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FOREWORD

Dear Reader,

Today, as we face an increasing number of environmental, economic, and social problems, sustainable development has become more important than ever. In June 2012, a conference and forum on sustainability ("Sustainability 2012: Regional Aspects") was held at the Eszterházy Károly College in Eger, Hungary, aimed at drawing attention to the problems of sustainable development at a regional level.

Cooperation between the initial organizing partners, the Florida Institute of Technology (FIT) and the Budapest University of Technology and Economics (BUTE) began in 2001 with a scientific research project supported by a U.S. State Department CUAP Grant in the field of environmental studies (environmental protection and environmentally sustainable technologies). The grant was one of only five in the world and the only one in Europe. At that time, the partners decided to meet annually in the framework of an international workshop devoted to environmental issues. In June 2002, faculty from FIT and BUTE convened in the small, amiable town of Eger, Hungary, for a Sustainable Tourism Workshop; and now, 10 years later, the discussion took place in Eger again, hosted by the Eszterházy Károly College. With the additional partner, the Karlsruhe Institute of Technology (KIT), previous conferences have taken place in Melbourne (Florida), Budapest, and Berlin. Presentations and contributions by international experts have served as a basis for joint research and education in the field of sustainability.

The papers in the current issue of *Periodica Oeconomica* are written by the Sustainability 2012 conference participants, who were asked to elaborate their thoughts and ideas presented in Eger. From a regional perspective, they analyze the economic, financial, geographic, climatic, and cultural dimensions of sustainability. They focus on various industries, for example agriculture, transport, and tourism, and also on different spheres such as the private sector, higher education, and government. The authors are from many countries and universities: there are 11 papers from Hungary, three from the US, and one each from Germany, Greece, and India, respectively.

We hope that our publication will be to the benefit of our readers and also enhance further cooperation in education and research among the organizing partners of the aforementioned conference.

Respectfully,

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INTERACTIONS BETWEEN REGIONAL AND SECTORAL ASPECTS OF SUSTAINABILITY

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Regions can show very diverse characteristics in their endowment of natural resources and other particularities, which will inadvertently lead to a territorial sectoral specialisation. Some regions will be more adapted for agricultural activities, others will be better for industry, yet others still will be ideal for services, including tourism. In their quest to transitioning to sustainable development, regions must look at their stock of natural, social and economic capital, and find the best strategy for sustainable development based on comparative and absolute advantages. Regions should not only look at their own assets, though, but identify partners with similar goals or interests, and engage in active collaboration. A 'critical mass' of human, natural and economic capital is needed for regional development, an absence of which all but forbids a successful transition to sustainable development. Furthermore, experiences gathered over decades and centuries of activities should be carefully considered in setting out the paths for sustainability. Presently, an emerging trend is a convergence between regional development and sustainable development. Reflecting on the particularities and the various forms of capital assets of the region, and considering the newest trend, a recommendation on a model of sustainable development is offered for the Island of Crete.

***Keywords*: specialisation of regions, regional sustainable development models, Greece**

Sectoral Specialisation of Regions

The sustainable development of the various economic sectors depends greatly on the particularities and natural resources of a region, but also on the absolute and comparative advantages the region can forge from these specificities. This leads to the sectoral specialisation of regions.

Interactions and correlation of regional and sectoral aspects of sustainability are particularly close in the secondary sector, as well as some branches of the tertiary sector of the economy. These observations can be demonstrated by numerous examples.

Focusing more closely on the primary sector, it becomes obvious that development in the various agricultural branches relies heavily on the natural particularities and resources. Soil, topography, climate and water all play a crucial role. Typical examples both include olive production in the

Mediterranean, as well as viticulture in various regions of different countries, such as is the Eger Wine Region.

A large proportion of global olive and olive oil production is concentrated around the Mediterranean. Countries around the Mediterranean Sea possess 98% of the global stock of olive trees, and account for 93% of the global olive oil production (Babanassis et al., 2011, pp. 319-320). The largest producer is Spain, followed by Italy, Greece, Tunisia, Syria and Turkey, all with large volumes of output. Morocco, Portugal, France and Cyprus have a more moderate output. Quite clearly, climatic and other natural particularities give the Mediterranean the absolute advantage in olive production, and absolute monopoly globally, which is reflected in sectoral specialisation. Olive production is a good example of sustainability, as agricultural traditions are passed down the generations, spanning thousands of years, and olive trees can also live for several centuries. A similar phenomenon of sustainability is inherent to numerous historical wine regions.

Consumption of olive oil has a positive influence on health and longevity. Research on the effects of the Mediterranean diet on cardiovascular diseases show a reduction in the incidence of these ailments. This is because olive oil is a good source of antioxidants, and it has anti-thrombotic and anti-inflammatory effects. Other components of the Mediterranean diet include plenty of vegetables, fruits, cereals and legumes, as well as red wine, all of which contribute to the positive effects of olive oil.

Processes contributing to the sustainable development of agriculture:

- Development of biological and environmentally friendly plant and animal products.
- Certification of agricultural products and foods.
- Protection of soils from erosion, preservation of soil fertility through irrigation, flood protection and other soil improving systems.
- Restriction or outright banning of using polluting pesticides.
- Protection of forests, national parks and NATURA areas by fire prevention systems, rational forestry and by other means.
- Rational management of natural resources, i.e. rational use of water reserves with new technologies, significant investments in dams, flood prevention and irrigation systems, restriction of squandering water assets, appropriate price policies, as well as strategies which ensure that water demand adapts to water supply, rather than vice versa.

Mining and the construction industry directly rely on ores and mineral resources. The energy sector faces a strong correlation between regional and sectoral factors. Hydroelectric power plants tend to be close to waterfalls, coal-fuelled thermoelectric plants are generally located close to coal mines. Solar, wind and

geothermal energy production directly depends on the particularities of the region. Numerous examples back this up, both in Greece, Hungary and other countries.

An important aspect of sustainability is the *development of the green energy sector*. Perhaps the most essential tool to ensure a transition to sustainability is the *transition from non-renewable resources to renewables* in the energy sector. Further crucial elements include energy saving and energy efficiency. Regrettably, on a global scale, this transition is only in its beginning stages. Priority must be given to the development of non-polluting or less polluting industries.

According to a May 2011 report by the United Nations, the world's energy balance is as follows: 34.6% petroleum, 28.4% coal, 22.1% natural gas, 12.9% renewables, and 2% nuclear energy. The composition of renewables at the time was 10.2% bioenergy, 2% water, 0.5% wind, 0.1% solar energy, 0.1% geothermal energy, 0.002% tidal and wave energy. A rather pessimistic prognosis in this report forecasts a measly 15% share of renewables in the total energy balance by 2050 (TO VIMA, 2011).

The European Union's strategy for the energy sector is in accord with the requirements of sustainability, insofar as it targets the spread of renewable sources of energy, de-carbonisation of energy production, increasing energy efficiency, reducing energy use and the reducing the emission of greenhouse gases by 20% by 2020.

Greece has favourable environmental conditions for the establishment of a sustainable green energy sector. The annual hours of sunshine are amongst the highest in Europe. It also has good opportunities for better exploiting its wind, water and geothermal assets for energy production. It is predicted that Greece could cover much of its energy needs from these sources. Use of these resources in practice is very limited. In Greece, the proportion of renewables in energy generation is much lower (9.63%) than the European Union average (16.96%). In contrast, lignite plays a more crucial role in energy generation (48%), followed by natural gas (17.8%) and petroleum (8.7%). Renewable sources of energy are dominated by wind power at 78%, followed by hydroelectric generation at 12%, solar energy at 7.4% and bioenergy at 2.7% (Babanassis et al., 2011, pp. 205–206).

An increased rate of development has been observed during the past years.

It is anticipated that Project Helios will contribute greatly to the development of the Greek green energy sector. This project is a Helleno-German cooperation, which targets the power output of 10 000 MW, which is approximately equal to the current energy generation potential of Greece. Solar panels covering an area of some 20 000 hectares would provide the energy for this project. According to plans, Greece would have a 70% stake in this project.

Sectoral development in the manufacturing industry does not depend solely on the natural particularities of the regions, but on a host of other factors too, such as production optimum, returns to scale, transportation infrastructure, proximity of markets, etc. There are avenues for development in the manufacturing industry too. Decarbonisation and similar measures can reduce industrial pollution. Priority must be granted to non-polluting or less polluting sectoral development. Potential for the creation of new industries exists in the sector of renewable energy sources, in processing waste and other pollutants, in recycling, but also in biological purifiers. A reduction in the use of natural resources may be achieved by the miniaturisation of products and the further development of smart technologies.

Branches of the *tertiary sector* of the economy face a strong interaction between regional and sectoral specificities, particularly in tourism and logistics. A large fraction of global tourism is concentrated in countries and with desirable marine beaches, favourable climate and a rich cultural heritage. Much of global trade is carried out via sea transportation. Also these claims can be demonstrated with several examples.

The Mediterranean is the largest centre of tourism. In 2007, 240 million tourists, some 26.6% of tourists from all over the world chose this region as their destination, generating a revenue that amounted to a 24.6% share of the global total (Szeimenisz & Szeitisz, 2011, p. 4, 48). According to prognoses, the Mediterranean is set to preserve its leading position in global tourism. This advantage can be traced to four favourable factors: expansive and beautiful beaches, countless islands, a favourable, warm and sunny climate, and a rich cultural heritage that spans from the antiquity through the middle ages to contemporary traditions and artifacts.

Some 4/5ths of global trade is carried out via naval transportation. The Mediterranean plays a key role in shipping as well, since it is wedged between Europe, Asia and Africa, and it connects to three oceans and seas: the Atlantic Ocean towards Gibraltar, the Indian Ocean through the Suez Canal, and the Black Sea through the Bosporus and the Dardanelles. Typically 3 000 vessels fare the Mediterranean Sea every day, carrying passengers, petroleum, natural gas and other goods, covering roughly 65% of Europe's energy demand. Greece has assumed a leading role in marine transportation, as 18% of the world's naval fleet is in Greek ownership. It can be anticipated that the Mediterranean Region's role in shipping will gain strength as international trade grows, as energy demand increases, and as new sources of petroleum and natural gas must be tapped to satisfy demand. Part of the satisfaction of demand will be by networks of pipelines, which will also go via the Mediterranean.

The future of the Mediterranean Region largely depends on the protection of the marine environment. Shipping, tourism, industrial waste and other factors may cause a catastrophic situation. Academic Paulos Sakellaridis and other

futurologists are talking about the "impending death of the Mediterranean". Italy's former environment minister, Alfonso Epecoraro Scanio said: "A state of emergency should be declared over the whole of the Mediterranean. If this does not happen, it will be threatened to become like the Black Sea, which shows no sign of life at a depth of just 150 metres" (TA NEA, 2007).

As a continuation, a few measures are mentioned, which are aimed at quelling the sources of pollution and protecting the Mediterranean environment.

- Removal of polluting industrial, agricultural and other activities from the Mediterranean coast.
- Reduction and termination of the pollution caused by fluid pollutants arriving from the 75 tributary rivers and the Black Sea, flowing into the Mediterranean.
- Banning dumping waste from vessels into the Mediterranean
- Biological cleaning, recycling and incineration of wastes and pollutants from settlements and hotels on the coast of the Mediterranean.
- A more rational exploitation of the Mediterranean for tourism and other polluting industries.
- Alleviation of the exponentially growing demographic pressure on the Mediterranean Sea.

The services-based tertiary sector of the economy contains more and less polluting branches. Information technology, modern telecommunication systems and other similar technologies pertain to a less polluting branch. The accumulation of electronic waste and an increased use of mobile telephones may pose a threat to public health. Some traditional activities, like banking, are also less polluting. Generally, a large proportion of other services will cause severe pollution, and their sustainability may only be secured through drastic measures. Transportation by private vehicles and by commercial vehicles is one of the greatest sources of air and noise pollution, but it also pollutes in other ways. Solutions to these problems may come in the form of pollution fines and taxes, the use of incentives and motivations, the use of less polluting vehicles and the development of the public transportation infrastructure.

Some thoughts about the new regional sustainable development models

Regional development models are based on the cohesion between long-term strategic goals of complex development and the tools in achieving this. They include not only economic development, but also the development of education, culture and technology, the protection of the environment, the improvement of the quality of life.

Several *regionally specialised development models* exist across the world: agrarian regions, industrial regions, touristic regions and complex development regions can all be named. According to Imre Lengyel: "[…] Regions were typified based on two dimensions, population density and GDP growth, into the following categories: cosmopolitan regions, special urban regions, dynamic regions, balanced regions, recreational regions, rural regions. Based on the results of research conducted using econometric methodologies, NUTS2-level EU regions were placed in four categories, which take part in the international competition based on different advantages (Fenyővári & Lukovics, 2008, Figure 4.12.):

- *Non-productive regions*
- *Regions as production sites*
- *Regions as sources of increasing returns*
- *Regions as hubs of knowledge […]"* (Lengyel, 2011, pp. 178-179)

Several criteria must be taken into consideration when designing new development models:

- The first criterion consists of the *production factors of the region*, which play a crucial role in establishing their specialisation. Traditional production factors of sustainable development are connected to the given region, to space, and to location: production factors (soil, water, etc.), human resources and economic activity. Management of these resources occurs on regional and local level. Capital and new, dynamic factors of production, such as knowledge, new technologies, information and management are more mobile, unfixed factors. This category includes such new sources of sustainable development such as silicon, optical fibres, radio magnetic waves and knowledge. Silicon is a fundamental material for microelectronic equipment. Optical fibres are essential to modern telecommunication. Radio magnetic waves are used for communication habitually. These three development resources are to be found in nature in plentiful quantities, and they do not pose a danger to the environment. Human knowledge is a key production factor of a knowledge-based economy. This special resource expands rapidly, and the volume of human knowledge doubles in roughly 5-10 years.
- Positive and negative experiences with old regional models, and the valuable experiences that can be deduced from them, are the second factor that need to be considered. The first experience is that nature and the carrying capacity of the region must be respected. Primarily this refers to natural resources. Irresponsible soil management, overuse of fertilisers and the extensive cutting down of forest destroys soil fertility and increases erosion. Water management must

consider the scarcity of available water resources. Therefore, a new water management strategy must be adopted, in which water demand adjusts to water supply, and not vice versa.

- Another experience is that *regional development based on monocultures needs to be avoided*. Neither agricultural nor industrial development ought to be based on a single product, as this cannot secure a persistent dynamic development. If demand for the product sags on the domestic or international markets, price revenues drop, and so does production, employment and the quality of life. Therefore, focus must be directed at the *creation of complex regional development models*. Securing a *critical mass* of human, natural and economic capital, *essential for regional development, is crucial*. This is particularly of great importance on the local level and in the case of smaller region. The critical mass of the inhabitants of the region or locality, with all their needs and demands, form the basis of the optimal regional level development of schools, hospitals, transportation and other infrastructural areas.
- The third factor relates to the *new trends in regional development*. The most prominent new tendency is the *coupling of sustainability and regional development.* Factors of sustainable development are linked to fixed locations: soil, sources of water and other natural resources, the climate, human resources and economic activities. Management and exploitation of territory and resources is carried out on a regional or local level. The new trend is a *transition from models organised along a top-down approach to regional development models based on local collaboration.* This means an increase in the importance of the role played by regional and local governments, corporations and other institutions in the planning process, development, financing and execution of regional development strategies. Another current tendency is the *increase in the role of competitiveness in regional development*. As a consequence of international integration and globalisation, competition thrives between nations, but also between nations. Previously, the main goal of regional development was the reduction of differences in development between regions. In our age, regional competitiveness has come to the forefront. An important new trend is the preservation and reinforcement of territorial cohesion. The European Union's strategic documents point at these goals as essential.
- In conclusion, we must also consider the *new avenues of regional development* strategies. According to István Bartha, we can identify several strategies, as a consequence of "regional development strategies [… are] interrelations and combinations of goals (and

> means) in space and in time". We can identify strategies based on the theory of poles of growth, strategies based on setting various goals simultaneously, and spatial development strategies based on the activation of local resources found in the region. A more novel version of this strategy is usually referred to as innovation oriented spatial development strategy, one that "aims to achieve its goals by relying on the intensified exploitation of local resources through innovation" (Bartke, 2009, pp. 146-147)

A dynamic regional development strategy that has been gaining space in our present age is based on knowledge, on new technologies and on innovation. This is in concord with the new knowledge-based economy and information society that has been developing in recent years. This strategy aims at creating knowledge centre regions, knowledge creating regions and knowledge using regions[1]. Knowledge-based development may contribute to the creation and widespread implementation of new regional, national and international models of sustainable development.

Preservation of *spatial cohesion* depends on the moderation of the inter-regional differences in development and quality of life, and on the improved access to healthcare, education, transportation, telecommunications and other services in every region. Special sustainable development models ought to be created and implemented in some underdeveloped regions. Such regions are typical across Europe, and they include the several hundred Greek islands and mountainous territories, as well as the rural homesteads across Hungary.

Adopted in Rio de Janeiro, Agenda 21 incorporates the local programme, fundamental principles and key indicators of sustainable development. Local and regional sustainable development programmes are in place in several countries, with greater or smaller success[2].[9]

I would like to mention the example of the development model of the Island of Crete. The Foundation for Mediterranean Studies has organised a scientific conference on Crete in early 2011, on "Sustainable Regional Development Models, the Example of Crete". A presentation was delivered at this conference by Professor János Szlávik and György Horváth, entitled "The Local and Micro-Regional Level of Sustainable Development". The aim of this conference was to contribute to creating a model of sustainable development for the island of Crete. The obvious starting point was to look at the particularities of Crete. With an area of 8 336 km^2 and a population of 606 274 (in 2008), 59% of the population dwells in cities, while the remaining 41% lives in rural areas. It is blessed with an expansive shoreline, a pleasant climate with plenty of sunshine. Its

[1] See more detail in Lengyel, 2011, pp. 179-186.

[2] See more detail in Valirakisz & Babanassis, 2012, pp. 85-116., 243-262.; Lengyel, 2011, pp. 79-80., 221-222., 234-235., 283-284., 343-364.

infrastructure includes two airports and several sea ports. Two universities, a university college and several educational and cultural institutions can be found here. Crete is in a favourable geostrategic location in the middle of the Mediterranean, wedged between three continents: Europe, Asia and Africa. Its development is at medium level, with an annual per-capita GDP of 18 260 euro (in 2008), a figure reaching 90% of the average of Greece, and a proportion of 85% of the European Union (EU-27) average. Crete ranks in fourth position among Greece's 13 regions in terms of GDP, contributing with some 4.9% to the country's Gross Domestic Product. However, as of 2010, Crete only assumes a rank of 245 from 271 EU regions, based on complex development indicators. This complex indicator encompasses economic performance, technology, investment, infrastructure, education, healthcare and employment aspects, a weighted average of 12 indicators. Based on this international competitiveness indicator, Crete scores a measly 21% of the Utrecht Region in the Netherlands (taken to be 100% for reference). 80% of Crete's GDP is generated in the tertiary sector, particularly from tourism, 10% from the primary sector, and 5% from the secondary sector (Greek counties, 2009, p. 64.; Valirakisz & Babanassis, 2012, pp. 49-54).

These particularities and specificities and other factors have urged conference participants to recommend a sustainable development model for Crete that unites the benefits of two strategies:

The first strategy is a traditional development strategy that is based on local factors of production and comparative advantages: agriculture, livestock raising, fishing, tourism, sea trade and culture must be developed in harmony and maintaining proportionality, whilst avoiding a "monocultural" development based solely on tourism and most certainly causing a destruction of the carrying capacity of the environment. A production and consumption basket must be established for Crete, which is to include its best and most unique plant and animal products, as well as touristic and cultural services.

The second strategy is a new dynamic development strategy, based on knowledge, research, emerging technologies and innovation, by establishing new and dynamic comparative advantages, through the collaboration of the University of Crete, the Technical University of Crete, the Technological Educational Institute of Crete, the Mediterranean Agronomic Institute of Chania and other scientific and cultural institutions.

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SUSTAINABILITY AND CULTURE: AN EXPANDED VIEW

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During the past decade research in the field of sustainability has taken more and more attention to the interdependences of sustainable development and cultural issues (in terms of requirements, linkages, connectivity, behavioral and educational content). This offers the chance to differ cultural sustainability from related perspectives (i.e. a regional one!) and the opportunity to look closer to those interdependences in a multidisciplinary "overall view". Developing this is a timely task that can be done in two ways: (1) "top down" from conceptual and political considerations, (2) "bottom up" by reference to existing discourse results (achievements as to be achieved, proposals such recognized deficits). The discussion on culture and sustainability takes place on a high abstract level so far, it's about the concept of culture on the one hand and to (culturally) blind spots in the current debate on sustainability on the other hand. The "culture" ("cultivation") of sustainability is the "Sustainabilization" of the culture lacking sustainability by today. The main and important question that arises concretely is the question of the cultural connectivity of sustainable solutions nowadays.

***Keywords*: cultural connectivity, culture of sustainable development, integrative concept of sustainable development, sustainability science**

During the past decade research in the field of sustainability has taken more and more attention to the interdependences of sustainable development and cultural issues (in terms of requirements, linkages, connectivity, behavioral and educational content). This is connected with a growing debate on conceptional topics. In the following we will discuss some of them.

Introduction

In the 1990th in Germany the so called "Integrative Concept of Sustainable Development" was developed in opposition to a three-dimensions-approach with an economic, an ecologic and a societal dimension (cf. Kopfmüller, 2011; Kopfmüller et al., 2001). The basis was: sustainable development is to be associated with some crucial new (or recalled) perspectives. This includes

- a comprehensive, holistic "view on the whole thing" considering complexities of social, economic, environmental, cultural etc. development dimensions and their interdependencies;
- the crucial role of distribution issues (regarding environmental and financial resources, development risks and opportunities, advantages and burdens from political measures, etc.);
- the global perspective which means setting goals at the global level and taking into account the national, regional and local level for implementation and implications;
- the longer-term orientation, e.g. in distinction from the political practice of parliamentary terms or the practice of company balances;
- the idea of limits, with respect to economic growth, the use of finite resources, etc.

On this basis there are the following two conclusions:

- Sustainable development is not (only) a programme of the protection of environment!
- Ecological, economical, societal, institutional-political (and other!) aspects of sustainable development are integrated and of equal rank!

So the Integrative Concept of Sustainable Development based on three constitutive elements:

- inter- and intragenerational justice, equal in weight;
- the global perspective regarding goals and action strategies;
- an enlightened anthropocentric approach, i.e. the obligation of mankind to protect nature out of a well understood self-interest to preserve the basics for living.

These constitutive elements are operationalised in two steps: first, they were "translated" into three general goals of sustainable development:

- securing human existence;
- maintaining society's productive potential (comprising natural, man-made, human and knowledge capital);
- preserving society's options for development and action.

In a second and essential step, these goals are concretised by sustainability rules, which apply to various societal areas or to certain aspects in the relationship between society and nature (see Table 1).

Table 1
Sustainability Rules of the Integrative Concept

General Goals of Sustainable Development		
Securing human existence	Maintaining society's productive potentials	Preserving society's options for development and action
Substantial Rules		
Protection of human health	Sustainable use of renewable resources	Equal access for all people to information, education, occupation
Ensuring satisfaction of basic needs	Sustainable use of non-renewable resources	Participation in societal decision-making processes
Autonomous subsistence based on own income	Sustainable use of the environment as a sink	Conservation of cultural heritage and cultural diversity
Just distribution of chances for using natural resources	Avoiding technical risks with potentially catastrophic impacts	Conservation of the cultural function of nature
Reduction of extreme income or wealth inequalities	Sustainable development of man-made, human and knowledge capital	Conservation of social resources (tolerance, solidarity, etc.)
Instrumental Rules		
Internalisation of external social and environmental costs		Society's ability to respond
Adequate discounting		Reflexivity of society
Public indebtedness		Society's steering abiloity
Fair global economic framework conditions		Self-organisation
Promotion of international co-operation		Balance of power

Note. Kopfmüller et al. (2001) pp. 172, 174

Another approach of sustainable development discusses c*ommitments or obligations* of the present generation in opposite to the future generations with the "creation" of fair bequest package ("What to sustain?"). This package includes (cf. Muraca/Voget-Kleschin, 2011; Ott, 2011):

- real capital (buildings, technology, infrastructure, …);
- natural capital (resources, services, information);

- cultivated natural capital (farms, herds of animals, plantations, …);
- social capital (*moral knowledge*, institutions);
- human capital (*education*, literacy, skills);
- knowledge capital.

But: Where are the discussions about "culture"? In these two concepts only some comments in this direction (above in italics) are made:

- the substantial rule "Conservation of cultural heritage and cultural diversity";
- the substantial rule "Conservation of the cultural function of nature";
- a part of social and of human capital – moral knowledge, education.

Let us look to other discussions:

- models or examples ("Leitbilder") of sustainable development;
- sustainability science.

Table 2 shows some models/examples related to sustainable development.

Table 2
Models / Examples ("Leitbilder") of Sustainable Development

Life styles	Political Concepts	Examples of Processes	Examples of Content
Asceticism	Internalisation of External Costs	Sustainable	Development
New Modesty	International Conventions	Technology Assessment	Recycling-friendly Design
New Leisureliness	Proscriptions	Risk Assessment	Recycling
Green (Soft) Tourism	Bids	LCA (Eco Audit)	Integrated Environment Protection
New Lifestyle	Incentive Systems		Rational Use of Energy
			Safety/Security Technologies
		Corporate	Culture

Note. Based on Detzer (1993) p. 58.

In this table you can find only some relationships to culture (in italics): life style and corporate culture – that's not very much…
In the article by Robert W. Kates et al. on *"Sustainability Science"* the authors discuss the interactions between nature and society and give arguments for the development of a sustainability science (cf. Kates et al., 2001). One of the core questions of this sustainability science is the following: "What systems of incentive structures – including markets, *rules, norms,* and scientific information – can most effectively improve social capacity to guide interactions between nature and society toward more sustainable trajectories?" (Kates et al., 2001, p.

642 – italics by us; G.B./O.P.). Even here you can find only one remark related to culture, but: no systematic view on culture!

The Cultural "Dimension"

During the last years cultural aspects have been a focus in some research areas of ITAS:

- "technology and culture" in general – concepts and representations in history and in the present (cf. f.i. Banse & Grunwald, 2010; Banse & Hauser, 2009; Parodi, 2010);
- culture of innovation (cf. f.i. Banse, 2012; Banse & Belyová, 2011);
- culture of security (cf. f.i. Banse, 2009a, 2011; Banse & Belyová, 2012; Banse & Hauser, 2008);
- culture in or of technology and its assessment (cf. Parodi, 2008);
- culture in education for sustainable development (cf. Parodi, 2011).

And – last but not least – the relationships between sustainable development and culture are a topic of ITAS. So far this research includes two small workshops with participants from Germany and Austria (cf. Hartard, 2009), the international workshop "Sustainability 2010: The Cultural Dimension" as the 7th Conference of the Sustainability Forum (cf. Muraca & Holz, 2019) and some book publications (cf. Banse, 2009b; Banse et al., 2011; Parodi et al., 2010, 2011).

The starting point for this research topic was the insight, that there is a "cultural lack" or "cultural gap" in all concepts of sustainable development (cf. Kopfmüller, 2010)! So the idea of the cultural dimension of sustainability was born by some colleagues of ITAS. This idea includes two directions: (1) culture as a condition for sustainability and (2) culture as an aim of sustainability.

It was shown that in most of the political and scientific documents on sustainable development only declarations (about the role of culture) are given, but a lack of reflections in these two directions. This depends on the understanding of "culture" (as a "fuzzy" term): norms, values, rules, hopes a.s.o., but manners (and ways!) to life and to work too.

There are two lacks:

- a lack of cultural topics in discussions around sustainability (mostly environmental, societal, political, …topics);
- a lack of sustainability in the discussions around culture (unilateral understanding of culture: art, literature, …).

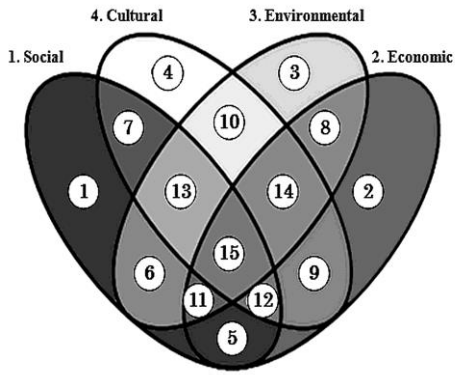
That led to two conclusions:

- There is a necessity of a "culture of sustainability".
- There is a necessity of a cultural change in the direction of sustainability.

Before we start with the research in the field "sustainable development and culture" in a more systematic way, there were only few relevant publications in Germany and abroad (cf. Duxbury & Gilette, 2007; Hawkes, 2001; Janikowski & Krzystofek, 2009; Krainer & Trattnigg, 2007; Kurt & Wagner, 2002; UNESCO, 1995)[1] and only few conceptual approaches. Here are two examples:

1. After *Ute Stoltenberg* (Lüneburg, Germany) the cultural dimension of sustainability includes the following components (cf. Stoltenberg, 2010, p. 297):
   - ethical assurance;
   - sustainability-oriented lifestyles;
   - holistic perception of nature;
   - aesthetic perception of sustainable development
   - cultural diversity as a component and potential for sustainable development;
   - traditional knowledge;
   - use of time;
   - culture of dealing with things;
   - consumer awareness;
   - international exchanges;
   - global responsibility.
2. The approach of *Kien To* (Singapore) is shown in Figure 1. There are some different topics in sustainability research related to cultural aspects (cf. To, 2011, pp. 349ff.).

[1] The Cultura21 Network (Berlin, Germany) published since some years an e-Book Series on Culture and Sustainability; cf. f.i. Grabe 2010; Hahn 2010.



Set / Zone:	1.Social	2. Economic	3.Environmental
Zone	Intersections	Intersections (verbal)	Vision
5	1∩2	Socio-Economic	Equitable
6	1∩3	Socio-Environmental	Bearable
7	1∩4	Socio-Cultural	Compatible
8	2∩3	Econo-Environmental	Viable
9	2∩4	Culturo-Economic	Compromisable
10	3∩4	Culturo-Environmental	Durable
11	1∩2∩3	Socio-Econo-Environmental	Harmonizable
12	1∩2∩4	Socio-Culturo-Economic	Harmonizable
13	1∩3∩4	Socio-Culturo-Environmental	Harmonizable
14	2∩3∩4	Culturo-Econo-Environmental	Harmonizable
15	1∩2∩3∩4	Socio-Culturo-Econo-Environmental	Sustainable

Figure 1. The Four Pillar Scheme of Kien To. Obtained from To (2011) p. 351[2]

Basics of the ITAS approach are:

- Cultural theory and cultural studies research are linked to sustainability theories, concepts and relevant sustainability research.
- It is important to consider the cultural dimension of sustainable development no more as a "sustainable development accessory", but to perceive it as effectually and 'real'.
- Common concern is about the importance and difficulty of cultural change to reflect in terms of a demand by the world community sustainable development – without the diverse meanings of "culture" and "cultural issues" to reduce premature judgements.

It is our goal, that step by step the cultural perspective is becoming an aspect in the debates on sustainable development. Contributions can be given from different sources: the range is from such related to cultural sciences up to conceptual contributions from the field of sustainability research.

Results in this research field *at first* depend on the understanding of "sustainable development" and "culture", *at second* they are influenced by the given scientific discipline, and *at third* they depend on the research question(s), the level of analysis (more local/regional, more national/global) and the methodological approach (case study, conceptual, …).

[2] There is a mistake in this figure: at the right side on "Set / Zone" was forgotten "4. Cultural"!

Concluding Remarks

As a summary and as concluding remarks we can diagnose to the state-of-the art:

- there are some different directions of research: cultural heritage, everyday life, contradictions between …, patterns of behavior, "cultural ability for connection" a.o.;
- there are different discussed topics: importance of culture, role of values, implicit norms a.o.;
- there are different meanings of "culture" and "sustainability" and their relationships;
- implications of the understanding of sustainability were shown;
- there are ideas for the expansion of the current concept(s) of sustainability (f.i. "District Future – City Lab", Parodi, 2012).

