cooperative engagement to move the people from the state of backwardness to quick adjustments capable of jumping into the information age.

3. The Economic Premises

It has been assumed, since the mid 1600s that there are some underlying conditions, once met, any country can within the framework of economic theories undeniably be on the path of sustainable socio-economic development. If not for the war against England, Holland would have been the pioneer country advocating for these four factors that could and have led to sustainable economic growth. These four elements, once concurrently used anywhere, can change the conditions of poverty of any nation. It is like the four legs of a table. The table cannot and will not stand unless it can do so on its four legs. It is also on such premises; one can launch the reconstruction of Haiti and reverse the two centuries of abject poverty of this impoverished nation.

The Four Elements of the "Big Leap" for a Sustainable Economic Development Program

1. Education and scientific rationalization

Without education and a sense of scientific rationalization, Haiti may continue to live in the Dark Age. After more than two centuries of independence, the country still has the highest level of illiteracy. The government is not able to date, to provide enough schools to the population of school age. Eighty per cent of the schools are private with *untrained* teachers and complete lack of the level of competency to teach. In no other country can one demonstrate the high cost of ignorance and the

lack of specialization, when compared with the cost of education in the advanced nation of the world. It is a pity sometimes to listen to the trend of rationalization of the people. Even though, the people are hustling to make a living and receive almost no services from their government, they tend to tie their resilient life to formula such as “Good is good” (Bondye bon), as their hope for a better living and as such they reason as a kind of “bon enfant” or good child with whom it is difficult to engage in a rational behavior or conversation. The people are so much motivated by their self interest for survival, from the political leader, usually in conjunction with the elite to the mass of the poor, they have lost all sense of rationalization. It is a pity that the international community has not helped much neither in the area of education nor in launching a campaign of scientific rationalization, so badly needed to lead the people to the cooperative engagement for development.

2. Ownership and Property Rights

If self-interest in a survival economy can make one lose a sense of rationalization, it can also be the engine of the “Wealth of Nations.” It has been so, since the time Adam Smith published his seminal work in 1776. It is the motive that also determines what, how, and for whom to produce in a way to create a steady flow of goods and services, as well as jobs and incomes for the masses of the country. Countries that cannot guarantee property rights, whether on its lands, home, intellectual or artistic creations, cannot grow, since the people would not have the incentives to produce and get the rewards of their production.

Haiti was known in the past as a country essentially based on the agriculture. During colonial time, the country contributed 2/3 of France foreign exports and was the richest colony of the region. Devastated by 13 years of war for independence, and paying an indemnity to French colonists for abolishing slavery, the country did not have the resources attend to economic development.

Today as the world is moving more and more toward organic foods (the U.S. alone consuming about 91 billion dollars a year) and since Haiti never used any fertilizers, it would be an immense task, due to the conditions of the environment, to have the country specialize in organic production. This is a sure way to have Haiti live in the future, the time of a glorious past. The

country has also various sources of minerals that can be used to produce a source of income and foreign currency reserves from various exports.

We also are looking not only to integrate the Diaspora and engage it in a program of decentralization, but to also establish strong partnership with the international community to make certain that they are more than observers or independent agents working in their independent areas. It should be an atmosphere of private initiatives. In a favorable climate of free enterprise that most countries have been able to exploit efficiently, Haiti will be able to make better use of most its resources. However, we must recognize that to date either an oligarchic or monopolistic tendency have prevailed in Haiti; a good government will have to favor private ownership in a competitive market.

3. Access to capital

Obviously, it takes capital to make capital. The industrial revolution started when men discovered they could create and make machines to create other machines. It takes financing for anyone, at any level, to be able to start a business anywhere in any part of the world. In an economy of poverty, throughout all the informal activities in the vast popular sector of the country, the need for capital is everywhere. Very detailed micro businesses and imported goods not produced in the country would necessitate access to capital. President Mobutu once said that: "Poor countries are not underdeveloped. They are underequipped and undercapitalized." It is often stated that because of the level of corruption in Haiti, the country has not been able to receive its share of grants and loans from the international community. Now that the earthquake has made it possible for Haiti to have access to vast amount of aid funds, it is expected that the Reconstruction Commission would be able to visualize the needs for some "poor people" banks that can reach out to the most remote parts of the county. There is also a lack of other forms of financial institutions, such as development and finance corporations, and credit unions. Most importantly, the government may have to create a network of financial institutions as well as layers of technical assistance to show the poor entrepreneurs how to use the funds and be successful in their business or agricultural endeavors.

4. Building the appropriate infrastructure

To date, Haiti cannot provide electricity to its population. Even in Port-au-Prince, the capital, electricity is rationed. There are people in the remote parts of the country that never had electricity. Haiti could use solar energy, wind energy, in addition to its dam, but the government has never launched any attempt to build this kind of infrastructure. The environment has been deteriorated because the mass in the rural areas had to destroy the forests to make wood charcoal as the only source of energy for cooking.

There are no comfortable means of transportation for our merchants and their goods to the market. This is complicated by a lack of good or accessible public roads. There is a complete lack of road maintenance except for the generosity of some donor agency or donor country.

Communication is still limited. There has been an immense increase in the number of mobile phones. However, access to television and computers is still limited, especially when it comes to communication via the web despite the number of “cyber café or stands” that can be found throughout the capital. So far, we have been working closely with various youth groups and private voluntary agencies to correct the inequity of distribution of communication resources. It is absolutely important that this leg of the table be used to set the tone to development possibilities. Due to the lack of governance, the country lost an opportunity to provide electricity for every corner of Haiti. An overall move needs to be called for, to make certain that the basic infrastructure is available to facilitate all the other aspects of development policies.

Conclusion

It is no doubt that Haiti has all the characteristics of a survival economy. It has been hooked to such a system for two centuries. To plan a better future, we must today take a few steps backward and project objectively what lays-ahead. To come out of the bottom pit, Haiti needs to change the paradigm and adopt a vision that is shared by the community, especially the youth population and the elites of this country (the intellectuals, the politicians, the entrepreneurs, the professionals, and the business men and women). They have to formulate and resolve their problems differently than they have been approaching them in their historical life. Einstein said it so eloquently: “There is no problem that cannot be solved: there are rather problems that are not well formulated.” No country in the world has ever changed their

economic conditions without their elites. Changing a paradigm does not require a change in ideology, but rather finding a practical approach capable of leading in the future; to mobilize some scientific discoveries adaptable to resolve the problems. ***To live the future would imply for Haiti to expect today that the former life is no longer acceptable, and that the new conditions are yet to come.*** As such the forces of change will have to develop intelligent, courageous, and scientific steps that can break the survival habits on the road to the reconstruction of Haiti. On the one hand, a mobilization of all the social layers of the Haitian society, using their political, cultural, and economic activities into a cooperative engagement toward effective change must be conceived. On the other hand, building a new state from the chaotic ungovernable entity that exists today is a major challenge. Plans must also be devised to be implemented on a sustainable basis. The new government must use the resources in an already limited pool as efficiently as possible. On the other hand, applying a methodology and theoretical framework to make sure that the four legs of the proven economic table can soon enough provide food, jobs and an improved standard of living to the Haitian population may be the most difficult and rewarding task. Such attempts are not dreams, but rather new doors that will open to the future we are expecting to build for Haiti.

THE FUTURE OF MICROFINANCE: FROM SUSTAINABILITY TO A GENERATIVE PARADIGM, THE GREATER CARIBBEAN ENERGY AND ENVIRONMENTAL FOUNDATION MICROFINANCE AGENDA

Andrew Oerke

Introduction

The 20th Century War of Who Knows Better How to End Poverty and Build a Great Society left a trail of world wars, innumerable smaller conflicts, staggering expenditures on killings machines, and a hundred million political targets and heretics snuffed out in concentration camps, gulags, re-education terminals, and in zones targeted for mass starvation, and yet hardly made a dent in the problem.

The desperation created by poverty cuts down forests, enlarges the deserts, attacks health and well-being, especially of mother and child, and breeds insecurity that explodes the birth rate creating yet more human misery and mounting political instability.

Poverty is systemic. Until development philosophy changes, development policies will not change either. Battles will be won while the war continues to be lost.

Development philosophy for the non-industrial world has evolved from a welfare to a sustainability mind-set. But whereas sustainability is an appropriate framework for the environment, with its intricate web of interdependency; for development, sustainability is too static a concept. It settles for equilibrium, not growth. With scarce resources, it will not engender sufficient dynamism. Also its promise is often misleading, in that rather than being sustainable, sustainability is often heavily donor-dependent.

Greater Caribbean Energy and Environment Foundation (GCEEF) proposes a shift from sustainability to a generative paradigm based on the following assumptions: 1. There is not enough donor money available to eliminate poverty within a framework that does not self-generate, that does not grow by itself. 2. Human consciousness has not yet evolved to where the social will exists to do as Rabbi Jesus suggested, “Sell all that you have and give it to the poor”. 3. A disastrous century has proved that you cannot force, bully, intimidate or brainwash people to do something they are not freely willing to do. Even if the end did justify the means (and we do not believe that it does), practically speaking, in the long run, this ethic just doesn’t work.

The new paradigm will be based on the law of Nature that produces “more seeds than it needs”. The reason business is powerful is that it is also based on the principle of surplus-generation, upon which civilization itself rests: surplus time to create social structures, art, games, inventions, and knowledge. Business calls this the “profit motive,” but “surplus generation” can be either for profit or not-for-profit, a more comfortable framework for most development agencies. The point is that surplus creation is dynamic and self-generating. If there is not enough money or will to eliminate poverty, then the poor must be given a system in which they can do it for themselves. An auto-generative paradigm, with its attendant spin-off policies and methodologies will allow them to do this.

The new generative paradigm will create new policies and methodologies. Some of them are already in place and are having success. One of these is microfinance, which has taken the development world by storm. It has emerged as the most important item in the anti-poverty tool kit. But whereas there is no bad microfinance and it is always helpful, it has the following limitations in its present popular form:

One: if microfinance is to avoid the ranks of development’s failed panaceas, (community development, integrated rural development, intermediate technology, women in development, trickle up, etc.) it should stop advertising itself as the panacea, which will “build the museum to poverty”. The right philosophy can create the proper context in which development aid can succeed, but microfinance is a methodology and no methodology by itself is a silver bullet. Silver bullets are destined to disappoint and discredit themselves by over-promising. Eliminating poverty is not simple. Systemic poverty is a system and is built of many pieces. Additional factors must be

integrated into the anti-poverty methodology if systemic poverty is to be defeated.

Two: the orthodox methodology for microfinance has come to be known as the “peer pressure” system, though it operates with many names and permutations. When David Scull (Partnership for Productivity, PfP) a Quaker businessman first developed the peer pressure methodology in Kenya in the 60’s, it worked as a breakthrough technology but fell apart several years later through late payments and defaults. (If someone defaults, the next person in line does not get a loan.) In Kakamega, Kenya, where this approach was introduced, the town was too large and diverse for peer pressure to function well. In 1973, a high-level development aid policy group concluded that microfinance was not a viable option and that money should instead be given directly as grants to start small businesses. PfP, then directed by Andrew Oerke, persevered with a combination of credit and enterprise creation. It expanded the peer pressure methodology to include physical, social, and intellectual collateral in a systemic (product-to-market chain) context based on subsistence economics, that could be linked step-by-step to a quasi-monetized and then a monetized system. This approach enabled farmers and the smallest of enterprises to link up with other enabling enterprises (transport, storage, manufacturing, repair, wholesale-retail and market connections) to increase reliability and productivity. Suddenly, microfinance repayment rates shot up to the 80’s and 90’s percentiles. This approach was replicated, and PfP designed and/or trained microfinance/microenterprise programs in more than fifty countries. USAID and other donors backed the movement in a big way. The rest of the development world followed suit. It should be noted that ACCION, Technoserve, PACT, Michaela Walsh’s Women’s World Bank, and Grumeen Bank in the 70’s and 80’s were other organizations critically important to the development of microfinance. The important lesson was that microfinance needed culturally flexible approaches, the right framework, and had to be linked up with other enabling enterprises and culturally appropriate technologies. Access to credit by itself alone does not eliminate systemic poverty.

Three: The reigning microfinance orthodoxy offers small loans for weddings, funerals, celebrations, loans to repay loans, and so on and so forth, all important objectives which must be included to build a training base for the use of money, credit and enterprise. But this approach has no tête de lance. For meager economies, for growth and productivity increases to occur, there must be a priority focus on enterprises that enable other enterprises.

Without enabling enterprises between product and market, farmers and other producers know better than to leave the subsistence base which has kept them and their families alive over the centuries, and whose subsistence economy remains invisible to Western eyes. Our Western, money-and-jobs economics lowers agricultural production by attracting rural areas to urban centers that then require extensive and expensive infrastructure outlays. Shanty towns are the result. Most governments in Africa can't even pay the interest on their loans. So much for money and jobs as the be-all and end-all.

Alexander the Great defeated armies far larger than his by focusing his forces to a sharp point to break through the enemy's lines. The enemy in this case is hopelessness, and the focus has to be on interlocking enterprises and increased productivity as well as on access to credit. Western economics, based on money and jobs, values redundancy that lowers costs through competition. In the poverty world, it is the House that Jack Never Built for the want of this or that link in the economic chain or value chain as it's called now.

Four: in the mid 1980's another policy shift occurred. Increased emphasis began to be placed on economies of scale and large, well-established organizations with large political and donor-based constituencies. Policy shifted to the use of prominent consulting firms good at proposal-writing and accounting, who would then dribble out small grants to local NGO's who would know better than First Worlders how to do development at the local level. This policy overlooked the positive fusion that results when two cultures mix together in an intimate and creative way to learn from each other. USAID, for example, soon lapsed from the greatest Aid agency in the world with intimate knowledge of its projects in the field to one in which its bureaucrats were chained to their desks in a bunker mentality that shovels money through large corporations who can write intricate, intense proposals and create impressive spreadsheets and evaluations. Innovation, that usually comes from small firms or individuals has been the unfortunate casualty.

Cracks are beginning to appear in the microfinance juggernaut. A recent article in the Wall Street Journal, while positive about microfinance, talks at length about the parallel services provided in developing countries by local moneylenders with comparable interest rates. Donors and critics will eventually note that moneylenders are self-sufficient and do not use up precious donor resources to achieve the same results. In the generative

paradigm, scarce donor resources would be used for start up, replication, cultural adaptation, experimentation, and scaling up. A recent book, *The AID Trap*, written by Glenn Hubbard, Dean of Columbia University's Business School and William Duggan, elaborates on the failure of the present system of aid to create economic development in non-industrialized countries. They call for a shift to a focus on promoting private businesses. It is the labor-cost differential between rich and poor countries that has attracted investment and capital flows to nations where wages are low. This may have done more to redistribute wealth than all the aid programs in the world put together. It is the generative principle that businesses follow that will enable us to successfully attack the immense inertia of the present system that locks poverty into a scheme whereby banks only give money to those who don't need money; ie, to those who already have a surplus of cash or collateral.

The transition from a welfare paradigm to a sustainability paradigm took years to achieve, but a tipping point occurred in the 80's when people began to gravitate towards that new philosophy. It is time to create a critical mass for the next paradigm, a generative paradigm using the principles of Nature and private business at first mostly in a non-profit mode. It is our estimate that in ten years the tipping point for the new paradigm can be reached if more experimental programs can be started soon. These programs will show that even the very poor can create a surplus and a dynamic that will attract donors and investors alike in a win/win strategy free of the politically partisan disasters that infested the 20th century. Several NGO's and banks working with cooperatives and groups organized around readily-marketable products are already achieving this result. To create critical mass, the successful methodologies at the neediest level will be linked informally and voluntarily on a horizontal scale to vertical integration with investors at increasingly larger and higher levels. This is very do-able with just a tiny fraction of what is now being spent on development aid in the present "Aid Trap" framework.