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THE CHALLENGE OF MULTI LEVEL ENVIRONMENTAL GOVERNANCE IN INDIA

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India's Constitution and the country's political framework provide possibilities for multi-tiered environmental governance systems. However this possibility has not been sufficiently explored on account of decades of centralized governance of natural resources in the country, which in turn was largely prompted by the indifference of 'development starved' provincial governments towards environmental concerns. With the advent of global environmental agreements, the complexity of environmental governance has increased for India. The country's national development goals have to be not only situated within the matrix of the country's conservation goals, but also within the context of India's commitments to global conventions dealing with global commons. Locally designed plans can solve the riddle, if structured well. This paper outlines the problem at hand, and proceeds to lay out a system of multi- tiered environmental governance for India that reconciles national development and conservation objectives with global environmental concerns.

Keywords: **Multi-level Environmental Governance, Global Public Goods, Local Self Governments, Transaction costs, Nested Systems**

Introduction

The challenge of environmental governance lies in pursuing environmental goals within the overall fabric of a country's political, institutional and socio-cultural systems. A political order that is presaged on a unitary State that has homogenous socio- cultural formations, may not face serious complexities in environmental governance. For such a State, a standard' one size fits all' administrative system can facilitate sustainable development. This is not true for a country like India. Apart from its burgeoning human population, the critical issue with a nation- State like India has been the existence of an amazing variety of natural regimes that has been subject to varying traditions of political and natural resource governance systems in the past. The wave of globalization and economic liberalization in the 1990s and the equally intense focus on global commons noticed in the closing decade of the 20th century, has added to the complexity of managing environmental resources in diversity countries like India. Today India is an emerging economy has catapulted itself to a higher

trajectory of economic growth since the 1990s, while at the same time, making serious efforts to conserve national, local and the global commons. By the closing decades of the 20th century, India had put in place, policies and programmes for achieving its multifarious environmental goals. These have assumed the shape of coherent national, sub- national and local level policies. However the larger task of breaking away from 'sectoral' or 'compartmentalized' approaches to the issue of commons remains to be achieved.

This paper briefly surveys the state of environmental governance in India against the backdrop of the country's rising economic aspirations. The paper proceeds to outline the nature of a multi-level environmental governance framework that can ensure sustainable management of local, national and global commons in India.

The Context

A close reading of India's Constitution indicates that the ideals of pluralism and diversity underpin our basic approach to environmental issues (Damodaran, 2012). India is a Union of States. The country represents a disaggregated federalism where powers devolve from the Central Government. Indeed India's Constitution carries three lists viz Union, State and Concurrent. As far as the concurrent list goes it enables legislation to be also enacted by the Central (Federal) Government on subjects that were originally part of the State List. The subject of 'Forests' and 'Environment Protection' were brought into the Concurrent List with the 42nd Amendment to the India Constitution adopted in 1975. Thus in the period following this amendment, forests, wildlife and coastal areas were increasingly viewed as national public goods and were subjected to Federal Government regulations and Legislations.

India's economic federalism has been consistent with the overall characteristic of its polity. Elastic tax revenues (such as Income/Corporate Tax and Central Excise duties) devolve on the Central Government. This contributes to a high resource base for the Federal Government. Resources so mopped up are distributed or transferred from Central Government to States, based on recommendations of the Central Finance Commissions, that are appointed every five years.

In the current scenario, India's approach to environmental governance in general and global public goods in particular, needs to be situated against the backdrop of the globalization process, the country's prowess in Information and Communications technology (ICT), its rurality, its civic communities, its environmental policies and structures of global environmental governance (Damodaran, 2010). One needs to look at the economic, political, and institutional play that has provided the context for addressing the global

environmental problems associated with climate change, biodiversity, desertification, and hazardous waste movements (ibid). Here one stumbles into a complex nation state where, despite the advent of the cyberspace and its seamless fantasies, Mahatma Gandhi and his 'village society' and methods of 'passive resistance', hold equal attraction (ibid).

India's Macro-Policy Framework

At the dawn of the 21st century, India's economy experienced accelerated growth rates in its Gross Domestic Product. From niggardly growth rates of 2-4% per annum, the India's annual economic growth rate went up to 8% – 10% per annum by 2008. Though the world economic crisis of 2008 slowed down the Indian economic growth story marginally, the fundamentals are strong, given the country's basic competitiveness in the services sector and the growing consumer base which is aided by the country's growing middle class segment and favorable demographics (It is reckoned that the percentage of population under 15 years is 33% as against China's 21%) that potentially raise the proportion of young and employable population in the coming decade.

The sustainability issues created by the favorable economic growth story have been equally challenging. Overall, India's population of 1.2 billion has been increasing at an annual growth rate of 1.58%. (IndiaNetzone, 2009). This has created a major challenge to its economic growth story. The rising consumerist base in emerging markets like India and China (Mostrous, Yiannis, Gue, & Mirtchev, 2006) has created conditions for unbridled growth in solid wastes in urban and peri-urban centers, serious shortage of energy resources, explosion of private road transport and immense pressures on land resources for infrastructural and industrial growth. At the same time, distribution of income and wealth has not been fair and the benefits of economic growth have not reached the rural and urban poor'. This creates major concerns about the social fall out of the growth model. Adding to the challenge are the threats of climate change, biodiversity loss and land degradation - concerns which though global in nature, are at the same time of central concern to India's economic and social well being. Thus sustainability poses to be a major challenge to India, requiring amongst other steps, new ways of governing the country's environmental resources. Figure 1 sums up the nature of the crisis of unsustainable growth India has been threatened with.

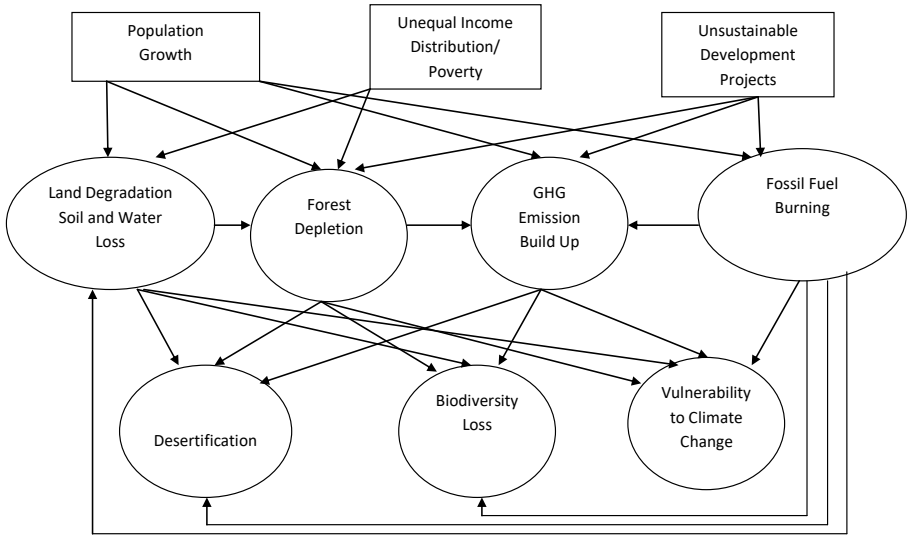

Figure 1. Sustainable Development: Anatomy of India's Pressure Points

As Figure 1 brings out, population growth, unequal income and unsustainable industrial production threaten India's environment. The three factors cause land degradation, depletion of forests and biodiversity with consequences to GHG emissions. The latter is also induced by burning of fossil fuel including coal and oil. India's environmental pressure points have the potential to contribute to desertification, biodiversity loss and climate change - matters which are addressed by the UN Convention to Combat Desertification (UNCCD), the Convention on Biological Diversity (CBD) and the UN Framework Convention on Climate Change (UNFCCC). Particularly vulnerable are fragile ecosystems and bio-geographic regions of India like the Western Ghats that have experienced high demographic and biotic pressures in recent times (Gadgil, 2011).

India's waste lands account for 63.85 million hectares which constitutes 20.16% of the country's geographical area (ICAR and NAAS, 2010). The figure includes degraded forest lands as well. Nearly 43 million hectares of the wastelands are in the reclaimable category, coming as they are cover lands that have lost out on 'productivity' due to biotic or climatic factors. In case adverse climatic and biotic factors faced by agro- ecosystems are not addressed by policies and governance mechanisms, it is likely that the reclaimable category of wastelands, will expand in area with passage of time. With intense rural and urban demographic pressures and unsustainable consumerism, it is likely that the area under wastelands will increase, unless corrective measures are undertaken. In other words, land degradation, agro-biodiversity erosion, depletion of forests

and GHG emissions (emanating from fossil fuel combustion) are matters of concern for national environmental governance as much as they are for the UNCCD, UNFCCC, and the CBD. While at the global levels, the three conventions work independently, at the national level, their concerns need to be integrated into the country's planning and development processes. The dangerous coupling of land degradation, biodiversity loss and carbon emissions mentioned in *Figure 1* assume significance here.

Current Policy Initiatives and their Limitations

India's National Environmental Policy 2006 was the first major effort on the part of Federal Government to integrate global and national environmental considerations into a policy framework for addressing the pressing sustainability problems facing the country. As Figure 2 illustrates, the NEP has the potential to relate India's social and economic sector policies with climate, land degradation and biodiversity concerns, through National Action Plans and National Communications (NATCOM). Figure 2 also illustrates the possibility of strategizing conservation of global public goods within the ambit of India's national economic aspirations and sustainable development plans. The approach spelt out in Figure 2, could thereby contribute to both national goals as well as to the fulfillment of the obligations to which India is subjected under the CBD, UNCCD and UNFCCCC.

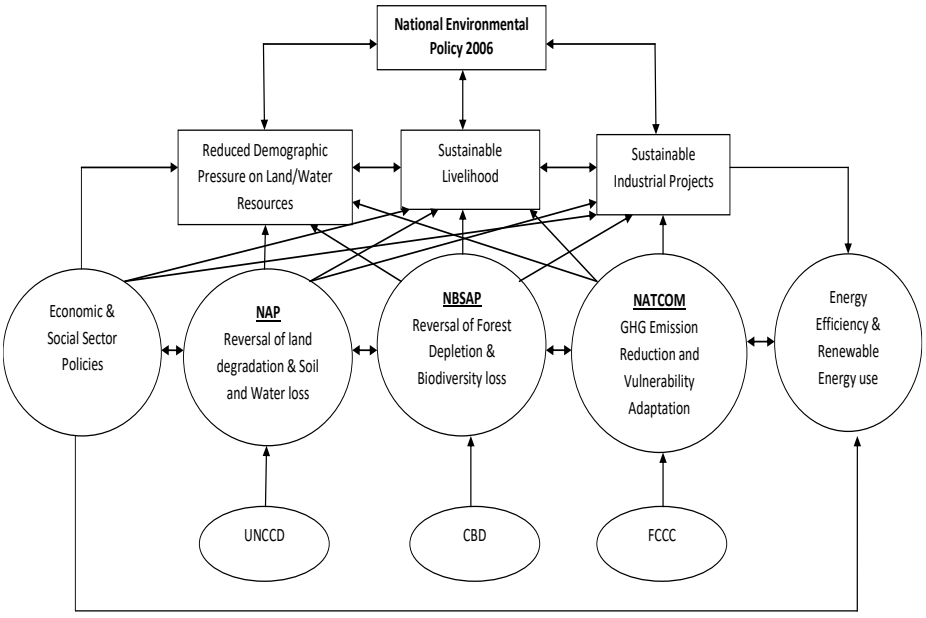

Figure 2. Integrating Global Public Goods to National Environmental Policies in India

Why Multilevel Environmental Governance?

It is often argued that the real merit of Multi-level environmental governance system is that it is sensitive to local conditions and inter-regional differences in conservation and resources consumption patterns. This is more so the case, with global public goods. However there are demonstrable cases where these location specific factors have been captured by federal Governments.[1] Therefore the main argument for multi level governance is to be located elsewhere. The main argument advanced here is that compartmentalized approaches towards global and national public goods entailed by centralized systems of governance is the main *raison d'être* for multi-level environmental governance.

The limitation of a centralized environmental policy structure is illustrated in *Figure 2*. As is brought out in Figure 2, 'sectoralism' is the bane of centralized approach to environmental governance. In such scheme of things, implementation of conservation schemes and emission reduction goals are compartmentalized through 'line departments'. Line departments view the 'problem at hand' within a narrow framework with scant regard to cross- cutting or overlapping factors and above all, 'local needs'. This limitation leads to high transaction costs by way of having to maintain centralized bureaucracies to implement project and programs. By contrast, decentralized natural resource management plans that are implemented by local self governments at the village or regional levels, can reduce transaction costs, besides being in consonance with local needs and sustainability aspirations.

Towards Multilevel Environmental Governance in India

Multilevel systems for environmental governance require adoption of non-compartmentalized approaches whereby local self governments design and implement schemes and programs. While at the federal level and sub- national levels, funds are allocated sectorally, the larger and more basic task of multi level environmental governance is to ensure that all development and conservation based funds are transferred from federal and provincial governments to local self governments at the village or village cluster levels. Such governing units are referred to as 'Gram' or 'Mandal Panchayats' in local parlance (Damodaran, 2006). The task of integrating the sectoral plans happens at the local self government level based on local plans already drawn up by these

[1] For instance Fisher and Chen (2011) state, how the issue of multilevel climate governance is complicated in China on account of inter-province differences in energy consumption profiles. As a result, China's federal government authority concerned worked hard to set different targets for 'saving energy' and carbon emission intensity for different provinces, that accounted for sub-national and regional differences (ibid).

bodies. Such a scheme accords well with what Berkes (1989) states as an inclusive approach to co-management whereby higher-level institutions can contribute to the enforcement and protection of local rights. In the case of shore areas of India, a system of nested institutions, based on decentralized management of natural resources, has been found to be useful. Indeed such an approach can be useful in resolving natural resource management issues in other agro ecosystems as well.

The other advantage of such a decentralized and 'nested approach' in coastal areas is that, this could facilitate empowerment of local communities and enhance their risk management capabilities. This, in turn, can ensure improved implementation of protection and conservation schemes in order to effectively manage natural disasters.

The more basic advantage of a nested approach is that it would permit a harmonious blending of goals of conserving global and local public goods within the development matrix of a village or a 'cluster of similarly situated villages.

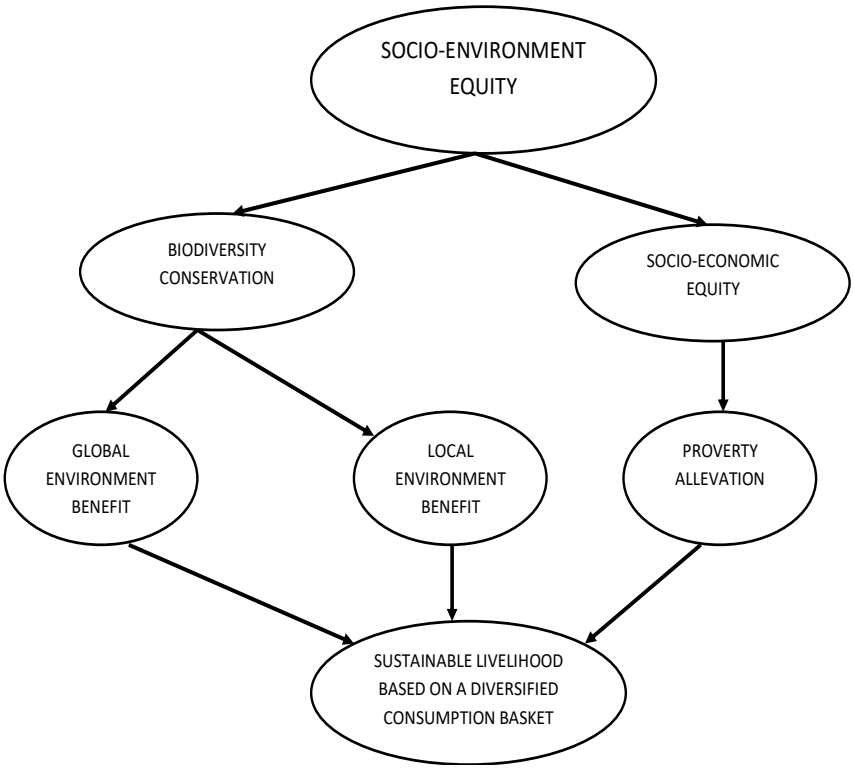

Figure 3. The Paradigm of Socio-Environmental Equity
Note. Figure based on Damodaran, 2001.

Indeed as Figure 3 depicts, it is possible for a locally conceived village development plan to encompass livelihood and poverty alleviation concerns with biodiversity concerns[2]. In this manner inter- Convention synergies are captured, at the lowest point where conservation activities take place.

Concluding Thoughts

The paper argues the case for a multi-tiered environmental governance system for India based on locally prepared and implemented plans that harmoniously blend conservation goals relevant to multilateral environmental agreements with local conservation plans which focus on sustainable development and livelihood protection. Such plans, being holistic and sensitive to local aspirations, have a higher probability of effective and efficient implementation. More fundamentally they achieve inter- convention synergies at the local level. As noted elsewhere (Damodaran, 2006)**,** in practical terms, this means that local self-governing agencies could facilitate 'co-management' of resources in the area based on the principle of nested representation. In the context of coastal ecosystems, this further means that local self-governing agencies that perform operational management functions at the local level would report on observance of shore zone guidelines and other protection schemes to the provincial and federal governments. Such an arrangement will induce reverse flow of opinions from local communities to federal governments and to global bodies that administer multilateral environment agreements.

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MARINE PROTECTED AREA MANAGEMENT: IMPROVING PERFORMANCE BY PROFESSIONALIZING CAREER PATHS WITH INTEGRATED TRAINING, CERTIFICATION, AND TRADE ORGANIZATION DEVELOPMENT

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Marine protected areas (MPAs) that conserve over-exploited marine resources and ensure sustainable livelihoods for local communities are among the highest of ocean management priorities for the 21st century. Unlike other professions, however, these areas are often managed by staff without: a) advanced training in MPAs, b) incentives for long-term skill development, or c) professional organizations to certify competencies and represent MPA management as the skilled career for which it deserves recognition. Without the professional development infrastructure found in other important professions (e.g., teachers, attorneys, physicians), MPA management can be constrained by high staff turnover, and an absence of resources or political status relative to other interests. MPA staff should be professionally empowered through their full career cycle by specialized training and explicit performance standards; these can be achieved through well-designed certification programs that incentivize improved performance and professional trade organizations to improve long-term career prospects. Therefore, the IUCN through the newly formed Work Group for Education and Learning within the WCPA Protected Area Capacity Development Program will work with partners including the Global Protected Areas Programme, CBD Secretariat, and many others to build a Global Partnership for Professionalizing Protected Area Management (GPPPAM). In terms of MPAs, the program will include: 1) open-access curricula specific to MPA rangers, managers, and system administrators; 2) accreditation of partner institutions and creation of a scholarship trust fund for MPA trainees; and 3) establishment of regional certification programs based on proven job performance following the MPA PRO model and the expansion of regional organizations to provide full professional career development services.

***Keywords*: MPAs, training, WCPA, GPPPAM, MPA PRO, fisheries management**

Introduction

Marine protected areas (MPAs) that conserve over-exploited marine resources have been widely identified as one of the highest sustainability priorities for marine systems (e.g., Lubchenko et al., 2003; Millennium Ecosystem Assessment, 2005). Many terms and concepts directly or indirectly involve MPAs including Coastal and Marine Spatial Planning, Ecologically or Biologically Significant Marine Areas, and Marine Managed Areas. It is important to emphasize that the policy objectives of protected marine areas often focus on social or economic issues as well as biological. Due in part to the diverse goals of many MPAs, the design and implementation of such areas is difficult and fraught with measurement and performance challenges (Sale et al, 2005; Mora, 2011).

The thousands of MPAs worldwide are complex institutions that require highly diverse skill sets to efficiently operate. Though potentially providing trillions of dollars' worth of ecosystem services, these areas are often managed by staff without formal professional training, certification or resource support. This is a suboptimal paradigm for managing billion-dollar institutions that also could serve to mitigate some impacts of climate change (MEA, 2005), though this will be difficult to assess in many marine systems (Jameson et al., 2002).

A series of meetings to professionalize protected area (PA) management worldwide has produced an evolving plan that received consensus endorsement at meetings of the World Commission on Protected Areas Training Task Force (WCPA) and Convention on Biological Diversity (CBD) in 2011 (Müller et al., 2012), and follow-up meetings at the Latin American School of Protected Areas in Costa Rica and the World Conservation Congress in South Korea in 2012. The new Global Partnership for Professionalizing Protected Area Management (GPPPAM) has identified the following goals to advance marine and terrestrial PA professionalization:

1. Develop advanced, open-source curricula to professionalize training for three essential staff categories: rangers, managers, system administrators;
2. Implement advanced training through accreditation of exceptional training institutions and creation of a scholarship trust fund for trainees;
3. Establish certification programs that assesse and certify on-the-job performance of PA professionals based on core competences and coordinate existing PA professional associations so that services for the entire career of PA professionals can be ensured.

Full-life-cycle development of PA professionals will be the focus of all components. In terms of MPAs, the program will innovate by moving beyond training programs alone to coordinate courses into a larger professional certification system that services the needs of both young and veteran MPA professionals throughout their career. It will incentivize staff to pursue new opportunities that will professionalize MPA management.

The training elements of the program build on verified online and in-person MPA curricula developed by WCPA and partners and will provide onsite training facilities in selected UNESCO sites throughout the world. Working with both World Heritage and MAB sites will provide a range of training models from iconic, highly protected reserves to multi-use MPAs. The GPPPAM initiative will be managed through the newly formed Work Group for Education and Learning within the IUCN WCPA Protected Area Capacity Development Program.

A strong existing example that the proposed certification elements will build from is the WIO-COMPAS (Western Indian Ocean - Certification of Marine Protected Area Professionals) program (http://www.wio-compas.org/) which is based on the MPA PRO model. In the case of WIO-COMPAS, 42 MPA staff are certified among three levels of achievement and are employed at over 27 MPAs across seven countries of southeast Africa. The MPA PRO certification is designed to be customized for MPAs in other regions and exemplifies a regional model to reinforce local ownership (Squillante et al., 2010). WIO-COMPAS is endorsed by IUCN-WCPA, WWF, International Ranger Federation, and others.

Marine Protected Areas are Critical yet Management is Erratic

At the international level, MPAs have been recognized as critical instruments in achieving the objectives of the CBD and the Millennium Development Goals. At national and local scales, many countries and regional or local governments have MPA initiatives underway. Complex government initiatives have established more than *200,000 PAs worldwide* covering nearly 13% of the Earth's terrestrial surface. Marine protected areas are also increasing, by 2010, 1.6% of the global ocean area, 4% of all marine area under national jurisdiction and 7.2% of all coastal waters were nominally protected (Bertzky et al., 2012). These efforts represent a continued emphasis on MPAs as increasingly critical management institutions. There has to be an increase in staff, *highly-trained staff*, to properly meet these increasing numbers.

MPAs face extraordinary challenges from climate change but also open windows of opportunity. MPAs are often fundamental to efforts to conserve ecosystem services, yet, diverse science and policy analyses have concluded that many PAs are not effectively managed (Appeldoorn and Lindeman, 2003; Mora, 2011). Despite their contribution to national and local economies, MPAs have

often not attained a prominent place in national policies, priorities, or funding. The CBD established goals to stop biodiversity loss, yet, the recently released Global Biodiversity Outlook 3 (http://www.cbd.int/gbo3/) concludes that targets have not been met. The Outlook states that the principal pressures leading to biodiversity and ecosystem services losses are, in many cases, intensifying.

MPA Staff Face Unique Ocean- and Coastal-based Operational Challenges

GPPPAM is focused on both terrestrial and marine protected areas but there are major differences in the design, implementation, and long-term management of each category of PA. These differences take multiple forms and place specialized demands on MPA personnel. In terms of physical structure, MPAs are largely underwater and there are typically no visible boundaries. In addition to the logistic challenges of governing areas that are very difficult to demark and establish signage on, there is also the major challenge of getting local stakeholders to value resources most of them may never even see. In most societies there is also a very limited history or cultural familiarity with zoning and protected areas in aquatic systems, in contrast to substantially more familiarity with PAs on land (National Research Council, 2000).

In terms of pure resource management considerations, many if not most MPAs are used as fishery management tools. The management of fishery resources is notoriously complex with very dynamic oceanographic processes affecting the population biology of the species under focus at multiple biotic and abiotic scales across dozens of spatial and temporal scales (Spencer and Collie, 1997). In addition, funding to implement basic fisher outreach, research monitoring of PA effectiveness, and compliance/enforcement is typically inadequate.

A prominent example of a PA management issues specific to marine system involves spawning aggregations near the drop-offs of continental and insular shelf platforms. Some of the most economically valuable reef fishes reproduce in dense aggregations that gather only once a year at such aggregation sites. Because these annual and brief concentrations hold high numbers of very valuable species (e.g. snappers and groupers), they are highly vulnerable to fishing. Overfishing of these special areas can have dramatic consequences on local and long distance populations of economically important resources. Regional and global trends demonstrate that declines in spawning aggregations have been and continue to be steep (Sadovy de Mitcheson et al., 2008).

Since marine spawning aggregations are highly site-dependent, they can lend themselves to spatial protection in the form of MPAs. However, there is considerable scientific and political complexity associated with optimized zoning-based protection of spawning aggregations that can also vary greatly

among differing regions and cultures. Whether a multi-use MPA or a no-take reserve focused on spawning aggregation protection 15 km offshore or many other different goals, the challenges associated with fisher outreach, monitoring of effectiveness, enforcement, and other needs can overwhelm even an excellent staff and administrative structure.

MPA Staff Need Professional Development in Diverse Skills

Many countries or regions are attempting to increase their MPA number and effectiveness, often through the creation of nominal MPA networks. Clearly, there are urgent needs for not only multidisciplinary training but for incentive-based professionalization including development of trade organizations dedicated to the career of MPA management, as other highly-skilled professions have developed. Long-term funding acquisition, administrative support, and incentives to view MPA management as a long term career have often been overlooked due to the understandable macro-focus on the potential values of well-managed MPAs (including biodiversity and ecosystem service conservation, protection of indigenous livelihoods, sustainable tourism, multi-use recreation, and climate change resilience).

The complexity of modern MPA management therefore requires professionals with knowledge of disparate fields who have been adequately trained to integrate diverse skills, including business management. Advanced professional development for diverse staff roles is crucial to ensuring PAs are capable of withstanding current threats and are prepared for new challenges. In economic sectors other than MPAs, formally trained professionals are required for managerial positions, with a degree or specialization related to what they are managing. Academic institutions that offer formal programs in MPA or terrestrial PA management are rare and MPAs in many developed and developing countries are managed by those trained in narrow technical fields like biology, anthropology, and forestry, who often modified their career paths after college.

An effective MPA manager should understand fundamental ecological dynamics with a broad knowledge of conservation science, including population dynamics and the marine sciences. Yet, this person should also understand complex human social dynamics including socio-economics, stakeholder outreach, traditional ecological knowledge, and conflict management (Russ and Alcala, 1999; Grant and Berkes, 2007), skills that are rarely delivered in a pure biology curriculum. In addition, knowledge of organizational administration, project management, budgeting, human resources, risk management, tourism, environmental education, infrastructure maintenance, and fundraising are also necessary.

In part, local limitations on staffing and career development have led to a dependency on international and national NGOs and government technical assistance projects that often operate for only a few years and can be over-focused on external actors. Relatively few long-term employees have specialized training or career support organizations to integrate the above skills and competencies for optimized MPA management. Challenges are increased for governments since professionals often migrate to the NGO or consulting sectors and the capacity for national systems to train new personnel is often limited. Training will not alone improve staff retention: there is a need for tools such as certification to reward consistently solid performance and larger professional organizations to incentivize additional career development.

Converging Training, Certification and Professional Development

To advance the professionalization of MPA and terrestrial PA management, the newly formed Work Group for Education and Learning within the IUCN WCPA Protected Area Capacity Development Program will work with a wide array of partners to establish a global partnership for training, accreditation and financing, and establish certification of professionals while building their career identities via professional organizations. Components specific to coastal and ocean protected area management within the GPPPAM framework are summarized below.

Building Advanced Global Curricula for Three Levels of MPA Professionals

The GPPPAM partnership will work to establish advanced, interdisciplinary training and competency standards for MPA professionals at a global level. Curricula will build from existing and new tools to best implement the Program of Work for Protected Areas.

Objective: To empower globally rigorous professional training at three levels: Rangers, MPA Managers, and MPA System Administrators to improve MPA management in all global regions.

Outputs:

- Development of regularly updated, training content on MPA management for three professional categories: Rangers, Park Managers and System Administrators;
- Three sets of differing curricula will cover all ecological, social, and management aspects of MPAs relevant to each of the three specific professional categories.

- All academic materials will be delivered using both e-learning and face to face modules.
- WCPA members will develop, review, and update course materials;
- WCPA will ensure quality control and the capacity building of trainees by developing an accreditation system for training institutions using the materials (Component 2 below);
- Management and updating of course material will be self-funded through fees from academic institutions for use of course material and for accreditation.
- Training curricula will promote curricula adaptations and their local cascades.

Partners: WCPA and Global Protected Areas Programme – IUCN, CBD, International Rangers Federation, The Latin American School for Protected Areas at the University for International Cooperation, the International Academy for Nature Conservation, AMPAM, and other organizations, academic and training institutions.

Accreditation and Financing of Training Centers of Excellence

Training will be implemented through accreditation of exceptional academic institutions and training centers which will provide scholarships as feasible to deserving trainees.

Objectives:

1. Establish a network of accredited "Training Centers of Excellence" to ensure best instruction practices using MPA curricula developed and maintained by GPPPAM partners.
2. Identify scholarship sources for training at accredited institutions for managers and system administrators (ranger programs will occur in national systems, supported by local institutions).

Outputs:

Accreditation

- Development of a system of WCPA Partners to accredit specialized GPPPAM training and host institutions to enhance existing institutional leaders and create new ones.
- The accreditation system will ensure best standards, assist in improvement of programs, and lever funding for the administration and updating of curricula.

- Institutions and their MPA training will be assessed against standards including: capacity to hire necessary staff, understanding and delivery of course content, feedback from recipient MPAs, use of practical training sites including UNESCO World Heritage and MAB sites.

Scholarship-based Financing

- GPPPAM courses will be supported by a scholarship trust fund at accredited institutions to provide capacity-building for MPA trainees with a focus on developing self-financing mechanisms.
- Funds will also provide for a small amount of seed-funding to facilitate practical projects on site to reinforce training and enhance management applications.

Partners: Training institutions include the ASEAN Regional Center for Biodiversity Conservation, the Latin American School for MPAs in Costa Rica, the International Ranger Federation, and marine conservation NGOs. Many universities and other organizations (e.g., Caribbean MPA Managers Forum) are associated with periodic MPA training and their expertise will be encouraged.

Certification of MPA Professionals and Building MPA Professional Associations

Following the successful MPA PRO model of the Western Indian Ocean Marine Science Association and the URI Coastal Resources Center, certification will be based on proven job performance and front end training programs using locally-guided core competences and standards for MPA professionals. MPA PRO provides clear milestones for MPA professionals who have applied skills from training courses to their work as well as for those veterans who have performed on the job without formal training. Certification addresses the demand of MPA professionals for recognition of their work, career guidance and networking.

To best sustain this initiative, there should be a foundation upon which these services can be layered. As with any other profession, such as doctors, engineers and lawyers, there is value in having professional associations that establish the standards, training process, ethics and professional services for an industry. Fortunately there already exist several MPA professional associations including the International Ranger Federation which could serve as the home for the expansion of services outlined in this initiative. Most MPA professionals are not scientists and need their own unique community to aid their development, advocate for their needs, establish performance standards, network people and

promote innovation. There could be a single global professional association or multiple regional associations that follow internally established competences and services for member professionals.

Objectives:

1. Establish certification programs that recognize MPA field and management staff based on assessments of proven on-the-job performance; and
2. Substantially enhance the identity of the profession by working with partners to respond to the needs of MPA professionals and expand the range of services to MPA staff at all scales.

Outputs:

- Core competences and standards for assessment of individuals at multiple levels of the profession (field operators, site supervisors, policy and planning)
- Regional certification bodies to lead the customization of general competences and standards with assessment instruments to conduct certification programs
- Formal processes to train and recognize regional assessors to deliver the program
- Standardization across regions to ensure the core of the certification program is rigorous and complimentary – regions can modify the program according to local needs
- Formal recognition of existing international MPA professional associations that can deliver services and provide the focus on the needs of MPA professionals in broader advocacy
- Development of the core competences and standards for MPA professionals from which other services can evolve (career guidance, performance appraisal, and hiring)
- Regional capacity development services to increase staff retention, career guidance, ethical standards and motivation
- Networking of regional MPA professional leaders to define the regional needs that can strengthen the performance of MPA professionals

Conclusion

The above document outlines an ambitious but necessary array of goals to assist the professionalization of MPA management. Professionalizing the career paths and status of MPA staff, whether field rangers or agency administrators will help

address many well-documented challenges to MPA effectiveness and enable badly needed increases in financial resources and the ability of MPAs to become more self-sufficient. The long-term stakes are high and the need for MPA employees to be incentivized to stay and flourish in the profession, as in other respected careers, is overdue. Resources should be mobilized to extend and expand upon extraordinary models like WIO-COMPAS in many other regions. The WCPA Training Task Force is actively seeking ideas to sharpen and better implement these ideas among all coastal and ocean regions.

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WHAT IS GREEN? FLORIDA REVISITED

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Florida is the 4th largest US state. While a part of the US, Florida has many unique aspects. This paper will discuss the regional aspects of sustainability in Florida. How do recent economic changes, political changes, and population changes impact Florida's sustainability long term? Will challenges of hurricanes, housing (affordability, foreclosures), Space Shuttle termination, materially change Florida's outlook? Population growth has been integral to Florida's culture since WW2. However, for the first time 4/08 to 4/09 Florida actually had a decline in population. Will population growth return? Will plans for "smart growth" materialize or fade away in the face of higher (than the US average) unemployment and foreclosure rates? Indeed, how does the recent global recession change the view of Florida's citizens about changes necessary to enhance/achieve sustainability?

Keywords: **sustainability, culture, Florida, challenges**

Introduction

This paper is in the context of discussions of regional sustainability, in particular, challenges to sustainability.

Among the most widely used definitions of sustainability is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, p. 24, no. 27). Sustainability is grounded in science and deals with resources, technology and business but it is also grounded in consciousness and deals with morality, aesthetics and religion. Its tripartite-values – Environment, Equity, Economics – are a continuous circle, one of continuous feedback (Marx, 2009).

Culture is "the totality of socially transmitted behavior patterns, arts, beliefs, institutions and other products of human work and thought considered with respect to a particular subject or group". The cultural dimensions of sustainable development include cultural heritage and historic patterns of activities. Sustainable development includes sustainable technologies, sustainable economics and sustainable government. Clearly, culture is the context. Culture determines what we value. Yet what we value is itself in constant change (Marx, 2009).

In this discussion of challenges to sustainability, I want to again use Florida as an example (Nelson, 2011). Florida is larger than all but 10 European countries in population and all but 14 in land area. It is only a bit smaller than Romania in population and land area. Florida has its own uniqueness in environment, economics, politics and culture.

The 5th International Sustainability Forum in Budapest focused on forecasting and on the importance of an adequate range of forecast scenarios (Banse, Grunwald, Hronszky, & Nelson, 2011, p. 279). Thus it is reasonable to begin by describing Florida and to try to put it into perspective.

Growth of Florida

The State of Florida is the fourth largest state of the United States in population (2010), with 18.8 million residents, behind California (37.3 million), Texas (25.1 million), and New York (19.4 million) (*Florida Quick Facts*, n.d.). The population growth of Florida 1950-2005 is nearly a factor of seven. Projected growth from 2000 to 2010, official census years, was 25% (actual 17.6%). The population projection for 2060 is 36 million. The Florida economy (GDP) is $729 billion (2005) ($673 billion, 2010) and is expected to grow to $3.7 trillion in 2036 ("Florida & Metro Forecast," 2007). As a result of this growth Florida has elaborate planning processes, both official and unofficial. Each county, the next smaller governmental division to a state, has a "Comprehensive Plan." Actions by county government must be consistent with its comprehensive plan. Growth in population impacts multiple areas of life: transportation, schools, housing, shopping, jobs, recreation, to name but six. Public processes must anticipate needs and plan for necessary future infrastructure. *Florida has had a culture of growth*.

The population of Florida is diverse and different from the U.S. as a whole (see Table 1) (*Florida Quick Facts*, n.d.). It is older, has a higher black population, a higher foreign born population, a higher percentage of languages other than English spoken at home, yet a lower Asian population and lower median household income.

Table 1

Florida 2010

Population	18,801,301	
	FL	U. S.
Under 18	21.3%	(24.0)
65 and Over	17.3%	(13.0)
White Persons	75.0%	(72.4)
Black Persons	16.0%	(12.6)
Asian Persons	2.4%	(4.8)
Native American	0.5%	(1.1)
Mixed (2 or more)	2.5%	(2.9)
Foreign Born	19.2%	(12.7)
Language ≠ English	26.67%	(20.1)
B. S. Degree	25.7%	(27.9)
Home Ownership	69.7%	(66.6)
Persons/Household	2.53	(2.59)
Median Household Income	$47,661	($51,914)
Persons Below Poverty	13.8%	(13.8)

Note. Florida Quick Facts Retrieved from http://quickfacts.census.gov

GDP by industry (Figure 1) (Glassman, 2012) shows a higher participation by real estate and construction industries and a lower participation by manufacturing and mining versus the U.S. as a whole.

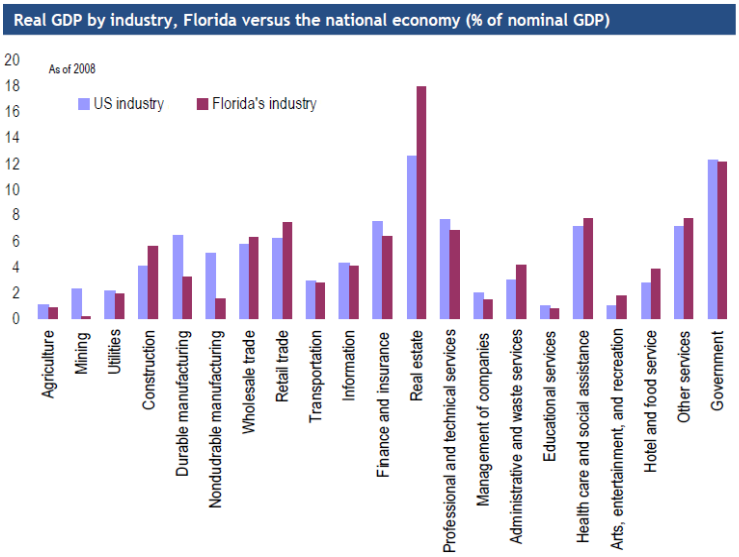

Figure 1. Florida's Economy adapted from Glassman (2012).

Note: Real GDP by industry, Florida versus the national economy (% of nominal GDP) as of 2008.

State growth of over 20% in ten years is not the norm in the United States or in Europe. Hungary, our partner in this Forum, has a population of 10 million in an area of 35919 sq. mi. (93030 sq. km.) (versus 65758 sq. mi. (170313 sq. km.) for Florida). Thus Florida and Hungary have similar populations per unit area (107 people/sq. km.). However, the population of Hungary has declined. At the end of World War II the population of Hungary was 9.2 million. The population of Hungary peaked in 1981 at 10.7 million and is 10.0 million today, with a projected population of 9.0 million in 2050. By 2050 it is projected that the 65 and over population in Hungary will go from 16.9 to 30.3%, that the 0-19 population will decline from 20.4 to 16.8% and the working age population (20-65) will decline from 63.7 to 53.9% (*Hungarian Central Statistical Office*, n.d.). Today the 65 and over population in Hungary and Florida are similar (16.9% versus 17.3%).

Planned (Smart) Growth

As noted above, some projections have Florida's population reaching 36 million by 2060. Assuming current development patterns, roughly 7 million acres (2.8 million hectares) will be converted from rural to urban of Florida's 38.3 million acres (15.5 million hectares). This would include 2.7 million acres (1.1 million hectares) of existing agricultural lands and 2.7 million acres (1.1 million hectares) of native/wildlife habitat. Urban development would go from 6 million acres (2.4 million hectares) to 13 million acres (5.3 million hectares). Counties like my own, Brevard, would be built out before the end of that period. The I-75 and I-4 corridors (interstate highways) would be fully developed. Thus the pressure is for more sustainable development (FoF, 2006). There have been multiple study efforts. One such effort is MyRegion.org. The MyRegion.org effort spent $1 million over 18 months in 2006-2007 to develop a shared 50 year vision for the seven counties (86 municipalities) of east central Florida. The work involved numerous public, private, and civic organizations, and some 20000 individuals through meetings and questionnaires. The author attended meetings and submitted a questionnaire.

Central Florida's population was 400,000 in 1950, 1.6 million in 1980, and 3.8 million in 2010. It is projected that Central Florida will grow to 5.1 million in 2030. The region's population is diverse, representing a broad mix of cultures, races, ethnicities, and ages. The region created one million new jobs between 1980 and 2005. The economy blends traditional strengths in agriculture, tourism, space, and defense with emerging industries related to aerospace, photonics, and life sciences. The income brought into the region has nearly tripled, from $37 billion in 1980 to $107 billion (in 2005 dollars) in 2005 (MyRegion, 2007b).

In its final report, "How Shall We Grow", August 2007, My Region.org elucidated six regional growth principles (MyRegion, 2007b):

1. Preserve open space, recreational areas, farmland, water resources, and regionally significant natural areas.
2. Provide a variety of transportation choices.
3. Foster distinct, attractive, and safe places to live.
4. Encourage a diverse, globally competitive economy.
5. Create a range of obtainable housing opportunities and choices.
6. Build communities with educational, health care, and cultural amenities.

The preferred alternative is a different approach to growth, in which the region preserves its most precious environmental and agricultural lands, focuses development in urban centers, and connects those centers with transportation corridors that provide more choices for how people travel, a more European lifestyle. Indeed, one would have a higher urban density with its associated services. Implementation requires some 86 municipalities and 7 counties to work together, to develop a regional "greenprint", to develop regional transportation corridors, to unleash creativity of developers and others, and to measure progress, inspect and improve over the 45 year timeframe. The report "How Shall We Grow" was followed by a much more detailed "Comprehensive Economic Development Strategy", September, 2007 (MyRegion, 2007a). But all of the above is predicated on a consistent pattern of growth, which provides the economic underpinning for development. Similar studies exist for other regions of Florida and for the state as a whole, with similar results ("Charting the Course," 2006; Thorner, 2007). But how valid is the forecast for continued growth?

Issues Challenging Growth

There have been multiple challenges to growth: hurricanes in 2004, the housing bubble/foreclosure crisis and the resulting global recession, home affordability, traditional low wages in Florida, as well as the termination of the NASA Space Shuttle program in 2011.

In 2004 four hurricanes hit Florida (Charlie, Francis, Jeanne, Ivan) covering most of the state. Statewide damage totaled $24 billion. In my county, Brevard County, alone, damage was $1 billion. While damage is largely repaired, the four hurricanes of 2004 and Wilma in Florida and Katrina in Mississippi and Louisiana in 2005 raised hurricane awareness in other parts of the country. There are certainly Florida people who said that they did not wish to go through a hurricane experience again. For Francis and Jeanne I evacuated to St. Petersburg on the other side of the state. While I experienced little damage, on return the city was a "war zone" with National Guardsmen, with machine guns, in the streets directing traffic. One follow on result of the 2004 and 2005 hurricane seasons was that some major insurance companies dropped thousands of Florida

customers for homeowners insurance. Many homeowners had to scramble for alternatives or use the State as the insurer of last resort. In the absence of insurance mortgages become due. Even those who did not need to find a new carrier saw their coverage increase in cost two- or three-fold. Fear of hurricanes and cost of hurricanes is the first issue.

The second issue involves the subprime mortgage financial crisis after the collapse of the United States housing bubble. The origin of the subprime financial crisis was the sharp rise in foreclosures in the subprime mortgage market that began in the United States in 2006 and became a global financial crisis in July 2007. Rising interest rates increased the monthly payments on newly-popular adjustable rate mortgages. Many sub-prime mortgages were in fact "balloon" mortgages, whose payments were fixed for two years and then rise sharply to a higher variable rate (in some cases double). This coupled with property value declines (50% in some markets) as the US housing market bubble collapsed, left homeowners unable to meet their financial obligations and lenders without a means to recoup their losses, since the property was now worth less than the mortgage alone. This resulted in a credit crunch threatening the solvency of marginal private banks and other financial institutions. This led to declines in stock markets worldwide, several hedge funds becoming worthless, coordinated national bank interventions, contraction of retail profits, bankruptcy of several mortgage lenders and finally in September 2008 the global financial collapse.

Subprime lending is a general term that refers to the practice of making loans to borrowers who do not fully qualify for market interest rates because of problems with their credit history or the ability to prove that they have enough income to support the monthly payment on the loan for which they are applying. Down payments may be less. Subprime loans or mortgages are risky for both creditors and debtors because of the combination of high interest, bad credit history, and murky financial situations often associated with subprime applicants. Subprime debt was then repackaged into wider debt offerings called collateralized debt obligations, which were resold on the global market.[1] Since the mortgage was not to be held by the initial lender there was less scrutiny of the applicant, and simply more financial institution pressure to sign-up applicants for mortgages.

With the rapid rise in home values in Florida, as homes sold, they took on the new value for property tax purposes. However, Florida has a "Save Our Homes" constitutional amendment which limits increases of assessed valuations of existing "Homestead" property to 3% per year. Thus a substantial tax differential resulted between owner occupied existing homes and recently sold homes,

[1] Subprime Mortgage Financial Crisis Retrieved from http//en.wikipedia.org/wiki/Subprime_mortgage_crisis.

perhaps sited next to each other. With rising property values, this doubling of property taxes plus the doubling to tripling in insurance premiums resulted in Florida homes no longer being affordable. Florida property which had been below the national average for some 15 years had by 2007 become 40% higher than the national average. Florida home affordability (price, mortgages, taxes, and insurance) is a second issue along with mortgage availability (Vittner, 2007).

In November 2011, of 50 Metropolitan Statistical Areas (MSA) in the United States with the highest FHA delinquent mortgages, the largest number (16) were in Florida ("FHA," 2012). New Jersey was next with 8, Ohio with 5, and Michigan with 4. The two MSA's with the highest delinquency (90 days or greater) were in Florida with delinquency rates of 21%. The median sales price for existing homes in Florida also dropped from over $250,000 in the August 2005 to August 2007 period to $139,000 currently (The Florida Legislature, 2012).

Housing is clearly related to other markets. In 2006 16 percent of new car purchases in Florida were made with home equity loans versus only 7% nationally. Families relied on cash from mortgage refinancing in an up market coupled with low interest rates to finance major purchases. In spring 2006 9 of 20 metropolitan areas that saw the sharpest home price appreciation in the US were in Florida. Now consumer confidence in Florida has dropped markedly, especially willingness to buy expensive items. The consumer confidence index was 77 in November 2007 versus 93 in 2006 (Ash, 2007; Cotterell, 2007; Goodnough, 2007). By April 2011, it had dropped to 68 ("Consumer Confidence," 2010) with a recovery to 73 in April 2012 (Clinton, 2012) and 77 in August 2012. In the 24 years of data prior to 2008, two-thirds of those years were above 90 and only two were below 80 (1991 and 1992 during a recession) ("Consumer Confidence," 2012).

Schools

For the fall of 2006 the Florida Department of Education (DOE) had forecast a 48,853 (51,000 average 1989-2004) increase in the school population (K-12). It turned out to be only 477. There are 2.64 million students in Florida schools. The 2006-2007 actual was the largest anomaly in DOE student projections in 20 years (Dukes, 2007*;* Florida Department of Education, 2011). Twenty-nine of 67 counties showed declines in enrollment, including 8 of the 10 largest school districts. The top ten school districts declined 19,000 students. Similar results occurred for the 2007-2008 school year; from Fall 2005 to Fall 2009 the top 10 school districts lost almost 40,000 students (Table 2). The top 5 school districts in Florida are 5 of the 15 largest school districts in the United States, with enrollments exceeding 175,000 each. In the period Fall 2009 to Fall 2011 those

10 districts recovered 27,000 students, but were still 13,000 below Fall 2005 levels.

Table 2

Annual Enrollment Change in Florida

Distinct	05 Fall	09 Fall	Δ 05 to 09	11 Fall	Δ 09 to 11
Miami-Dade (4th Largest in US)	362,033	345,766	-16,267	350,227	+4,461
Broward	271,470	256,175	-15,295	258,454	+2,279
Hillsborough	193,669	193,239	-430	197,001	+3,762
Orange (12th Largest in US)	175,307	173,021	-2,286	179,989	+6,968
Palm Beach	174,911	173,025	-1,886	176,901	+3,876
Duval	126,535	122,649	-3,886	125,464	+2,815
Pinellas	112,127	105,176	-6,951	103,705	-1,471
Polk	89,483	94,577	+5,094	96,034	+1,457
Brevard	75,160	72,402	-2,758	71,786	-616
Lee	75,579	80,470	+4,891	83,896	+3,426
			-39,774		+26,957

Note. Annual Enrollment Change for Florida's ten most Populous Districts; State Aid $7,300. Data obtained from Dukes 2007; Florida Department of Education 2010, 2011.

Because of the lower than expected growth some school districts delayed or cancelled building projects. State aid ($19 billion) is distributed to school districts on the basis of the number of students (FTE), about $7000 per student (Chambliss, 2007; Rushing, 2007). Thus, for a school district to lose 1000 students means a loss in revenue of $7 million. The result is loss of teachers and other staff. Education constitutes approximately 34% of the overall Florida state budget ($70 billion). The piece of good news is that it is easier to find teachers to meet the state mandated class size limits. Overall Florida needs to fill 17,000-20,000 teacher positions each year. In Fall 2011 Florida employed 168,135 teachers plus 21,795 instructional personnel (guidance counselors, librarians, etc.) out of a total full time staff of 318,209 (Florida Department of Education, 2007, 2012). If one had been watching carefully, the 2005-2006 school year actually showed the lowest growth since the 1984-1985 school year (Florida Department of Education, 2006). School year 2005-2006 also showed the largest enrollment decline October to February in a decade (Florida Department of Education, 2006). Thus overall school enrollment stalled in Florida, meaning that population growth for the young family segment of the population had stalled.

Economy

Indeed estimates of population growth for Florida showed a 57,000 loss for April 1, 2008 – April 1, 2009. This was the first annual loss of population for Florida since WWII: Estimates for April 1, 2009 – April 1, 2010 showed a gain of 23,000 to 18,773,000 (actual 18,801,350), so the 2000-2010 decade growth was 17.6% not 25% as forecast as late as 2005 (Harrington, 2010).

Such discussion does not consider foreign immigrants. South Florida (Arthur, 2007) growth is largely due to foreign immigrants, some 400,000 between April 2000 and July 2006. While domestic migration was negative since mid-2005. It is said that one-quarter of Florida's population growth since 2000 is due to foreign immigrants.[2]

Loss of population growth also means loss of jobs. Between the fall of 2007 and the fall of 2009, Florida lost 800,000 jobs and unemployment rose from 4 to over 12% ("Consumer Confidence," 2010), remaining at 11% in 2011, and nearly 9% today.

Figures 2 and 3 show GDP change by quarter and employment growth by quarter. Florida had higher economic growth than the United States from 1990 to 2007. It suffered less from the 1991 and 2002 recessions than the U.S. as a whole. But Florida was in recession earlier and longer in the current recession cycle. Employment growth follows the same pattern. Unemployment had a higher peak than the United States as a whole at 12% (Glassman, 2012).

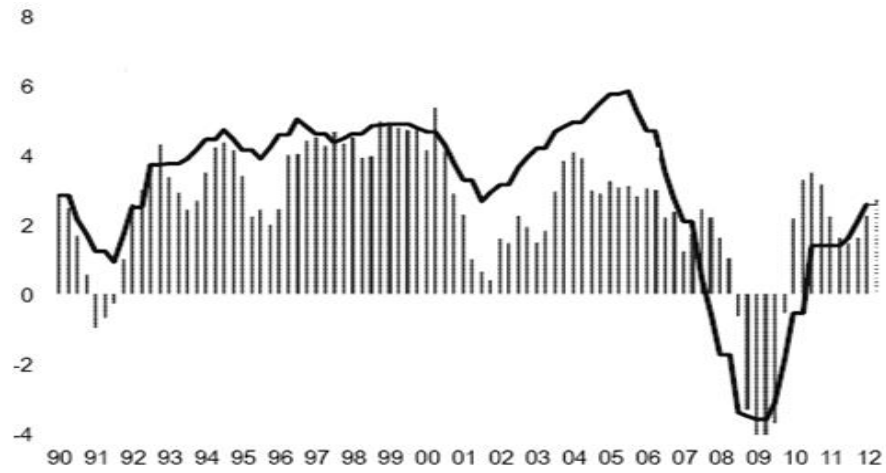

Figure 2. Economic Growth – Florida Versus U. S. (Florida – Solid Line)
Note. Real GDP (% change from four quarters earlier, thin lines or altered shading are forecasts). Data obtained from Glassman (2012).

[2] Immigrant impact: Florida Retrieved from http://www.fairus.org.

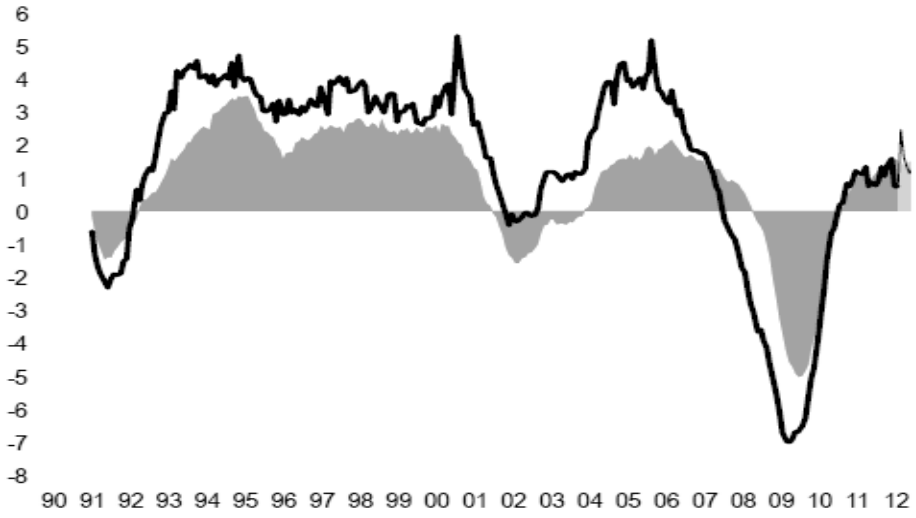

Figure 3. Employment Growth - Florida Versus U. S. (Florida – Solid Line). Data obtained from Glassman (2012).
Note. Employment (percent change from 12 months earlier). Updated through February 2012.

Culture of Growth?

For decades Florida had a pattern of extensive growth. It can be argued that that growth was based upon sunshine/beaches, low cost housing, low taxes, low living expenses, and ample jobs (low wage). Housing, taxes, insurance, living expenses are now higher than states such as Texas, Tennessee, and North Carolina. Salaries have not changed to reflect living expenses. The hurricanes served as a reminder of dangers and of quality of life issues. Little (no) polling is done to determine the attitudes of people in other parts of the US toward moving to Florida. Yet, the scenario of no growth is not on the planners list of options. Will sunshine and beaches be a sufficient magnet for growth in the absence of low costs and with low wages in the future? How long will the present situation last? Will growth of over 200,000 people per year begin in 2013 or 2014 as forecast by planners? Or is there a no growth scenario which in fact will last for years (Harrington, 2010). However, the US Census Bureau estimated that Florida grew by 256,000 residents from April 2010 to July 2011 ("Florida has 3rd Largest," 2011).

South Florida is one of five metro areas losing residents in the 25-34-year-old demographic group along with New York, Los Angeles, and Chicago due to lack of career opportunities (Acosta, 2011). Current mobility of Americans has dropped sharply. Only 11.6% (35 million) of the population changed residence

from 2010 to 2011, the lowest since statistics began in 1945. In the mid -1980's more than 20% were moving each year. Reasons are the recession and the mortgage/housing situation discussed above. Seniors (55 and over) who fueled the move to the Sunbelt either can't sell their homes or can't afford to retire. The preferred retirement destination is now the Carolinas (North Carolina and South Carolina) (El Nasser & Overberg, 2011).

Survey Results

If Florida has had a culture, economics and politics based on growth, how has the stalled growth and the deep global recession of 2008-2009 changed attitudes towards the environment and towards sustainability.

Voters were asked in a Quinnipiac Poll (of 1169 Florida voters completed May 3, 2012) whether they were satisfied with the way things were going in the nation today. Some 45% indicated they were very dissatisfied, 26% somewhat dissatisfied, versus 24% somewhat satisfied and 5% very satisfied (Quinnipiac, 2012).

In *Table 3*, one finds the issues of most interest to voters in 2009 and 2007.[3] The change in economic fortunes between 2007 and 2009 clearly changed voter's perceptions. Improving the economy/creating jobs/reducing unemployment went from 6% in 2007 to 29% in 2009.

Table 3

What One Issue do You View as the Most Important to the State of Florida?

	2009	**2007**
ECONOMIC	58	51
Improve Economy	15	6
Create Jobs/Reduce Unemployment	14	
Reduce Property Taxes	9	10
Cut Wasteful Government Spending	8	5
Hold Line on State Taxes	6	18
Lower Cost of Home Insurance	6	12
SOCIAL	31	29
Improve Education	15	12
Fight Illegal Immigration	8	-
Health Care Afford-Access	8	11

[3]AIF Poll: Floridians Concerned About Energy Issues Retrieved from http://aif.com/polling/2007/070808energypoll.htm.
AIF Statewide Survey Retrieved from http://aif.com/state_survey.shtm
Results of AIF Energy Poll Retrieved from http://aif.com/state_survey.shtm.

	2009	2007
Protect the Environment	1	6
RESTORE HONESTY/INTEGRITY TO GOVERNMENT	3	-
CONTROL GROWTH/DEVELOPMENT	2	6
FIGHT CRIME & DRUGS	2	9
NOT ANSWERED	4	6

Note. See Footnote 3.

An issue of more voter interest in 2009 versus 2007 was cutting wasteful spending. Of less voter interest was holding the line on taxes, cost of home insurance, affordability/access to health care, controlling growth, and (of most interest for this paper) protecting the environment, which went from 6% to only 1%.

Of voters in 2009, 90% felt that Florida was in a recession (66%) or depression (24%); 67% thought that it would take 2-5 years for recovery. Interestingly "if the governor and state legislature had to cut spending" the two top areas chosen from 7 identified for cuts were purchasing land for conservation (33%) and Everglades's restoration (16%).

In 2009 voters identified the most important environmental issue facing Florida. Almost 40% who answered the survey (Figure 4) identified water shortages or water pollution (32.5% did not know or answer the survey). Only 4.1% of voters who expressed an opinion picked global warming as the most important issue. While Everglades restoration was identified above for budget cuts, it was also the third most important environmental issue identified by voters.

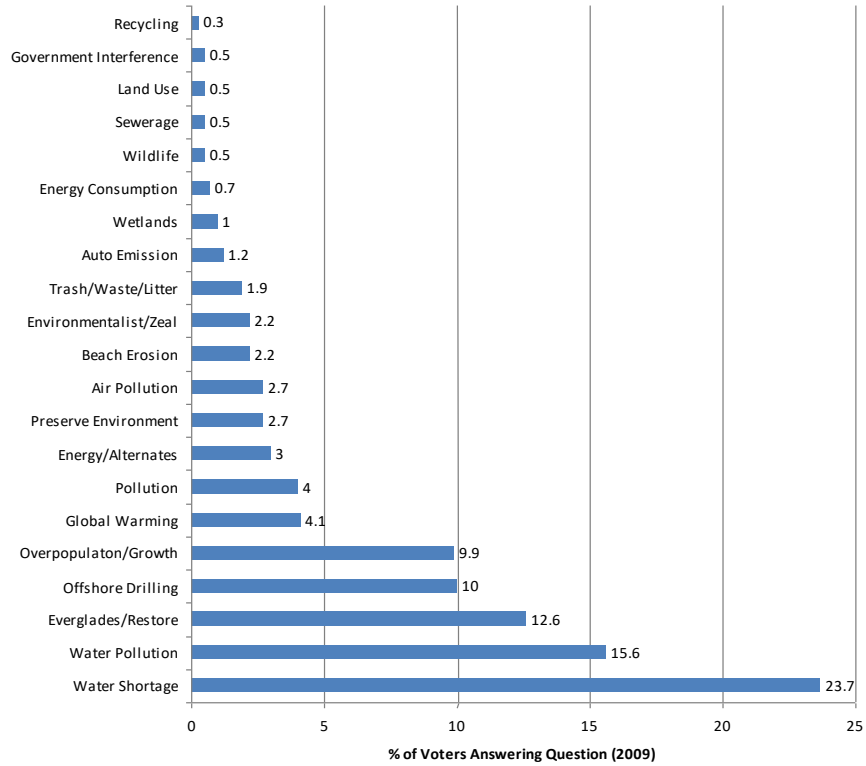

Figure 4. "What Would You Say Is the Most Important Environmental Issue Facing Florida Right Now?"
Note. See Footnote 3

In 2009, voters felt that reducing reliance on foreign sources of energy was more important (65.8%) than addressing global warming (11.7%); 11% of voters identified both and 7.5% expressed no answer. When asked what they would be willing to pay each year in higher gasoline prices, higher electricity prices, or higher heating bills to deal with global warming, 47.5% did not answer the question and 32.8% answered $100 or less. Only 3% indicated willingness to pay $500-$1000/year and 6.7% over $1000/year.

Overall, as noted in a 2007 poll, when thinking about the environment, 85% of voters think of themselves as pro-environment (28% consider themselves active participants in the environmental movement who make significant lifestyle changes to conserve natural resources, and 57% care about the environment and do the best they can without necessarily changing their lifestyle to do things like conserve and recycle). Another 10% of voters think of themselves as someone who cares about the environment, but won't necessarily go out of their way to help the environment. Only 3% say they don't care much about the environment.

By 2010, the continuing global recession showed a further impact. A national *Gallup Poll* (March 4-7, 2010) of 1014 American adults showed environmental concerns at the lowest level in 10 years (Gallup, 2010). A Rasmussen poll reported April 7, 2010, only 17% of adults believe most Americans would be willing to make major cutbacks in their lifestyle in order to help save the environment, versus 65% "not the case" and 18% not sure. 51% of adults believe major life style cutbacks *are* necessary in order to help the environment, while 32% disagree, with 16% undecided. Only 17% of Americans say it is at least somewhat likely that the next car they buy will be all-electric. By a 55% to 32% margin, most voters continue to believe that finding new sources of energy is more important than reducing the amount of energy Americans consume (Report, 2010).