To achieve the paradigm shift called for in this paper, the following things need to happen:

1. For the shift to occur quickly, people must be conscious of the need for a shift and of what constitutes the new paradigm. This means that the development community's negative attitude towards profit and business must be turned into a positive by using the term "surplus generation"

- instead of “profit” and by operating at but at first in a not-for-profit context to re-assure donors that greed is not a factor. Words matter.
2. An emphasis on enterprise creation and support, especially for those enterprises that enable other enterprises in the “value chain,” must be brought back into focus as the indispensable partner of microfinance. Culturally appropriate technological improvements must be included in the mix. They say Norman Borlaug’s technology and the green revolution “saved a billion lives” and that may be an understatement.
 3. The guiding principle of the new paradigm must be that the poor, even the very poor, can and will lift themselves out of poverty if we give them the chance to create surpluses (profits) that will then attract the capital markets. Innumerable financial instruments and opportunities will appear as soon as people see that this is possible.
 4. There must be a policy shift not only to private sector principles and methodologies, but away from the bureaucratic reliance only on big “reputable” organizations be they private sector or governmental. The stakeholders are the key, and policy must go back to working as well with small organizations, local, national or international, eager and willing to take the risks to be innovative outside the present failed “Aid Trap” system. Remember, the mouse survived; the dinosaur did not.
 5. This means the donor organizations themselves must change. They desperately need to “de-bureaucratize” and go back to a reliance on experienced field hands who frequently visit the projects and work on the ground where the truth lies.
 6. This also implies that the evaluation context must change. Evaluation has been taken over by the green shades, the bean counters, with nimble digital fingers. In its initial, most seminal period, Peace Corps relied only on subjective evaluations done by experienced field hands who made their mistakes but whose noses were close to the ground. We need much more of this to make Development with a capital D exciting and relevant again.
 7. “Embedded generosity” is catching on along with a policy shift towards a private sector approach to development practice. Microfinance/microenterprise needs to take advantage of this movement in an “adopt a small or micro-enterprise” approach. A few organizations already do this and several businesses donate, for example, a gift shoe for every one you buy. Corporations will be competing in the new paradigm to involve the customer who is purchasing the product in adopting a tiny little microenterprise, say for that Mama on a street corner in

a shantytown near Nairobi who needs to buy a few cabbages to sell them today, or the farmer who has no seeds or fertilizer, and so forth and so on. You get the idea.

Most of all it is a new attitude that is needed, that the poor can lift themselves out of poverty if we apply generative principles to the art of development.

**Thinking the Unthinkable:
on the Verge of Reality and Fiction**

FROM BIOLOGICAL TO TECHNOLOGICAL EVOLUTION

José L. Cordeiro

The famous astronomer and astrobiologist Carl Sagan popularized the concept of a Cosmic Calendar about three decades ago. In his 1977 book, *The Dragons of Eden: Speculations on the Evolution of Human Intelligence*, Sagan wrote a timeline for the universe, starting with the Big Bang about 15 billion years ago. Today, we think that it all started about 13.7 billion years back, and we keep updating and improving our knowledge of life, the universe and everything. In his Cosmic Calendar, with each month representing slightly over one billion years, Sagan dated the major events during the first 11 months of the cosmic year (see Table 1).

Table 1: Cosmic Calendar: January–November

Big Bang	January 1
Origin of Milky Way Galaxy	May 1
Origin of the solar system	September 9
Formation of the Earth	September 14
Origin of life on Earth	~ September 25
Formation of the oldest rocks known on Earth	October 2
Date of oldest fossils (bacteria and blue-green algae)	October 9
Invention of sex (by microorganisms)	~ November 1
Oldest fossil photosynthetic plants	November 12
Eukaryotes (first cells with nuclei) flourish	November 15

Source: J. L. Cordeiro based on C. Sagan (1977)

Interestingly enough, most of what we study in biological evolution happened in the last month. In fact, Sagan wrote that the first worms appeared on December 16, the invertebrates began to flourish on the 17th, the trilobites boomed on the 18th, the first fish and vertebrates appeared on

the 19th, the plants colonized the land on the 20th, the animals colonized the land on the 21st, the first amphibians and first winged insects appeared on the 22nd, the first trees and first reptiles evolved on the 23rd, the first dinosaurs appeared on the 24th, the first mammals evolved on the 26th, the first birds emerged on the 27th, the dinosaurs became extinct on the 28th, the first primates appeared on the 29th and the frontal lobes evolved in the brains of primates and the first hominids appeared on the 30th. Basically, humans are just the new kids in the block, and only evolved late at night on the last day of this Cosmic Calendar (see Table 2).

Table 2: Cosmic Calendar: December 31

Origin of <i>Proconsul</i> and <i>Ramapithecus</i> , probable ancestors of apes and men	~ 1:30 p.m.
First humans	~ 10:30 p.m.
Widespread use of stone tools	11:00 p.m.
Domestication of fire by Peking man	11:46 p.m.
Beginning of most recent glacial period	11:56 p.m.
Seafarers settle Australia	11:58 p.m.
Extensive cave painting in Europe	11:59 p.m.
Invention of agriculture	11:59:20 p.m.
Neolithic civilization; first cities	11:59:35 p.m.
First dynasties in Sumer, Ebla and Egypt; development of astronomy	11:59:50 p.m.
Invention of the alphabet; Akkadian Empire	11:59:51 p.m.
Hammurabi legal codes in Babylon; Middle Kingdom in Egypt	11:59:52 p.m.
Bronze metallurgy; Mycenaean culture; Trojan War; Olmec culture; invention of the compass	11:59:53 p.m.
Iron metallurgy; First Assyrian Empire; Kingdom of Israel; founding of Carthage by Phoenicia	11:59:54 p.m.
Asokan India; Ch'in Dynasty China; Periclean Athens; birth of Buddha	11:59:55 p.m.
Euclidean geometry; Archimedean physics; Ptolemaic astronomy; Roman Empire; birth of Christ	11:59:56 p.m.
Zero and decimals invented in Indian arithmetic; Rome falls; Moslem conquests	11:59:57 p.m.
Mayan civilization; Sung Dynasty China; Byzantine empire; Mongol invasion; Crusades	11:59:58 p.m.

Renaissance in Europe; voyages of discovery from Europe and from Ming Dynasty China; emergence of the experimental method in science	11:59:59 p.m.
Widespread development of science and technology; emergence of global culture; acquisition of the means of self-destruction of the human species; first steps in spacecraft planetary exploration and the search of extraterrestrial intelligence	Now: The first second of New Year's Day

Source: J. L. Cordeiro based on C. Sagan (1977)

The previous Cosmic Calendar is an excellent way to visualize the acceleration of change and the continuous evolution of the universe. Other authors have developed similar ideas to try to show the rise of complexity in nature. For example, in 2005, astrophysicist Eric Chaisson published his latest book, *Epic of Evolution: Seven Ages of the Cosmos*, where he describes the formation of the universe through the development of seven ages: matter, galaxies, stars, heavy elements, planets, life, complex life, and society. Chaisson presents a valuable survey of these fields and shows how combinations of simpler systems transform into more complex systems, and he thus gives a glimpse of what the future might bring.

Both Sagan and Chaisson wrote excellent overviews about evolution, from its cosmic beginnings to the recent emergence of humans and technology. However, a more futuristic look is given by engineer and inventor Ray Kurzweil in his 2005 book: *The Singularity is Near: When Humans Transcend Biology*. Kurzweil talks about six epochs with increasing complexity and accumulated information processing (see Table 3).

Table 3: The Six Epochs of the Universe according to Kurzweil

Epoch 1	Physics and chemistry (information in atomic structures)
Epoch 2	Biology (information in DNA)
Epoch 3	Brains (information in neural patterns)
Epoch 4	Technology (information in hardware and software designs)
Epoch 5	Merger of technology and human intelligence (the methods of biology, including human intelligence, are integrated into the exponentially expanding human technology base)
Epoch 6	The universe wakes up (patterns of matter and energy in the universe become saturated with intelligent processes and knowledge)

Source: J. L. Cordeiro based on R. Kurzweil (2005)

According to Kurzweil, we are entering Epoch 5 with an accelerating rate of change. The major event of this merger of technology and human intelligence will be the emergence of a “technological singularity”. Kurzweil believes that within a quarter century, non-biological intelligence will match the range and subtlety of human intelligence. It will then soar past it because of the continuing acceleration of information-based technologies, as well as the ability of machines to instantly share their knowledge. Eventually, intelligent nanorobots will be deeply integrated in our bodies, our brains, and our environment, overcoming pollution and poverty, providing vastly extended longevity, full-immersion virtual reality incorporating all of the senses, and vastly enhanced human intelligence. The result will be an intimate merger between the technology-creating species and the technological evolutionary process it spawned.

Computer scientist and science fiction writer Vernor Vinge first discussed this idea of a technological singularity in a now classic 1993 paper, where he predicted:

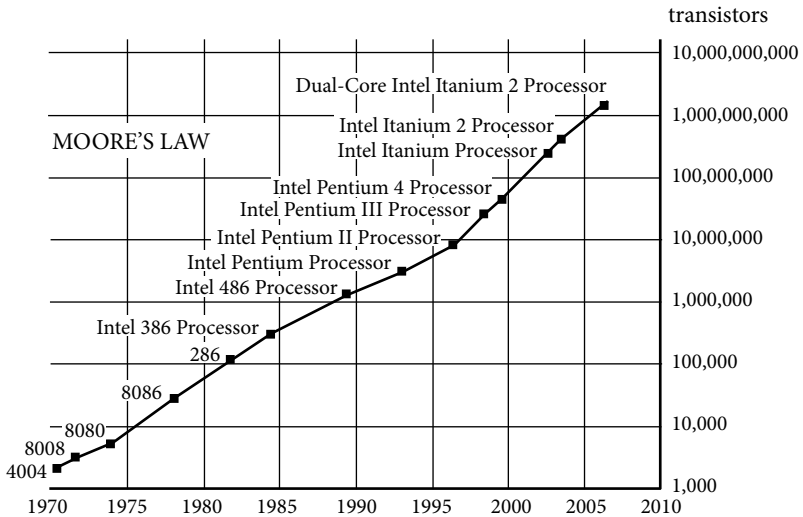
Within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended.

Other authors talk about such technological singularity as the moment in time when artificial intelligence will overtake human intelligence. Kurzweil has also proposed the *Law of Accelerating Returns*, as a generalization of Moore’s law to describe an exponential growth of technological progress. Moore’s law deals with an exponential growth pattern in the complexity of integrated semiconductor circuits (see Figure 1).

Kurzweil extends Moore’s law to include technologies from far before the integrated circuit to future forms of computation. Whenever a technology approaches some kind of a barrier, he writes, a new technology will be invented to allow us to cross that barrier. He predicts that such paradigm shifts will become increasingly common, leading to “technological change so rapid and profound it represents a rupture in the fabric of human history.” He believes the *Law of Accelerating Returns* implies that a technological singularity will occur around 2045:

An analysis of the history of technology shows that technological change is exponential, contrary to the common-sense ‘intuitive linear’ view. So we won’t experience 100 years of progress in the 21st century—it will be more like 20,000 years of progress (at today’s rate). The “returns”, such as chip speed and

Figure 1: Moore's Law



Source: Intel

cost-effectiveness, also increase exponentially. There's even exponential growth in the rate of exponential growth. Within a few decades, machine intelligence will surpass human intelligence, leading to the Singularity - technological change so rapid and profound it represents a rupture in the fabric of human history. The implications include the merger of biological and non-biological intelligence, immortal software-based humans, and ultra-high levels of intelligence that expand outward in the universe at the speed of light.

Technological Convergence

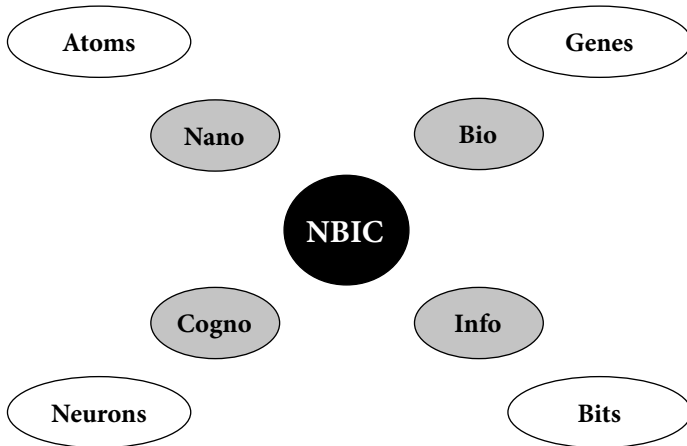
Futurists today have diverging views about the singularity: some see it as a very likely scenario, while others believe that it is more probable that there will never be any very sudden and dramatic changes due to progress in artificial intelligence. However, most futurists and scientists agree that there is an increasing rate of technological change. In fact, the rapid emergence

of new technologies has generated scientific developments never dreamed of before.

The expression “emerging technologies” is used to cover such new and potentially powerful technologies as genetic engineering, artificial intelligence, and nanotechnology. Although the exact denotation of the expression is vague, various writers have identified clusters of such technologies that they consider critical to humanity’s future. These proposed technology clusters are typically abbreviated by such combinations of letters as NBIC, which stands for Nanotechnology, Biotechnology, Information technology and Cognitive science. Various other acronyms have been offered for essentially the same concept, such as GNR (Genetics, Nanotechnology and Robotics) used by Kurzweil, while others prefer NRG because it sounds similar to “energy.” Journalist Joel Garreau in *Radical Evolution* uses GRIN, for Genetic, Robotic, Information, and Nano processes, while author Douglas Mulhall in *Our Molecular Future* uses GRAIN, for Genetics, Robotics, Artificial Intelligence, and Nanotechnology. Another acronym is BANG for Bits, Atoms, Neurons, and Genes.

The first NBIC Conference for Improving Human Performance was organized in 2003 by the NSF (National Science Foundation) and the DOC (Department of Commerce). Since then, there have been many similar gatherings, in the USA and overseas. The European Union has been working on its own strategy towards converging technologies, and so have been other countries in Asia, starting with Japan.

The idea of technological convergence is based on the merger of different scientific disciplines thanks to the acceleration of change on all NBIC fields. Nanotechnology deals with atoms and molecules, biotechnology with genes and cells, infotechnology with bits and bytes, and cognitive science with neurons and brains. These four fields are converging thanks to the larger and faster information processing of ever more powerful computers (see Figure 2).

Figure 2: Technological Convergence NBIC

Source: J. L. Cordeiro based on M.C. Roco and W.S. Bainbridge (2003)

Experts from the four NBIC fields agree about the incredible potential of technological evolution finally overtaking and directing biological evolution. Bill Gates of Microsoft has stated that:

I expect to see breathtaking advances in medicine over the next two decades, and biotechnology researchers and companies will be at the center of that progress. I'm a big believer in information technology... but it is hard to argue that the emerging medical revolution, spearheaded by the biotechnology industry, is any less important to the future of humankind. It, too, will empower people and raise the standard of living.

Larry Ellison of Oracle, Gates' chief rival in the software industry, agrees: "If I were 21 years old, I probably wouldn't go into computing. The computing industry is about to become boring". He explains that: "I would go into genetic engineering." Biologist Craig Venter has said that he spent 10 years reading the human genome, and now he is planning to write new genomes. He wants to create completely new forms of life, from scratch. Scientist and writer Gregory Stock also believes that cloning, even though a fundamental step in biotechnology, is just too simple and unexciting: "why copy old life forms when we can now create new ones?"

Biological evolution allowed the appearance of human beings, and many other species, through millions of years of natural selection based on trials and errors. Now we can control biological evolution, direct it and go beyond it. In fact, why stop evolution with carbon-based life forms? Why not move into silicon-based life, among many other possibilities? Robotics and artificial intelligence will allow us to do just that.

Scientist Marvin Minsky, one of the fathers of artificial intelligence at MIT, wrote a very famous 1994 article “Will robots inherit the Earth?” in *Scientific American*, where he concludes: “Yes, but they will be our children. We owe our minds to the deaths and lives of all the creatures that were ever engaged in the struggle called Evolution. Our job is to see that all this work shall not end up in meaningless waste.” Robotics expert Hans Moravec has written two books about robots and our (their) future: *Mind Children* in 1988 and *Robot* in 1998. Moravec argues that robots will be our rightful descendants and he explains several ways to “upload” a mind into a robot. In England, cybernetics professor Kevin Warwick has been implanting his own body with several microchip devices and published in 2003 a book explaining his experiments: *I, Cyborg*. Warwick is a cybernetics pioneer who claims that: “I was born human. But this was an accident of fate – a condition merely of time and place. I believe it’s something we have the power to change... The future is out there; I am eager to see what it holds. I want to do something with my life: I want to be a cyborg.”

As these authors and thinkers suggest, we need to start preparing ourselves for the coming NBIC realities of technological convergence, including robotics and artificial intelligence. Thanks to technological evolution, humans will transcend our biological limitations to become transhumans and eventually posthumans. To ease this transition into a posthuman condition, we must ready ourselves for the distinct possibility that the Earth, and other planets, will be inherited by not just one but several forms of highly intelligent and sentient life forms. The philosophy of Extropy (see Appendix 1) and Transhumanism (see Appendix 2) explain these boundless possibilities for future generations, while we approach a possible technological singularity as studied in the nascent Singularity University (See Appendix 3).

The Human Seed

Humans are not the end of evolution but just the beginning of a better, conscious and technological evolution. The human body is a good beginning, but we can certainly improve it, upgrade it, and transcend it. Biological evolution through natural selection might be ending, but technological evolution is only accelerating now. Technology, which started to show dominance over biological processes some years ago, is finally overtaking biology as the science of life.

As fuzzy logic theorist Bart Kosko has said: “Biology is not destiny. It was never more than tendency. It was just nature’s first quick and dirty way to compute with meat. Chips are destiny.” And photo-qubits might come soon after standard silicon-based chips, but even that is only an intermediate means for eternal intelligent life in the universe.

Humans are the first species which is conscious of its own evolution and limitations, and humans will eventually transcend these constraints to become posthumans. It might be a rapid process like caterpillars becoming butterflies, as opposed to the slow evolutionary passage from apes to humans. Future intelligent life forms might not even resemble human beings at all, and carbon-based organisms will mix with a plethora of other organisms. These posthumans will depend not only on carbon-based systems but also on silicon and other “platforms” which might be more convenient for different environments, like traveling in outer space.

Eventually, all these new sentient life forms might be connected to become a global brain, a large interplanetary brain, and even a larger intergalactic brain. The ultimate scientific and philosophical queries will continue to be tackled by these posthuman life forms. Intelligence will keep on evolving and will try to answer the old-age questions of life, the universe and everything. With ethics and wisdom, humans will become posthumans, as science fiction writer David Zindell suggested:

“What is a human being, then?”

“A seed.”

“A... seed?”

“An acorn that is unafraid to destroy itself in growing into a tree.”

Appendix 1: The Principles of Extropy

- **Perpetual Progress:** Extropy means seeking more intelligence, wisdom, and effectiveness, an open-ended lifespan, and the removal of political, cultural, biological, and psychological limits to continuing development. Perpetually overcoming constraints on our progress and possibilities as individuals, as organizations, and as a species. Growing in healthy directions without bound.
- **Self-Transformation:** Extropy means affirming continual ethical, intellectual, and physical self-improvement, through critical and creative thinking, perpetual learning, personal responsibility, proactivity, and experimentation. Using technology – in the widest sense to seek physiological and neurological augmentation along with emotional and psychological refinement.
- **Practical Optimism:** Extropy means fueling action with positive expectations – individuals and organizations being tirelessly proactive. Adopting a rational, action-based optimism or “proaction”, in place of both blind faith and stagnant pessimism.
- **Intelligent Technology:** Extropy means designing and managing technologies not as ends in themselves but as effective means for improving life. Applying science and technology creatively and courageously to transcend “natural” but harmful, confining qualities derived from our biological heritage, culture, and environment.
- **Open Society – information and democracy:** Extropy means supporting social orders that foster freedom of communication, freedom of action, experimentation, innovation, questioning, and learning. Opposing authoritarian social control and unnecessary hierarchy and favoring the rule of law and decentralization of power and responsibility. Preferring bargaining over battling, exchange over extortion, and communication over compulsion. Openness to improvement rather than a static utopia. Extropia (“ever-receding stretch goals for society”) over utopia (“no place”).
- **Self-Direction:** Extropy means valuing independent thinking, individual freedom, personal responsibility, self-direction, self-respect, and a parallel respect for others.
- **Rational Thinking:** Extropy means favoring reason over blind faith and questioning over dogma. It means understanding, experimenting, learning, challenging, and innovating rather than clinging to beliefs.

Appendix 2: The Transhumanist Declaration

1. Humanity stands to be profoundly affected by science and technology in the future. We envision the possibility of broadening human potential by overcoming aging, cognitive shortcomings, involuntary suffering, and our confinement to planet Earth.
2. We believe that humanity's potential is still mostly unrealized. There are possible scenarios that lead to wonderful and exceedingly worthwhile enhanced human conditions.
3. We recognize that humanity faces serious risks, especially from the misuse of new technologies. There are possible realistic scenarios that lead to the loss of most, or even all, of what we hold valuable. Some of these scenarios are drastic, others are subtle. Although all progress is change, not all change is progress.
4. Research effort needs to be invested into understanding these prospects. We need to carefully deliberate how best to reduce risks and expedite beneficial applications. We also need forums where people can constructively discuss what should be done, and a social order where responsible decisions can be implemented.
5. Reduction of existential risks, and development of means for the preservation of life and health, the alleviation of grave suffering, and the improvement of human foresight and wisdom should be pursued as urgent priorities, and heavily funded.
6. Policy making ought to be guided by responsible and inclusive moral vision, taking seriously both opportunities and risks, respecting autonomy and individual rights, and showing solidarity with and concern for the interests and dignity of all people around the globe. We must also consider our moral responsibilities towards generations that will exist in the future.
7. We advocate the well-being of all sentience, including humans, non-human animals, and any future artificial intellects, modified life forms, or other intelligences to which technological and scientific advance may give rise.
8. We favour allowing individuals wide personal choice over how they enable their lives. This includes use of techniques that may be developed to assist memory, concentration, and mental energy; life extension therapies; reproductive choice technologies; cryonics procedures; and many other possible human modification and enhancement technologies.

Appendix 3: The Technological Singularity and Singularity University

The Singularity is Near: When Humans Transcend Biology is the best-selling book published in 2005 by Raymond Kurzweil. This book remained at the top of the charts in science and technology during many months, and Microsoft cofounder Bill Gates wrote that “Ray Kurzweil is the best person I know at predicting the future of artificial intelligence. His intriguing new book envisions a future in which information technologies have advanced so far and fast that they enable humanity to transcend its biological limitations - transforming our lives in ways we can’t yet imagine.”

Kurzweil graduated in 1970 with an engineering degree in computer science, and literature, from MIT. Since then, he has become a prolific inventor and futurist writer. He was one of the pioneers in optical character recognition (OCR), text-to-speech synthesis, speech recognition technology, and electronic keyboard instruments. He has received two dozen honorary doctorates and also honors from three US presidents. He has been the recipient of the \$500,000 MIT-Lemelson Prize, the world’s largest prize for innovation. He received the National Medal of Technology, the US highest honor in technology, from President Bill Clinton in a White House ceremony. In 2002 he was inducted into the National Inventors Hall of Fame, established by the US Patent Office. More recently, in November 2009, he received the Innovation Award by *The Economist* in the category of Computing and Telecommunication for his optical character recognition and speech recognition technology. These awards, described as the “Oscars of Innovation,” celebrate individual innovators whose work has had the greatest impact on business and society. Thus, Kurzweil’s past credentials are very impressive, but what does he think about the future? In particular, what does he say about a supposedly technological singularity, and what is it exactly?

The technological singularity is the theoretical future point which takes place during a period of accelerating change sometime after the creation of a super intelligence. Mathematician, computer scientist and science fiction writer Vernor Vinge famously called this event the “Singularity” as an analogy between the breakdown of modern physics near a gravitational singularity and the drastic change in society he argues would occur following an intelligence explosion. In the 1980s, Vinge popularized the singularity in lectures, essays, and science fiction. More recently, some prominent technologists such as Bill Joy, cofounder of Sun Microsystems, voiced concern over the potential dangers of Vinge’s singularity.

Kurzweil argues that the inevitability of a technological singularity is implied by a long-term pattern of accelerating change that generalizes Moore's Law to technologies predating the integrated circuit, and which he argues will continue to other technologies not yet invented. According to him, artificial intelligence should be able to pass the Turing Test by 2029, and the technological singularity should occur by 2045. It is estimated that US\$ 1,000 will then buy a computer a billion times more powerful than the human brain. This means that average, and even low-end, computers will be hugely smarter than even highly intelligent, unenhanced humans.

The singularity will be an extremely disruptive, world-altering event that will change forever the course of human history. The extermination of humanity by violent machines is unlikely (though not impossible) because sharp distinctions between man and machine will no longer exist thanks to the existence of cybernetically enhanced humans and uploaded humans. In fact, Kurzweil strongly believes that humans will enhance themselves by merging with the machines.

In January 2007, while trekking in Chile, Peter Diamandis was reading *The Singularity is Near*, and was inspired to use those ideas to create a new university in order to improve the future of humankind. Diamandis graduated as an aerospace engineer from MIT and later as a medical doctor from Harvard Medical School. In 1987, he cofounded the successful International Space University and served as its first Managing Director and CEO, while Sir Arthur C. Clarke became its first Chancellor. Since then, the International Space University has been training astronauts and cosmonauts, spacecraft engineers, scientists, managers, scientists and experts in space law and policy from its current permanent campus near Strasbourg in France. Diamandis is considered a key figure in the development of the personal spaceflight industry, having created many space-related businesses or organizations. He is the Founder and Chairman of the X Prize Foundation, an educational non-profit prize organization whose mission is to create radical breakthroughs for the benefit of humanity. Diamandis is also CEO and co-founder of Zero Gravity Corporation, which offers parabolic weightless flights to the general public, and also cofounded Space Adventures, which has flown four private citizens on Soyuz to the International Space Station.

According to Diamandis, the interdisciplinary, international and intercultural principles originally pioneered by the International Space University could also be applied to create Singularity University. The

concept of the Singularity University was originally proposed by Diamandis to Kurzweil in mid-2007, an exploratory meeting was held in November 2007, followed by a Founding Meeting in September 2008, hosted at NASA Ames in Mountain View, California.

In February 2009, Diamandis and Kurzweil announced publicly the creation of Singularity University in the annual TED (Technology, Entertainment, Design) conference in California. In just three months, the university received close to 1,200 applications for the 40 places of the inaugural summer class. Thus started the first GSP (Graduate Studies Program) class at Singularity University, during 9 weeks, at the new campus at NASA Ames. By 2010, the GSP doubled in size, with 80 students being selected among 1,600 applications from all over the world.

Evidently, Singularity University derives its name from Kurzweil's book *The Singularity is Near*. Here again, the term singularity refers to the theoretical future point of unprecedented advancement caused by the accelerating development of various technologies including biotechnology, nanotechnology, artificial intelligence, robotics and genetics. However, Singularity University makes no predictions about the exact effects of these technologies on humanity; rather, its mission is to facilitate the understanding, prediction and development of these technologies and how they can best be harnessed to solve the grand challenges faced by humanity.

Singularity University is an interdisciplinary university whose mission is to assemble, educate and inspire a cadre of leaders who strive to understand and facilitate the development of exponentially advancing technologies and apply, focus and guide these tools to address humanity's grand challenges. Salim Ismail, former Yahoo! manager and the Executive Director of Singularity University, emphasizes their important role to "prepare humanity for accelerating technological change," as the motto of the new university reads.

A number of exponentially growing technologies (biotechnology, nanotechnology, infotechnology, artificial intelligence, etc.) will massively increase human intelligence and capability and fundamentally reshape our future. This concept, known as the technological singularity, as advanced by Kurzweil, warrants the creation of an academic institution whose students and faculty will study these technologies, with an emphasis on their interactions, and help to guide the process for the benefit of humanity and its environment. The inaugural 2009 summer program was divided in 10

academic tracks dealing with subjects from futures studies and forecasting to policy, law and ethics. According to Bruce Klein, Vice-president for University Relations, Singularity University wants to “prepare the next generation of intellectual and entrepreneurial leaders for humanity.”

Academically, the new university has 10 major scholastic tracks, with an interdisciplinary emphasis on scientific and technological issues:

1. Futures Studies and Forecasting
2. Policy, Law and Ethics
3. Finance and Entrepreneurship
4. Networks and Computing Systems
5. Biotechnology and Bioinformatics
6. Nanotechnology
7. Medicine, Neuroscience and Human Enhancement
8. Artificial Intelligence, Robotics and Cognitive Computing
9. Energy and Ecological Systems
10. Space and Physical Sciences

Singularity University is based at NASA Ames Research Center in Silicon Valley, California, and counts with support of many important sponsors like Google, Nokia, ePlanet Ventures, 23andMe, AutoDesk, Canon and other top companies. The faculty is also very impressive and includes, besides Kurzweil and Diamandis, personalities like Vint Cerf (“the father of Internet” and Chief Internet Evangelist of Google), George Smoot (2006 Nobel Prize in Physics), Pete Worden (Director of NASA Ames), Dan Barry (three times NASA astronaut and President of Denbar Robotics), Bob Metcalfe (“father of Ethernet” and General Partner of Polaris Venture), James Canton (CEO and Chairman of the Institute for Global Futures), Aubrey de Grey (Chair and CSO of the Methuselah Foundation), Paul Saffo (Visiting Scholar in the Stanford Media X Research Network), Sunil Paul (Founding Partner at Spring Ventures), Jerome Glenn (Executive Director of the Millennium Project) and Peter Norvig (Director of Research of Google), among many other prestigious engineers, scientists and entrepreneurs.

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WHY WE ARE NOT SUSTAINABLE

Jaroslav Kalous

Introduction

We live at an exciting and special time. The number of people on the Earth will reach 7 billion this year (World Population Clock). When I was born sixty years ago, there were only 2.5 billion. This exponential growth has far-reaching effects. It influences our own lives and life on our planet in general. But it is not possible just to open our eyes and to see that. Our senses have evolved to deal with the near-at-hand information; what involves the whole planet is difficult to perceive directly.