In a March 8-11, 2012 poll by Gallup, when asked which statement do you agree with most – "Protection of the environment should be given priority, even at the risk of curbing economic growth", *or* "Economic growth should be given priority, even if the environment suffers to some extent" (See *Table 4*). In 2012 the spread between environment and economic growth had grown to 8 points (Jacobe, 2012). A similar spread occurs versus environmental protection and energy production, 44% versus 47% in 2012 as opposed to 52% versus 40% in 2002 (Jones, 2010, 2012).

Table 4
Level of Environmental Concern

	3/8-11/2012	3/19-21/2010	6/26-29/2008	3/7-10/2005	4/3-9/2000
Environment	41	45	49	52	67
Economic Growth	49	51	44	37	28
Both Equally	6	3	6	6	2
No Opinion	4	1	1	4	3

Note. Based on Jacobe (2012)

Referring back to Table 3, one can see clearly that economic climates change voter priorities. Of importance in this discussion, protecting the environment is clearly not the top voter priority, although voters consider themselves to be highly pro-environment. While voters are perhaps willing to make some lifestyle changes, they are not willing to endure substantial cost increases for energy and are even willing to tee-up purchases of conservation lands and Everglades restoration for Florida state budget cuts if cuts are needed.

Sustainability Dilemma

The dilemma for Sustainability is clear; Sustainability is for the long term. Sustainability requires sustained political agreement and will. It requires long term economics. Acceptable, sustainable, technologies are not enough. There are political cycles. Sustainability must have sufficient support to survive changes in the leadership political party. Sustainability must be able to survive economic cycles. What we value is determined by culture. Cultural change in the direction of sustainable development is required. Will it happen? How can it be encouraged to happen? The case study of Florida shows that moving toward sustainability is exceedingly difficult.

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BREVARD COUNTY STORMWATER AWARENESS AND BEHAVIOR: ANTECEDENTS OF THE LIVE BLUE EDUCATION CAMPAIGN

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LIVE BLUE is a cooperative partnership among non-profit organizations, local governments, businesses, educational institutions and residents of Brevard County designed to reduce the pollutant load to the Indian River Lagoon, St. Johns River, and the many tributaries that flow to them. These nationally acclaimed bodies of water support an unparalleled treasure of biological diversity that is increasingly threatened by pollutants transported from the land via stormwater runoff. LIVE BLUE is premised on the notion that by educating community residents on pollution sources, the pathways by which these contaminants enter waterways, and their subsequent impact, more sustainable lifestyle practices will be inculcated. This paper reports results from a survey of almost 1,350 households in southern Brevard County, Florida dealing with stormwater awareness and the household behaviors germane to the contamination of waterways. It represents the pre-LIVE BLUE educational campaign baseline to which post-campaign results will be compared.

Keywords: **stormwater knowledge, household behavior, non-point pollution**

Introduction

Pursuant to the Clean Water Act (CWA) Amendments[1], non-point sources of contaminants flowing into rivers, lakes, and estuaries were codified as a complementing focus in combating water pollution, augmenting the CWA's efforts, to date, which had principally centered on point source discharges. Non-point sources typically are associated with agricultural byproduct, fertilizers, pet

[1] Water Quality Act of 1987, Title III, Section 316.

waste, litter, and other debris, which are carried into waterways via stormwater runoff. In urban environments, the stormwater issue emanates from residential development, which eliminates natural, pervious surfaces and replaces them with constructed impervious layers such as driveways and roofs, hindering the saturation of rainwater into the ground. Without this natural safety valve, stormwater flows into nearby rivers and streams, transporting nitrogen, phosphorus, fecal coliform, pesticides, and other urban pollutants into waterways, with ultimately deleterious effects. Algal blooms associated with the legacy of nutrient deposition compromise the natural and economic properties of water-assets, potentially yielding large economic losses for surrounding communities.

From its inception, the CWA required EPA to establish Total Maximum Daily Loads or TMDLs.[2] EPA delegated this task to the states, mandating that they determine how much pollution each water body can assimilate, while still meeting designated use. Both point and non-point discharges contribute to water quality deterioration, but it is the latter that EPA defines as the largest water quality problem[3] and which principally falls under the rubric of stormwater management.

Stormwater management has both agricultural and residential components.[4] The focus of this paper is on the development side, and more specifically, the ability of public education and outreach to mitigate the environmental damage associated with stormwater runoff from residential communities. For the past two decades Brevard County, located on Florida's Space Coast, has operated a stormwater management program with revenues derived from a base maximal fee of $36 per year for single family homeowners,[5] with discount factors available for mitigation. The purchasing power of this utility fee has eroded due to inflation, and combined with legacy nutrient loads, a construction boom, and more stringent TMDL criteria (Gao, 2009), effective stormwater management practices are under-funded.

Investigating whether behavioral modification on the part of Brevard County homeowners can surmount revenue gaps in program budgets is thus of paramount importance. In short, can educational efforts to limit the problem at its origin, rather than remediate after the fact, succeed? Detention and treatment of stormwater runoff is capital-intensive and prohibitively costly. Avoiding capital expenditures closes funding shortfalls and/or frees up dollars for other abatement strategies. This recognition provides the genesis for the LIVE BLUE education campaign.

[2] Federal Water Pollution Control Act Amendments of 1972, Title III, Section 303(d).
[3] See water.epa.gov/polwaste/nps/outreach/point1.cfm.
[4] It should be noted that the residential dimension includes flooding as well as water pollution.
[5] Slotkin and Vamosi (2010) explore whether Brevard County homeowners would be willing to pay additional rates for stormwater protection.

LIVE BLUE is a cooperative partnership among non-profit organizations, local governments, businesses, educational institutions and residents of Brevard County, designed to reduce the pollutant load to the Indian River Lagoon,[6] St. Johns River, and the many tributaries that flow to them. These nationally acclaimed bodies of water support an unparalleled treasure of biological diversity that is increasingly threatened by pollutants transported from the land via stormwater runoff. LIVE BLUE is premised on the notion that by educating community residents on pollution sources, the pathways by which these contaminants enter waterways, and their subsequent impact, more sustainable lifestyle practices will be inculcated.

This paper has two ulterior purposes. First, it provides a prospectus of the LIVE BLUE educational campaign, and its efforts in educating Brevard County residents on the pathways to limit their stormwater footprint. Secondly, it reports results from a survey of almost 1,350 households in southern Brevard County, Florida dealing with stormwater awareness and the household behaviors germane to the contamination of waterways. As an empirical experiment, pre and post-surveys will be administered to Brevard County residents at both ends of the LIVE BLUE outreach program. The results reported here represent the pre-LIVE BLUE educational campaign baseline to which post-campaign results will be compared.

LIVE BLUE[7]

There are two methodological choices to managing an education, outreach, and marketing program like LIVE BLUE: (a) slow and steady or (b) fast and the furious. Much like the tortoise in Aesop's Fable, LIVE BLUE stakeholders have adopted a deliberative path, mixing old school grass roots operations with modern multi-media marketing. The basis of this decision is predicated upon funding. LIVE BLUE operates on revenues provided by local governments. Municipal *membership* is calculated at $0.30 per person, with population indicated by the Census Bureau's 2009 estimate.[8] Approximately 27 percent of available revenues funds are steered towards multi-marketing efforts, with about 65 percent of program funds utilized for the delivery of education and outreach

[6] In 2007 the Indian River Lagoon's economic value was estimated at about $4 billion per annum. While that number was probably inflated due to "bubble" real estate values, the likely annual benefit still exceeded $3 billion.

[7] To consult the LIVE BLUE website, see www.livebluefl.org.

[8] In 2009 the total population of Brevard County amounted to about 535,000 individuals. If all municipal governments participated in LIVE BLUE the membership fee would produce revenues of about $160,000. In reality, municipal partnership is concentrated in the southern end of Brevard County.

mandates from the federal government. The residual is retained for administrative overhead.

Since the launch of LIVE BLUE in February 2012, educational outreach has adhered to a purposeful, incremental pace, strategizing marketing placement with grass roots operations. In its initial four weeks, LIVE BLUE commissioned eight digital billboard displays, with an estimated viewership of about 225,000 individuals. Additionally, LIVE BLUE used donations from local businesses to prompt viewership of the LIVE BLUE website and friendships on Facebook.

Other platforms for outreach included a "Decal Pal – Summer Sightings" contest. For this competition, residents needed to display a LIVE BLUE decal on their vehicle to be eligible to receive a "Decal Pal Prize Pack," which included gift cards to local grocery stores, restaurants, gas stations, and other retail outlets. Moreover, for the Sunday edition of a local newspaper (circulation about 21,000), LIVE BLUE commissioned a front page sticky note campaign that simply asked, "Do You LIVE BLUE?" This was accompanied by a banner advertisement on the newspaper's website, providing exposure to some 60,000 online subscribers during the weekend in question.

In terms of outreach probably the biggest success, to date, for LIVE BLUE was the early completion and airing of music video entitled, "Change to Blue." Screened during the summer 2102 school recess, the video was shown in three movie theaters for an eight week run, partially supported by a grant from the Florida Department of Environmental Protection. The odd morphing of the Blue Man Group and Blues Brothers provided a lasting impression for theater goers. All told, an estimated 103,250 people saw this entertaining yet effective message on stormwater pollution.

Turning to grass roots efforts, between March–September 2012, LIVE BLUE participated in about 30 events, and held about 100 school age programs. Understanding how to prevent pollution of community waterways is an ongoing effort, designed to instill stewardship and teach healthy lifestyles to local children. Educational curriculum includes but is not limited to the following: 1) Kindergarten, first and second grades, Stormwater Story Time Series, "The Pledge" - young students learn how three little girls discover the resting place of ground debris and take the *pledge* to always LIVE BLUE. Following the story, students take the LIVE BLUE pledge themselves, and sign an oath with the program's signature, a blue footprint; 2) third grade and up, "Enviroscape" - young students participate in the living story of Billy and his family as they proceed through routine tasks of everyday life and unknowingly create stormwater pollution; and, 3) fourth grade and up, "Pup-Poolution" - not for the weak of knees, this hands on science lab dissects "dog waste" so students can discover for themselves the pathogens that lurk within pet poop. In addition to outreach specifically targeted for children, 18 adult education programs were conducted as well as two kayaking clean up excursions. For the purpose of

reminding people that only rain should flow down a storm drain, 64 volunteers set about marking approximately 300 storm drains, reinforcing the notion that individual behavior has communal impacts.

Finally, LIVE BLUE adheres to the methodology of cyclic outreach. If children can be reached in the school, positive spillover effects occur vis-a-vis parents. By engaging in cyclic outreach and utilizing a slow and steady marketing technique, the LIVE BLUE message can sustain itself for the foreseeable future.

Stormwater Awareness and Behavior Survey

The LIVE BLUE cooperative effort contacted the economic consulting firm PRÆCIPIO EFS for purposes of survey design, data collection, and statistical analysis assessing whether educational outreach can significantly influence the personal behaviors that impact stormwater management. Utilizing monthly water bill mailings in the municipality of Melbourne, Florida, about 50,000 utility recipients were solicited for input via a paper survey which they could return with their bill, or through a weblink which would take them to an online survey platform housed by Survey Monkey. The pre-campaign baselines would then be compared to post-campaign results revealed after a period of educational outreach.

From an economic perspective, the ability to modify behavior solely through education is an uncertain outcome. One of the foundations of environmental economics involves the Pigovian tax, which attempts to rectify market failure through a financial penalty equivalent to spillover costs. This serves to steer the market to the correct or efficient outcome. That polluters would necessarily amend their behavior and absorb the spillover costs in the absence of a policy corrective is doubtful.

Another factor which potentially impacts behavioral modification is the magnitude of outreach dollars. The ability to introduce and reinforce educational messages with the goal of altering client behavior requires sizable budgeting for marketing and grassroots efforts. Given revenue decreases experienced by municipal governments in the aftermath of the real estate bust,[9] LIVE BLUE, like any program, operates on thin margins.

Nevertheless, with respect to household actions, educational outreach has achieved marked increases in behaviors such as recycling, even in areas without garbage collection penalties. With respect to stormwater, educational outreach programs such as Tallahassee-based TAPP (Think About Personal Pollution; www.tappwater.org) and North Carolina-based CWEP (Clean Water Education

[9] In the United States, local governments are typically funded through property taxes.

Partnership; www.nccwep.org) reveal mixed success with respect to behavioral modification. The CWEP program greatly informed this research effort, which now turns towards the pre-campaign instrument.

Survey Composition and Sample Attributes

The survey was composed of three sets of questions pertaining to demographics, knowledge, and behavior. Basic demographic questions inquired about household income, education, age, gender, ethnicity, household composition, and resident location. These were followed by questions designed to reveal respondent "knowledge" about the location and source of stormwater runoff, as well as how much information the respondent had already received about these issues prior to the Live Blue campaign. The survey also included a series of "behavioral" questions primarily related to lawn maintenance. These included an inquiry as to whether respondents had tested their lawn to determine the correct amount of fertilizer usage, and additional questions dealing with fertilizer types, amounts of fertilizer and pesticides applied to the lawn, and the disposal of lawn clippings. Some additional behavioral questions concerning car-washing, oil disposal, and dog waste were also asked.

Data was collected during early spring 2012, and a total of 1,347 usable surveys were collected. In terms of demographics, about 50 percent of respondents had household income of $50,000 or more, and more than 25 percent had household incomes in excess of $75,000. The educational attainment of the respondent group was quite high, with close to 50 percent of the sample indicating that they had earned a 4-year college degree or post-graduate degree. The sample respondents were collectively an older population, with almost 67 percent indicating an age of 55 years old or higher. All told, more than 40 percent of respondents fell in the traditional retirement ages of 65 years or greater.

Regarding their knowledge about stormwater runoff, about two-thirds of respondents had received little or no previous information about stormwater runoff prior to the Live Blue campaign. Despite this, almost 60 percent were aware that stormwater drains to the nearest pond or river and knew that the largest sources of water pollution in Brevard County are lawn and garden fertilizer, stormwater runoff, and pet waste.

The mean responses to the behavioral questions suggest that knowledge does not always drive behavior in the desired direction. For instance, when their grass is mowed, almost 80 percent of respondents indicated that the grass clippings are left on the lawn, which is the desired response. On the other hand, almost 80 percent of respondents have not had their lawn tested to determine the correct amount of fertilizer to use, and when fertilizer or pesticide is utilized, the frequency of application is excessive (more than twice per year) for at least one-

half of the respondents. Most respondents engage in the correct behavior with respect to disposing their car oil or retrieving their dog's waste, yet a larger proportion wash their cars at home rather than taking it to a commercial or volunteer car wash, and most respondents allow the dirty washwater to flow down the street or driveway rather than soaking into grass, dirt, or gravel.

Knowledge and Behavior Correlates

This section further explores which of the stormwater related "behaviors", if any, is significantly correlated with "knowledge" of stormwater runoff. Whether prior "information" better correlates with behavior than "knowledge" is also considered.

The following table summarizes the correlates between the behavior of Brevard County residents and two proxy measures signifying their knowledge of stormwater runoff. As a point of reference, the pre-campaign survey results revealed by the CWEP program are also included.[10] In addition to the two measures of knowledge, correlates between behavior and how much 'information" the respondent had received on stormwater runoff in the past are also provided. The correlates associated with "information" are for Brevard County only.

Table 1
Comparison of Correlates: Pre-Campaign CWEP v. LIVE BLUE [11]

QUESTION	*What is the biggest source of water pollution?*		*Where does stormwater go once it enters a storm drain?*		*Information*
	CWEP	LIVE BLUE	CWEP	LIVE BLUE	LIVE BLUE
What do you do with the grass clippings after you mow your lawn?	0.174**	0.087*	0.003	0.108*	0.061**
How often does someone fertilizer your lawn?	-0.285**	0.028	0.011	0.020	-0.111*
Has anyone ever tested the soil to determine how much fertilizer it needs?	-0.043	-0.039	0.027	-0.018	0.064**

[10] The comparisons to the CWEP correlates are suggestive only; there are minor differences between the two sets of survey questions and the list of allowable responses.

[11] The usable sample size is larger in Brevard County for many of the behavioral responses. For this reason, the correlates can be smaller, yet statistically significant.

QUESTION	*What is the biggest source of water pollution?*		*Where does stormwater go once it enters a storm drain?*		*Information*
	CWEP	LIVE BLUE	CWEP	LIVE BLUE	LIVE BLUE
How do you get your vehicle washed?	-0.009	0.017	0.040	-0.091*	0.005
When you wash your vehicle at home, where does the soapy water flow?	-0.051	0.013	-0.484*	0.117*	-0.004
If you change your own oil, how do you dispose of the used oil?	0.184	0.148**	0.111	0.039	0.024
How often do you pick up your dog's waste?	-0.106	-0.070	0.188	0.042	-0.004

*Correlation is significant at the .01 level

**Correlation is significant at the .05 level

*Note. S*maller correlates in LIVE BLUE are statistically significant because the sample size for CWEP is much larger.

The survey responses were re-coded so that correlations are positive when those who are more knowledgeable or have more information are more likely to engage in the "desired" behavior. Conversely, a negative correlation signals that respondents who are more knowledgeable or have more information are more likely to engage in "undesirable" behavior.

At first glance there appears to be a dearth of statistically significant relationships between behavior and knowledge in either the LIVE BLUE or CEWP experiments. Out of a possible fourteen relationships in each study location, knowledge correlates with behavior in five instances in the LIVE BLUE study area, and on three occasions only in the CWEP analysis. On closer inspection, however, it is observed that all but one behavioral response in Brevard County is significantly related to at least one measure of knowledge or to information. The only behavior that is unrelated to either knowledge or information is the response to the disposal of pet waste.[12]

A more thorough assessment of the LIVE BLUE outcomes reveals that both measures of knowledge are positively correlated with the desired behavior in the disposal of grass clippings, i.e., more knowledgeable people are more likely to leave the clippings on the grass or to pile the clippings in the yard or composted

[12] The insignificance associated with pet waste disposal may reflect municipal and county ordinances that require people to pick-up their dog waste or risk a citation and the prospect of paying a fine. People are responding to information, but information that is unrelated to stormwater runoff. It is related, however, to an economic penalty.

mulch. But the disposal of grass clippings is the only variable associated with lawn maintenance that is correlated to a measure of knowledge.[13]

Although lawn maintenance activities in the LIVE BLUE study area are largely uncorrelated with knowledge, it is observed that all three behaviors are significantly correlated with "information." Brevard County residents who had received more information prior to taking the survey were more likely to dispose of their grass clippings in the desired manner and have their lawn tested to determine how much fertilizer to apply. On the other hand, they were less likely to limit the frequency of application to one or two times per year. What cannot be discerned from the data is whether the negative correlation described in the latter result is influenced by the testing of lawns that call for more than two applications a year, but (perhaps) with less fertilizer per application.[14]

With respect to the correlates related to car washing behavior, it is observed that those who are more knowledgeable about "where" stormwater runoff ultimately flows to are *less* likely to take their vehicle to a commercial or volunteer car wash (the desired response); however, when washing their vehicle at home (a less desirable behavior), the dirty washwater is *more* likely to soak into grass, dirt, and gravel rather than flow down the street or driveway. Thus, the seemingly contradictory responses associated with car washing may have some basis. Apparently, many people who avoid the desired behavior of taking their vehicles to a car wash may still be behaving in an environmentally responsible manner by washing their vehicles in a location that allows the dirty washwater to soak into grass, dirt, and gravel.

The final behavior that has a significant relationship to knowledge is the disposal of car oil. Results indicate that those who are more knowledgeable about the largest sources of water pollution are more likely to dispose of their car oil by taking it to a recycling center. Knowledge about where stormwater ultimately flows to, or pre-survey information about stormwater runoff, is statistically unrelated to the disposal of oil.

Conclusion

In contrast to the findings in the CWEP study, LIVE BLUE pre-campaign results suggest that almost all behavioral responses are significantly related to at least one measure of "knowledge" and/or to pre-survey "information" pertaining to

[13] The significant correlations associated with the disposal of grass clippings may be spurious. Many residents in Brevard County live in neighborhoods governed by Homeowners Association covenants that limit the control individual homeowners have in cutting and disposing of grass clippings, testing the lawn, utilizing types of fertilizer and pesticides applied to gardens and lawns, the frequency of fertilizer and pesticide application, and watering of lawns.

[14] Pre-survey information about stormwater runoff is unrelated to any other behavioral response.

stormwater runoff. The behavioral responses of Brevard County residents appear to vary according to the type of knowledge or information they possess about stormwater runoff. For example, lawn maintenance responses are associated primarily with pre-survey "information." Car washing behavior is significantly correlated to knowledge about where stormwater ultimately flows, and there is a direct relationship between the disposal of car oil and knowledge about the largest sources of water pollution in Brevard County. There is also the suspicion that the disposal of pet waste is related to pre-survey information about county and municipal ordinances that mandate the pick-up of dog waste.

Some of the correlations with behavior are negative, meaning that those with more knowledge or information were less likely to engage in the desired behavior. There are, however, seemingly rational explanations for these contradictory results. For instance, those with more knowledge about where stormwater runoff ultimately flows apply fertilizer to their lawns more frequently than desired. This result may partially reflect that those with more knowledge are also more likely to have their lawn tested to determine the optimal amount of fertilizer to apply. In another example, people with more knowledge about where stormwater runoff ultimately flows are also less likely to take their vehicle to a car wash; however, they are more likely to wash their cars in an area that allows the dirty washwater to soak into the surrounding grass, dirt, and gravel. Thus, there is more than one response that can attain the desired outcome of less pollution.

This preliminary investigation has shown that desired behavior may be influenced by certain types of knowledge and/or information that people possess about stormwater runoff and pollution. Pre-campaign results suggest that a successful educational campaign may yield incremental improvements in behavior by properly aligning the information specific to the activity and it's desired response; be it lawn maintenance, car washing or the disposal of oil or pet waste.

In future research, assessing the relationship between "knowledge" of stormwater runoff and variables such as pre-campaign information, educational attainment, and household income will be undertaken. It is conjectured that responses to the knowledge question (i.e., where stormwater goes once it enters a storm drain and the largest sources of water pollution) are significantly related to pre-campaign information, educational attainment, and household income, and thus, the latter items moderate the relationship between knowledge and behavior.

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LOCAL SUSTAINABLE DEVELOPMENT PROGRAMS IN HUNGARY

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The issues of environmental protection, climate change and sustainability come to the fore more and more. The elaboration of the National Strategy for Sustainable Development in 2007 and the establishment of the National Council for Sustainable Development in 2008, show that governmental work in this field has also gained momentum. Our investigations cover 48 municipal and 2 micro regional initiatives related to sustainability. Despite the errors and deficiencies of the initiatives we found on the Internet, these strategies mean a major progress and a milestone towards local sustainability as they can serve as a role model for other municipalities.

Keywords: **sustainable development, local agenda, strategy, NSSD**

Introduction

The concept of sustainable development is currently one of the most important concepts in the world. The message of the concept is that environmental problems cannot be handled on their own, as independent problems, they can only be solved with the integrated application of economic, social and environmental policy, which means that environmental interests must be taken into account increasingly when making economic and social decisions.

The implementation of the global idea is based on the action laid down in the sustainable development strategies of local communities. Many communities in the world – countries, regions and municipalities – urged by the international community, realizing the danger of the destruction of environmental values, decided to elaborate sustainable development strategies.

The system of local sustainable development strategies (local agendas) is formed by top-down intentions and bottom-up initiatives as well. Beside the support of the central government, the success of local sustainable development strategies relies heavily on the self-organizing and initiative skills of local communities. (Lafferty, 2001) The self-organizing skill ensures that the objectives set in the strategy reflect the priorities of the general public, while the initiative skill helps to create innovative solutions for local problems. The result

of the successful cooperation between the national government and the local community is the local sustainable development strategy, the so-called Local Agenda. The strategy contains the environmental approached problem analysis of the community. The basis of successful strategies is the bottom-up initiatives of the community based on voluntary participation. The innovative initiatives of the local community create local solutions for handling the global problem of sustainability (Eckerberg, 2001).

Nowadays almost every country in the world as well as several local communities possess local agendas. However, these strategies have been prepared on political pressure. According to the Hungarian National Council for Sustainable Development politics is governed by the necessity to give priority to economic growth, as the financial resources of the budget derive from it, which express the success of the applied politics (NFFT, 2010, p. 22). These strategies aim to pass the criteria of weak sustainability as a clear environmental-based strategy, which subordinates economic and social interests to giving successful answers to environmental challenges and forces economic compromises for this reason would be rather unacceptable for the general public presently.

In professional literature there have been several references that suggest that there are some municipalities in Hungary which possess local sustainable development strategies, or have some initiatives related to sustainability. Some of these are listed here:

- The book „Sustainable development in the local government's practice" talks about 7 initiatives (Nyíregyháza, Szekszárd, Tamási, Mezőkövesd, Sümeg, Kerekegyháza, Tatabánya-Tata) which give examples to good practices (Glover et al., 1999).
- The national information for the Johannesburg Summit mentions that there are "a few local governments (which – the author) launched even Local Agenda 21 programmes" (HCSD, 2002).
- *Szlávik* made a study about the initiatives related to sustainability of the town of Kőszeg and the region of Karcag, Egyek and Kunmadaras (Szlávik, 2002).
- The study of *Mária Csete* examines the sustainability of the Tisza Lake region (Csete, 2005).
- In her diploma work *Nóra Dankó* (Dankó, 2006) examined nine local sustainability processes and shows with great subtlety that these processes only partly fulfill the criteria of LA21.
- The Aalborg Charter has four signatory municipalities from Hungary (Aba, Kecskemét, Monor, Nagykanizsa). (The Aalborg Commitments Secretariat, 2010)

There have been some studies carried out in other regions, and there are several projects going on which can be connected to sustainability all over the country.

However, when preparing a paper for an international conference in 2006, we found that these initiatives can hardly be seen as formulized local agendas, they are just encouraging initiatives. The personal and telephone interviews we made with domestic experts (e.g. Szlávik, Füle, Pomázi) also reflected our opinion (Baják & Kuti, 2006). We finally arrived at the consequence that in 2006 no documents existed in Hungary which could be referred to as formulized local agendas.

According to our hypothesis the main cause of this was the lack of knowledge about this important international initiative. The lack of the national government's commitment also influenced municipality leaders in the wrong direction, who as a consequence undervalued the importance of the topic. It is also an adverse effect that as a consequence of the national government's commitment there are not enough guides and case studies available. Altogether it leads to the lack of interest from the local governments and the especially low number of local agendas.

The Local Sustainable Development Plans and Programs Examined

Since 2006 the situation has significantly changed. Environmental protection, climate change and sustainability come to the fore, and governmental work in this field also gathered momentum. In June 2007 the *Hungarian National Sustainable Development Strategy* (MKK, 2007) was prepared, in February 2008 the *National Climate Change Strategy* (MKO, 2008), and in October 2008 after almost a year of preparatory work the *National Council for Sustainable Development* was founded, the aim of which is to foster the implementation of sustainable development in Hungary. The Council also works for the propagation of local sustainability; in the course of 2010 it asked eight municipalities to prepare their own local agenda as a pilot project.

In 2006 we did not manage to find a formulized local agenda, however in 2012 there are about 50 municipalities in Hungary whose documents related to sustainable development can be found on the Internet. This progress is highly welcome, not to mention the fact that no legal bindings and no newer guides than the one published by the Ministry of Home Affairs are available (Szlávik & Turchany, 2002).

In our paper we examine the initiatives of 48 municipalities and 2 micro-regions related to sustainable development we found on the Internet. The spatial distribution of the examined municipalities is illustrated by Figure 1.

Figure 1. The spatial distribution of the examined municipalities which possess documents related to sustainable.

The strategies were completed after the elaboration of the *National Sustainable Development Strategy*, in the period between 2009 and 2011. In five cases the planning process has not been finished, therefore the strategic document is not accessible yet, only the community questionnaires and the short summary can be read.

Among the documents we can find titles like sustainability plan or program, environmentally sustainable development plan or program, sustainable development strategy and local agenda. The title of the document refers to its character. In many cases under the title sustainability plan the organizational development plan of the local government can be found. Naturally these are the shortest documents in length (Figure 2).

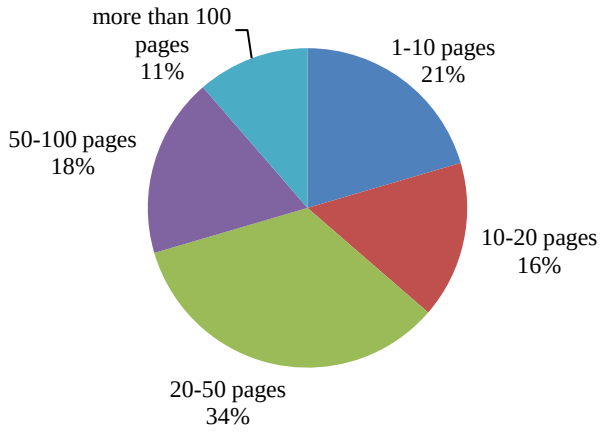

Figure 2. The length of the examined strategies.

Environmentally sustainable development plans and programs only deal with the environmental perspective of sustainability; therefore these programs can be considered environmental programs. The most complete documents of sustainable development are the ones titled Local Agenda21, 9 of which are included in the examination. In these strategies, beside the environmental aspects economic and social issues are included, which means that these documents are among the longest ones (Figure 3).

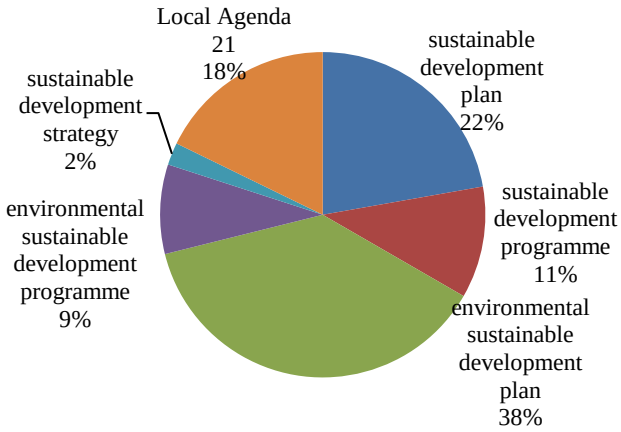

Figure 3. The title of the examined strategies.

Only in case of these documents can it be examined whether they were elaborated in the spirit of strong or weak sustainability, whether the economic and social aspects included in them are in balance with environmental aspects or they are subordinated to them and only appear in the strategies because of their interconnections.

Most of the strategies use the Brundtland definition as a starting point, indicating that the reason for the elaboration of the strategy was the conservation of natural values for future generations. Most of the documents refer to Agenda 21, the Sustainable Development Strategy of the European Union as well on the considerations drawn up in the National Sustainable Development Strategy.

In many cases the strategies are counterparts of each other, one was made with the basis of the other. Contextual analysis justified that it is not a good solution, as municipalities differ from each other, therefore the adaptation of a strategy leads to the distortion of priorities.

The elaborated programs and strategies pay attention to situation analysis, the identification of problems, and the definition of strategic objectives related to the problems, but some essential elements – like the definition of the vision, the identification of partners, and the specification of authorities – are missing from several strategies.

It was also our aim to examine the timing of the strategies, but there were only 9 of the 45 examined strategies that contained information about it. Among these there were documents which contained short and long term objectives as well.

There are 8 topics in the examined 45 strategies which are of major importance. These are energy management and conservation, transportation, the protection of the built environment, natural values, the protection of municipal green spaces, waste management, water management, the development of environmental awareness among citizens and air quality. It can be stated that these are the elements that most municipalities put an emphasis on (Figure 4).