The present unlimited growth is unsustainable within a limited system, as our planet certainly is. What does it mean? What are the consequences? What should we do? Reflection of such questions is the contents of this paper.

Human population

Historical perspective

At the end of the last glacial period about 10 000 BC around four million people lived in the world. Changes in farming, which occurred around 5000 BC brought a larger increase in population. At the beginning of AD an estimated 260 million people inhabited the Earth. Despite rare declines (one came around the year 400 AD with the disintegration of ancient society, another was caused by plague in the 14th century) the population still increased only very slightly. At the end of the 5th century 430 million people lived on Earth, at the end of 15th century population moved closer to 500 million. At that time, the mortality rate decreased, while birth rates remained at a high level and the result was faster growth of the population. But still the total number of people on Earth for many thousands of years did not exceed one billion.

At the beginning of 20th century the total amount of people was 1.6 billion, at the end of 20th century it was already 6.2 billion. Today it is 6.9 billion.

Every year the world population grows by about 70 million people. Latest projections imply that population growth will continue, although more slowly. The world population is projected to reach 9 billion by 2044 (World Population Clock).

Demographic-economic paradox

There is an inverse correlation between wealth and fertility. The higher the degree of GDP per capita, the fewer children are born in any industrialized country.

Developed countries usually have a much lower fertility rate due to greater wealth, education, and urbanization. Mortality rates are low, birth control is understood and easily accessible, and costs of child-rearing are often deemed very high because of education, clothing, feeding, and social amenities. With wealth, contraception becomes affordable. In addition, lengthy periods of higher education often mean that women start to have children later in life.

In developing countries on the other hand, families desire children for their labour and as caregivers for their parents in old age. Fertility rates are also higher due to the lack of access to contraceptives, generally lower levels of female education, and lower rates of female employment in industry.

The result is the demographic-economic paradox. Nine out of ten people born in 2010 will live in developing countries. Consequently, the gap between developing and developed countries is widening further. The demographic share of developing countries in the total world population will still increase. If two thirds of all humankind were living in developing countries in 1950, today there are three quarters and by 2020 there will be four fifths (U.S. Census Bureau).

Ageing world

The world is aging. With only a few exceptions, this process is taking place in every country and region across the globe. Among the developed countries the overall median age rose from 29 in 1950 to 37 in 2000, and is forecast to rise to 45 by 2050. The corresponding figures for the world as a whole are 24 in 1950, 27 in 2000, and 38 in 2050.

Population ageing arises from two demographic effects: increasing longevity and declining fertility. An increase in longevity raises the average age of the population by increasing the number of surviving older people. A decline in fertility reduces the number of babies, and as the effect continues, the numbers of younger people in general also reduces.

In 1900, the global average lifespan was just 31 years and even in the richest countries below 50 years. By the mid-20th century, average life expectancy rose to 48 years. In 2005, the average lifespan reached 66 years; over 80 years in some countries. By 2030, average life expectancy at birth in most developed countries will be 85 years (Prentice, 2006).

Life expectancy, and therefore the number of elderly people, has been growing for a long time, but the decline of fertility in developed countries is something new.

Population growth consequences

Consumption

An exponentially growing population needs an equally exponential growth of food production, extraction of raw materials, building homes, roads, etc. People are living longer, and urbanisation and population expands most in regions where it is most difficult to ensure the necessary living needs. After World War II humanity has consumed more natural resources than during the whole of previous history (Laszlo, 2003).

There is a huge gap between rich and poor – both people and countries. The richest 20% take 86% of the world consumption. The poorer 80% of people consumes only the remaining 14%. A fifth of the world's population is now living in developed countries, profligately producing, consuming and polluting. The remaining four fifths live in developing countries, mostly in poverty. 2.7 billion people live below the poverty line of \$2 a day. Not only is it difficult to survive on such a small amount, but other negative factors apply such as the unavailability of clean drinking water (1.1 billion people) and basic health care (2.4 billion people). Starvation and poverty cause 25 thousand lives every day, including 17 thousand children under five years-of-age who die daily. In total, six million small children die of poverty every year (Food and Agriculture Organization of UN).

Environment

Population growth also brings rapid growth of other problems. Each problem multiplied by seven billion involves enormous dimensions (for example, if everyone will have one fish a day, 7 billion of fish would be caught every day). More precisely, the problem is not the population growth as such, but the growth of consumption. The environmental burden is caused not only by numbers but also by lifestyles.

Some examples of the environmental problems are: soil erosion, desertification, deforestation, air and water pollution, water contamination by toxic substances, depletion of stocks of oil and mineral resources, flushing the soil into rivers and water reservoirs, spread of human habitation on to arable land, falling ground water levels, shrinking wilderness area, global warming, radioactive waste, acid rain, and so on.

The Ecological Footprint is a measure of humanity's demand on nature. It measures how much land and water area a human population requires to produce the resource it consumes and to absorb its wastes, using present technology. Humanity is now using nature's renewable services 50 % faster than the rate at which the Earth can renew them.

The Ecological Footprint of our species has more than doubled since 1966. In 2007, the most recent year for which data are available, humanity used the equivalent of 1.5 planets to support its activities. Even with modest UN projections for population growth, consumption and climate change, by 2030 humanity will need the capacity of two Earths to absorb carbon dioxide waste and keep up with natural resource consumption (2010 Living Planet Report).

Mass extinction

The last global mass extinction which eliminated the dinosaurs and many other species was most likely caused by an asteroid hitting the earth. This happened sixty-five million years ago. Another similar catastrophic extinction of species is happening now. We are causing it and most humans are not aware of it. Only a tiny fraction of humans are aware.

The numbers are the following: At the minimum, twenty-five thousand species are going extinct every year. If humans' activity were otherwise, or if humans were not here, it is estimated that there would be one species going extinct every five years. We have pushed up the natural extinction

rate a hundred thousand times. Human activity is actually eliminating some forms of life.

Gaia

Thirty years ago James Lovelock created a theory that the Earth has a global system of ecological balance. He called it Gaia, and his theory is widely accepted today. In terms of the systems approach Lovelock notes: *“Mankind on the Earth behaves in a sense as pathogenic organisms or cells of a tumour or neoplasm. We have multiplied to such an extent that our presence is causing perceived failure of systems Gaia ... the human species is now so large that it poses a serious global disease. Gaia is suffering from scattered primatemaia – human pestilence. The human species is now so large that the planet is a serious disease.”* (Lovelock, 2000).

The reduction of the human population may occur in different ways – climate change, the spread of new types of diseases, wars, a declining birth rate or a combination of these and other unknown factors. Lovelock envisages that the collapse curve will mirror the curve of population growth. This means that around the year 2150 human population could return to the state it was in before the “contamination”, i.e. between 0.5 and 1 billion.

Why we are unable to solve global problems

Unconcern

Václav Havel started the series of Forum 2000 conferences with the following statement (Havel et al, 2007): *“It seems to me that what is critical now is not to point out again and again such horrors that may be lying in wait unless our global civilisation changes its essential direction. Today the most important thing, in my view, is to study the reasons why humankind does nothing to avert the threats about which it knows so much, and why it allows itself to be carried onward by some kind of perpetual motion - basically unaffected by self-awareness or a sense of future options and, as it seems, virtually incapable of being affected.”*

People need to believe in progress in their lives. Thinking about the loss of the all good things and the inevitability of decline would deprive life of its positive perspective and dynamic. Alarming information about the state of our world appears in the media among floods of other horrors; anyone wishing to can easily get it. However, people read a negative vision

with the same interest as they would watch a horror movie on television, nothing else. It is distant and abstract; it is uncomfortable to think about. People do not speak about such things publicly; it is as much a social taboo as death, for example.**Lack of global cohesion**

Currently there is a steadily growing gap between the need for comprehensive global action to save our civilization and humanity's ability to agree on it. The problem is not in communication technologies; on the contrary they have interconnected the whole world. The whole world hears of an assassination on the other side of the globe in a few minutes. Some events (Olympic Games, World Cup competitions, the selection of Miss World) are watched simultaneously by billions of people on their TV screens. But we are not by this way closer to each other. "Humanity" is a term we use, but it has a minuscule influence on our thinking, feeling and acting.

The most important issues of the coming decades are global in nature, and therefore, their solutions must be at the global level. Factors that impede solutions seem to be similar everywhere in the world and largely independent of ethnicity and culture. An International Panel identifies as the most serious (Glenn, Gordon 2002):

- Lack of interest in the needs of future generations
- Caring for the welfare of one group or one nation
- Corruption of officials decision-makers (politicians)
- Waste
- Greed and selfishness

Demographic revolution

Can we go deeper and find some common denominator? I think that it is a form of individualism, in which man is himself a goal, the purpose of life itself and in which everything else assumes a secondary role. In some relationships (mother love) and in certain situations (for a revolutionary uprising), manifestations of individualism are emended, but individualism and its associated values and activities seem 'normally' universal and prevalent.

The demographic revolution brought to an end the past times when human life used to be relatively short, when it was associated with something that significantly exceeds its duration (e.g. tribe, religion, kingdom). Today it is precisely the opposite. In the last one hundred years the lifespan has doubled; meanwhile the time-scale in which the external institutions

function (e.g. political regimes) has shortened and quickened. And in this uncertain, unstable, turbulent and risky world, the only certainty seems to be my own self-existence, what I acquire for myself that will remain.

The extreme individualism of western society is hardly to be changed. There is prevailing belief that individuals are behaving rationally, when they can satisfy their needs and wants, without assuming responsibility for possible consequences. The sense of community responsibility has diminished and individuals feel little collective responsibility for anything beyond themselves and those close to them. *“People were never able to think about more than a year or two ahead - but now it becomes fatal for them. Most remarkable among all other risks is that people refuse to note all the mess, that they do not care... Humanity is considered to be six billion individuals, each is thinking of its individual life extension in tragicomic way rather than of the fate of mankind”* (Machovec, 2002).

The tragedy of the commons

Founders of economics in the second half of the 18th century recognized that if a person should benefit from cooperation with others, it is only under pressure of rules of good conduct. Olson (1971) in his book *The Logic of Collective* offered the following thesis: If the number of members of a group is not quite small or in the absence of means of coercion, rational individuals will always act only in their individual rather than collective interests.

Today's society is characterized by a growing rift between individual and public interests: individuals are rational in an irrational society, and the more rationally we behave as individuals, more irrational we are collectively. In the era of globalization, the huge population growth and the related increase in urbanization, industry and transport, the public good has gradually become the good of the entire planet. If each individual tries to make its own profit within a society whose rules allow the use of cheap public goods, such as water, air and earth, in a world of limited resources, humanity necessarily heads for disaster.

Cave ethics

Man and his predecessors spent million years in small, clearly defined and enclosed groups of hunters and collectors, usually numbering several

dozen individuals. This way of life shaped us. Our patterns of congenital behaviour were developed as an adaptation to the environment during the long period, which constitutes 98% of our species history.

We used to care for the children, keep a fire, fight with the animals and survive the winter. But our predecessors did not have to take care for abundant nature. Hunter-gatherers in the Stone Age did not have any mercy on nature. They hunted and gathered, cut down and burned whenever it seemed appropriate. Damage was limited, because there were few people, so there was no reason to restrict human activity. From being a small group on the relatively huge planet, humanity has evolved to seven billion on a now relatively tiny overcrowded planet.

During the development of civilization over the past ten thousand years our biology has not changed. While there has been enormous cultural development, our emotions, instincts and restricted ways of thinking have remained the same. In this respect, we do not differ from our ancestors, the reindeer hunters of the Ice Age. The mentality of Stone Age persists, “transplanted” into modern society.

Humans are programmed to work with relatives and to some extent even with unrelated individuals, but only in groups of a certain size. And also to look into the not-too-distant future: why should our ancestors have been interested in what happens fifty years ahead? They had to deal many more important current challenges. We are prisoners of deeply ingrained archaic thinking, which is concerned only with immediate causes and consequences. We may sense that the destruction of the environment will finally lead to our extinction, but we are still directed by our evolution not to be concerned about it, we do not seem to mind. Now we have no more time to learn the trial-and-error.

Led by the hand of natural selection, we strive to continue to spread our own genes and the genes of our tribe. Human inability to see further than beyond the next few years will pay out back to us. So will the fact that we are not programmed to work together beyond the narrow structures of our social world. Our hunter-collector morality is inadequate for the third millennium. Global problems require extensive cooperation. In its current stage of development, humanity neither wants to deal with this issue, nor is it capable of doing so.

In sum

What sense of existence does humanity have? Could it be living to the age of 100 without diseases and problems? Ever increasing standards of living? Travel into the cosmos? Nobody formulates the targets of humankind, but one thing is clear: for at least two hundred years we have been dominated by the religion “growth of the Growth” (Bělohradský, 2007) based on the thesis that the purpose of life is to accumulate as many goods and to experience as many material delights as possible.

All social and political efforts are focused on achieving and maintaining the fastest possible pace of economic growth. The consequence is a constant acceleration, flattening and materialization of life which goes hand in hand with the degradation of personal relationships, pollution of nature and playing down these facts.

Environmental problems are taken as the justifiable side effects of economic growth. Continuous increase in material production and consumption absorbs increasing resources extracted from our basic resource - nature. We assume that in order to live better, we need to produce more, profit more, and contaminate more. The consequences are largely permanent, which means that the current situation is unsustainable. Natural resources will be exhausted, the only question is when. The availability of resources is geometrically shortened by accelerating economic growth. In the consistently limited system (Earth) everything is growing (exponentially), the time gets thicker (virus time, Borscheid, 2007) and there is too much of everything (Bělohradský, 2007).

The ship is slowly sinking, but we do not feel anything. The coming disaster waits for our children and grandchildren. They do not know it too, and happily enjoy even more than we do. The Zeitgeist is hedonism; the goal is to maximize pleasure with a minimum of suffering, as if we came to this planet just to “lick the life”.

We can abandon the idea of human progress; our main concern should be survival. *“Today is simply too late for any action. If we had started to do something in 1967, it could maybe have helped. But now we do not have enough time. Before this century is over, billions of people will die and a handful of those who survive will live in the Arctic where the climate remains acceptable”* (Lovelock, 2007).

The beauty of creatures and plants in the natural system developed through natural selection over millions of years. But the way they will look in the

future is going to be determined primarily by how they interact with us – people – because we are everywhere. We have become a global-scale powerful planetary dynamic. Our power has outrun us; it has got ahead of our consciousness. It is the decisions of humans that are going to determine the way this planet functions and looks for hundreds of millions of years in the future.

As long as we hold the worldview in which the Earth itself is just stuff, empty material, and in which the individual is most important, then we are programmed to use the Earth in any way we like. The idea is to move from thinking of the Earth as a storehouse to seeing the Earth as our matrix, our fundamental community. The fact is still alien to us that we and everything else that is alive, from bacteria to whales, are part of a much larger and more diverse entity – The Living Earth.

Let us end with a story: There was a rumour that the rabbi from Sasov is experiencing the suffering of others as his own. When asked: “Is it true that you experience the suffering of others as your own?” he replied: “But it’s my own suffering!” – The unity of all beings, their interdependence and interconnectedness, is not a theoretical hypothesis, but experienced reality.

In an endless variety of forms, we are all just manifestations of a single being; we are like the waves of one ocean. My body is composed of atoms which were once part of a star! When Albert Einstein was asked whether he is afraid of death, he replied: “No, I’m so connected with all living that I do not care where in this endless stream starts or ends a concrete existence.”

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TOWARDS AN ETHICS OF THE EXCEPTION: THE FORESIGHT OF THE UNTHINKABLE

Romi S. Mukherjee

In 1893, French dramatist and provocateur, Alfred Jarry, already infamous for his experiments in absurdist theatre and utter disregard for 19th century French decorum, founded a new discipline that he called “pataphysics.” According to Jarry this new field of inquiry would take shape in an anti-scientific realm beyond metaphysics and examine the laws which preside over *exceptions* – an attempt to elucidate an imaginary cosmos. Jarry specifically defined Pataphysics as the “science of imaginary solutions, which symbolically attributes the properties of objects, described by their virtuality, to their lineaments.” Physics is of course a science that prides itself on not having “exceptions,” but what Jarry was pointing to was simply the fact that the tried and true laws of this discipline may stand to be transgressed in certain contexts and situations, producing strange outcomes, oddities, and perversions.

Although influential on a host of contemporary thinkers, including most notably, Jean Baudrillard, “pataphysics” remained stuck in the 19th century, an epoch where the laws of the real were distinguished with enough clarity that one had the comfort to dwell on the laws that preside over exceptions. As the future rolled on, however, the distinction between the “real” and the “expected” and the “exception” and the “unexpected” became thoroughly blurred, creating new anxieties and new epistemological needs concerning the state of exception(s) that is the present becoming future. After the magical thinking of prophets and soothsayers and after the dialectical optimism of so many philosophies of history, we find ourselves, as Fuyuki Kurasawa remarks, in a “post-metaphysical age, where the idea of discovering universal and stable temporal laws has become untenable, the philosophy of history lies in the ruins,” and “steeped into the breach is a variety of sciences of governance of the future, ranging from social futurism to risk management.”²⁰ In a more

²⁰ Fuyuki Kurasawa, “Cautionary Tales: the Global Culture of Prevention and the Work of Foresight,” *Constellations* Vol. 11, No. 4, p. 452. Such a statement, none-

general sense, it is from within this breach, one which engenders the fever of the exception, that foresight emerges, if foresight be understood as not simply a science of predictions and extrapolation, but as a type of radical “forecasting.”

A distant heir to pataphysics, foresight nonetheless, is a serious scientific enterprise and one with direct bearings on the future of policy. On one hand, its scientism and impact-oriented nexus serve to not only legitimate its speculations (which extend into voids of indeterminacy), but also mask the fact that it is responding to social anxieties about “the breach” and epistemological anxieties about the end of a certain positivist coherence that mastered object-concept – identity, cause and effect, and mistook progress to be the road to an absolute humanism or what Derrida described as “full presence.” According to such an interpretation, foresight would be a science of despair and underneath its pronouncements are the residues of a larger socio-historical wound which necessitated that sociology be pushed into the void of the future. Yet, on the other hand, foresight is a science and discourse of strategy and strategy necessarily implies a certain relationship to power, gain, and advance. Hence, foresight can also be understood as that which could potentially bring a competitive advantage – who would not want to know “the secret” of the future? This is, of course, not say that foresight is an esoteric discourse or that it functions as the modern counterpart to prophecy. On the contrary, it is the rigor and transparency of foresight’s methods that distinguishes it from prophecy and, conversely, it is therefore also an error to think that all forms of prophecy are necessarily foresight. However, regardless of one’s general perception of foresight, the question that cannot be elided is that of “responsibility”. In other words, thinking the future (and indeed thinking the unthinkable) whether this take the form of projections about climate disasters, epidemics, or war, is an enterprise replete with ethico-political implications. Foregrounding the ethico-political stakes of foresight demands asking two questions: What is our responsibility in “thinking the future” and how do we imagine “future responsibilities?” Bearing directly on these concerns is the larger problem of the misuses and perversions of foresight wherein the issue of ethical responsibility is foregrounded. It might therefore be helpful to briefly examine some common assumptions about foresight’s use and misuse.

theless, can easily be problematized through reflection on the historical and dialectical relationship between science and metaphysics.

Firstly, in certain contexts, foresight can be instrumentalized to naturalize hierarchical political paradigms and legitimate the construction of real and imaginary borders and militarization by simply confirming present social anxieties in the future. In other words, foresight is a place where the present is played out, a political discipline buoyed by mutating social imaginaries that recalibrate themselves to new and looming threats.²¹ Following from this, foresight becomes a means of transposing and resolving the present in the future.

Secondly, foresight can lose its rigor and precisely that which makes it a vital and radical science by remaining relegated to certain “safe” paradigms of modeling which extrapolate from past and present conditions to imagine the future in a conventional manner, resulting in a short-sightedness of foresight wherein futurology makes room for the exception but remains convinced that things will go on as they always did with variations in ratio and breadth. The culture of prevention can become conservative and find itself plagued by the fact that its own vision and daring might force it to confront those scenarios which call into question its tools and methods. Such recapitulations can potentially betray the spirit of foresight itself.

At the other end of the spectrum, one can, however, locate dystopian delirium and the thirst for the apocalyptic future which, on one hand, seizes the middle-class liberal thirsty as it is for an encounter with the “real” while simultaneously offering it with a type of symbolic nourishment that locates the disaster in an “elsewhere.” The “elsewhere” could be the future, or Africa transplanted onto a global future, but regardless of the variation, the middle class experience a cathartic moment of shock and awe tinged with charitable concern and total paralysis. This type of foresight exists to shock. In its more noble forms, it aims to mobilize consciousness and inspire action. In its lesser forms, it devolves into catastrophe-porn or kitschy entertainment that nonetheless takes place “elsewhere.” Apocalyptic foresight of this kind, bound inextricably to the existence and development of disaster-capitalism, is contagious and, following Jean-Joseph Goux, perilous insofar as it strips the human of its desire for transcendence and plunges him into a post-

²¹ For instance, the “fear of the south” was confirmed through demographic analysis which moreover, also confirms various theories concerning the total war of the future which will be a result of dangerous overpopulation. More broadly speaking, one could also speak of a biopolitics of foresight in relation to the creation of risk groups, refugee and migrant populations, as well as “camps” (in all of their various manifestations).

messianic and thus, post-utopian universe where nothing is possible.²² Contra Goux, the fulfillment of the dialectic of the enlightenment should be considered a welcome event, one which puts an end to the *camera obscura* of myth and points to a demystified site not occluded by super-natural and celestial claims that naturalize certain forms of power and authority on the ground. However, if such a fulfillment is synonymous with a depoliticized consciousness that no longer understands politics proper as the striving for certain collective goals in the future, one should question the implications of its emancipatory status.

Moreover, amongst Goux's greatest concerns was his observation that young people, while glorified by a cult of youth that lauds the excesses of capitalism and leisure-technologies, lack the spirit of utopia and creation that once formed their ethos. While reveling in the eternal present, the disasters to come in the future have demoralized them and scoured them of the desire to create a new society. Goux can easily be accused here of lapsing into a rather crotchety vision of "*jeunisme vulgaire*" where no one under 30 should ever be trusted. But if one moves past his reactionary pose, what becomes abundantly clear is that as foresight is about the future, it is also about these and other future generations. Future modeling cannot occur without a serious reflection on the values and knowledge bases that such modeling espouses and their continuity with the capacity of future generations or those others that cannot even be envisaged. As Jérôme Bindé has noted, foresight remains mired in something of a "temporal myopia" which "brings into play the same processes of denial of others as social shortsightedness. The absence of solidarity in time between generations merely reproduces selfishness within the space of the same generation."²³ Following from the ethical question is whether foresight is a "science" which should consciously participate in the promoting such solidarity with future generations and an epistemology that, in providing the knowledge bases and value structures that will strengthen future adaptation and mitigation, should "reciprocate in advance," all the while knowing that the uncertainty of future scenarios may render useless the findings of the present. Of course, assigning moral tasks to science, let alone foresight, is not without its contradictions, but one cannot deny that all of the aforementioned dimensions of foresight are embedded with deep ethical issues: science

²² See Jean-Joseph Goux, "Beyond Hopes and Disasters, The Rejuvenation of Utopia," *Diogenes* February 2006 vol. 53 no. 1 95–102

²³ Jérôme Bindé, "Toward an Ethics of the Future," *Public Culture*, Vol. 12, No. 1, p. 93

ethics and the political instrumentalization of science, individual and social responsibility in the age of consumerism and the spectacle, and our responsibility to a spatio-temporal universe that we cannot even think etc. But the question comes down to how to think the future and how to think it “ethically.” Following from this, and to pastiche *Bindé*, projecting an ethics of the future is not necessarily an ethics in the future.

The notion of “responsible” or “ethical” thinking is by no means a given. On one hand, utopians and certain strains of liberal thought, fearful of the viral nature of the dystopian fantasy and its real capacity to depoliticize citizens, insist that foresight be geared towards the advancement of democratic principles in the future and that the urge(ncy) to map future disaster scenarios be treated with some suspicion. However, as James Lovelock has recently noted in relation to climate change, there is certainly no guarantee that really existing democratic principles and really existing democracies are best placed to cope with future environmental risks.

One should also ask if it is bad to think bad things. The question could be dismissed as being rooted on a fallacy which dictates that if one does think bad things, one will do bad things, or bad things will happen etc. and thus surmise that the basic premise of the question was grounded in a primitive form of mystical thinking which establishes an ontological identification between the thought and its potential reality, rejecting the capacity for people to make willful choices, act as moral beings, and weigh the consequences of their thoughts. But there is also another epistemological dimension that needs to be taken into consideration – is it dangerous to become fixated on extremes? It is well know that thinking about utopias or cataclysms is much easier than the arduous and less glamorous work of attempting to improve the human condition by 5%. Should foresight be revolutionary or reformist in its scope?

In addition, the former rubrics are also blurred in a context without strict normative moral frames demanding us, particularly in the case of foresight, to “think about how we think.” On the other hand, the “ethics of thought” can easily be interpreted by some as a harbinger of another dystopia, one that resembles *Orwell’s 1984*, wherein the “ethical” and the “responsible,” according to the codes of Oceania, was in fact the most oppressive, totalitarian, and unethical. The totalitarian tendency, no different than any fundamentalism, is where any fracture to the rules would risk the descent into pure chaos. Terry Eagleton notes that “most people expect a spot of security in their personal lives, so why shouldn’t the demand it

in social life...fundamentalism is just a diseased version of this desire... the fundamentalist is adrift on the rough ground of social life, nostalgic for the ice of absolute certainty where you can think, but not walk. He is really a more pathological version of the conservative, who *suspects that if there are not water tight rules and exact limits then there can only be chaos.*

²⁴ But post-modern ethics of course is not about “rules” in this sense, but rather about walking on cracking ice, looking for normative and perhaps temporary ethical frames in a context where one cannot necessarily identify the boundaries of the thinkable or know of the intrinsic impact or goodness of one’s thoughts or actions.

However, another current of thought, namely that associated with Georges Bataille, would posit that the very possibility of an ethics, a shared community, and communication rests upon imagining the unimaginable or rather “going to the end” in projecting the catastrophe. If Bataille were to conduct a foresight exercise he would undoubtedly demand that we collectively envisage the most gruesome and harrowing of catastrophes to come precisely in order to forge the foundations for a community to come,²⁵ one which can only be erected around the mutual apprehension of humanity’s finitude and being-for-death. Ethics and community, for Bataille, could only emerge through the sharing of nocturnal terror and the kind of ecstatic spasms spread by death.; the greater this is, the stronger being is in them, and the stronger their community, a tragic community. Death, or the consciousness of death, awakens being for everyone and it is only such a consciousness that can set being free. In other words, ethics cannot emerge from a-priori constructions but must be created from the space of non-essence, non-history, and non-vocation. The ethical experience of the Other is only possible when that Other is no longer inscribed into the human, its collective destiny, and limitations. We are all mutually responsible to finitude, to the *abime* and negativity of Being. Following from this, it could be argued that we are also responsible to the catastrophe to come. Hence, foresight must be precisely that which thinks the extreme and therein is found its ethics.

²⁴ Terry Eagleton, *After Theory*, New York, Basic (2003), pp. 204–205

²⁵ There are several epistemic binds laden in Bataille’s thought; in so far as Bataille’s catastrophe is coded as simply extreme negativity, it is unclear whether it can be grafted on to the “might happen,” “could happen,” and “worst we can imagine.” Negativity exceeds these frames as well.

In conclusion, foresight can no longer remain a disinterested affair, but one which, must rethink a farsighted version of responsibility within the uncertainty of the future. This requires firstly, the critical examination of the political-ethical stakes of the present and their collusion with globalization and science and technology, and secondly, a recasting of the way we think the ethics of the future *vis à vis* ethics in the future.

Open Space

POST-CRISIS SCENARIOS OF GLOBALIZATION

Ladislav Hohoš

The present civilization crisis is a consequence of the victory of liberalism which originated from of the European philosophical thinking of the 17th–18th century as a sign of leaving the past times. This civilization paradigm of the new times played a positive role, especially by the postulate of uniqueness of human individuality and hence derived negative freedoms meaning hegemony of anthropocentrism. The Enlightenment was a cult of reason and until recently the successes of the Euro-American civilization were confirming the triumph of rationality or progress perceived as a linear advancement. The above-mentioned also resulted in total uniqueness of human being who was given the right to control and manipulate. The Pythagorean harmony in relation to the nature as an example of perfection as well as submission represented by the religion have disappeared. Theocracy failed in the medieval times, today we can feel a dramatic impact of secularization. The request to make heaven on Earth here and now has not been more successful and as far as intensity of violence is concerned it has been even worse. Instead of classical liberalism, the present textbooks speak about modern liberalism. Individual of classical social agreement is atomized and non-historical, in the latest models, from the point of view of utility, he is a rational egoist. These models do not solve the problem of responsibility to community and future generations, for example also because they do not expect the possibility of the use up of natural resources. I think the mankind noticed the possibility of social devastation of human resources earlier and it was already after the economic crisis in the first third of 20th century. The discussion today is at the level of communitarianism, especially as far as the scale of the role of state in relation to individual choice of quality of life is concerned. In my opinion it seems to be necessary to amend radical individualism to some extent, because individual and community are mutually dependent entities. On the other hand, we have had the opportunity to see the failures of the attempts to substitute some universal values at the cost of undervaluation of individual rights (e.g. the socialist collectivism). I prefer the moderate position which approves

of moral value of individual rights as well as obligations in relation to community.²⁶

At the end of the twentieth century, the contemporary social philosophy and sociology of the Western cultural sphere is dominated by the concept of freedom as representing the spirit of relevant, i.e. liberal, tradition and a certain kind of “success” for liberal democracy, but in contrast to the end of the nineteenth century, it concerns not only political liberty but freedom as a human end. I would like to remember Nancy Fraser’s definition of emancipation representing the non-domination being a dynamic force instead of marketization.²⁷ In reality, however, individual freedom came to mean individualised consumption in a consumer society and consumer freedom within the framework of the market mechanism because a means of self-realization and individual independence. This concept of freedom expresses the social relations between an individual and the social order in the form of a hierarchic normative structure. The question is what kind of normative structure of the social order can foster the advancement of the measure of positive liberty – if it can do so at all.