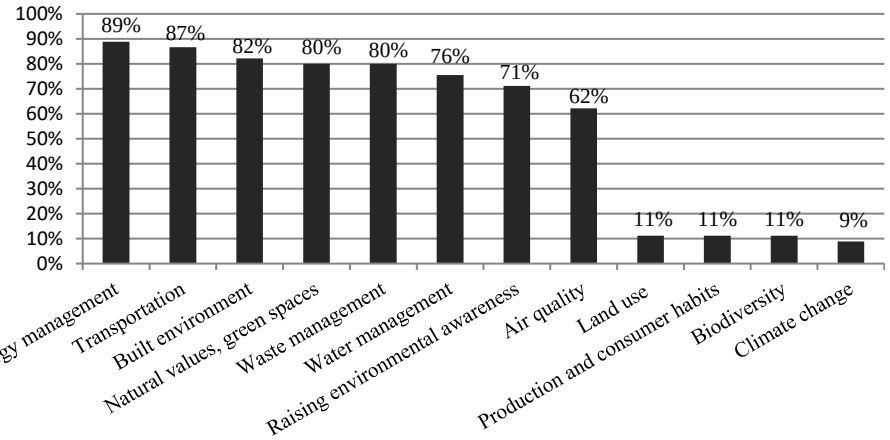

Figure 4. The appearance of environmental aspects in the examined strategies.

Beside the aspects that are related to environmental sustainability, economic (for example the development of the economy, tourism) and social (employment, education, health care) objectives also appear in the strategies which define themselves as local agendas (nine pieces). It is a positive fact that the 3 pillars are in balance: objectives that are primarily economic and social ones have the same priority as environmental objectives. However it must be mentioned that there are some aspects and objectives that appear in the strategies (increase in tax revenues, public safety, religious life), which are quite far from the basic idea of sustainability, therefore their appearance in the strategy can be questioned (Figure 5).

The strategies prioritize the tasks related to the objectives on the basis of whether their implementation requires financial sacrifices from the local government or the local community. Those tasks are implemented first which do not require great financial input from the community or the input can be obtained from application tenders.

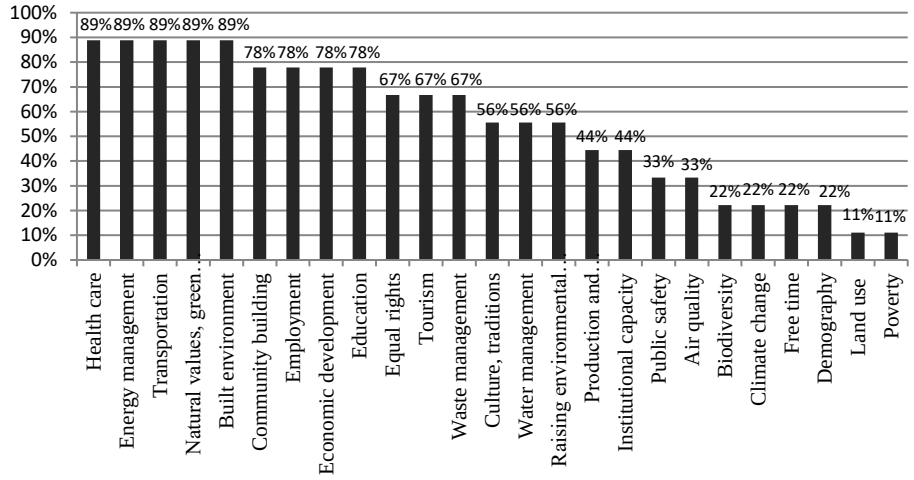

Figure 5. The appearance of some factors in the local agendas of the examined nine municipalities.

The contextual examination of the strategies shows that the basic goal of the strategies is the creation of the conditions of sustainable environmental, social and economic development. However, the balance between the pillars and the objectives which are not necessarily in harmony with environmental interests indicate that these strategies were made in the spirit of weak sustainability. The leaders of the municipalities may have realized that a strategy which provides priority to environmental interests in every area would be difficult to accept for the public in Hungary.

As a summary it can be said that the elaboration of these strategies together with their deficiencies and errors is a major progress and can be considered milestones towards sustainability. In many cases we experienced that among the references of the strategies other municipalities' strategies were mentioned, which means that municipalities which do not possess a strategy look at these municipalities and their programs as role models.

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The local sustainable development document (strategy, program or plan, local agenda) or their executive summary in the following municipalities:

Aszód, Bonyhád, Budakalász, Bükkszentkereszt, Csenger, Csorvás, Dávod, Dévaványa, Dunavecse, Elek, Enying, Érd, Forráskút, Füzér-Pusztafalu, Gellénháza, Győr, Hajdúböszörmény, Hajdúszoboszló, Hangács, Homokhát, Jánossomorja, Jászfényszaru, Józsefváros, Kimle, Komoró, Kondoros, Körösladány, Martfű, Mezőkövesd, Miskolc, Mosonmagyaróvár, Nagyhegyes, Pesterzsébet, Pusztamérges, Röszke, Sióagárd, Szarvas, Szécsény, Szendrő, Szentendre, Szentkirály, Szolnok, Tét, Tiszaföldvár, Tótkomlós, Üllő, Veresegyház, Zalakaros Kistérség, Zirc, Zsámbék

BELIEFS AND MISBELIEFS ABOUT SUSTAINABILITY IN AGRICULTURE

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Sustainability has recently become one of the most frequently used and interpreted, often misinterpreted notions. The one-sided conservationist approaches are placed more and more often in the forefront of the concept, in contrast with the previously frequent economic interests and aspects. Since 60–90% of each country's territory is occupied by agricultural areas, most of the conflicts arise around agricultural production. The increasingly aggressively articulated false charges awake uncertainty in the organization of production and even environmentally conscious producers are groundlessly and permanently forced to defend. The basic problem of conservationist attacks is the lack of a future-oriented mentality in the consideration of the ongoing processes, instead their starting base is the conservation of the status quo, or rather the reconversion of the past natural states which is unacceptable from developmental point of view.[1]

***Keywords*: agriculture, sustainabilty, eco-farming, integrated farming, industrial farming**

Introduction

Sustainability, which has been the basic concept of environmental protection since the UN Conference in Stockholm in 1972, was first defined by the Brundtland Commission's Report in 1987. It has become an essential part of international political thinking, and, since then, it has been both widely used and interpreted (in many cases misinterpreted). In spite of the fact that the definition of 'sustainability' requires sustainability simultaneously in economy, in society and in ecology, at least some of the actions taken in the name of the concept break the unity of the three requirements. Earlier, economic interests ignored the ecological and social requirements (especially the latter), but today the ecologists do precisely the same with the other two factors. Their increasingly extreme and belligerent appearance often heightens social hostility – the exact opposite of the basic aim of environmental protection, which is to ease social tension and avoid unnecessary stress.

[1] This study and the integral survey were undertaken with financial assistance from the European Union's Social Renewal Operational Programme TÁMOP-4.2.1.B-10/2/KONV-2010-0002.

The most important paradox is derived from the perception of the environment. The lop-sided ecological perception of environmental protection has the declared aim of protecting, broadening and enforcing the principles of the so-called "natural environment". The truth of the matter, however, is that – at least in Europe – man has transformed his environment to such a degree that we can no longer talk about "natural ecosystems" – not even in "protected natural areas". Water habitats, marshlands and highland forests, the areas which are considered to be the most untouched, can only exist in their current condition because, in earlier times, man deemed it economically pointless to try to exploit them: only after their value was recognised were these areas protected. At that point, humans took over – at least partly – the regulatory role, although this, in many cases, resulted in the artificial obstruction of ecological succession. For example, in order to halt sedimentation in a lake or in fenland, it may be preferable to remove the unwanted sludge; or, should the problem be drying up, water replacement might be the solution. As a direct consequence, of course, the protected ecosystem survives – but not as a result of natural processes. The same situation occurs when new species naturally appear in a protected ecosystem (aggressively spreading weeds, bushes or trees) and man roots them out to protect the natural values.

In the case of rural areas (60–90% of every country) it is even more contradictory to enforce ecological principals concerning natural ecosystems. These are semi-natural ecosystems, where the main regulator is man. These areas (ecosystems) are basically subordinated to human economic needs, and so they must be considered when striving for the most favourable ecological status. One must possess not only ecological but also extensive agro-economic knowledge, and so the most appropriate farming methods must be developed by agrarian experts with broad vision, and not by ecologists.

It is not possible to enforce unilateral environmental requirements, especially when they go against the principles of ecology. A good example of this can lie in those grasslands – rich in species – which really belong to forests in terms of their climate and soil. The grasslands in these areas were formed by deforestation and were maintained by continuous grazing and cropping. With the declining economic importance of grazing farming, these areas are transformed into either fields or forests, or, if they are left to themselves, reforestation will occur in a natural way. Grazing farming can be maintained by continuous assistance in some of these areas, but not on in the long term and not on huge areas of land. Therefore we must take the simple view of environmental protection – 'everything should stay as it is' – with a pinch of salt, since it often contradicts not only economic and social requirements, but also ecological ones. In such cases we are talking not only about the deliberate obstruction of ecological succession, but also about climate change or the appearance of new species – which in themselves challenge this standpoint. There is also a

geological side, which means the continuous filling of the lowlands, and a biological side, which means that the biome or ecosystem has to adapt to the changed habitat.

Controversial Issues

As agriculture, forestry and freshwater fish farming cover most of the areas, environmental protectionist proposals aiming to influence agriculture and also the requirements concern this sector the most. These proposals serve to achieve certain environmental goals, but they never consider the socio-economic or even the environmental sacrifices which have to be made in order to achieve them. Perhaps we can now highlight these contradictions:

1. If we are to maintain and increase biodiversity, it is necessary to use small parcel or strip farming in fields! Major tracts are no more than "ecological, cultural deserts"!

It is undeniable that, on small parcels, the richness of species and biodiversity are greater, but at what price? The domestication of plants and their cultivation, which started 10,000 years ago, meant the most drastic intervention in natural ecosystems. The basic feature is that, totally unnaturally, only one breed is cultivated on a specific piece of land and other breeds of plants – and the animals consuming the specific cultivated plant – must either be destroyed or, ideally, kept away. This is a fundamental contradiction. The situation has improved over the last few thousand years in the sense that mankind started to use different methods. These included different approaches: crop change and crop rotation, 'plant association' cultivation (e.g. corn + beans), grass cover sowing (between lines as in orchards or vineyards) or the modern pest control which no longer means the extermination of "pests" but keeping them below a specific economic threshold. So- called "permaculture", a newly promoted farming method has tried to increase biodiversity, although, as yet, with no practical success. The reason for the failure is simple: every plant means competition for water and minerals for the cultivated plant, and so its yield decreases. Breaking fields up can have negative consequences for other reasons also:

- Production on small parcels of land can increase the need for machinery, the cost of energy and of production 3- or 4-fold, but the actual yield cannot be expanded;
- With small parcels it is also inevitable that chemicals spread onto other parcels; not only is output damage likely, but problems with food safety can also arise;

- The intensive use of machinery and the tight manoeuvres needed will compact the soil excessively, damaging natural air and water passage and decreasing productivity.

Table 1
Specific data of machinery work necessary for a field of 98 ha. (=100%)

Name	0.5	2.0	4.5	18.0	50.0	98.0
	Size of field (ha)					
	The proportion of the cost of machine operation (%)					
Wheat	477.6	213.2	155.7	114.1	103.4	100.0
Maize	488.4	224.5	162.1	115.7	103.8	100.0
Alfalfa	429.9	198.4	149.1	113.5	103.3	100.0
Sugar beet	301.2	162.9	132.2	108.8	102.2	100.0
	Machinery operating time as proportion (%)					
Wheat	724.8	280.2	173.7	114.2	103.3	100.0
Maize	833.9	322.9	189.8	116.4	103.4	100.0
Alfalfa	569.6	246.2	181.6	114.2	103.2	100.0
Sugar beet	425.0	190.3	138.1	109.0	101.4	100.0

Note. Data obtained from Gockler (2009) p. 114.

Finally it should be underlined that the term "ecological cultural desert" is somewhat extravagant and not accurate, as, despite the intensive use of chemicals in orchards, hundreds of plant and pest breeds can be detected.

2. Small scale production is environmentally friendly whilst large-scale production is damaging!

How production strains the environment depends, on the one hand, on the amount of utilised material and the energy consumed on one unit of land and, on the other hand, on the technology applied and the level of technology. Even if we do not take the above disadvantages into account, it is obvious that, due to their greater financial strength, large manufacturers with well-qualified management can afford to buy modern technology and make use of professional forecasting and monitoring systems. In order to be able to sell the products constantly these plants with established market connections must maintain "good production practice" and guarantee food safety. On the other hand, small producers must become highly specialised in order to produce market-compatible products and reduce equipment needs. They are unable to indulge in professional crop change policy or crop rotation farming methods. As a result, the soils are overloaded, and so their only advantage, greater biodiversity, is likely to vanish.

3. Products from small producers are healthy, those from large manufacturers are unhealthy!

The degree of 'healthiness' is a consequence of the level of production technology, of hygiene conditions and of the proficiency of technological leadership. These factors are readily available at the large manufacturers. Products are continuously inspected by the large producers, but, with the lower volume of products of the small producers, this particular process, due to its high cost, is missing, and so the differences are not obvious. Concerning the products where inspections were carried out (e.g. milk), the disadvantage to small producers was clear.

4. The only environmentally friendly way of farming is eco-farming!

Eco- or bio-production in farming is a method which primarily uses local resources and pays special attention to the soil, to the flora and fauna and to human health – and so tries to eliminate chemicals to produce high-quality products. The target group in the market is those people who are able and willing to pay the higher price. The main difference between traditional and eco-production is that the latter rejects synthetic chemicals (fertilizers, pesticides) and so forgoes this possibility of boosting the yield or effectively protecting the crop. As a result, production is some 20–40% lower, more unbalanced and less "market compatible". By eliminating chemicals, the bio-producer lowers the "chemical risk" to the consumers – in other words, produces a special quality. However, he also takes risks and accepts extra costs, which can only be compensated by prices at least 30–50% higher. These, already higher, producer prices are often at least doubled by the traders and these prices not only cannot be paid by consumers, but are also unreasonable, assuming controlled food supply. Eco-production can only guarantee chemical-free products – which may be good – but not healthy products. 'Healthiness' can only be proved by lengthy inspection; since limiting the use of chemicals can increase the risk of fungal infection, and the damage caused by fungal toxins could be even higher than any chemical residues in the crops.

5. Eco-products are healthier than industrially produced products!

That may be true, although industrial production has already been replaced by other methods of production. Industrial production in agriculture was the result of cheap oil (energy), when the industry could supply agriculture with relatively cheap production aids (fertilizers, pesticide, machines etc.) and so their use was unlimited. Production became unilaterally yield-oriented. As a result of the unreasonably high and simply mechanical use of industrial assets and the non-utilization of by-products (manure, straw etc…) agriculture polluted the environment. Radically increasing energy prices post-1973 and more stringent environmental requirements made the system's reason for existence questionable both in economic and environmental terms, and enforced changes. One mode of change was input-saving eco- production and another was improved industrial

production – that is, integrated production. Integrated farming production is a market-oriented system, which holistically uses the advantages of intensive farming (fertilisers, crop-change, crop rotation etc…), of industrial farming (mechanisation, chemicals) and eco-farming (preservation and improvement of soil fertility, mulching) in order to increase yields, economic efficiency and marketability. At the same time it complies with environmental, natural and food safety requirements. This can be achieved by a high level of technology and expertise and the use of forecasting and monitoring systems at every stage in production. In this way input consumption can be rationalised and outstanding performance can be achieved (apples: 60–80 tons/hectare, maize: 8–12 tons/hectare and milk: 8–12,000 litres/cow). It is expected that future production will supply 90-95% of food requirements by integrated production and only 5–10% by eco-production. The two types of farming, however, are not opposed to each other; they are complementary. Integrated production satisfies mass consumption needs and eco-production meets special needs since it can be especially favourable for those who are intolerant of chemicals (e.g. infants or invalids). It must also be underlined that the products of both farming methods products are controlled and guarantee healthy products 'from field to table'.

6. Traditional local breeds should be preferred to the large-scale production of uniform world breeds!

The preservation of traditional, local breeds is of fundamental economic interest, as they have features (frost tolerance, resistance to disease, taste, etc…) which are of great importance in the age of modern breeding processes, and especially of genetic modification. However, it is no accident that they are overshadowed. Their yield, appearance, shelf life, nutrient composition and nutrition cannot meet the needs of modern consumers and markets. Since the end of the 19th century Hungarian Grey cattle have been almost totally ousted from the market by Hungarian Simmental cattle and Mangalica pigs have been replaced by White Meat-type pigs. In the 1960s Bánkút wheat yielding 2 tons/hectare was replaced by Bezostaya wheat yielding 4 tons/hectare. The large, juicy Hungarian tomato and the very tasty but a too rapidly softening Hungarian apricot went in the same direction. Of the annually produced thousands, or even tens of thousands, of traditional breeds, only a few can live up to the complex requirements of the modern food production and supply. This narrows the use of breeds as increasingly uniform tastes appear on the markets, and, if one wishes to stay competitive, this must be taken into consideration. Contrary to the opinions deriving from nostalgia, the production of modern breeds does not increase the exploitation of the environment. The larger yields are achieved by better use of soil nutrient content and water and they produce more valuable products. To confirm this let us examine some figures.

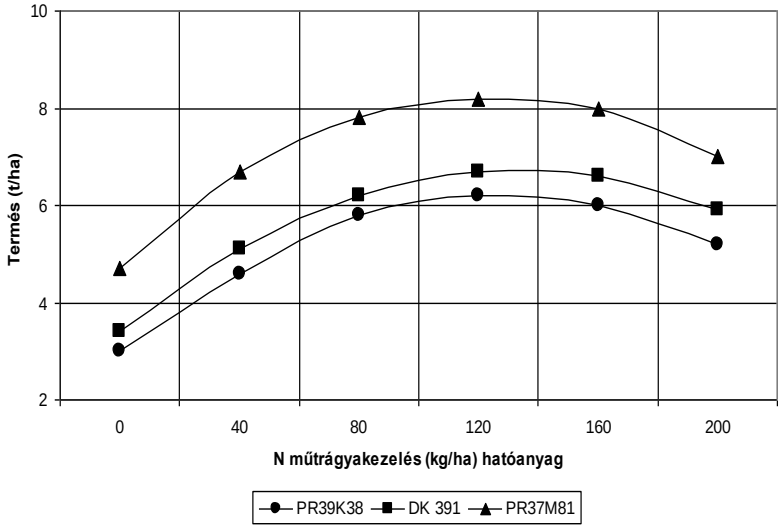

Figure 1. Fertilizer utilization of different types of maize hybrids in case of increasing portions of fertilizers. Data obtained from Futó (2009) p. 39.

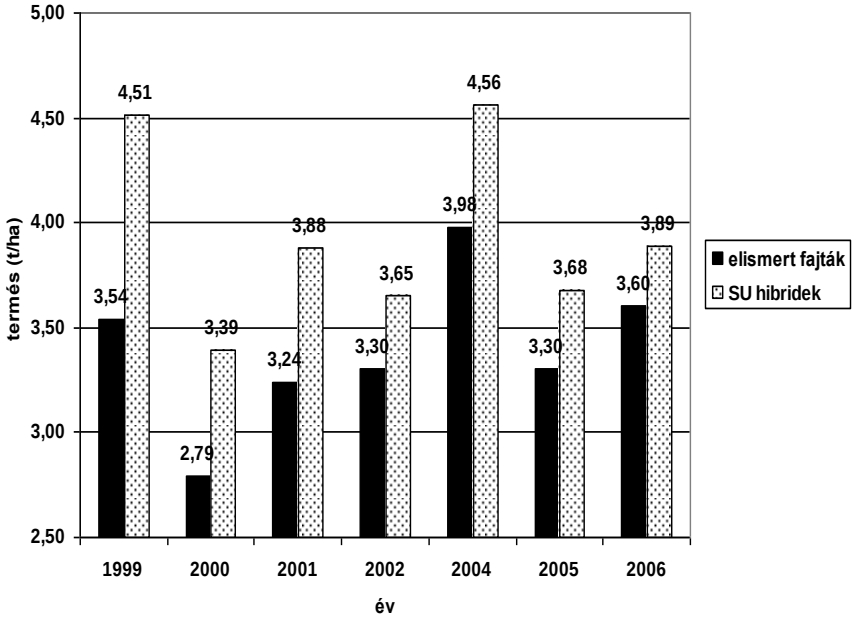

Figure 2. The hybrid advantage in colza cultivation (OMMI–MgSzH 1999–2006). Data obtained from Blum (2008) p. 39.

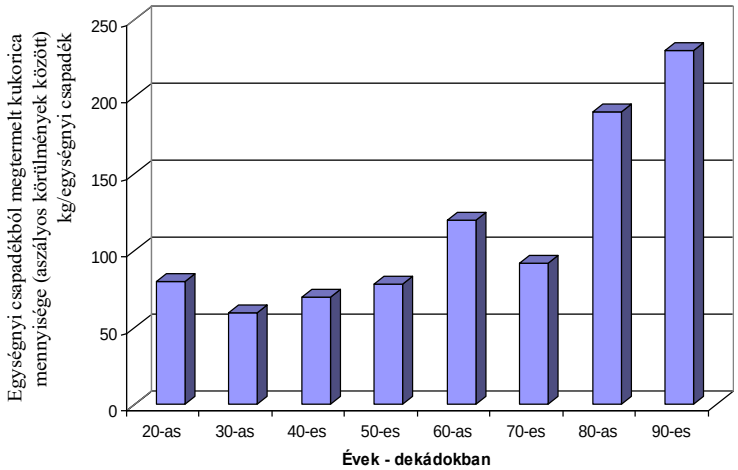

Figure 3. The efficiency of water utilization of maize as of nowadays. Data obtained from "A 2007-es aszály első tapasztalatai a Pioneer kukoricák termesztésében" (2007)

Table 2
The difference in performance of large (Type 2004) turkey and the native bronze turkeys (male)

Type	On the hoof in the age of 20 weeks, kg	Fodder sale, fodder kg on the hoof	The weight of breast fillet, kg
BUT Big 6	18.2	2.9	5.09
Bronze turkey	6.4	3.3	0.83

Note. Data obtained from Horn et al. (2005), Wixey (2002), Sütő et al. (2004). In Horn (2007) p. 399.

Table 3
The water and fodder demand for producing one kg of breast fillet for different types of male turkeys

Type	For producing one kg		
	Fodder, kg	Water, l	Water to produce the fodder, l
BUT Big 6	10.5	21	10500
Bronze turkey	25.3	50.6	25300

Note. 2 to 1 ratio of water and fodder, 5 t/ha (cereals and maize production, 500 mm of annual rainfall. Data obtained from Horn (2007) p. 399.

The above seen tables and figures obviously show that holding on to traditional breeds causes market and economic losses. The followers of this are from those who live under the circumstances of safe food supply. They totally neglect the quality and price competition occurring on solvent markets, and what

is more, they forget about the fact that even on the current production level there are more than 1 billion people starving. In the meantime the world population is growing by 70–80 million annually, therefore in 2050 the food supply of 2.5 billion more people must be solved using smaller fields than today. In order to reach this we must use the modern breeding methods, including the results of GM because sustainability can only be achieved by smaller resource and energy supply and by the lower level of environmental impact.

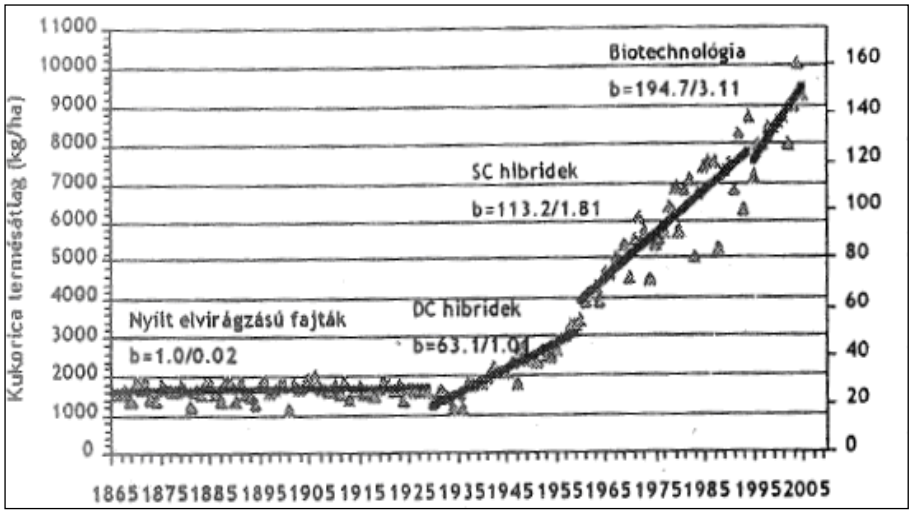

Figure 4. The average yield of maize in the USA. Data obtained from Szanyi (2007).

Conclusion

The pure aim of environmental protection is not against development. It sees the solution in sustainable development which is prudent and aims at the maintenance of environmental systems. Based on the Vienna Report of the Club of Rome in 1979 the condition of it is the innovative learning, whose most important element is the future oriented thinking (anticipation). Future oriented thinking can create the requirements of sustainable development, the basic aim of environmental protection and the balance of the lives of the people by holistically using sustainability in parallel in the economy, in society and in ecology. This development must be in simultaneously moral and rational, because the most rational decision must be made between the morally acceptable (so both ecologically and socially impeccable) development purposes. This means on the one hand an extended openness and a foresight towards everything new, and on the other hand the strict refuse of unscientific manipulation regardless of financial interest or the misconception of the situation.

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TOURISM ADAPTATION PORTFOLIO FOSTERING REGIONAL SUSTAINABILITY

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The regional, local level is exceptionally important in sustainability adaptation, as local communities are often able to adapt more flexibly to changes in the natural environment. Social, economic and environmental sustainability can be enhanced by adaptation approaches. Tourism industry needs to adapt to changing environmental and especially climatic factors. While the impact of climate change on tourism is a scientifically verified fact, the relevant research literature so far has put little emphasis on the supply aspects that typically tend to be local and small scale. The results of this analysis may contribute to fashion adaptation and mitigation portfolios in tourism that could provide local decision makers with valuable input for combating the effects of climate change at the local level in accordance with the aims of regional sustainability.

Keywords: **sustainable development, adaptation types in tourism, Hungary**

Introduction

Adaptation in the context of human dimensions of global change usually refers to a process, action, outcome in a system in order for the system to better cope with, manage or adjust to some changing condition, hazard, risk or opportunity (Smit & Wandel, 2006). The definition is approached from a broader aspect based on time horizon, the effected measures of adaptation directed at enhancing the ability to tackle with external stress, so it means taking preparations for the future impacts of climate change. Beside the anticipatory behaviour the adaptation does include minimising or reducing the unavoidable consequences of the altering process at the present (UKCIP, 2009).

Adaptive capacity can be examined at different levels, from national (Yohe & Tol, 2002; Haddad, 2005; Greiving et al., 2009; Westerhoff et al., 2011) to local. Adaptation decisions are context specific and the adaptation decisions are often made at the local level, thus the regional and local scales are particularly relevant for assessment of adaptive capacity (Storbjörk, 2007; Greiving et al., 2009; Engle & Lemos, 2010) as well as adaptation.

The number of National Adaptation Strategies (NAS) in Europe is increasing since 2004, when Finland's National Strategy for Adaptation to Climate Change was developed. Examinations indicate a gap between local, bottom up adaptation and national adaptation strategies (EEA Report, 2012). As the Finnish example shows local and regional adaptation strategies and measures can develop independently with very little linkages to national adaptation strategies. In the case of the Finnish NAS, the national focus was diminished the regional and local perspectives, making the strategy less interesting for local stakeholders (Juhola, 2010).

There are many issues that can lead to adaptation strategy development in European countries. It is possible to identify the key factors that play role in most countries, however the weight of these factors depends on the country (Swart et al., 2009). Among these driving forces are the international climate negotiations, EU policies, experience of extreme weather events, examples of adaptation actions in other countries, research on impacts and adaptation, assessment of the economic costs of inaction or recognition of the opportunities presented by climate change. The key facilitating factors can be also highlighted. These mean for instance the availability of knowledge, political will, good co-ordination between key actors and identification of compatibility with other policies. It can be stated that the key challenge for adaptation at the national level is to ensure it is integrated into sectoral policies (Swart et al., 2009). Our examination is focusing on a special sector also considering the aspect of regional sustainability.

The present EU Territorial Agenda 2020 (Hungarian EU presidency, 2011) notes that the different regional challenges highlight the territorial coordination of policies especially climate, energy, water management, agriculture, housing, tourism and transport (Szendrő, 2010). The adaptation of tourism industry is determined by the interdependency between the supply and demand sides, the possibilities of the actors are dissimilar while they are affecting each other as well (Figure 1). Climate change could inevitably alter the character of previous tourism resources generating new demand and product, or substitutes like the greening of the accommodations, other services or the wide range of extra insurance related to the increasing prevalence of weather extreme events.

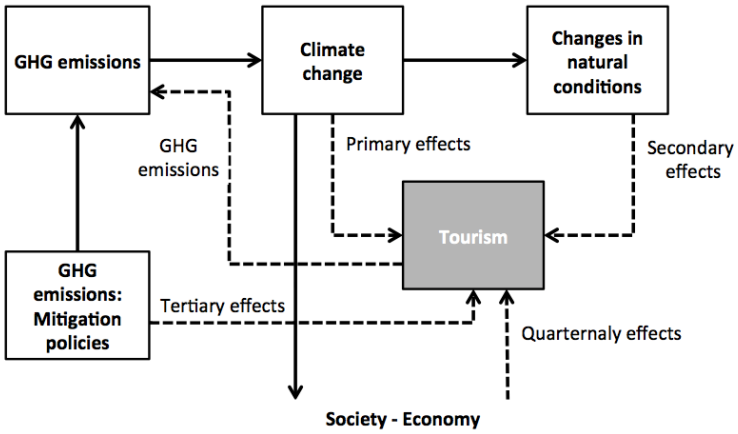


Figure 1. A model for analysing the relations between climate change, adaptation and tourism. Figure based on All & Høyer (2005).

It can be stated that adaptation process in the tourism industry is arising from a rational business response above all (Weaver, 2011). So it is not surprising that a distinction should be made according to the quality and environmental attributes as well. The specific set of adaptation form a highly heterogeneous group. The related determinants are the human resources, the improvement of raising awareness, technological and technical innovations, the proper selection of management tools, and its compliance with the external regulatory environment. All of these assume the flow of necessary information in a direct and an indirect way, the horizontal and vertical integration at regional and national levels, as well as the synthesis of individual adaptation's actions to a larger community system.

Figure 2. Adaptive capacity of tourism. Figure based on UNWTO (2008).

The capacity of adaptation to climate change is thought to vary between the sub-sectors of the industry; the most important difference is the relative capacity of the available resources (UNWTO, 2008) (Figure 2). While tourists have the greatest capacity with relative freedom to avoid destinations impacted by climate

change especially through their time, financial factors, knowledge and other flexible resource, but the service sphere does dispose moderate options to harmonise their activity to the changing conditions. For example large tour operators, who do not own the infrastructure, are in a better position to manage and gear their business to the new possibilities. The above mentioned group keep in touch directly with the clients, they could get and provide information to influence travel choices and respond to the constantly altering demand abridging the time of reaction.