The transition of capitalism from labour to consumption was subjected to critique by Herbert Marcuse, writing a generation before Zygmunt Bauman. The hypothesis of the so-called “third way” was attributed to Marcuse in the stormy 1960s, despite the fact that it would probably never have occurred to him. For instance, he regarded the welfare state as an unsuccessful hybrid of organised capitalism and socialism. He noticed that in advanced industrial societies a comfortable democratic unfreedom prevails free of conflict, which is a sign of technical progress; as a result of being liberated from deficiency, industrial society loses the previous content of freedom, which was related to a lower degree of productivity not only in authoritarian but also in non-authoritarian systems: there is no reason why production and the division of property and/or services should develop by means of competition between individual liberties. In advanced industrial societies, the scientific control of nature is thus used for the scientific degradation of humans. For instance, political and economic freedom (critical ideas in the early stages of industrial society) lose their former content and rationality. At a time when the post-war boom was fading away, Marcuse required

²⁶ HOHOŠ, L.: Hľadanie novej ekonomickej a ekologickej paradigmy. In: *Filozofia*, Roč. 51, 1996, N. 2, p. 86.

²⁷ FRASER, N.: “Marketization, Social Protection, Emancipation: Toward a Neo-Polanyian Conception of Capitalist Crisis”. A lecture at the conference “Philosophy and Social Sciences” in Prague, May 12–16, 2010.

new ways of realizing economic, political and spiritual liberties: economic freedom in terms of liberation from the economy as a necessary means of earning a living or struggling for existence; liberation from politics as a tool of effective control through so-called “repressive tolerance” (repressive needs prevail because the dominant interest of society is repression); the revival of individual thought as against mass communication and indoctrination through public opinion.²⁸

Charles Taylor, well-known for his representations on the philosophy of communitarianism goes even further: he refers to a position held by the adherents of the idea of negative liberty as the “Maginot Line” because this attitude derived from Hobbes’s mechanistic-materialist metaphysics guarantees defeat. In terms of negative liberty it makes no difference whether or not we make use of a particular opportunity, whereas positive liberty is most concerned with having control over one’s life, the concept of freedom is therefore associated with the experience and not only the possibility of freedom; at the same time, negative liberty itself is not enough because there are also other values and only the struggle for them gives meaning to the life. According to Taylor, from a historical perspective, liberalism defended the idea of negative liberty in relation to different variants of authoritarianism; this, however, was at the cost of giving up the concept of individual self-realisation, which seemed to him to be the loss of a significant liberal potential.²⁹ The “Maginot Line” implies that in order for people to be really free, i.e. the possibility of acting on the basis of will and guaranteed rights; rather, the issue is whether a subject really makes use of this possibility, which is applied in an organized human society through the active participation of the subject in the political sphere. Taylor is therefore concerned about the freedom of citizens actively participating in the republic (by republic he understands a liberal regime that allows the citizens control over their own lives). Taylor blames liberalism for the fact that although liberal society is based on consensus over the issue of the rule of law, individualism leads to self-isolation and an absence of civic identification with the common good. It is in fact a sense of common good that builds ties of solidarity among citizens. The idea of authenticity goes beyond simple self-determination, for people choose their own paths in life and this presumes that they have their own identity

²⁸ MARCUSE, H.: *Jednorozměrný člověk*. Praha 1991. (One-Dimensional Man. Boston 1964.)

²⁹ TAYLOR, Ch.: *Omyl negativní svobody*. *Filosofický časopis* 1995, N. 5. (What’s Wrong with Negative Liberty. *Philosophical Papers*, Vol. 2, Cambridge 1985.)

and individuality; people acquire this only at the level of higher common values. Taylor positioned the concept of authenticity against the ideal of autonomy (humans as bearers of rights) and requested that the individual be incorporated as a moral person into the context of a value community.

Although Marcuse's above-mentioned demands may seem utopian, they represent realistically formulated demands on normative structures that should function in the future in terms of expansion and not as repressive constraints of positive freedom. We can imagine a scenario with an elite cosmopolitan minority profiting from globalization, which feels no responsibility for the majority of society that is left to its own fate. The majority will accentuate its unique cultural identities ("the rebellion of minorities") because it commands nothing else against successful economic globalization. Moreover, and this is crucial, it can reject the ideology of economic growth by not accepting profit and competitive strength as primary goals in the name of its own values (happiness) even at the cost of a certain decline in consumption and/or in the standard of living (the revolt against meritocracy); this leads to a situation where the political consensus ceases to function and even fails. Another, warning scenario is based on the fragility ephemerality of the well-being achieved in the so-called advanced countries during the post-war boom in the second half of the twentieth century: this welfare is for example the basis of the unique integration of Europe. Since we cannot rely on a predestined plan of history, there are not objective guarantees that the development characterised by Dahrendorf as "an unprecedented growth in life chances"³⁰ and thus the prerequisites of freedom, will move (if at all) towards the future with the same rate; it is more likely that we will encounter its limits (the problem of sustainability of the parameters of civilization). Reflecting upon the vicious circle of bureaucracy and consumer freedom (the market game), Bauman considers that it would be possible to achieve individual autonomy through civic cooperation and with the support of local government.³¹ With capitalism transforming into a consumer system, labour has been gradually losing its privileged position in favour of individual consumption in a consumer form. Consumer freedom (not labour) has become a significant force, connecting the world of individuals and the rationality of the system, the struggle to gain goods and services available exclusively through the market has

³⁰ DAHRENDORF, R.: Hledání nového řádu. Přednášky o politice svobody v 21.století. Praha 2007, p. 12 (Auf der Suche nach einer neuen Ordnung. München 2003.)

³¹ BAUMAN, Z.: Svoboda. Praha 200 p. 114. (Freedom. Buckingham 1988.)

replaced the “work ethic”. The individual achieves emancipation, autonomy and freedom in material enrichment.³²

The crucial problem of the post-capitalist globalised society is how to ensure the right to minimum human dignity and a meaningful life for the ostracized who find themselves outside the compulsory employment enforced by autarchy or should they not have been born at all? Egon Bondy³³ points out that intensification of labour is a belief that was enforced on people only a few generations ago; if labour was alienated in traditional societies, the relationship between people and their own production was not based on inadequate toil. The owners of the means of production counted on the workers wearing themselves out to death, while another ten people were to be found starving nearby who could have taken over part of the work and earned their living. This is the economic reality on which the belief that production must continually grow and be even greater otherwise civilization would collapse, was built.³⁴ This scenario, envisioned by Bondy, is based on the exclusivity of profit motivation that leads to a situation where in the end there will remain only one monopoly owner, who in fact no longer needs profit or power; he can only maximize his own prestige. Since it is the legal system that model the structure of the society, the elite the global players need (“symbolic analysts” – Robert Reich) might be able to work out legislative schemes. The schemes would observe the takeover of power from within and thus enable the overthrowing of supranational oligarchies. Legal science should formulate certain legal norms, fixed to such an extent that it would be very difficult to violate them; moreover, the norms should become natural or customary for the rest of the inhabitants of the planet.³⁵

Bondy’s vision may seem utopian, but Rothkopf in his “Superclass” made an important remark that every powerful elite in history used to exaggerate and therefore had been destroyed. He appeals at least to a part of the new global superclass not to exaggerate and contribute to bring the global inequality under control.³⁶ Keller’s scenario is derived from a situation where a number of people are redundant because the market does not need

³² I. c. p. 88–92.

³³ Zbyněk Fischer, PhD. (pseudonym Egon Bondy) famous Czech underground poet and Marxist philosopher († 2007).

³⁴ BONDY, E.: O globalizaci. Brno 2005, p. 114.

³⁵ I. c., p. 96–99.

³⁶ ROTHKOPF, D.: Supertřída. Jak globální mocenská elita pretváří svět. Beta s.r.o. 2009, p. 317, 319.

them for abstract labour. Therefore, those who are not able to face the risks at their own costs became clients, meaning that they are not capable of equipping themselves. The result of the second phase of globalisation might, according to Keller, mean a return to pre-modern conditions, to a form of unorganised barbarism, which he termed “postmodern refeudalization”.³⁷ The common denominator of the above-mentioned scenarios by Bondy and Keller is their consideration of a new elite – the winners of globalization who fulfil their own interests and, since they are successful, launch the self-destructive mechanism of the social order which they themselves established. This evokes Marx’s idea that capitalism will collapse only when it fulfils its historical mission and thus becomes a bearer of hidden immanent self-destructive mechanisms.

Perceiving of the crisis, intellectual reflection of the value and moral vacuum are not new, mainly in the European cultural environment. In principle since 19th century they have been part of the diagnosis of Western civilization. Value relativism of recent postmodernism reflects the historical tectonics in which shocks are the signals of starting global transformation. As far as the period of crisis is concerned – the analogy of the thirties of the 20th century is not right, it is not only the economic crisis or one of its partial aspects – the financial crisis – but it is a systemic (civilization) one, i.e. the crisis of transformation. Under the pressure of medial reality and ideology of neo-liberalism the term reality and fiction are often interchanged, the partial is considered as substantial, the prosperous is considered as permanent. Reality of fiction is reflected as a financial crisis which was caused by the toxic assets, i.e. mortgages in the USA. The crisis has been appearing in the form of different shocks and instability of the monetary system since the seventies and it was partly shifted in time after removal of the iron curtain at the end of the eighties, which made partial temporary expansion of capital to the new markets possible, but did not prevent the currency crisis in the nineties. Fiction of reality is based on misinformation that after inflow of money of taxpayers in the financial system, a gradual transfer to consolidation comes (more precisely a temporary moderation of the symptoms) which is said to start another stability and possible growth, so all will be the same as before.

In both cases the systemic approach is ignored at the global level: if destruction is to be constructive (J. Schumpeter), it requires creation of conditions for the rise and development of the new in the sense of innovation, invention

³⁷ KELLER, J.: *Teorie modernizace*. Praha 2007, p. 176.

and creativity. W. Robinson warns that it is necessary to differentiate between the cyclic, structural and systemic crisis. In capitalism cyclic crises are coming back approximately every ten years, recession functions as a self-corrective mechanism. At present we are in a deep structural crisis which reflects deeper inner contradictions of the system and can be solved only by principal changes of systemic structure. The systemic crisis enforces replacement of the system by a completely new system or it leads to a total collapse. It is not predetermined if structural crisis will switch to the system one or, if in such a case it will lead to replacement of capitalism or fall of global civilization and it depends on reaction of social and political forces to the crisis.³⁸

As a matrix of global scenario of political development I will use a scheme applied on the order of Royal Dutch Shell from the year 2005 to 2025.³⁹ Possible alternative futures are dependent on basic directive forces forming a Trilemma triangle framework. The model represents the complex interplay between the three forces – the legal environment, the market culture and the global forces of integration and fragmentation. These factors shape how different societies and the global community strive towards three objectives – efficiency, social justice and security. The result of the research enunciates three alternatives: (i) Low Trust Globalisation, e.g. a legalistic world (pattern “prove it to me”) based on security and efficiency at the expense of social cohesion, because the market forces run under growing distrust, therefore costs for safeguard are extensive; (ii) Open Doors, e.g. a pragmatic world (pattern “know me”), the advanced globalization tends to social cohesion and more efficiency at the expense of less security; (iii) Flags, e.g. a dogmatic world (pattern “follow me”), great emphasis is laid on security and the force of community at the expense of efficiency, the zero-sum games cause regulatory fragmentation and conflicts over values and put a break on globalization. These scenarios do not reflect the necessity to re-evaluate or to surmount the parameter of efficiency because of its unsustainability and injustice.⁴⁰

³⁸ ROBINSON, W.I: *Teorie globálního kapitalismu*. Transnacionální ekonomika a společnost v krizi. Praha 2009, p. 17–18. (A Theory of Global Capitalism. Baltimore 2004.)

³⁹ Shell Global Scenarios to 2025. www.shell.com.

⁴⁰ J. Rawls argues for The System of Democratic Equality in “A Theory of Justice”, a combination of the principle of fair equality of opportunity with the difference principle. The principle of efficiency relevant in the System of Natural Liberty is substituted by his second principle of justice which, according to Rawls, represents the most plausible interpretation of justice.

I think that the last scenario of fragmentation is relevant, maybe in a longer period than twenty years. Sociologist Jan Keller formulated a scenario of a new feudalisation, which refers to the Feudal Age and supposed a return to some kind of unorganised barbarism. The population will be divided into those who are able to pay for private services and those who are dependent on self-help. The relationship between patron and client will be re-established because the demand for security will increase abruptly.⁴¹ (Marx used the term “relations of personal dependence”). Real marginalisation and pauperisation of a great part of world population including the middle class verifies this scenario.

The famous Czech philosopher Jan Patočka in his “Heretical Essays” proved that the crucial event of the 20th century was the First World War. The war as a modus of being corresponds to the advanced civilization based on extreme exploitation of natural as well as human resources. Nevertheless, our present situation is similar to that one before Second World War. The war as a modus of being corresponds with the advanced civilization based on total exploitation of natural as well as human resources in a global dimension. From the point of view of political arrangement there are two visions of contemporary global conflict: either the vision of unipolar or the vision of multipolar world.

The first alternative: unilateralism

Legal imperium: because the imperium is a representative of stability, the world-wide government based on the rule of law may persist on the authority of the empire. This idea is reflected in the well-known conceptions by J. Rawls and R. Dahrendorf concerning the world-wide expansion of the liberal order. R. Reich introduced the term “supercapitalism”: he argued against popular ideological damnation of transnational corporations. These ones operate at the extent of the whole planet and therefore their interests are not reducible to the interests of the American Empire.⁴² In the process, the Empire may occur like a “new sense of being imposed by the creative moment of the multitude”⁴³. Instead of legality which is required to the citizens of imperium the global capitalists may due to efficiency prefer the

⁴¹ KELLER, J.: *Teorie modernizace*. Praha 2007, p. 174–176.

⁴² REICH, R.: *Supercapitalism. The Battle for Democracy in an Age of Big Business*. Cambridge 2008

⁴³ HARDT, M. – NEGRI, A.: *Empire*. Harvard U.P. 2000, p. 62.

legitimacy of power, e.g. Pragmatism instead of formal rule of law. Then a scenario of re-feudalisation will be fulfilled.

The second alternative: multilateralism

Separate empires: the vision of multiculturalism. Separate empires achieved *modus vivendi*, they are able to co-exist while respecting actual power conditions, the principle of tolerance is established. This scenario may seem to express desired future. The problem is the scenario is based on utopian expectations and therefore lacks on stability and truthfulness.

A new barbarism: more stable scenario. It represents the alternative of a war “all against all”, e.g. the state of anarchy. This warning scenario corresponds with a return to some kind of unorganised barbarism.

WORLD ORDER

<u><i>Unilateralism</i></u>		<u><i>Multilateralism</i></u>	
<i>Legal imperium</i>	<i>Legal imperium</i>	<i>Separate Empires</i>	
<i>US government</i>	<i>World-wide government</i>	<i>Modus vivendi</i>	
<i>Legitimate imperium</i>		<i>War of “all against all”</i>	
<i>A new feudalization</i>		<i>A new barbarism</i>	

In its substance globalization does not really represent a natural catastrophe similar to the biblical flood as it is sometimes presented by the mass media, but its negative impacts could, under some circumstances, be of the same fatal consequences. Promotion of old-fashioned ideological schemes supported by the media, which disguise the substance of the present conflict processes generated by the class of global capitalists, is also of anti-productive effect. We are presenting the possible scenarios of globalization (the range of possibilities has five alternatives):

- warning scenario anticipates destruction, e.g. atomic war or total collapse of environment; the alternative of total destruction of mankind is, in the “better case”, destruction of the reached level of civilization or return to the barbarian manners;
- partly optimistic scenario: it can lead to success of temporary consolidation, so that transnational globalization would continue for some time on the basis of normative liberalism until the unsolved needs of qualitative changes caused another crisis;
- unfavorable change could provoke the start of a new form of protofascism and so dictatorship with the possible ecological-ideological cover; new technologies make total control over individual possible, thus solving the problem of control of the exceeding population at the global level;
- explorative, i.e. optimistic scenario: there would be some regulations of economy and mainly of financial markets, founding new wealth creating institutions – but they can be successful only at the transnational level; a cartel of élites may emerge with the purpose of saving the capitalism from itself;
- scenario distant in time: target (normative) provision of reaching society and civilization of the new quality at the level of human society (a higher level of socialization) as well as at the level of human species (the problem of trans-humanism).