Research Area

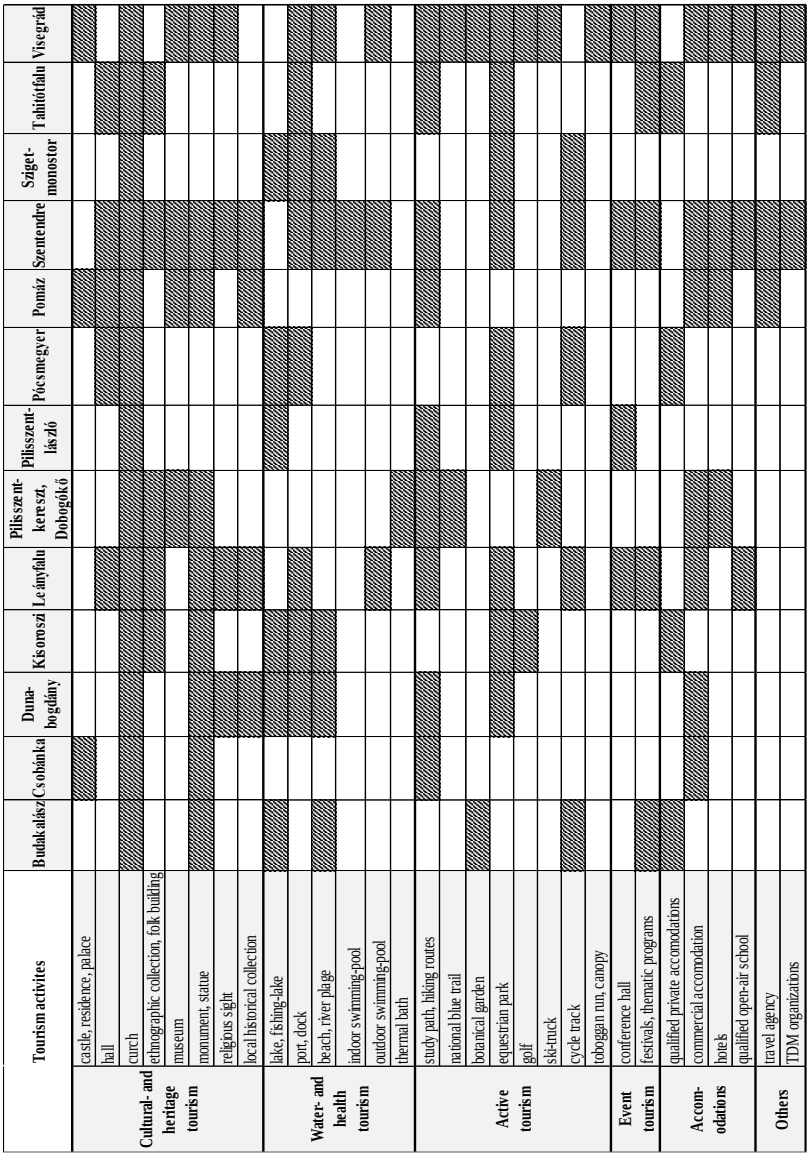
The study site is located in Central Hungary, in the neighbourhood of the capital city, Budapest. The territory belongs to the famous tourism resort, the Danube Bend. Due to the location of the sample territory the effected region is the Budapest and Central Danube region. In the light of the above, it is no startling that the destination has a remarkable role in the international and domestic tourism as well. It frames a coherent region from economic and environmental aspects; therefore it is important to consider a unit in the case of long-term developments.

The investigated area is based on planning-statistical administration division. The chosen micro-region is situated on the right bank of Danube Bend. In terms of natural features this spot is unique, where the river and the mountains meet, which determined the local historical, social and economic pattern. The analysis covered 13 settlements within the most visited Szentendre micro-region from the eight micro-regions of Danube Bend. The relevance of the choice:

- on the one hand there is a strong economic dependency on tourism activities;
- on the other hand due to the heterogeneous natural environment and rich cultural background the local tourism activities are not focused in only one, narrow segment, but provide a large number of tourism-related services and various kinds of tourism based on miscellaneous resources.

The wide range of tourism activities in the micro-region is presented in the developed thematic matrix summary as Table 1 shows. The values of the table are combined, so it is important to emphasize singular features of the three tourism centers such as the ethnographic outdoor museum in Szentendre, the complex skiing, hiking, and religious centre of Pilisszentlászló together with the architectural heritage of Visegrád (the citadel and royal palace) beside the significant role of thermal tourism.

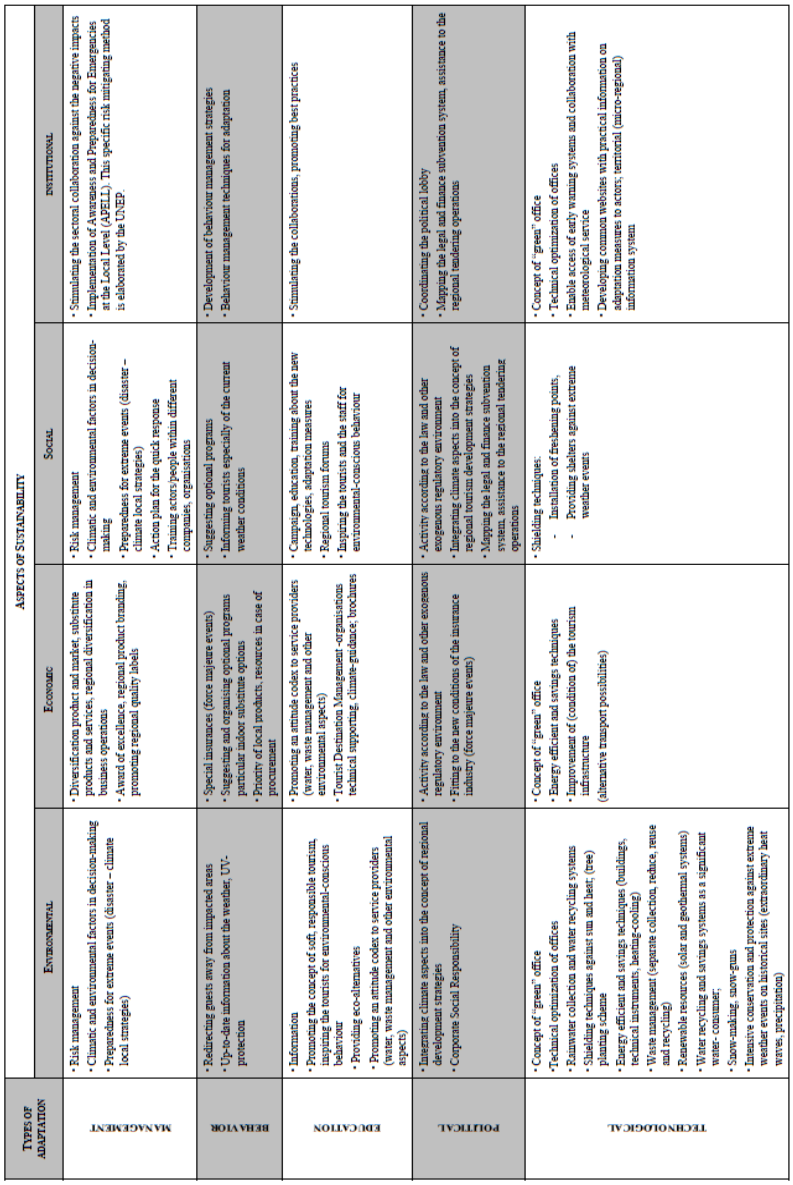
Table 1
Tourism activities in the micro-region Szentendre



	Tourism activites	Budakalász	Csobánka	Dunabogdány	Kisoroszi	Leányfalu	Pilisszentkereszt, Dobogókő	Pilisszentlászló	Pócsmegyer	Pomáz	Szentendre	Szigetmonostor	Tahitótfalu	Visegrád
Cultural- and heritage tourism	castle, residence, palace													
	hall													
	curch													
	ethnographic collection, folk building													
	museum													
	monument, statue													
	religious sight													
	local historical collection													
Water- and health tourism	lake, fishing-lake													
	port, dock													
	beach, river plage													
	indoor swimming-pool													
	outdoor swimming-pool													
	thermal bath													
Active tourism	study path, hiking routes													
	national blue trail													
	botanical garden													
	equestrian park													
	golf													
	ski-track													
	cycle track													
	toboggan run, canopy													
Event tourism	conference hall													
	festivals, thematic programs													
Accomodations	qualified private accomodations													
	commercial accomodation													
	hotels													
	qualified open-air school													
Others	travel agency													
	TDM organizations													

Note. Table based on Danube Bend Sustainable Tourism Development Strategy (2006).

Table 2
Interrelations between sustainability and Tourism Adaptation Portfolio in the examined micro-region



Types of adaptation	Aspects of Sustainability			
	Environmental	Economic	Social	Institutional
Management	• Risk management • Climatic and environmental factors in decision-making • Preparedness for extreme events (disaster – climate local strategies)	• Diversification product and market, substitute products and services, regional diversification in business operations • Award of excellence, regional product branding, promoting regional quality labels	• Risk management • Climatic and environmental factors in decision-making • Preparedness for extreme events (disaster – climate local strategies) • Action plan for the quick response • Training actors/people within different companies, organizations	• Stimulating the sectoral collaboration against the negative impacts • Implementation of Awareness and Preparedness for Emergencies at the Local Level (APELL). This specific risk mitigating method is elaborated by the UNEP.
Behavior	• Redirecting guests away from impacted areas • Up-to-date information about the weather, UV-protection	• Special insurances (force majeure events) • Suggesting and organising optional programs particular indoor substitute options • Priority of local products, resources in case of procurement	• Suggesting optional programs • Informing tourists especially of the current weather conditions	• Development of behaviour management strategies • Behaviour management techniques for adaptation
Education	• Information • Promoting the concept of soft, responsible tourism, inspiring the tourists for environmental-conscious behaviour • Providing eco-alternatives • Promoting an attitude codex to service providers (water, waste management and other environmental aspects)	• Promoting an attitude codex to service providers (water, waste management and other environmental aspects) • Tourist Destination Management -organizations technical supporting, climate-guidance, brochures	• Campaign, education, training about the new technologies, adaptation measures • Regional tourism forums • Inspiring the tourists and the staff for environmental-conscious behaviour	• Stimulating the collaborations, promoting best practices
Political	• Intermingle climate aspects into the concept of regional development strategies • Corporate Social Responsibility	• Activity according to the law and other exogenous regulatory environment • Fitting to the new conditions of the insurance industry (force majeure events)	• Activity according to the law and other exogenous regulatory environment • Integrating climate aspects into the concept of regional tourism development strategies • Mapping the legal and finance subvention system, assistance to the regional tendering operations	• Coordinating the political lobby • Mapping the legal and finance subvention system, assistance to the regional tendering operations
Technological	• Concept of "green" office •Technical optimization of offices • Rainwater collection and water recycling systems • Shielding techniques against sun and heat; (tree) planting scheme • Energy efficient and savings techniques (buildings, technical instruments, heating-cooling) • Waste management (separate collection, reduce, reuse and recycling) • Renewable resources (solar and geothermal systems) • Water recycling and savings systems as a significant water- consumer; • Snow-making; snow-guns • Intensive conservation and protection against extreme weather events on historical sites (extraordinary heat waves, precipitations)	• Concept of "green" office • Energy efficient and savings techniques • Improvement of (condition of) the tourism infrastructure (alternative transport possibilities)	• Shielding techniques: - Installation of freshening points, - Providing shelters against extreme weather events	• Concept of "green" office • Technical optimization of offices • Enable access of early warning systems and collaboration with meteorological service • Developing common websites with practical information on adaptation measures to actors; territorial (micro-regional) information system

Note. Own work

Method

The primary focus of our adaptation analysis is tourism activities and services based on local endowment. At first, the status of the micro-region related to the climate change and tourism was examined in order to detect the adaptation capacity and furthermore the vulnerability appointing the pillars of the local adaptation policy. Then, the conducted survey aim to reveal participants' knowledge of and attitudes to climate change, and further willingness to change their behavior, because beside the fixed capacity of resources these factors considerably influence the ability of adaptation. In a final section, the research elaborated by a potential practical toolbox of local adaptation on the basis of the present conditions and possibilities together with the motivation of the selected stakeholders. The survey covered three major subjects, namely

- the degree of knowledge on climate change;
- the extent of awareness of the possible impacts of potential changes on tourism;
- the capacities to adapt to the expected consequences; the adaptation instruments they currently possess; the main barriers to adaptation.

The selection of the stakeholders is justified, on one hand, by their lower adaptive capacity due to activities based on local resources, and, on the other hand, by the importance of the tourism sector in mitigating the risks of local climate security challenges due to increased involvement. As it was mentioned before, the presented research was conducted as a part of the first nationwide survey of the attitudes of the targeted segment. We selected 45 tourism stakeholders of the Szentendre micro-region, in view of their geographic distribution and the presence of major attractions. The response rate was 51% (23 questionnaires were returned). The responses were complemented with in-depth interviews. The distribution of responses shows the geographic distribution of the tourism capacities of the region, since 47% of them was from Szentendre, followed by 26% from Visegrád.

Results and Conclusion

Environmental security is one of the keywords in adaptation to climate change, the main objectives being the mitigation of projected risks by different activities and the provision of a relatively stable economic and social environment. Environmental security cannot be achieved with one-time measures. Climate change is a phenomenon whose mechanisms shift again and again, so the adaptation to these is also required to be continuous. In order to outline regional adaptation possibilities and proposals for a combination of tools is pivotal to inevitably map the knowledge and expectations of the actors concerned, as well

as the current stage of adaptation. Based on our research so far we can affirm that the tourism stakeholders of the Szentendre micro-region are already involved in certain adaptation procedures at an individual level. Our questionnaire survey showed that certain environmentally conscious behaviours have a secondary effect of promoting sectoral adaptation.

The most relevant cornerstone in environmental and climate security is the human dimension, both at individual and community level. The adaptation of the tourism sector is particularly difficult because it is extremely interdependent with the activities of other economic sectors, and because it uses resources which not only serve tourism purposes. The sector has a high responsibility, since tourism provides the basic conditions for the living standard of the local population and yields a significant part of its income. Besides, it places a charge on critical and wider infrastructure, which is especially vulnerable to problems related to climate change. This latter statement was affirmed by our survey, since respondents judged the roles of the state administration, the general public and the business sector to be more or less of the same extent. However, the issue of climate change is still in the attention and awareness raising stage in the micro-region in question, therefore adaptation is rather spontaneous.

We developed a sustainability based Tourism Adaptation Portfolio for the Szentendre micro-region in order to promote an efficient and sustainable adaptation (Table 2). It presents the potential tools for the different dimensions of sustainability according to the five types of adaptation (management, behaviour, education, political, technological). Beyond specific consideration for the characteristics of individual activity profiles, some universal, general procedures also appear. Some of the listed techniques are already present, but very often only as isolated activities, which are neither in accordance with the individual possibilities, nor are they part of a conscious, planned operation with an environmental point of view. It is pivotal that the organisations concerned recognize that it is their utmost interest to use and coordinate these tools in order to make their economic operation sustainable on the long run, safe and resistant to external environmental stress. The toolbox of the Regional Adaptation Portfolio might help other regions to find a way of practical adaptation.

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BRIDGING GAPS IN CLIMATE CHANGE MITIGATION AND ADAPTATION: OVERCOMING GOVERNMENT SHORTFALLS AND EXPLORING NEW FORMS OF COOPERATION

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Dealing with the possibly devastating effects of climate change is perhaps the greatest challenge humanity is forced to face in the 21st Century. Under the auspices of the United Nations, a large proportion of national governments have committed themselves to curb their greenhouse gas emissions, in a bid to avoid catastrophic climate change. The UN Environment Programme's most recent Emissions Gap Report indicates that although governments are making an effort, their efforts are not delivering the anticipated results. Delays in climate action will be costly for all of humanity, thus prompt and profound action is necessary. Commitments to curb emissions have direct policy implications, including the social, economic and environmental dimensions. Governments cannot reach climate goals by themselves; they need to forge partnerships with stakeholders to do this. Shortfalls indicate that a change in the forms of cooperation may be necessary, and novel forms of cooperation may need to be put in place. This paper offers an overview of the circumstances that make it necessary to seek new avenues of cooperation. In particular, this paper considers the Open Method of Coordination, as a possible means of avoiding and managing a climate crisis. Crucially, this paper also addresses the implications of these new forms of cooperation, especially in times of crisis, on the democratic functioning of the European Union.

***Keywords*: EU integration, climate change, mitigation and adaptation, Open Method of Coordination, democratic deficit, crisis management**

Introduction

The quest for sustainable development and climate change poses a double challenge for the whole of Planet Earth. In an attempt to prevent dangerous human interference with the Earth's climatic system, the UNFCCC's Copenhagen Accord recognised "the scientific view that the increase in global temperature should be below 2 degrees Celsius" compared to pre-Industrial Revolution levels, which should be achieved by sustainable development. To tackle the serious consequences of climate change, the Accord calls for the establishment of "a comprehensive adaptation programme including international support", which must be "consistent with science and on the basis of equity". The accord points out that cooperation is needed to achieve "the peaking of global and national emissions as soon as possible, recognizing that the time frame for peaking will be longer in developing countries and bearing in mind that social and economic development and poverty eradication are the first and overriding priorities of developing countries and that a low-emission development strategy is indispensable to sustainable development". (U.N. Framework Convention on Climate Change [UNFCCC], pp. 1-2)

At the time of signing the Accord, the 2°C target was already nothing new. Governments in the European Union have set this target in 1996, which has since then been reaffirmed by the Environment Council in 2003 (Commission of the European Communities [Commission], 2008, p. 3), and then the European Councils in 2005 (Commission, 2005, pp. 3-4; Council of the European Union [Council], 2005, p. 2), and 2007 (Commission, 2007, p. 3). The fact that the European Union was successful in promoting setting such a target globally shows both its commitment and global negotiation power.

This 2°C target directly translates to a maximum in atmospheric carbon-dioxide-equivalence concentration (CO_2e), which, because of the uncertainties surrounding climatic feedback loops, is estimated to be between 350 to 450 parts per million (ppm) CO_2e. Scientists have found that 350 ppm is the safe upper limit with which a 2°C target can still be met (Rockström et al., 2009a; 2009b), p. 10). Targeting stabilisation between 400 and 450 ppm, just like the European Union has done, reduces the chances of meeting the 2°C target to 66-90% and 50% respectively (Commission, 2008, p. 27), but allows for continued emissions. As the current atmospheric CO_2e concentration is already fluctuating above 395 ppm (Earth System Research Laboratory [ESRL], 2012), attaining a target of 350 ppm would require an immediate net reduction in greenhouse gas emissions, to which even the European Union is not willing to commit itself (Commission, 2007, p. 3). The aim to meet the 2°C target, and thus remain within a range of 350 to 450 ppm, also sets a maximum of all possible net emissions, and in turn, policy constraints for the European Union: social, environmental and economic policies must be formulated within these.

As the necessity for more drastic climate action becomes clearer, the widening gap between actual climate performance and climate targets becomes a startling reminder that much needs to be done. According to the UNEP's 2012 Emissions Gap Report, meeting the global climate targets is still possible from a technical standpoint. However, what governments commit themselves to today define our progress trajectory for the next few decades. For example, large-scale investments into satisfying energy demand by burning fossil fuels outlines a path, rigid and unchangeable, for decades to come (United Nations Environment Programme [UNEP], p. viii). We "lock ourselves" into high energy consumption patterns, with no viable 'emergency exits' in place, should they be needed. Present short-sightedness will come with a hefty price tag attached in the future. Unwillingness to correct our decisions today will cost us dearly in the future.

And the future may hold some very unpleasant surprises. As a consequence of the almost incomprehensible complexity of Planet Earth's climatic system, some uncertainties about the magnitude and the effects of climate change do exist. They, however, in stark contrast to what climate change sceptics would like to believe, do not mean that climate change is going to be less severe than predicted. On the contrary: scientists reviewing climate models have now determined that climate models projecting a greater rise in global temperatures are more likely to be accurate than models showing a more moderate temperature change (Harvey, 2012; Fasullo & Trenberth, 2012). This, in turn, also means that the resulting effects are also going to be more severe, and they would come earlier than previously predicted (i.e., already with more moderate temperature increases). This should alert us that greater caution is in order, since such unnerving findings may come to light with increased frequency. This should also remind us that the time for action on our hand is much shorter than we wish it would be, and it could also become even shorter very quickly.

To add insult to injury, the Gap Report also draws attention to the lack of ambition on behalf of governments to take action. The report bluntly states that "[i]f there is a gap, then there is doubt that the ambition of countries is great enough to meet the agreed-upon 2°C climate target." (UNEP, p. 1) This is not to say that there is an outright governmental inaction towards tackling climate change. There is movement. However, in some cases incompetence can be at least as damaging as inaction.

Government Commitments and Missed Targets

It is quite clear that governments — national, regional or local — are forced to think in terms of budgets and election cycles. Ambitious and/or painful actions by governments are usually scheduled to just after the elections, with at least some results already showing up sometime before the next elections. Tackling climate change and steering society and the economy towards a

sustainable future is a massive challenge. It requires ambition, dedication and strategic vision much, much longer than intervals between general elections. Climate efforts and sustainability efforts are also costly and painful, and they have barely noticeable results in the short run, say, in the time frame of an election cycle. Therefore, governments are tempted to sacrifice medium and long-term political and development goals for short-term gains. (Majone, 1998, pp. 16-18) From a game theory approach, climate change is a multi-player game, where in the short-term time frame payouts are greater for desertion than cooperation, but where long-term time frame payouts are greater for cooperation than desertion.

Indeed, climate reports, including the Gap Report, are conclusive in stating that any current inaction must be made up for in the future, if targets are to be met, with the flexibility of action and the room for manoeuvring greatly reduced — both technologically and financially. (UNEP, p. 21) These so-called "later-action scenarios" postpone some or all of the required action to the future. While the Gap Report admits that even these later-action scenarios may yield the desired results, it implicitly warns of their technocratic approach, and the possibly disproportionate future costs of later action, thus falling outside the range of Least Cost Scenarios. (UNEP, p. 22) Indeed, the price of inaction has been made very clear in the Stern Review, estimating future costs of current inaction to stop climate change to reach a staggering 20% of the annual global GDP, year on year, in the form of damages, risks, lost revenues, additional expenses and other impacts. (Stern, 2007, p. 144)

By its very nature, the United Nations (and therefore, UNEP too) deals with – *nations*: sovereign countries. When performances are assessed and evaluated, it is done on a national level. Besides its sovereign members, the European Union is also taken into consideration as a special case, practically as a future super state. However, sub-national entities are not considered at all. Therefore, target shortcomings which arise from a myriad of issues on a sub-national level, are completely ignored.

Yet the European Union has set out its Sustainable Development Strategy and its Climate Action strategies as a cooperation between the various levels of government: a cooperation *between* European, state, regional and local levels (i.e.: vertical cooperation), but also a cooperation *within* these levels (i.e.: horizontal cooperation). "[T]his [better policy-making] requires all levels of government to support, and to cooperate with, each other, taking into account the different institutional settings, cultures and specific circumstances" (Council, 2006, p. 6).

The willingness to adopt and implement this strategy was met with varying enthusiasm among the States: some were more eager to take the lead in sustainable development and climate defence, whilst others were more reluctant to commit themselves to more than what was absolutely necessary. This

willingness is reflected in the individual member states' own sustainable development strategies and climate strategies. However, commitment on sub-national level seems to show great variations too. It is not difficult to accept that local governments on very tight budgets and with paralysing debts tend to be more sceptical, or in some cases, rejecting towards sustainability and climate initiatives, than local councils with more permitting budgets. To achieve a successful transition to sustainable development, having citizens and lower levels of government on board is a necessary, but insufficient condition. Citizens may decide not to cooperate with policy goals that they perceive as either remote or as not serving their interests. Such resistance may arise on political and spatial (e.g. a policy is perceived to have been decided "in Brussels", i.e. without sufficient citizen consent) or temporal grounds (i.e. the costs will be felt immediately, but the benefits only at a later point in time). Such resistance may render government efforts ineffective, and therefore, needs to be prevented.

Governments must attempt to avoid being "left on their own" by lower levels of government and citizens in their sustainability and climate efforts. In general, government initiatives take a top-down approach. However, both the European Union's Sustainable Development Strategy and the Climate Action strategy recommend the support of bottom-up initiatives. The so-called Open Method of Coordination could be a practical tool that proves both effective and efficient in channelling in such bottom-up initiatives, which will be discussed in more detail further on.

It is clear, that governments need to foster the establishment of novel and innovative partnerships between actors in what is known as multi-layered governance, including individual citizens, entrepreneurs and corporations, interest groups and trade unions, as well as government agencies. Furthermore, careful consideration must precede all and any decisions to be taken about which policy goals will be left to the markets, and which ones will require government supervision and intervention. As observed by Tietenberg, it cannot be just one or the other; it has to be a balance of both. He adds, "[e]ach problem has to be treated on a case-by-case basis", and the necessary tools are at our hands to be able to decide what decisions need to be taken (Tietenberg & Lewis, 2012, p. 594). Additionally, Giddens points out that "the most dramatic initiatives are likely to bubble up from the actions of far-sighted individuals and from the energy of civil society" (Giddens, 2009, p. 5). These initiatives could help fulfil government pledges to cut emissions. At the moment, however, these bottom-up initiatives are not appropriately channelled into the decision-making and policy-setting process, which adds up to the national shortfall in meeting the climate targets, and thus, the Gap remains. This also means that governments could potentially delegate some tasks to different levels of government, and still achieve better results than previously, provided that governments improved their ability to recognise worthy initiatives. This would grant governments a much-

needed flexibility of action, reduce the burdens of oversight, and give all stakeholders more room for manoeuvring.

The problem we face is this: how could we establish a network-based structure or an Open Method of Coordination that would more effectively and efficiently channel in bottom-up initiatives into the decision-making process? Furthermore, how would these novel models stand up to the scrutiny of democratic standards?

Creating New Channels of Integration

A fundamental problem with creating policies for climate change mitigation is that the inherent multi-dimensional approach of sustainable development must be respected: any climate change mitigation or adaptation policy will directly depend on social, economic and environmental policies. Crucially, within the European Union's framework, these policies will affect areas which are either wholly under member state competence, or are shared competences between the Union and the member state. The coordination of social, economic and environmental policies is a very serious challenge on a supranational level, as defection from agreements offers more lucrative returns than cooperation. This is even more challenging on an international level. According to Zandstra, "mutual adjustments are turned out to be extremely difficult" — if not impossible — "in these areas due to the lack of political support". (Zandstra, 2007, p. 252)

Without political consent, the creation of a common climate protection policy across the classical Community Method or the classical political institutions is unlikely to succeed. However, to reduce the negative effects of conflicts of interest, it may prove necessary to turn towards alternative governance structures, which channel in the bottom-up initiatives, and integrate more actors than the Community Method does. Under "Community Method", we refer to the ordinary functioning of the European Union. This includes the delegation or transfer of a number of particular competences of Member States' to the supranational level through the alteration of Treaties, and through the ordinary legislative and decision-making process of the Union. This process has its strict rules and regulations, which make it less dynamic and reactive then the new governance structures do. One of these alternative structures is the Open Method of Coordination.

Applying the Open Method of Coordination is useful in sustainability and climate change mitigation and adaptation policies, as both sustainable development and climate protection have high political and economic costs in the present, but their goals and benefits are anticipated in the medium and long term future. As Moravcsik and Majone explain, long term policies which impose high cognitive costs to the electors and require generally unavailable information

could be depoliticised (Moravcsik, 2002, p. 614; Majone, 1998). Under high cognitive costs we mean that the electors generally are not adequately informed to carry out a controlling role in these areas. Gaining enough competence that would enable them to make an informed choice between even basic policy alternatives would result in excessive costs, energy and time spent by the citizens. Thus, depoliticisation is the removal of the control of certain policies from the classical political framework, which are then delegated to the competence of independent and politically not responsible institutions, i.e. institutions which do not answer directly to voters. Its fundamental logic is the prevention of sacrificing medium and long term goals, whilst bodies of experts ensure the necessary scientific competence and knowledge

We must take note of a fundamental flaw in this approach: it presupposes that there is a clear difference between regulatory and redistributive policies. Majone differentiates between regulatory and redistributive policies. Regulatory policies attempt to correct market failures (i.e.: internalise externalities, thus making the results Pareto efficient. According to Majone, these areas can be fully depoliticised, due to the fact these types of decisions don't cause an outright loss to anybody: those that remain in minority are also compensated by the results themselves. However, redistributive areas and its related policies should not be depoliticised, because those incurring a loss will not be compensated adequately (Hix & Follesdal 2006, pp. 537-538). But, as Hix & Follesdal point out, a clear differentiation between the two policy types is more than questionable. There are simply no purely regulatory policies which would not have a redistributive effect, and as a consequence, depoliticisation is not desirable in either of in these policy types (ibidem, pp. 542-544). As it has been mentioned previously, sustainable development and climate policies will always have an effect on social, economic and environmental policies, therefore a redistributive effect will also be observed. Following the logic of Majone, Hix & Follesdal, sustainable development and climate change mitigation and adaptation policies should not be depoliticised. Instead, the most appropriate governance structure for sustainable development policies and climate protection policies is to be found in the Open Method of Coordination, for several reasons.

First, as we have seen, due the inherent tri-dimensionality of sustainable development, sustainable development and climate change policies affect some core areas of sovereignty of nation states, including, but not restricted to, social and economic policies. This makes the delegation of some competences to Union level impossible, thus rendering the Community Method essentially impossible.

Second, efforts towards a transition to sustainable development and achieving climate targets have profound redistributive consequences, making its depoliticisation impossible. As Kjaer cites, Borrás and Jacobsson mention three main areas where this method is applied:

- in the field of social policies and research and technological development – where the transfer of competencies has failed previously,
- in policy areas where the European Union's visible public involvement is relatively new - including policies related to the information society,
- in policy areas which do not fall under the Community Method, but are strongly interdependent of other European Union policy areas, which themselves also fall under the Community Method. As an example, the coordination of economic policies of the Member States and their relations to the Economic and Monetary Union can be mentioned (Kjaer, 2010, p. 57).

Third, the Open Method of Coordination offers the possibility of wider involvement of different actors, including, but not restricted to European institutions, national, regional and local governments, citizens, entrepreneurs and corporations, civil society, and so on (Council, 2000, § 38).

In continuation, the general characteristics of the Open Method of Coordination will be analysed. The Presidency Conclusions of the Lisbon European Council was one of the first documents to mention the Open Method of Coordination. This method involves four basic actions.

1. It sets guidelines for the Union with specific timetables for achieving short, medium and long term goals.
2. It establishes indicators and benchmarks against the best in the world and tailored to the needs of different Member States and sectors as a means of comparing best practices.
3. It translates these broader, Union-level policy targets into national and regional policies, creating more specific targets and measures adapted to the given policy field and geographic territory.
4. It sets out for periodic monitoring, evaluation and peer review, organised as mutual learning process (Council, 2000, § 37).

Its central elements include, for example, collective planning, benchmarking, target development and multilateral surveillance, making it a novel method of policy-making. Among these, perhaps the most important is 'its "seemingly" soft character' (Zandstra, 2007, p. 254). On Union level, we can distinguish between 'hard laws' and 'soft laws'. Hard laws are derived from Treaties, their modifications and legislation of the Community Methods. Soft laws, however, are the result of other decision-making processes, which are outside the classical institutional framework, like the Open Methods of Coordination (ibidem).

In the case of soft law tools, there is no transfer of competences, so the process of mutual cooperation is almost entirely reliant on a loose form of community-based control or peer pressure. In the functioning of the Open

Method of Coordination, a strong emphasis is placed on the pooling of problem-solving experience, best practices and the like. According to Jacobsson and Vifell, and as cited by Zandstra, because of this process, national officials are now capable of mapping out a domestic strategy by identifying broad common goals and concerns, sharing ideas and experiences with a wide range of actors, in the private and public sector as well. The Open Method of Coordination merges joint action and national sovereignty, in line with the principle of subsidiarity (Jacobsson and Vifell, 2003, p.6-7 cited by Zandstra, 2007, p. 254)

Despite the fact that the Open Method of Coordination is a soft law tool, it can be distinguished from the others through four characteristics, which make it more appropriate for sustainable development policies and climate change mitigation and adaptation policies.

First, due to the substantial role played by the European Council, it has a stronger intergovernmental basis (ibidem). This means that the key competences and roles of member states are secured and not questioned. As it has been mentioned previously, the policies in interference with climate policy are highly relevant for national sovereignty this character is necessary to the well-functioning of the policy area. Because of the prominent role of governments, the Open Method of Coordination ensures better compatibility with the UN's own climate protection efforts, where the main actors also the states. Crucially, soft-law tools in general are not based on the logic of intergovernmental cooperation, but in Open Method of Coordination, the European Council assumes a prominent position alongside the European Commission, which strengthens the role of member states. As this falls in line with UN frameworks of action and cooperation, this provides a more compatible and competent system.