There are also other systemic alternatives which are offering solutions towards the nearest future. There is an enormous asymmetry between the demand of democratic participation at the political level and the total absence of democracy in the posts or labour relations. D. Schweickart analyses the System of Economic Democracy as follows: It is a market economy but it makes ecological sustainability possible. Capitalism requires economic growth as a stability condition, company must generate profit for owners. But the aim of company of Economic Democracy is to prevent the loss of its market share and therefore it can choose a less aggressive strategy, the system expects social control of investment without dictation by

financial markets.⁴⁴ W. Robinson considers globalization as an epoch shift, i.e. fundamental world-wide changes of social structure. Globalization represents a new epoch in the development of world capitalism. The first epoch was period of inventions, mercantilism and primary accumulation. The second one was capitalism of free competition – industrial revolution, rise of bourgeoisie and originating of national state. The third epoch means start of monopoly capitalism, uniform world market and rise of socialist alternative. At present we are experiencing the early phase of the fourth period of globalization: information technologies, failure in attempts to build socialism and disability of the national-liberalization movements of the Third world to provide an alternative in the relation to capitalism, it is a transition to the transnational phase of the system.⁴⁵

The problem which should be discussed within the whole community and the whole planet lies in the way how (in a democratic way?) to realize the switch to the strategy of the permanently sustainable life as the time we have at the disposal is strictly limited. Solution of the transformational crisis lies in seeking such an alternative of globalization which would meet the parametres of permanently sustainable terrestrial civilization in the widest sense of the word.

In the present times it is not possible to foresee how deep the present transformational crisis will be. Whether it will be possible to manage it at the level of structural changes and there will be a temporary stabilization at the systemic level or whether it will enforce some changes at the systemic level while their running will be to some extent emergent. Both alternatives are open. The attribute of temporariness in relation to systemic stabilization is a relevant parameter because the economic system of capitalism, based on permanent extreme waste, is, in any case, permanently unsustainable in its present form. As far as the waste of the wealth creation of the relevant civilization is concerned, there is a law of fall of marginal profits: from the specific point, any further unit invested in the input is bringing smaller production growth (performance) at the output than the previous ones, so from the specific moment, even with the sufficient amount of units at the input the gains at the output are falling. This law can explain the extinction of the civilizations (e.g. the Roman Empire) when they could not keep the level complexity reached any more, the falling marginal profits enforced

⁴⁴ SCHWEICKART, D.: *After Capitalism*. Rowman & Littlefield 2002, p. 156–158.

⁴⁵ ROBINSON, W. I: *Teorie globálního kapitalismu*. Transnacionální ekonomika a společnost v krizi. Praha 2009, p. 32–33. (*A Theory of Global Capitalism*. Baltimore 2004.)

the economic process, i.e. collapse by which we understand return to the normal or lower complexity (“barbarian manners”).⁴⁶

According to famous non-conformal philosopher Slavoj Žižek: “There are four antagonisms: the looming threat of an ecological catastrophe; the inappropriateness of the notion of private property in relation to so-called «intellectual property»; the socioethical implications of new technoscientific developments (especially in biogenetics); and, last but not least, the creation of new forms of apartheid, new Walls and slums. ... We should insist on the qualitative difference between the fourth antagonism – the gap that separates the Excluded from the Included – and the other three: it is only this reference to the Excluded that justifies the use of the term communism.”⁴⁷ Nevertheless, if the Earth civilization is to survive it must get rid of the fiction of permanently unsustainable economic growth and set the sustainable parameters of the new civilization paradigm which need not be and probably also will not be called “socialism” or “communism”, avoiding ideological issues it may e.g. be called *The System of “Global Justice”*.

⁴⁶ There is a basic difference between the fall of the West Roman and East Roman Empires. Collapse can take place only in the power vacuum (the West) where there is no competitor who will expand territorially and will take over the administration which may cause a small disintegration (the East).
TAINTER, J.A.: *Kolapsy složitých společností*. Praha 2009, p. 264–265. (*The Collapse of Complex Societies*. Cambridge 1988.)

⁴⁷ ŽIZEK, S.: *First as Tragedy, Then as Farce*. Verso London – New York 2009, p. 92, 97.

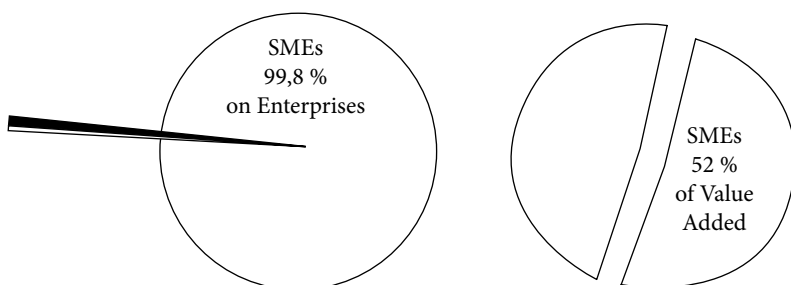
FORESIGHT IN SMALL AND MEDIUM ENTERPRISES: POLISH PERSPECTIVE

Piotr Jutkiewicz, Norbert Kołos

What is the future place of small and medium enterprises (SMEs)? Is there any? One is easily mesmerized by the enormous innovative power of big corporations. It is they who have the funds for future oriented projects and massive R&D programs. Moreover, their innovative potential is increased further still by ideas imported from mother-companies. The usage of business foresight tools and solutions is inherent to them. Small and medium enterprises, on the other hand, are not as frequently mentioned in the context of business foresight and futures studies. Being both futurists and economists, we think that more attention should be devoted to the subject of business foresight in small and medium enterprises.

Why is foresight in SMEs such an important subject? According to the European Commission SMEs constitute 99,8% of the total number of companies in Poland and create more than a half of the value added (Fig. 1). These numbers are similar all over the European Union. This makes SMEs a crucial field of research for futurists.

Fig. 1



Source: Own work, based on European Commission, 2009

Why then is SMEs' impact underestimated so often when we consider possible futures? The main reason is their dispersion, which in turn limits purchasing power as well as R&D funds. In the world of small and medium enterprises, the usage of business foresight tools and solutions is neither easy nor obvious. Everyday issues receive much higher priority than long term planning. However, when we look at SMEs from a macroeconomic perspective, we notice that together, they are responsible for over half of the value added in an economy. Such immense power cannot not remain shortsighted without far reaching consequences. SMEs, especially in countries like Poland, need to become more future-oriented.

Burmeister (2007) conducted a study of German SMEs and their foresight needs. He concluded that those needs are substantial, although their origin may not be the same as in the case of large enterprises. SMEs do not necessarily require long-term planning, but the need for foresight is caused by the highly dynamic environment in which they're operating. The picture of German SMEs revealed in Burmeister's research, shows, that foresight tools and solutions are much often employed in German SMEs than in their Polish counterparts (Jutkiewicz, 2009). In many SMEs, even when foresight is being employed, it is limited to the most basic tools and solutions (PARP, 2010).

SMEs should not be regarded merely as service- and supply-providers for big companies. They often have invaluable knowledge of local trends and market demand as well as superior recognition of local resources. Their advantages are not limited to the geographical level – they also have the potential to be much more flexible and hence to recognize niches for innovation on the market and, accordingly, to specialize in such areas. This in turn frequently entails the implementation of modern technologies. With their employment the produce becomes better suited for market demand in those areas. Moreover, due to limited resources, SMEs often introduce pioneering sales and management practices. They can employ their flexibility and quickly adjust to new, developing market niches. This dormant potential of small and medium enterprises is waiting to be released. There are, however, certain difficulties.

The perfect example of a problem encountered by medium Polish enterprises is one which is faced by a Polish manufacturer of engine valves. It is a company with 100% polish capital, employing around 100 people. It needs to address the issue of a shrinking market for its products. Modern car engines are equipped with virtually unbreakable valves. Therefore, the

need for replacements is incredibly small compared to what it was 20 or 30 years ago. As if this was not enough, there are even more problems ahead – with the introduction of electric vehicles (EV), there will be absolutely no demand for the product – nor many other parts used in a gas engine for that matter.

Given this situation it would seem reasonable for this, and other similar companies, to prepare for the future, to invest in foresight research, so that the company might prosper in the years to come. Looking beyond the nearest 2 or 3 years should be the highest priority.

Unfortunately, that is not the case. Everyday issues receive much more attention. The management has to deal with present problems – finding funds, replacing broken machinery or simply securing next month's salaries. In many of those companies, everything beyond 2 or 3 years is considered almost science fiction. Consequently, spending money on foresight is out of the question.

According to data gathered by the European Commission (2009), on average, managers in the EU SMEs regard four factors as key for their innovation plans:

- access to finance
- expensive human resources
- scarcity of skilled labor
- lack of market demand

The innovativeness of many Polish SMEs is strongly limited because of the above. Modern technologies do not originate in Poland, they are mostly the domain of companies with foreign capital. It is most unfortunate, as, in a modern world, the strength of an economy depends increasingly on innovativeness – not the amount of labor or energy used. Furthermore, the days when low labor costs were the advantage of Poland and other eastern European countries are passing.

The fact that modern technology in Poland is mostly the domain of foreign companies means that R&D divisions are not located in Poland and do not employ Polish researchers. Government spending on science is too low and private capital is still too weak to invest in R&D on a large scale by itself. Many young Polish scientists are leaving the country, so Poland is experiencing what we could call a 'brain-drain', and thus the vicious cycle is complete.

The problem of business foresight solutions for SMEs is in many ways similar (and also in many ways connected) to the issue of sustainable entrepreneurship. With the introduction of this concept came various certificates – certificates targeted mainly at large companies, for the simple reason of being costly and time consuming to implement. Thus, the whole concept of sustainability had a very limited reach amongst SMEs. Once again, a sector responsible for more than half the value added is strangely omitted. There is clearly something wrong with the entire notion of far sighted ideas being oriented mainly at the big players.

The most fundamental question is: what is needed for SMEs in Poland and similar countries to “join the race” of innovativeness and seize to be passive bystanders. There are some key challenges to be faced if this is to happen. The first one is a change of mindset. It is important to raise awareness that small and medium enterprises can benefit from future oriented studies, to pass the knowledge that, although costly, it is an investment that can pay off. Luckily, this is already beginning to happen: the younger generation is more proactive and innovative. Thus, the number of future oriented companies is on the rise.

The second challenge is a change in government policy. It is slowly improving, although Poland is still among countries where it is difficult to both start a business and to run it. In a recent report of the World Bank (2010), Poland’s is ranked 70th out of 183 countries. Projects carried out by the European Union are a huge help as they promote innovativeness and new technologies.

The third challenge is self organization. Better government policy or the change of mindset are, of course, vitally important, but they aren’t quite enough for a major change. The strength of small and medium enterprises lies in their number. That’s why, to undertake future oriented projects they need to employ that strength by collaborating. Working together can increase their purchasing power and their ability to undertake future oriented research.

The fourth challenge lies with foresight services’ providers. They devote their attention mainly to large companies and their offer does not take into account the specific needs of smaller enterprises. Services suited for SMEs would make future oriented management more accessible for them.

What is the future of SMEs? Does the future belong to them, or to multinational corporations? Perhaps neither? Maybe companies of the

future will resemble borderless social networks as some suggest? The views are diverse. In fact, from the viewpoint of future-oriented, responsible entrepreneurship, the form factor of an enterprise is not crucial. What is important, is whether the decision makers in those companies can understand the need to look further into the future than the next fiscal year.

John Galsworthy once said: “If you do not think about your future, you cannot have one”. For the purposes of the world of business, we can rephrase the thought: “If you do not think about your futures, you may end up out of business” – and this probably applies to big multinational corporations, humble SMEs and entrepreneurial, borderless social networks all alike.

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THE FUTURE ECONOMICS: CREATIVE DESIGN OF THE UNIFIED ECONOMIC THEORY

Ivan Klinec

Introduction

The economic theory is the same subject of the evolution as all the other scientific fields. The main stream of the economic theory is the dominant source of the current global crisis of our civilization. The main reason of such state is non-reflection of the societal evolution by the main stream of the economic theory.

The economic theory of main stream is the industrial age economic theory and the ongoing global civilization transformation is connected with the search of the information age economic theory. The main shift in the economic theory therefore will be the transformation of the economic theory on the base of the information age paradigm.

The solution of the current global civilization crisis is interconnected with the creative design of the new syntropic theory of economics. Such theory can support the shift from the entropic character of the current industrial age economy to the new syntropic model of the information age economy.

We have the appropriate methodological tools for such syntropic model of the information age economy in the works and in the theories of R. Buckminster

Fuller⁴⁸, Luigi Fantappie⁴⁹, Albert Szent-Georgyi⁵⁰, Erwin Schrodinger⁵¹, Ilya Prigogine⁵², Isabelle Stengers⁵³, Ossip K. Flechtheim⁵⁴, Robert Rosen⁵⁵, David

- ⁴⁸ Fuller, R. Buckminster (1981): *Critical Path*. St Martin's Press, New York; Fuller, R. Buckminster (1982): *Synergetics. Explorations in the Geometry of Thinking*. Collier Books, Macmillan Publishing Company, New York; Fuller, R. Buckminster, McHale, John (1963): *World Design Science Decade 1965–1975. Five Two Year Phases of World Retooling Design Proposed to the International Union of Architects for Adaptation by World Architectural Schools. Phase I (1963). Document 1. Inventory of World Resources Human Trends and Needs. World Resources Inventory*, Southern Illinois University, Carbondale, Illinois.
- ⁴⁹ Fantappie, Luigi (1993): *Principi di una teoria unitaria del mondo fisico e biologico*. Di Renzo Editore – Principles of a Unitary Theory of the Physical and Biological World Based on Quantum Mechanics and Special Relativity. Cited by Di Corpo, Ulisse, Vannini, Antonella (2009): *An introduction to Syntropy*. www.syntropy.org, www.syntropia.it; Vannini, Antonella (2005): *Entropy and Syntropy: From Mechanical to Life Science*. In: *NeuroQuantology 2005, Issue 2*, page 88–110; Vannini, Antonella (2006): *Entropy and Syntropy: causality and retrocausality in psychology*. In: *Syntropy 3 / 2006*, page 1–268, www.syntropia.it, www.syntropy.org.
- ⁵⁰ Szent-Gyorgyi, Albert (1972): *The Living State: With Remarks on Cancer*, Academic Press, New York; Szent-Gyorgyi, Albert (1977): *Drive in Living Matter to Perfect Itself*. In: *Synthesis 1, Vol. 1, No. 1*, page 14–26.
- ⁵¹ Schrödinger, Erwin (1992): *What is Life ? With Mind and Matter and Autobiographical Sketches*. Cambridge University Press, Cambridge.
- ⁵² Prigogine, Ilya, Stengers, Isabelle (1984): *Order out of Chaos. Man's New Dialogue with Nature*. Heinemann, London; Prigogine, Ilya (1997): *End of Certainty. The Free Press*, New York.
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- ⁵⁵ Rosen, Robert (1985): *Anticipatory Systems. Philosophical, Mathematical and Methodological Foundations*. IFSR International Series on Systems Sciences and Engineering. Volume 1. Pergamon Press, New York; Rosen, Robert (1999): *Essays on Life Itself*. Columbia University Press, New York.