Second, according to Zandstra, contrary to other forms of soft law, the procedures of Open Methods of Coordination are generally well-defined.

Third, consequently, the processes of deliberation and problem solving are cyclical, instead of sequential which makes possible to steering on the basis of benchmarking and peer pressure (ibidem). It is important to draw the attention to the fact that this deliberation and problem solving cycle essentially follows the logic of the Deming-cycle, a widely-known basis for environmental planning.

The fourth important aspect is the presence of the systematic linking of issues across policy areas and between national and European level (ibidem). From the aspect of climate protection and sustainable development policies, this results in improved possibilities for preserving the balance between the three policy dimensions. This systematic linking is placed on an active participation of social actors, the explicit aim of enhancing deliberation and mutual learning process (ibidem). During the course of this process, the channelling in of the bottom-up initiatives is instigated.

Democratic Implications

As it has been underlined, the Open Method of Coordination may be the most appropriate governance structure for the elaboration and functioning of climate protection and sustainable development policies. Now the analysis of the democratic aspects of this governance structure will be outlined. According to Bekkers, the application of new governance structures means a transfer of problem-solving capacity form the classical institutional framework of representative democracy, towards other entities (Bekkers et al., 2007, pp. 3-5, 20-22, 307). In the literature of political sciences, the democratic deficit in the European Union is a frequently-debated topic. (See also: Moravcsik (2002), Majone (1998), Follesdal & Hix (2006), Bellamy (2010), Scharpf (1997), Papadopoulos (2003).) Democratic deficit could be defined as the difference between the delegated competences on supranational level and the electoral controls over them. There are several points of view considering the above mentioned transfers of problem-solving capacities as another source of democratic deficit as well (Romani & Liakopoulos, 2009, pp.17-18; Bekkers et al., 2007, pp. 3-5; Papadopoulos, 2003, pp. 467-477).

At first, the Open Method of Coordination was considered as a new tool for a better legitimisation and democratisation of the European Union, as a consequence of its wider integration of actors. As more and more experts describe it, one may observe a shift from it being a vote-based democratic theory to a dialogue-based democratic theory (Chambers, 2003, p. 308; Zandstra, 2007, p. 256). This denotes a change in the electoral control mechanisms. Instead of controlling the political decision-making processes through elections, citizen control is exercised through public deliberations and dialogue. As citizens are not forced to just plainly choose from a very limited number of options, more aspects and factors may be deliberated and integrated into policies. Stakeholders such as citizens, entrepreneurs and businesses, social pressure groups and the civil society will more than likely have an improved way of making their voices heard and their priorities incorporated into policies (ibidem). Indeed, this may prove to be a very effective and efficient means of fine-tuning policy targets, provided that they are used appropriately.

But the Open Method of Coordination cannot be considered as a tool in a deliberative democracy, as it does not provide a universal participation and involvement for every citizen. However, according to the arguments put forward by Zandstra, it would not even be necessary. It could be thought of as deliberative technocratic form of pluralism (ibidem, p. 258). This means that some actors would be involved who are competent in a given scientific field. Thus, the involvement on the decision-making process is wider than in other structures of governance, but the universal access is not made available to every single voter. Even in this case, though, the Open Method of Coordination offers

new possibilities to a more legitimate decision-making process. Zandstra stipulates that the legitimacy of this method is secured by its qualitative representation, its procedural openness, its transparency and its public debate (ibidem, p. 259).

Lamentably, this argumentation has several weaknesses. First of all, there are some presuppositions related to representation. As Bekkers & Edwards observed, cited by Zandstra, how this process is being legitimised is significant. At the very least, the qualitative representation of all affected stakeholders should be ensured in some ways (Bekkers & Edwards, 2007, pp. 36-61). But Zandstra points out that the Open Method of Coordination does not require a direct representation of all stakeholders (Zandstra, 2007, p. 259).

We can agree with the statement that the Open Method of Coordination creates efficient results and fosters vivid public debates through its wider stakeholder involvement. However, at the core of democratisation lies political responsibility and accountability, which are not guaranteed through this process. Essentially, electoral control mechanisms are absent. As it has been mentioned previously, the use of the Open Method of Coordination means a removal of problem-solving capacity from the classical institutional framework, which is then transferred to its own new structure, where political control mechanisms of voters are missing. Consequently, we can observe a democratic deficit within its own functioning.

This problem is similar to the general dilemma in the debate about democratic deficit. Is the presence of democratic deficit a real problem? From our point of view, yes it is. As sustainable development and climate protection policies must respect all three dimensions of sustainability, thus have a direct effect on economic, social and environmental policies, which in turn have redistributive consequences. Compensation of those suffering a loss will have to be covered from taxpayers' contributions. As one of the fundamental principles of democracy is "*no taxation without representation"*, covering losses from tax contributions without allowing for outright citizen control is unacceptable from a democratic aspect.

As it has been demonstrated, the Open Method of Coordination is far from being a perfect tool from the aspect of democratic legitimisation. However, could it prove useful, with all its shortcomings and mistakes, in case of climate protection and sustainable development policies? In our view, yes, it could. We can regard climate change as not just a crisis, but a string of self-enforcing crises. As it is made clear by numerous climate reports, including the Gap Report, carrying on with 'business as usual' would certainly mean that we miss our climate target of 2°C (UNEP, p. 7). As a consequence of this, we may describe our current situation as a crisis. Like all extraordinary situations, climate change requires special tools for crisis management. The European Union already has some mechanisms in place for climate change mitigation and

adaptation, but as the Gap Report shows, these fell short of expectations. Therefore, extraordinary measures need to be prepared to deal with the impending climate crisis. Since extraordinary measures of mitigation and adaptation would be instated to deal with a crisis, some of these special steps could be legitimated.

At this point, we would like to underline an analogy with the European economic crisis management. In that case, the political and democratic logic was put to second place, and was overshadowed by the economic rationality and logic. Various steps of economic crisis management, such as the nomination of what is effectively a Community supervisor for the Greek budget, or the letter by Jean-Claude Trichet and Mario Draghi, sent to the Italian Government, were non-democratic measures by conventional standards. Nevertheless, the use of such extraordinary measures is justified by the special circumstances that arise in a crisis. We have born witness to the *de-facto* birth of the special economic legal order of the European Union. (Varga, 2013) These steps, legitimated by the necessities of the crisis, create a need for retrospective democratisation once the crisis is over: the creation of a de-jure special legal order, as is the case in general with the application of special legal orders.

The threat of a climate crisis grows larger, and the factors that contribute to this crisis also appear to reach critical states. As we ought to prepare extraordinary measures for climate crisis management, we may need to face up to temporarily disregarding some questions of democracy in some policies, as the logic of climate protection (both in the form of mitigation and adaptation) may need to assume priority over political and democratic logic. Some events, which are factors of the climate crisis, but are themselves in an outright crisis, may have to fall temporarily under the auspices of a special legal order, which is to be democratised as soon as the crises is over.

Such extraordinary measures are an uneasy choice for governments and citizens and other stakeholders equally, and therefore efforts that strive to the avoidance of crises ought to receive much wider support from all stakeholders. As is apparent from the efforts of the European Union's agencies and national governments, the logic of sustainable development is to be integrated into all policies *anyway*, the European Union is already doing as much as it can to mitigate and adapt to climate change as democratically as possible. Nevertheless, it may be necessary for the European Union to adopt extraordinary measures of governance to tackle an imminent climate crisis, even at the expense of democratising its actions when the crisis is over.

Conclusion

Climate change studies have shown that should the global economy carry on with "business as usual", there is no probability that we would be able to attain our climate change target of 2°C. It is clear that the global community has recognised this climatic crisis, and has started its management already. As we have demonstrated, national climate protection initiatives have shown considerable shortcomings from the internationally agreed targets, and although the UNEP's Gap Report admits that meeting these targets is still technologically possible, achieving them would require absolute dedication and virtually immediate action. National governments have shown both commitment to tackle climate change, as well as more or less of an incapability of doing so. Yet governments could improve their performance in climate protection, if some new avenues of cooperation, such as the Open Method of Coordination, were to be given more room for action. This could improve the way bottom-up initiatives are channelled into the decision-making process. The Open Method of Coordination, being a novel tool for policy making, would allow a more efficient and effective decision-making process to be created, and it would better reflect the policy-setting particularities in the UN and its associated agencies. We believe that the Open Method of Coordination could prove to be a useful tool for policy-making in the fields of sustainable development and climate protection.

Nevertheless, there are questions of democracy and citizen control which must be addressed. As we are dealing with a crisis, the European Union ought to prepare itself for extraordinary climate protection policies and measures, and special legal order as well, which may need to temporarily substitute general political and economic logic and rationality with the logic of climate change prevention, as in the case of economic crisis management. The necessity of the special legal order on the European level is the consequence of the global character of the phenomenon. As the crisis is inherently larger than the range of national jurisdictions, the instatement of national special legal actions would not yield sufficient results, thus, action on a supranational level, the level of the European Union, would be necessary. As has been showed, the presence of a temporary democratic deficit during the climate crisis management would not present any problems or interference with democratic order and principles, provided that the democratic deficit is absolved once the crisis is over.

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TRENDS AND INDICATORS FOR SUSTAINABLE MOBILITY IN HUNGARY

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Transport is the lifeblood of all developed economies, but at the same time, it is also one of the most polluting sectors. In the wake of the economic crisis and the looming threat of climate change, a number of solutions have been developed to create a transport sector for the 21st century, with varied success. This article aims to improve our understanding of the different trends in the transport sector by analyzing time series of indicators for different aspects of sustainable mobility in Hungary and Europe. Specific indicators have been developed from a variety of data sources to describe the driving forces shaping the present and the future of the European transport sector, with a view on the different medium and long-term objectives set out on national and European levels, such as the White Paper on Transport, the Climate and Energy Package, or the National Energy Strategy of Hungary.

Keywords: **transportation, sustainability, trends, policies, indicators**

Introduction

As climate protection and control over the emission of greenhouse gases became a crucial issue, it became clear that the transport sector was not only one of the key players, but also slow to respond to policy action, as reflected by the goals set out in the Decarbonization Plan of the EU (considering GHG emissions from transport in 2030 between +20 and -9% based on 1990 levels). This seeming inertia is due in part to the steady expansion of motorization, while the renewal of the vehicle fleet and the role of other modes are also important factors. Sustainable mobility is an important and integral part of regional sustainability (Szlávik & Csete, 2012), and is one of the focus areas of technological and policy development. Through the following paragraphs and figures, we will present the current state of the sector in Hungary and Europe, with an outlook on policy goals and future development. Hungary will have to develop and implement its transport policy together with the rest of the EU, requiring a comprehensive vision in transport development (Szendrő, 2011). The areas covered include modal split and tonnage changes, the renewal of the vehicle

stock, passenger transport performance, as well as differences between Member States.

During the recent history of climate and transport policy, a whole range of different strategies and goals have been established in several policy documents. Before going forward with the analysis of the current state of the art, it is useful to take a brief look at them to see what the goals are for this sector (the list is not exhaustive):

1. EU Climate and Energy Package (EC, 2007):
   - A reduction in EU greenhouse gas emissions of at least 20% below 1990 levels
   - 20% of EU energy consumption to come from renewable resources
   - A 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.
2. EU Decarbonization Plan: decreasing transport GHG emissions on 1990 levels by 54-67% by 2050.
3. White Paper on Transport (DG Mobility, 2011):
   - Halve the use of 'conventionally fuelled' cars in urban transport by 2030; phase them out in cities completely by 2050
   - Low-carbon sustainable fuels in aviation to reach 40 % by 2050
   - 30% of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030, and more than 50 % by 2050
   - By 2050, complete a European high-speed rail network. Triple the length of the existing high-speed rail network by 2030 and maintain a dense railway network in all Member States. By 2050 the majority of medium-distance passenger transport should go by rail.
   - A fully functional and EU-wide multimodal TEN-T 'core network' by 2030, with a high-quality and capacity network by 2050
   - Achieve a 60% reduction in CO_2 emissions by 2050
4. Hungarian National Energy Strategy (NFM, 2012):
   - Electrification of road transport
   - Decreasing import dependence and CO_2 intensity
   - Increasing to role of rail in passenger and freight transport
   - Supporting alternative fuels and propulsion systems
   - Preparing for the structural changes brought about by peak oil

The objectives and time frames of these policy documents are different, and there is no single, unified set of goals and deadlines, which makes it very challenging to implement coordinated efforts in this area on a national, let alone European scale.

Current Status of the Sector

In the following paragraphs, we will investigate key indicators of the Hungarian transport sector. For the sake of perspective, Hungarian data sets will in most cases be compared to 4 countries, 2 of them more developed that could in many cases serve as an example to follow (Austria, Germany), and 2 from the region of Central Europe, having similar characteristics and issues as Hungary (Slovakia, Czech Republic).

One of the key indicators of the Hungarian transport sector is the number of new vehicle registrations. This figure is important because it affects the renewal rate of the vehicle fleet, and through it, the time it takes for new policies to take effect.

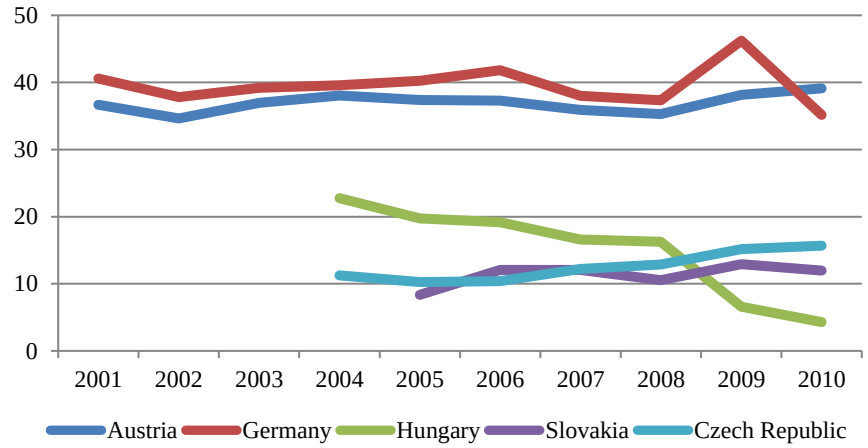

Figure 1. New vehicle registrations (1000 inbabitants). Own compilation based on Eurostat data.

The number of new vehicle registrations (an indication of the renewal rate of the vehicle fleet) have been average in Hungary for the first part of the decade, but have dropped sharply as a result of the financial crisis by about 80% compared to 2004, when passenger car sales were driven by the availability of cheap credit. The bubble burst with the rapid increase in the exchange rate of the Swiss Franc (and, to a smaller extent, the Japanese Yen), creating a considerable amount of bad loans. The ultimate effect was that, since the crisis, the majority of new vehicle sales are driven by company fleets, and the number of registrations is among the lowest in the region, dropping to just over 4/1000 inhabitants in 2010. Motorization has started with a delay in Hungary, and while it more or less follows European trends, the overall magnitude remains less than the average. The motorization rate (the number of vehicles per 1000 inhabitants)

is around 300, while for most of the EU-15 countries, this indicator is around or over 400. It is therefore likely that without strong policy intervention, the vehicle fleet will continue to expand, even after EU-15 countries have stabilized.

The second key indicator is the age composition of the vehicle fleet. This gives general information about the current state, but when observed over a time period, it also shows the reaction to external effects, such as the economic crisis. The point of reference in this case will be Austria:

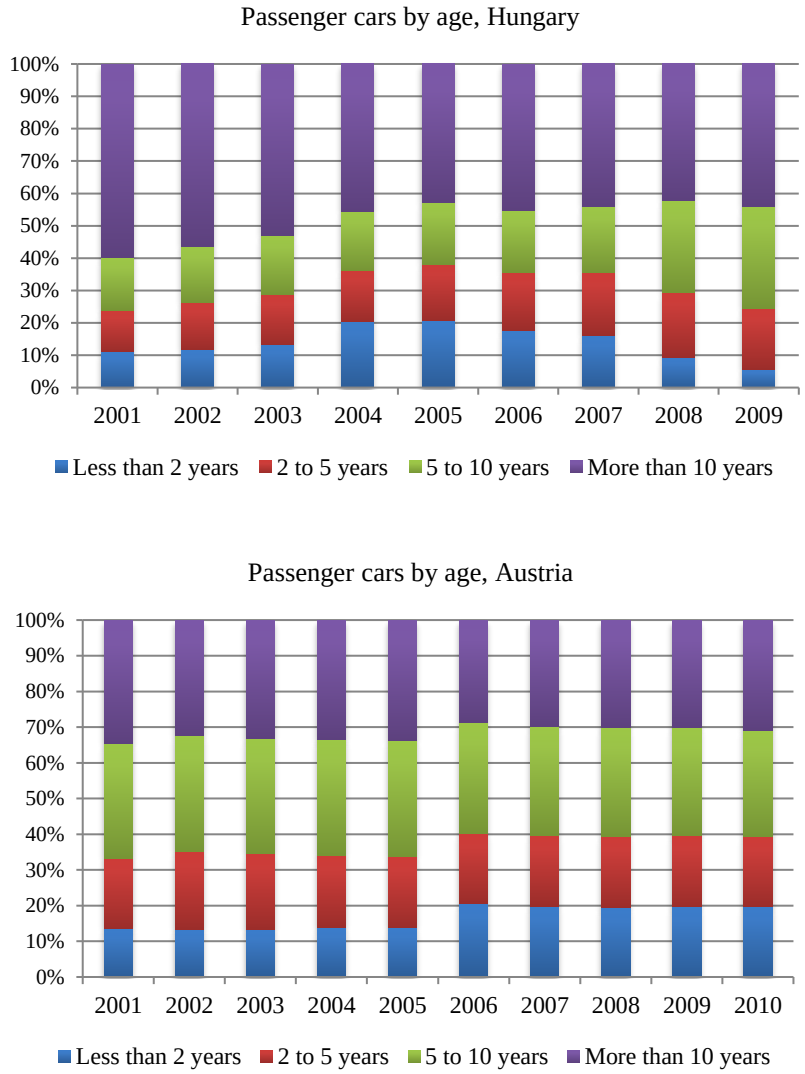

Figure 2. Vehicle age distribution. Own compilation based on Eurostat data.

It is interesting to note how in some other countries (e.g. Austria), the crisis had no discernible effect on the age distribution of vehicles. The low amount of new vehicles in Hungary (along with low scrappage numbers) means that the age distribution moves in an unfavorable direction, and that policies (such as the electrification of road transport, advocated not only by the White Paper, but also Hungary's own Energy Strategy) that require the use of new technologies will need a long time to take effect, possibly resulting in the inability to reach climate and energy targets set out, such as the ones in the Climate and Energy Package.

The importance of cooperation between manufacturers and policy makers is undeniable. Passenger car manufacturers are sometimes criticized for their lack of commitment to innovation that could decrease the impact of their products on the environment, and that efforts on their part will only be made if ever more strict vehicle emission standards force them to act. Today, the majority of passenger cars on the road still use the internal combustion engine, a technology developed in the late 1800s.

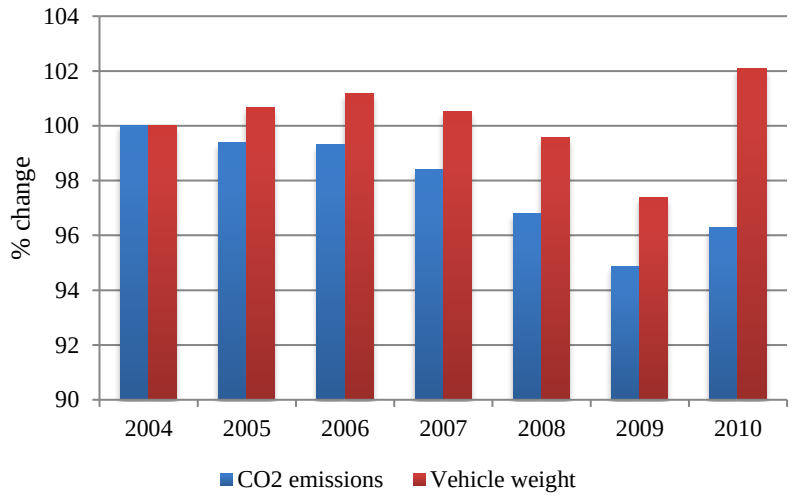

Figure 3. Weight and emissions. Own compilation based on Eurostat data.

Note. EU-27 average, 2004=100%. Data for EU-25 before 2007.

However, this does not mean that there has not been any development. From a very simplistic perspective, a vehicle has 3 areas of possible development: performance, weight and emissions. For example, the Ford T-Model weighed 540 kg, had 20 horsepower and a 72 km/h maximum speed. The reality is that there has been tremendous development since then, but emissions aren't improving fast enough because the majority of gains had to be used in the other two areas due to consumer preferences: weight and performance, both of which have an adverse effect on emissions.

As the graph above shows, the average weight of new vehicles was on a steep upward slope from 2004 onwards, reaching its peak in 2007. The correlation of this statistic with the state of the economy is also shown by the progression as the crisis unfolded: after a slight decrease from 2007 to 2008, the crisis induced a sharp drop in 2009, after which the graph has rebounded somewhat (in the meantime, vehicle emission standards have become more strict, arriving at 140 gCO_2/km in 2010). There also seems to be a disconnect (or decoupling) between emissions and weight. The latter is unregulated, and has in recent years decreased less and grown more than emissions. Apparently, larger vehicles (such as SUVs) have become popular shortly after the first "shock effects" of the crisis in 2008. It is worth noting that not all countries followed this trajectory – in Hungary, for example, remaining vehicle sales are mostly limited to company fleets with different priorities and preferences, and the changes in weight have not been as significant as Figure 3 shows.

The next area to examine is the performance of the passenger transport sector in terms of absolute volume, changes over time and mode choice.

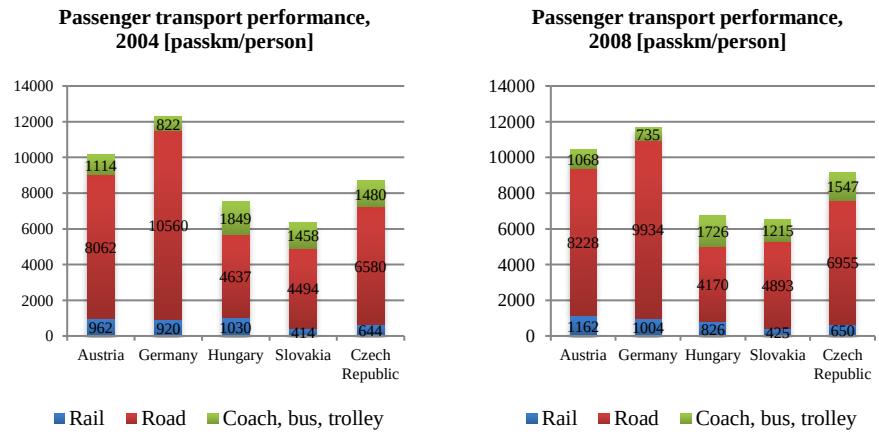

Figure 4. Distance traveled. Own compilation based on Eurostat data.

The evolution of different countries has been divergent in this respect. Both Austria and Germany have seen a slight increase in rail and a slight decrease in public transport over road. The total passenger-km in Germany has dropped, mainly because of the decreasing share of individual road transport.

In Hungary, not only did the overall performance decrease (in part as a result of the crisis), but also road transport has continued to increase its share and replace the other two modes – the exact opposite of policy goals. Increasing motorization rate can also be observed in Slovakia and the Czech Republic, with no significant change in total transport performance.

The final aspect of the transport system to be analyzed is the state of railway infrastructure. Traditionally, Hungary was in a favorable position in this respect

owing as much to its geographical location as the density of the railway network. However, since 1989, the railway sector has been in decline, an ever increasing share of rail freght and passenger transport shifted to road, and the infrastructure is obsolete, although the density is still quite high on a European scale:

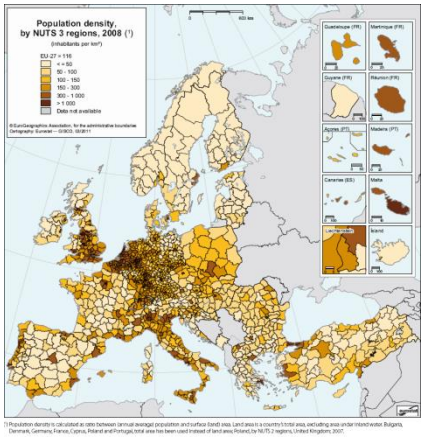

Figure 5: Population density

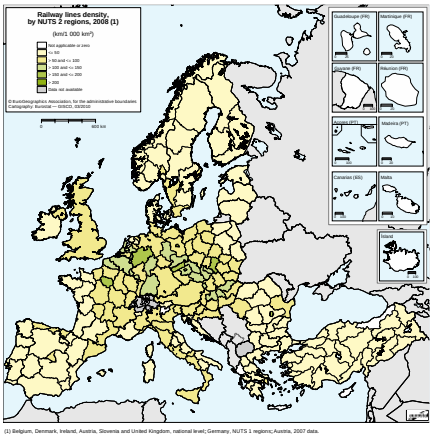

Figure 6: Railway line density

Note. Own compilation based on Eurostat data.

It is clear that Hungary is in a good position with respect to its railway network density. However, the obsolete state and quality of infrastructure (upgrades to 130 km/h are in progress) is a significant obstacle and it is possible that a population density like this is simply not sufficient to sustain a railway network that is among the most dense in Europe. The result is line closures and attempts to eliminate parallel bus services, which may result in a decreased service level, while financial sense is questionable, given the large share of fixed costs (infrastructure maintenance) in the railway industry.

Conclusion

The current state of affairs in the transport sector and the economy in Hungary make the chances of successfully reaching the targets set out in various strategy documents questionable at best. An enormous effort will be required to move toward a more sustainable transport system, and it is not yet clear where associated funds or consumer motivation will come from.

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CRITICAL REMARKS ADDRESSED TO CLIMATE FANATICS AND CLIMATE SCEPTICS

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Since two decades, climate change has been considered as the No. 1 global environmental problem. Its propaganda, but also the debates about the origin of climate change (whether it is man-made or not) have led to ignorance of several simple, but threatening facts. Namely, that mankind requires more and more energy and materials from our finite planet, such as freshwater, raw materials, soil, and we occupy more and more land surface. All these activities have direct and multidimensional consequences in the long term: depletion of resources and saturation of sinks. Various environmental indicators, such as chemical pollution, change in geochemical global cycles, biodiversity loss, are due to the ever-increasing human activity. Climate change is merely one of many possible environmental indicators, and the main problem with it is that it is not exclusively of man-made origin. Therefore, instead of focusing on climate change, it would be advisable to turn our attention to much more burning environmental issues.

Keywords: **climate change, global problem, sustainability**

Introduction

„The World is a very complex system. It is easy to have too simple a view of it, and it is easy to do harm and to make things worse under the impulse to do good and make things better" (Boulding, 1986).

As it comes from the message of the phrase *"Think global, act local",* global environmental problems are present at the core of any discussion about regional sustainability issues. It is widely considered that climate change is the most important of all global environmental problems. The purpose of this paper is to convince readers that the No. 1 global environmental problem is the multidimensional degradation of the environment, directly caused by humanity. Climate change is merely one of many environmental indicators, and it is not the most characteristic one. In the climate change paradigm we'll never find out what the real problem is, and we might continue suggesting false solutions not

only to global challenges, but to a wide range of regional sustainability issues, as well.

As widely known, climate sceptics emphasize, that there is no – or no problem with – greenhouse-based global warming. They support the traditional economy, based on fossil energies. Climate fanatics on the other hand are convinced that greenhouse-based global warming is the only – or at least, the central – environmental problem. They support the so-called green economy, based on alternative energies. They concentrate on the dangers society faces from climate change, and suggest urgent actions that need to be taken immediately, which are refused by climate sceptics. Two books, written by politicians (Gore, 2006; Klaus, 2008) are an excellent illustration of the two sides. The central topic in both books is climate change itself: whether urgent mitigation is needed against climate change or whether it exists at all.

As a geophysicist, I have never doubted the reality of "climate change", since throughout its 4,5 billion years' history, the Earth's climate has been changing continuously. At the same time I think, the term "climate change" has been so much overused (not only by politicians and in everyday discussions, but also in the environmental science), that many other environmental phenomena and indicators have been almost totally ignored. Both climate fanatics and climate sceptics bear responsibility for the fact, that the No. 1 environmental topic is climate change.

Climate fanatics and climate sceptics accuse each other of profit interests. In this paper it is benignly assumed, that both climate fanatics and climate sceptics have the same objective, namely sustainability, i.e. to sustain (and enhance) the creative comforts of humanity, and both sides advertise their own solutions as exclusive.

I show in this paper that it is neither possible for humans to continue without changing the economy, as suggested by climate sceptics, nor is it possible for humans to continue with changing the economy as suggested by climate fanatics. Unfortunately, the problem is the expanding economy itself.

Before reaching conclusions, at first I give a brief summary about the state of the Earth, then some open questions in the climate change science are summarized.

The State of the Earth

In 2012 the Earth is inhabited by 7 billion people (four times more than in 1912). Several simple facts about the state of the Earth are as follows.

Energy resources

1. In 2010 global energy demand was twelve times higher than one hundred years ago. (See the series of informative figures by Tverberg, 2012). It means that the world's energy demand is driven by the economic development, rather than population growth. (In more detail: proved oil reserves cover around 40 years of today's demand, strongly concentrated in the Middle East; proved conventional gas reserves are equivalent to 65 years of today's demand; world coal reserves represent about 200 years of today's consumption, with a widely spread geographical distribution of reserves; nuclear fuel reserves are certainly enough for several generations to come (Myers, 2008).
2. It is absolutely necessary to develop alternative / renewable energy options, but it is evident (MacKay, 2008) that the so-called renewable energies are physically not able to satisfy the present energy demand of humans.

Mineral resources

3. Nevertheless, no global shortage of non-fuel mineral resources is expected in the near future (Myers, 2008). The only exceptions are the rare earth elements. In several years worldwide demand for rare earth elements is expected to exceed supply significantly (by 40,000 tonnes annually), unless major new sources are found (Fessler, 2009).

Water resources

4. More than half of all accessible freshwater resources have come to be used by humankind (Myers, 2008). Superficial waters and most near-surface waters are already polluted, therefore a large part of drinking water (and unfortunately also irrigation water) comes from aquifers. The natural recharge of aquifers is slower than consumption. Aquifer *drawdown* or *over-drafting* and the pumping of – largely fossil – water increases the total amount of water in the *hydrosphere*, which might influence the climate. Large-scale hydrological interactions (as the deviation of rivers, which supplied the Aral Sea), may be directly responsible for regional climate changes. Wada et al., 2010 presented the increasing trends of the total global water demand (which was doubled between 1960 and 2000), the global groundwater abstraction (734 ± 82 km^3a^{-1} in 2000) and the global groundwater depletion (283 ± 40 km^3a^{-1} in 2000). According to their conclusion, a large-scale abstraction of groundwater may lead to a sea level rise of 0.8 mm per year, which is about one fourth of the current rate of sea level rise of 3.3 mm per year.

Soil resources

5. The mean rates of cropland soil loss may exceed rates of formation by up to an order of magnitude.
6. With the present agricultural methods, the world is likely capable of feeding 9 billion inhabitants, expected for 2040 or 2050, but at the expense of natural ecosystems and biodiversity, soil degradation, and with little room for biofuels.
7. 30-50% of the Earth's terrestrial net primary productivity (NPP) is appropriated by human actions (Vitousek et al., 1986).