Bohm⁵⁶, Nicholas Georgescu-Roegen⁵⁷, Alfred Korzybski⁵⁸, Fritjof Capra⁵⁹, Hazel Henderson⁶⁰, Alvin Toffler⁶¹, Barbara Marx Hubbard⁶², Antonella Vannini⁶³, Ulisse Di Corpo⁶⁴, Leon S. Fuerth⁶⁵ and many others.

⁵⁶ Bohm, David (1980): *Wholeness and the Implicate Order*. Routledge and Kegan Paul, London; Bohm, David (1995): *Thought as a System*. Routledge, London, New York.

⁵⁷ Georgescu-Roegen, Nicholas (1971): *The Entropy Law and the Economic Process*. Harvard University Press, Cambridge, Massachusetts; Georgescu-Roegen, Nicholas (1976): *Energy and Economic Myths*. Pergamon Press, New York.

⁵⁸ Korzybski, Alfred (1995): *Science and Sanity. An Introduction to Non-Aristotelian Systems and General Semantics*. Fifth Edition. With New Preface by Robert P. Pula. Institute of General Semantics, Englewood.

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⁶¹ Toffler, Alvin (1970): *Future Shock*. Random House, New York; Toffler, Alvin (1990): *The Third Wave*. Bantam Books, New York; Toffler, Alvin (1990): *Power-shift. Knowledge, Wealth and Violence at the Edge of the 21st Century*. Bantam Books, New York; Toffler, Alvin (1984): *Science and Change*. Foreword in Prigogine, Ilya, Stengers, Isabelle (1984): *Order Out of Chaos. Man's New Dialogue with Nature*. Heinemann, London.

⁶² Marx Hubbard, Barbara (1998): *Conscious Evolution. Awakening the Power of Our Social Potential*. New World Library, Novato.

⁶³ Di Corpo, Ulisse, Vannini, Antonella (2009): *An introduction to Syntropy*. www.syntropy.org, www.syntropia.it; Vannini, Antonella (2005): *From mechanical to life causation*. In: *Syntropy 1 / 2005*, page 80-105, www.syntropia.it, www.syntropy.org; Vannini, Antonella (2005): *Entropy and Syntropy: From Mechanical to Life Science*. In: *NeuroQuantology 2005*, Issue 2, page 88-110; Vannini, Antonella (2006): *Entropy and Syntropy: causality and retrocausality in psychology*. In: *Syntropy 3/2006*, page 1-268, www.syntropia.it, www.syntropy.org.

⁶⁴ Di Corpo, Ulisse, Vannini, Antonella (2009): *An introduction to Syntropy*. www.syntropy.org, www.syntropia.it; Di Corpo, Ulisse (2005): *Syntropy: the energy of life*. In: *Syntropy 1 / 2005*, page 77-79, www.syntropy.org, www.syntropia.it; Di Corpo, Ulisse (2005): *Syntropy: a third possibility in the debate on evolution*. In: *Syntropy 3 / 2005*, page 66-68, www.syntropy.org, www.syntropia.it.

⁶⁵ Fuerth, Leon S. (2009): *Foresight and anticipatory governance*. In: *Foresight*. Volume 11, Issue 4; Fuerth, Leon S. (2007): *Congress and the Climate Research: A Case for Forward Engagement*. Research Brief – Number 3, NYU Wagner, Robert F. Wagner Graduate School of Public Service, John Brandemas Center

The evolution of the economic theory can lead to the new understanding of our rapidly changing economic reality. We can understand the ongoing transition to the global civilization and solve the emerging problems via new understanding of emerging global economic reality. The new syntropic economic theory can make possible the overcoming the struggle between individual economic theoretical schools and also can make possible to create the base for the unified economic theory.

Outline of the Syntropic Theory of Economics

The new syntropic paradigm of the economic theory is interconnected with redirecting the economic systems towards the future and with overcoming the present split of the economic theory via establishing the unified economic theory.

Among main characteristics of the syntropic theory of economics can be following:

- Reorientation of the economic theory and the economic systems towards the future. Implementation of the concept of syntropy to the economic models and the economic theories. Implementation of the long-term horizons into the policymaking with positive impact on the economic reality.
- Understanding the economic theory as a mental map and as a map of economic reality. All economic theories are only mental maps limited in the time and in the space. The plurality and not the struggle is the base for the syntropic theory of economics.
- Understanding the economic laws as evolving similar as the economic reality is emerging. The basic law of the syntropic theory of economics can be the information theory of value instead of the industrial age working theory of value.
- Creative design of economic theory is necessary for the design of economic solutions for the global civilization and the local economies and communities.
- Understanding the global economy as a field. Disruption of the field in one area is leading to the instability of the whole global economy.

for the Study of Congress, March 2007; Fuerth, Leon S. (2006): Strategic Myopia. The Case for Forward Engagement. In: The National Interest. Number 83, Spring 2006; Fuerth, Leon S. (2004). Creation of a National Commission for Strategic Planning under the direction and guidance of Leon Fuerth. In: Futures Research Quarterly. Winter 2004, Volume 20, Number 4.

The field theory of economy is key to understanding the current global crisis.

- Redefining the basic core of the theory of economics on the base of the theory of syntropy according to Luigi Fantappie and R. Buckminster Fuller and implementing the concept of syntropy into the model of economic reality.
- Understanding the civilization evolution as a change of the civilization attractors. We can understand economic productive factors as the civilization attractors. The change of such attractors in the information age is the main cause of the transformation of the whole civilization around the information and the information networks. The industrial age attractors were work and capital. The information age attractor are information and knowledge.
- Understanding the economy as an implicate order according to David Bohm with the hidden code of the civilization in the form of the main principles of the civilization. The evolution of the economy is therefore the part of holomovement of the whole civilization.
- Understanding the role of human within the economic systems as a part of the collective body also as the individual. The human can act as the individual or as the part or the member of the collective body. It depends on free will of the human.

Economy as an Anticipatory System

Reorientation of the economic systems towards the future is interconnected with the implementation of the long-term horizons into the economic models, the economic theory and also into the policymaking. Economy has to be transformed into the anticipatory system in the term of Robert Rosen. Economy as evolving system can be understood as a living organism with permanent transformation of its structure, organization, laws etc.

Luigi Fantappiè described concept of the syntropy as the opposite to the entropy. He published the book *Principles of a Unitary Theory of the Physical and Biological World Based on Quantum Mechanics and Special Relativity*⁶⁶. In this book, according to Ulisse Di Corpo and Antonella

⁶⁶ Fantappie, Luigi (1993): *Principi di una teoria unitaria del mondo fisico e biologico*. Di Renzo Editore – Principles of a Unitary Theory of the Physical and Biological World Based on Quantum Mechanics and Special Relativity. Cited by Di Corpo, Ulisse, Vannini, Antonella (2009): *An introduction to Syntropy*. www.syntropy.org, www.syntropia.it; Vannini, Antonella (2005): *Entropy and*

Vannini, he showed that retarded waves which diverge from causes located in the past, are governed by the law of entropy (en = apart, tropos = tendency) and correspond to mechanical and chemical phenomena; while advanced waves, which converge towards causes located in the future are governed by a law symmetrical to entropy, which Fantappiè named syntropy (syn = together, tropos = tendency)⁶⁷.

Economy as the anticipatory system has to deal with the cause located in the future which are the new attractors forming the economic, the social and the civilization systems. Leon S. Fuerth created the concept of Forward Engagement⁶⁸ which is oriented toward the implementation of the long term horizons into the policymaking and can be the tool of reorientation of the economic systems towards the future. The implementation of the long term perspectives into the policymaking is one of the 15 global challenges of the biggest future oriented project in the world The Millennium Project⁶⁹.

Economics as a Mental Map – Plurality of the Economic Theory

The view of the partial economic theories and the economic theoretical schools as partial maps of the economic reality and as the fragmentary views of one undivided reality enables the view of economics as one science consisted of a great number and diversity of the partial economic theories, all of which have their own time, space, purpose and limits, and no economic theory is possible to be absolute in any time and any space.

Syntropy: From Mechanical to Life Science. In: *NeuroQuantology* 2005, Issue 2, page 88-110; Vannini, Antonella (2006): Entropy and Syntropy: causality and retrocausality in psychology. In: *Syntropy* 3/2006, pages 1–268, www.syntropia.it, www.syntropy.org.

⁶⁷ Ibid.

⁶⁸ Fuerth, Leon S. (2009): Foresight and anticipatory governance. In: *Foresight*. Volume 11, Issue 4; Fuerth, Leon S. (2007): Congress and the Climate Research: A Case for Forward Engagement. Research Brief – Number 3, NYU Wagner, Robert F. Wagner Graduate School of Public Service, John Brandemas Center for the Study of Congress, March 2007; Fuerth, Leon S. (2006): Strategic Myopia. The Case for Forward Engagement. In: *The National Interest*. Number 83, Spring 2006; Fuerth, Leon S. (2004). Creation of a National Commission for Strategic Planning under the direction and guidance of Leon Fuerth. In: *Futures Research Quarterly*. Winter 2004, Volume 20, Number 4.

⁶⁹ Glenn, Jerome C., Gordon, Theodore J., Florescu, Elizabeth (2010): 2010 State of the Future. The Millennium Project, Washington, D.C.

The economic theory is not the economic reality as all theories are only the maps of the reality as described Alfred Korzybski in his works on general semantics⁷⁰. Economic theory therefore has to be a puzzle of the individual economic theories with the possibility of the innovation or the change of the individual pieces of such puzzle.

Evolution of the Economic Laws – Information Theory of Value

Understanding the economic laws as evolving similar as the economic reality is evolving can incorporate the aspect of the dynamics and the irreversibility in the economic theory.

The basic law of the syntropic theory of economics can be the information theory of value. During the industrial age the dominant law of the economics was the working theory of value, which was the subject of the discussions between the various economic theoretical schools.

The concepts of entropy and syntropy and their implementation into the economic theory can help the creation of the information theory of value as the main anti-entropic law of syntropic stage of human evolution. The information is the main source of the value in the information age instead of the work as the main source of the value in the industrial age.

Creative Design of the Economic Theory

Creative design of economic theory is necessary for the design of the economic solutions for the global civilization. Totalitarianization of the economic theory during the period of the communism and also during the last decades of free market utopia show us that the creative design and the new solutions for the global economic system are necessary and the only way from the current global crisis is the design of the new economic system with respect to the higher laws of the Nature and the Universe.

The creative design of the economic theory can be the important part of the transition of humankind toward the conscious evolution. The creative design of the economic theory is therefore the conscious design of economic theory and their transformation to a tool of the conscious evolution.

⁷⁰ Korzybski, Alfred (1995): *Science and Sanity. An Introduction to Non-Aristotelian Systems and General Semantics*. Fifth Edition. With New Preface by Robert P. Pula. Institute of General Semantics, Englewood.

From Entropy to Syntropy – Field Theory of the Economy

We can understand the global economy as a field. The disruption of the field in one area is leading to the instability of the whole global economy. The field theory of economy is the key to the understanding of the current global crisis. The global interdependence is the other view of the global economy as the global field. The turbulences on the financial markets, the security threats, the poverty, the climate change and many other disbalances are the disequilibrium creating processes with global impact on the economies all over the world.

Redefining the basic core of theory of economics on the base of the theory of syntropy according to Luigi Fantappie and R. Buckminster Fuller and implementing the concept of syntropy into the model of economic reality can lead to creation of the new global economic system. According to R. Buckminster Fuller humanity has now reached that critical moment of potential transformation of humans' affairs from class-two evolution to class-one evolution⁷¹.

The drive to make money, wrote R. Buckminster Fuller, is inherently entropic, for it seeks to monopolize order while leaving disorder to overwhelm others⁷². Mind on the other side is according him essentially anti-entropic⁷³. The shift from entropy to syntropy is therefore essential for creating global economic system based on the principles of sustainability.

Evolution as a Change of the Civilization Attractors – Disruptive Forces

The key principle of understanding the civilization change is the view of economy as a dissipate structure, which is dissipating energy, materials and information and creating a new structure of the society and the whole civilization around the civilization attractors in the form of economic productive factors as are soil, work, capital and information and which are determining for the structure and the profile of the economy, the society and the civilization during their evolution.

We can understand the civilization evolution as a change of civilization attractors. We can understand the economic productive factors as the civilization attractors. The change of such attractors in the information age is the main cause of the transformation of the whole civilization around

⁷¹ Fuller, R. Buckminster (1981): *Critical Path*. St Martin's Press, New York.

⁷² Ibid.

⁷³ Ibid.

the information and the information networks. The industrial age attractors were work and capital. The information age attractors are information and knowledge. Therefore the new structure of global civilization is network-centric instead of industrial age hierarchic structure.

Economy as an Implicate Order – Hidden Code

The view of the global world economy as one undivided whole, the view of this economy as implicit order and the view of economic development and the globalization process as holomovement, with using the theory of wholeness and implicate order, which was created by David Bohm⁷⁴, can help us to understand the processes of the globalization and their impacts on the individual countries and their economies.

Understanding the economy as implicate order according to David Bohm with the hidden code of the civilization in form of the main principles of civilization can show us how the hidden code of the civilization, described by Alvin Toffler⁷⁵, is changing our economy, society and civilization.

The evolution of the economy is therefore part of the holomovement of the whole civilization. The interdependence of the global economic system and the synchronicity of the economic and societal changes in the individual countries as e.g. in the year 1989, can be understood via the concept of the holomovement and the processes of unfolding the hidden code of civilization in form of the implicate order.

Economy as a Web of Connections – Role and Importance of the Social Capital

The view of the emerging global economy as the challenge and the chance of renewing the original significance of economics as the science about the householding and overcoming the alienation of their original significance in the industrial age era is interconnected with the restoration of the the social capital enormously damaged during the processes of the globalization.

⁷⁴ Bohm, David (1980): *Wholeness and the Implicate Order*. Routledge and Kegan Paul, London; Bohm, David (1995): *Thought as a System*. Routledge, London, New York

⁷⁵ Toffler, Alvin (1990): *The Third Wave*. Bantam Books, New York; Toffler, Alvin (1990): *Powershift. Knowledge, Wealth and Violence at the Edge of the 21st Century*. Bantam Books, New York

In the global world economy the man has to be a housekeeper first and a manager, a businessman and a financier second. Therefore the financialization of the global economy has to be changed towards the global economic household of the humanity and the economy can serve as the web of the connections within the communities on all levels and also as the tool for the restoration of the social capital.

The dominant form of the capital in the information age economy therefore has to be the social capital instead of the industrial and the financial capital in the industrial age economy.

Conclusion

The design of the syntropic economic theory and the syntropic economic system can lead to syntropic class-one evolution in terms of concept of R. Buckminster Fuller⁷⁶. The design of the syntropic economic theory is at a starting point and must be done by a great number and great diversity of economic thinkers from the whole world from various countries, but the speed of its creation is one of the main preconditions of changing the present direction of humankind toward a sustainable world and toward overcoming the emerging global crises.

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⁷⁶ Fuller, R. Buckminster (1981): *Critical Path*. St Martin's Press, New York.

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