Land use changes

8. Half of the world's ice-free land surface has been transformed by human action. (The land under cropping has doubled during the past century at the expense of forests, which declined by 20% over the same period (Steffen et al., 2004).
9. Humans are now an order of magnitude more important at moving sediment than the sum of all other natural processes operating on the surface of the planet. The amount of weathering debris that compose continental and oceanic sedimentary rocks provide one such source of information and indicate that mean denudation over the past half-billion years of the Earth's history has lowered continental surfaces by a few tens of meters per million years. In comparison, construction and agricultural activities currently result in the transport of enough sediment and rock to lower all ice-free continental surfaces by a few hundred meters per million years. (Wilkinson, 2005)

Biological production, biodiversity changes

10. The extinction of species has accelerated. The loss of biodiversity is appropriated to humans.
11. Humans remove a large part of the primary production not only of the lands, but about one third of the primary production in oceans, too.

Pollution trends

12. Local air and water pollution has become (or is becoming) more and more regional, finally global. Overemphasizing the pollution due to one group (namely the so-called greenhouse gases, first of all CO_2, which is essential to photosynthesis), may lead to ignorance of pollution caused by aerosols, pesticides, fertilizers, accumulating in the global environment. The Food and Agriculture Organisation of the United

Nations observed an amazing increase in nitrogen and phosphorus fertilizer use, and also in the increase of the irrigation area (Table 1).

Table 1
Total global nitrogen and phosphorus fertiliser use and the global irrigation in 1960 and 2000.

Category	1960	2000
Nitrogen fertiliser use (10^6 tonnes)	~8	~80
Phosphorus fertiliser use (10^6 tonnes)	~10,5	~33
Global irrigation (10^9 ha)	~0,13	~0,26

Note. Food and Agriculture Organisation of the United Nations (2002).

13. Waste production is steadily increasing, in spite of re-cycling efforts. Although on very different human time scales (one day, one year, a few decades), each human product will finally become waste.

Population Growth, Consumerism, and Planetary Boundaries

Energy & mineral & groundwater & soil resources, land use changes, extinction of species and the increasing pollution are strongly inter-related issues. We entered the Anthropocene epoch (Crutzen, 2002; Zalasiewicz et al., 2008), characterized by population growth and increasing consumerism.

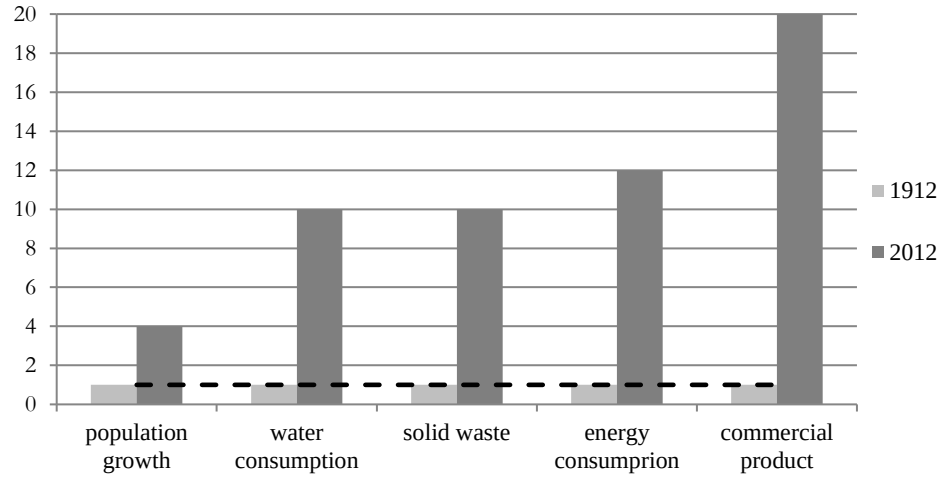

Figure 1. Growth of population, water consumption, solid waste and commercial products between 1912 and 2012. Estimation by the author.

In spite of the fact, that during the last 100 years the total biomass of humans has been increasing four times (from 125 million tons to 500 million tons, including water), the primary problem is principally not with the biomass of humans: this mass is less than that of some other species (for example the Antarctic krill or the termites). As summarized in Figure 1, during the same 100 years, humans have increased their

(1) energy consumption twelve times,
(2) groundwater consumption ten times,
(3) amount of municipal solid waste at least ten times,
(4) amount of commercial products twenty times.

The demand for global resources per capita have been increasing at a 2.5-5 times higher rate than world population. Consequently the main driving force is not over-population, but over-consumption. All activities of humans aimed at maintaining (sustaining or even enhancing) their creature comfort need more and more energy and various materials (mineral resources, water, soil, each of which is of Earth origin). The result is the degradation of the environment. The so-called "developed world", that is the richest 20% of the world's population consume 76.6% of all goods, while the world's poorest 20% consume only 1.5% (Figure 2).

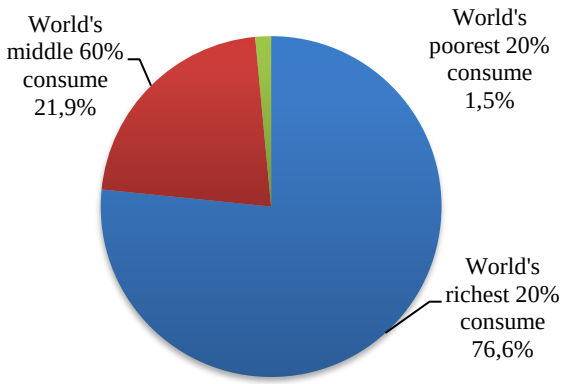

Figure 2. Share of world's private consumption. Data obtained from World Bank Development Indicators 2008.

Humans need energy, freshwater, soil (for food), suitable environment and various raw materials to assure (and even enhance) their creative comfort. These components are structured in *Figure 3*, on basis of the classification by Smalley (2003), and of the International Year of Planet Earth (Szarka, 2010).

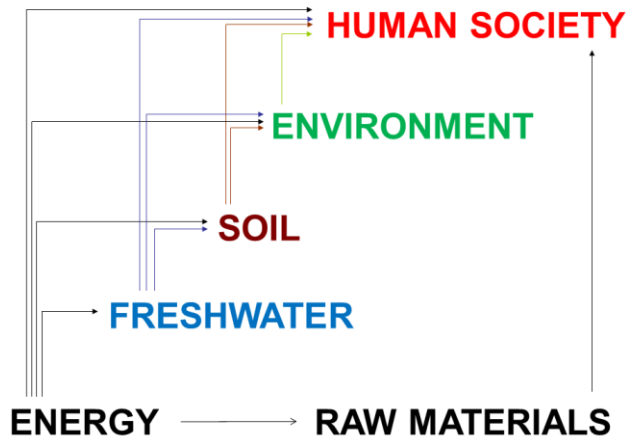

Figure 3. Energy, raw materials, freshwater, soil, environment as the elementary needs to the welfare of human society. Developed by Szarka (2010) based on Smalley (2003) and Dinya (2008).

Table 2
Planetary boundary parameters by Rockström et al. (2009), together with the comments by the author of the present paper (in the right column)

Indicator	Estimation compared to the planetary boundary value=1	Importance order	Man-made or natural?
Climate Change	~1,5	No 3	both
Ocean acidification	~0,75		man-made
Stratospheric ozone depletion	~0,4		man-made
Nitrogen cycle (as biogeochemical flow boundary)	>3,5	No 2	man-made
Phosphorus cycle (as biogeochemical flow boundary)	~0,9		man-made
Global freshwater use	~0,6		man-made
Change in land use	~0,6		man-made
Biodiversity loss	>5	No 1	man-made
Atmospheric aerosol loading	not yet quantified		man-made (mostly)
Chemical pollution	not yet quantified		man-made

Note. (1) nine parameters are of largely or exclusively of anthropogenic origin, but climate change is at least partly of natural origin, (2) change in land use and global

freshwater use is probably underestimated by Rockström et al. (2009), (3) the depleting (limited) earth resources are completely missing from the approach of Rockström et al. (2009).

Rockström et al. (2009) investigated ten environmental indicators (climate change, ocean acidification, stratospheric ozone depletion, freshwater use, biodiversity loss, the global cycles of nitrogen and phosphorus, land-use change, atmospheric aerosol loading and chemical pollution), and compared their present state to the assumed thresholds, called by them as "planetary boundaries". Unfortunately, Rockström et al. (2009) completely ignored the resources (energy, mineral resources), underestimated the effect of land and freshwater use. In spite of these problems, their approach means a great step, because they put climate change (identified with atmospheric CO_2 content) „only" in the third place (Table 2).

Climate Change

The science of the climate has NOT been settled. The following serious questions are still open.

1. The Earth's climate is a complex physical system, involving a number of different scientific disciplines, spatial regimes, and feed-back mechanisms, including the oceans, land vegetation, the atmosphere, the cryosphere, space, etc. Climate models do not include many of these physical processes, therefore the present models are insufficient to understand the climate.

2. The term "climate change" is ambiguous. The climate has never been constant during the Earth's history. Long-term periodic changes in climate are determined by the way the Earth orbits around the Sun, and by the variations in the direction of its rotational axis (Milankovich, 1969), resulting in a quasi-regular saw-toothed time variation of the temperature and the CO_2, with maximums about 420, 324, 235, 128 thousand years ago, and at present, as it is known from the climate and atmospheric history of the past 420,000 years from the Vostok ice core, Antarctica (Petit et al., 1999). The present warm period lasting more than 10 thousand years is exceptionally long. As long as the Earth continues to orbit around the Sun, a forthcoming cool period in the long term is inevitable.

3. Cooling and warming were the rules, not the exceptions for shorter time intervals (a few thousand years), too, as it is known from historic records

(the Medieval Warm Period in the 11-13th century, the Little Ice Age in the 17th century, etc.). Those periods are assumed to be connected with cloudiness changes, influenced by particles from space (Friis-Christensen, 2008).

4. Most people (even in science) think that the present global warming is due to the increase in atmospheric CO_2. The atmospheric CO_2 has been continuously increasing since 1955 (from the start of observatory records), but the global temperature was decreasing for three decades before 1970, which means that CO_2 cannot be responsible for climate change. By the way, at the beginning of the 1970s climate fanatics were worried about a possible global cooling.

Kerr (2009) all the three scenarios of near-future climate change (increasing, decreasing and oscillating around the present level) described as realistic ones. In spite of all aforementioned (and further, here not mentioned) problems, it is easily possible that a large part of the present warming is appropriated to humans, but probably not via the greenhouse gas mechanism (Miskolczi, 2010). The multidimensional human activity (transforming the land surface and the hydrological cycles) may provide alternative explanations for the man-made contribution to the present climate change. For example, the shrinking of the Aral Sea is not a consequence of climate change. On the contrary: such human interactions world-wide (as river diversions in this case) might be one of the causes of man-made climate change.

Conclusions

There are serious environmental problems due to the fact that humanity has reached the planetary boundaries, as predicted by Meadows et al. (1972). At the same time, there are uncertainties in climate science. In the early seventies, when Meadows et al. were working on their book "Limits to growth", in climatic sense, there was a cooling period on Earth. Nowadays, the global climate is thought to be somewhat warmer than 40 years ago, but the main problems, namely the limits to growth are the same, or even greater, since we have crossed the threshold of the Earth's system. It is absolutely irrelevant, how climate changes meanwhile. Climate change is not a central, but only a peripheral question among environmental problems.

My criticism to climate fanatics and climate sceptics is that the global discussion has been diverted from the basic environmental problems to a peripheral one. As long as this is the case, the direct link between human activity and its multidimensional consequences on nature remains masked. The greenhouse-based climate change should not be used as a universal explanation

to everything (as climate fanatics force it) and climate change should not be denied completely (as climate sceptics do).

I think, the No. 1 problem is consumerism, combined with population growth, which is only a secondary problem. The exponential growth on a planet with finite resources cannot be sustained in the long term. The world's richest 20 % consume more than ¾ of the goods. Due to the fact, that nearly half of the Earth's resources have already been used (most of them within the last 100 years), this unsustainable process should be ended somehow. It is completely irrelevant, how the global climate will change within the next 100 years, since we are facing much more burning issues than climate change. If global consumption could be reduced to the consumption of the middle 60% of the world population, the world's global consumption would be reduced to 36,5% of its present value. This simple example shows that it is high time to change the leading paradigm of the economy.

As Kenneth Boulding (1910-1993), a famous economist put it: *"Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist"* (Boulding, 1986).

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THE REGIONAL CURRENCY AREA AND ECONOMIC SUSTAINABILITY

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Sustainability must balance between its three dimensions: social, environment, and economy. Sustainable development requires cross-border connections built on information, integration, and participation among regional partners. This paper centers on economic (financial) integration through national/regional currencies. Given the important relationship between regional currency areas and economic development, the paper explains advantages and disadvantages of currency areas and the sustainability characteristics supportive of a currency area. Focus includes: (1) Theoretical and empirical determinants of sustainable currency areas; (2) Identification of variables and their sources which provide objective measurement of those determinants.

***Keywords*: economic sustainability, exchange rates, optimum currency areas, euro, Visegrad Four**

Introduction

Economic development must be considered in the framework of the three pillars of sustainability. Environmental, social, and economic emphasis can lead to balanced stability. However, each of these pillars is founded on numerous connections and supporting conventions. This study is directed to one of those connections, that between a common currency area and economic development. If stable currency relationships facilitate sustainable economic output and growth, and promote human development, then it is important for nations to adopt stable and sustainable currency relationships. (The authors would prefer to build the case for considering the Human Development Index [HDI] as the objective rather than economic growth, but the limited space requires that topic be covered in another paper.)

The financial system facilitates economic interactions. A stable financial system, based on sound relationships, can lead to positive economic growth and human development. However, the system must be built on sustainable relationships or the economic output, growth, and human development will not be sustainable. A key financial relationship between countries is that of the rate

of exchange between the currencies of those countries. Since the exchange rate is the link between prices and rates of return of the countries, it plays a significant role in the economic relationships of the nations.

In a recent paper, the authors addressed the financial crisis from the viewpoints of Hungary and the United States (Collins & Kacsó, 2009). The emphasis was on differences and similarities in the way the crisis entered and affected both countries as well as in the corrective actions the countries took. It was a global crisis, but the impact affected countries differently. Our work also stressed the connections between countries. The integrated nature of financial markets transferred the crisis worldwide.

The effects of the crisis can rightly be called shocks to the nations, and those effects were not uniform across nations. They were asymmetric shocks. Neither were nations' abilities to react to the shock symmetric. Some countries were able to sustain economic output or rapidly return to pre-crisis output level, while most were not.

One possible policy tool to apply to the impact of an asymmetric shock is an exchange rate change, an automatic change if freely floating, or an administrative change if a pegged rate. However, exchange rates which change leave business firms facing uncertainty. Furthermore, those nations within the European Union have or are expected to surrender their national currency to join in the common currency of the Euro.

The Visegrad Four

Nations joining the European Union are expected to progress toward joining the common currency, the Euro. This will be most advantageous when a nation is ready, when its economy is compatible with being a member of a common currency area, specifically the Euro area. We consider this question in general and from the viewpoint of the "Visegrad Four," the Czech Republic, Poland, Hungary, and Slovakia. These four, so named for an historical trade relationship dating from 1335 and recently a summit in 1991, all entered the European Union May 1, 2004. Requirements for joining in the Euro are:

1. To follow the Exchange Rate Mechanism (ERMII) by maintaining the currency within ± 15% of a central rate with the Euro.
2. Adhere to the other convergence criteria:

   a. Price stability: The inflation rate of a member state must not exceed by more than 1.5 percentage points that of the three best-performing member states.

   b. Control government finances:

      i.) Annual: Government deficit must not exceed 3% of GDP.

ii.) Debt: Government debt must not exceed 60% of GDP. If it does, it must be approaching 60% at a satisfactory pace.

c. Long-term interest rates: Nominal long-term rates must not exceed by more than 2 percentage points the average long-term rates of the three best-performing countries based on price stability.

As Table 1, illustrates, the Visegrad Four have taken quite different paths toward joining the Euro. Slovakia has already met the requirement (January, 2009), but the others have yet to join the ERMII. As Table 2 illustrates, none including Slovakia actually met the convergence criteria in 2011.

Table 1

Exchange rate mechanisms – the example of the "Visegrad Four" (from the beginning of the EU membership)

Country/year	2004	2005	2006	2007	2008	2009	2010	2011
Czech Republic	Managed float							
Poland	Floating							
Hungary	Currency-stripe ± 15%				Floating from 26. 02.	Floating		
Slovakia	Controlled Floating	Controlled floating ERM II (28.11.2005)		ERM II		Joined Euro (01.01.09)		

Note. Adapted from Annual Report on Exchange Arrangements and Exchange Restrictions, International Monetary Fund. Various years.

Table 2

Meeting the Convergence Criteria – Visegrad Four

		Price Stability		Government Budgetary Position		ERM II	Long–Term Interest Rate	
		HICP Inflation	Ref Value	General Govt. Surplus (+) or Deficit (-)	General Govt. Gross Debt % GDP	Currency Participating ?	Long–Term Interest Rate	Ref Rate
Czech Republic	2008	6.3	3.2	-2.2	28.7	No	4.6	6.5
	2009	0.6	3.2	-5.8	34.4	No	4.8	6.5
	2010	1.2	1.0	-4.8	38.1	No	4.7	7.8
	2011	2.1	1.0	-3.1	41.2	No	3.9	7.8
Hungary	2008	6.0	3.2	-3.7	73.0	No	8.2	6.5
	2009	4.0	3.2	-4.6	79.8	No	9.1	6.5
	2010	4.7	1.0	-4.2	81.4	No	7.3	7.8
	2011	3.9	1.0	4.3	80.6	No	7.6	7.8
Poland	2008	4.2	3.2	-3.7	47.1	No	6.1	6.5

		Price Stability		Government Budgetary Position		ERM II	Long–Term Interest Rate	
		HICP Inflation	Ref Value	General Govt. Surplus (+) or Deficit (-)	General Govt. Gross Debt % GDP	Currency Participating ?	Long–Term Interest Rate	Ref Rate
	2009	4.0	3.2	-7.4	50.9	No	6.1	6.5
	2010	2.7	1.0	-7.8	54.8	No	5.8	7.8
	2011	3.9	1.0	-5.1	56.3	No	6.0	7.8
Slovakia	2008	3.9	3.2	-2.1	27.9	Yes	4.7	6.5
	2009	0.9	3.2	-8.0	35.6	In Euro	4.5	6.5
	2010	0.7	1.0	-7.7	41.1	In Euro	4.8	7.8
	2011	4.1	1.0	-4.8	43.3	In Euro	3.9	7.8

Note. Adapted from Eurostat, Statistics, European Commission.

Financial Interaction

Financial interaction is conducted through the international monetary system, "the institutional framework within which international payments are made, movements of capital are accommodated, and exchange rates among currencies are determined" (Eun & Resnick, 2012). Since 1944, the multilateral body with oversight for the international monetary system has been the International Monetary Fund (IMF). Currently 188 countries are members of the IMF.

Among other responsibilities, the IMF has oversight responsibilities for exchange rate arrangements. Countries may allow their exchange rate to be freely floating; attempt to fix or peg their currency to another currency or basket of currencies; or employ a managed floating model somewhere in-between. While experts differ on the definitions and numbers, approximately 110 currencies could be considered fixed, 46 managed float, and 33 freely floating. Many of the currencies in the fixed exchange rate set are fixed against the currencies of neighboring or regional countries. Stable currency relationships may facilitate sustainable economic activities in the region. Rogoff, Husain, Mody, Brooks, and Onmes (2003) find developing economics show more growth under fixed rates.

Characteristics of exchange rate arrangements considered most desirable include: stable currency value relationships; markets open to international financial flows; and independent monetary policy. Unfortunately, these three characteristics are incompatible; only two of the three can exist in a country at a time. To have stable rates and be open to financial flows denies a country the use of its monetary policy. The Euro-area countries face this scenario. China reflects the case of stable currency and the ability to use monetary policy, but at the cost of having a financially closed economy. The United States is representative of

the third case, open financial markets and monetary policy control but unstable (floating) currency.

Both fixed and floating rates have advantages. Business seeks the stability of fixed rates, and proponents argue that lack of that stability leads to a reduction in international trade and investment. They claim the resulting resource allocations fail to maximize output and growth.

Arguments for floating rates, determined through the interaction of supply and demand, are really arguments for automatic adjustment. Changes in underlying supply and demand conditions in the goods and capital markets can lead to significant effects on the real economy. If a country experiences a negative shock causing widespread unemployment, a correcting drop in real wages is required. However, in most economies nominal wage rates are relatively inflexible downward. The exchange rate, as a link between price levels in the countries, can help make the adjustment effectively and quickly. The necessary adjustments will be transferred rapidly through the economy.

Fiscal, monetary, foreign exchange, and administrative policies (such as price controls or limits on capital mobility) all may be utilized to bring about adjustment in an economy. With floating rates, the foreign exchange policies are not available to policy makers, but supply and demand in the market lead to (almost) automatic adjustments. Fixed rates allow a government to use foreign exchange policy, but only on an occasional basis and usually only by making large incremental changes.

Currency Areas

A currency area is "a domain within which exchange rates are fixed." (Mundell, 1961, p. 657). The fixed rates of the currency area may float against the rest of the world but remain set against one another. Still, "there will be a major difference between adjustment within a currency area which has a single currency and a currency area involving more than one currency" (Mundell, 1961, p. 658). Discussions of the optimum currency area usually assume the former, a currency union wherein all member countries surrender their national currency and adopt one common currency.

Several members of the European Union became a common currency area beginning in 1999 with the establishment of the Europe Monetary System and the adoption of the Euro. Now 17 countries are full members in the Euro area. They have surrendered their national monies monetary policies to the European Central Bank. Twenty-seven other countries use the euro as a currency anchor; 24 that are tightly pegged and three with a managed float. Included in the 24 are the 14 members of the CFA franc zone. The CFA franc zone consists of two common currency areas: the West African Economic and Monetary Union with

eight countries; and the Monetary Community of Central Africa with six countries. They share the CFA franc which is pegged to the Euro.

The Eastern and Caribbean Currency Union has six members. They share a common currency, the East Caribbean dollar which is pegged to the US dollar. In addition to these six countries, six others either use the dollar as their legal tender or have adopted a currency board and pegged their currency to the U.S. dollar.

The currency areas with a common currency must surrender independent monetary policy, as do those countries which have adopted a currency board. Rates which are truly pegged must do that also. Briefly, the advantages and disadvantages of a common currency area are presented as follows.

The arguments put forth by the European Union in support of the Maastricht Treaty and the European Monetary Union were: reduced transaction costs from currency conversion; reduced currency exposure; increased transparency of prices and enhanced competition; capital market developments, including depth and liquidity leading to reduced costs of capital; and improved political cooperation (One Europe, One Economy, 1991). Later, Frankel and Rose (1998) added the benefit of a reduction in asymmetric shocks resulting from increased economic integration.

Costs for joining a common currency area stem from the loss of independent monetary policy. Centralized monetary policy leaves individual countries (or regions) with fewer tools to use to react to a shock. If the shock is symmetric, affecting all nations in the common currency area roughly equally, the central monetary authority can take actions to benefit all countries in the currency union. However, an asymmetric shock, affecting the countries differently, most likely cannot be addressed with a single tool or policy that affects each country positively. The recent financial crisis is an example of such as asymmetric shock. Greece had a much stronger reaction than Germany, and Greece had few ways to react, easy money and a reduction in interest rates were unavailable.

The magnitude of costs and benefits depend on specific factors. The extent a country or set of countries has or shares certain characteristics will determine the benefit/cost menu. Another way to state this is, specific country characteristics support joining a currency area or remaining independent with either a freely floating or managed floating currency. Understanding and assessing these factors is a necessary step in the analysis of the decision to join a currency union or not, in answering the question, “How can we decide if Hungary or other Visegrad countries should join the Euro-Area?”

Determinants of Common Currency Area Compatibility

Mundell is usually given credit for introducing the question of the optimum currency area, “What is the appropriate domain of a currency area?” (Mundell 1961, p. 657). A number of other scholars followed. Two who receive credit as

original contributors include McKinnon (1963) and Kenen (1969). A useful approach is to identify and briefly discuss factors cited as favorable or unfavorable for a common currency area by key scholars. In doing so, we draw on the excellent summary by Tavlass (2009).

Mundell's (1961) path breaking contributions to the theory of optimum currency areas include a change of thought from a country to a region. He explained factor mobility, labor or capital, provides an adjustment mechanism when a shock affects the economy. He further argued wage/price flexibility also could be a source of adjustment. In addition, he identified asymmetric shocks as having an inverse relationship with a strong common currency area.

McKinnon (1963) added the levels of openness and integration as determinants of how suitable a currency would be for a common currency area. He argued open economies have built-in adjustments through the relative prices in the markets and so could function with fixed exchange rates, or join a currency area. Those open economy countries trading with one another were particularly strong candidates to form a common currency area. Economies that are relatively closed need the currency adjusting features of a floating rate arrangement.

Kenen (1969) brought fiscal integration into the analysis; closer fiscal integration makes monetary integration more compatible. He also introduced diversification in production and consumption. He added the argument that without factor mobility, across sectors and geographic areas, diversity may be inadequate to provide recovery from shocks. A More comprehensive set of determinants supporting the common currency would include:

- High labor mobility
- High capital mobility
- More wage/price flexibility
- More open economy
- High trade integration
- High fiscal integration
- Sustainable fiscal integration
- Greater product diversity
- More similar economic structure
- Less frequent asymmetric shocks
- Smaller economy is more suitable for fixed rates

Assessing Suitability

Many of the factors identified in section V have been tested in earlier papers. In this section, we discuss factor assessment models that would meet the overall objective of reaching a decision: Should a country give up its currency and join a common currency area? The output of our factor assessment would provide

economic input into a decision that is both economic and political. The authors do not intend to address political factors.

Factor Mobility, Labor: If labor is willing and able to move from one industrial sector to another or from one geographic area to another, within the common currency area, that process will allow adjustment to asymmetric shocks. For example, in the United States, a recent boom in the energy industry of North Dakota has led to significant migrations. However, measurements of mobility vary, and it is unclear what measure is most meaningful: any movement; cross-border migration; or migration between regions within a country.

Recent data sources on mobility include the Eurobarometer (GESIS) and the European Labor Force Survey which are relatively new sources of data on migration. A recent study by Bohin et al., (2008) presents significant correlation between lifetime job changes and internal mobility based on this data. These sources should provide relative data for Hungary or other countries considering joining the Euro area.

Factor Mobility, Capital: Although the data is presented in summary form and generally on an annual basis, capital account balance of payments data is available from reliable and consistent sources including the International Monetary Fund and the United Nations as well as the European Union. While the analysis between different sub-categories may be necessary, assessing relative capital mobility should be straightforward based on the capital flows.

Wage/Price Flexibility: The wage/price flexibility in a country depends on a number of things including labor laws and collective bargaining agreements. Multi-employer collective bargaining agreements have a much higher percentage of covered workers and low wage flexibility. Single-employer agreements yield lower percentages of covered workers and are thought to have higher wage flexibility.

The European Industrial Relations Observatory on-line, published by Eurofound, a European Union body, has data by country on collective bargaining agreements. For several sectors it shows the percent of workers covered by union contracts, and whether a sector uses multi-employer or single-employer bargaining agreements in that country.

Open Economy: McKinnon (1963) first introduced the concept "of the openness of the economy, i.e., the ratio of tradable to non-tradable goods" (McKinnon, 1963, p. 717). It was his argument that a more open economy is better suited for a fixed exchange rate regime than a freely floating one. A more open economy is better suited for a common currency area with its trading partners. A standard measure of openness is imports as a fraction of Gross Domestic Product (Import/GDP). (See Kotil et al., 2009 for application of that measure.)

There are numerous sources of reliable balance of payment data one may use to construct this measurement for individual countries, areas, and benchmark comparisons. Among them are the United Nations, International Monetary Fund, and the World Bank.

High Trade Integration: Most countries maintain trade data by country on exports and imports. This data will be used to assess the level of trade interaction between a country and other countries in a potential common currency area.

High Fiscal Integration: Two of the original Maastricht Treaty convergence criteria are fiscal measures. The requirement that any fiscal deficit may not exceed three percent of GDP puts a limit on the current fiscal conditions. The requirement that public debt may not exceed 60 percent of GDP limits the fiscal policies over time. These fiscal measures, even though they were (possibly) not met by all of the original Euro members in 1999 and are not met by all 17 now, are two available and basic values for consideration. Others include average tax rates as a percent of income, total tax as a percent of GDP, and total government spending as a percent of GDP. All this data is readily available from national sources and also through the European Union.

Sustainable Fiscal Integration: In order for fiscal integration of independent nations to be sustainable, there should be requirements or guidelines, written and understood, which the nations follow. In a one nation currency area, such as the United States, this coordination is easy as there is one government. In the Euro area there are 17 governments. The European Union "Treaty on Stability Coordination and Governance" currently in the approval stage could be such a statement of guidelines and agreement.

Assessment of the fiscal sustainability of fiscal integration should include longitudinal examination of those convergence measures mentioned above, namely annual deficit as a percent of GDP and total debt as a percent of GDP.

Less Frequent Asymmetric Shocks: Frenkel and Nickel (2005) examined shocks for EU and Central and Eastern European countries based on real GDP data obtained from the IMF's International Financial Statistics and Eurostat. Shocks may be specified as supply shocks or demand shocks. Correlations between countries or between one country and sets of countries, such as the Euro-area may be performed. Correlations between the types of shock (supply or demand) determine the levels of asymmetric shocks.

Summary and Further Research

Foreign currency exchange is a vital connection between nations, and a vital link in supporting financial development. Forming the link between the prices and rates of return in different countries, stability in the exchange rate mechanism is a key factor in that economic development. One mechanism, of upmost concern

for countries in Central Europe such as the Visegrad Four, is the common currency of the European Union, the Euro.

How does a country measure its readiness to give up its national currency and fix its rate and monetary policy to currency area money? The most significant measures are listed and discussed earlier in the paper. Key among them are factor mobility, fiscal integration, and the sustainability of that integration. This paper identifies measurable variables and sources for those variables.

Summarizing those factors which support joining a common currency area and identifying variables and sources of those variables are the contribution of this paper.

The next step in this research is to collect the data and present a complete assessment for the Visegrad Four with special regard to the Euro-based evaluation of Slovakia. To estimate the sustainable economic development we will use the HDI (Human Development Index) as well. We would like to note that all of the nations considered in this analysis have higher HDI rankings than their GDP per-capita rankings. E.g.: in 2011 the HDI world rankings were: USA 4th; Czech Republic 27th; Slovakia 35th; Hungary 38th; and Poland the 39th. The ranking of these countries by GDP per-capita is the same but they are in a much lower position: USA 10th, Czech Republic 47th, Slovakia 51st, Hungary 57th, and Poland 58th (CIA, 2011.). We also will direct our future examination on the reasons and background of the above-mentioned deviations.

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THE ROLE OF TECHNOLOGY IN REALISING SUSTAINABLE REGION

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In the 21st century, due to the emergence of information and communication technologies (ICT), we have to face new challenges in achieving sustainable development. It is widely accepted that the main determinant of economic growth is innovation, which is often associated with the regional concentration of economic activities. It is because the geographical proximity facilitates knowledge and technology transfer and also spillovers that generate technological progress. According to the ICT–based new techno–economic paradigm, less developed regions can catch up with the leaders because knowledge became the main economic resource. Emphasizing the role of technology, this paper evaluates the current situation of Northern Hungary, which is one of the least developed regions in Hungary and provides recommendations on how sustainable economic development could be realised.

***Keywords*: technology, ICT, regional development, sustainability, human resources**

Introduction

Technology plays an important role in explaining cross-country income inequalities[1]. Modelling innovating and non-innovating countries, Krugman (1979) pointed out that the knowledge and material resources required in realising innovation which is available in developed countries, while developing countries can benefit from them due to the diffusion of technologies. The aim of research, development and innovation (RDI) is the creation of new knowledge and putting it into practice. The regional concentration of economic activities facilitates technology and knowledge transfer that generate technological progress which is the driving force of the economic growth.

At the end of 20th century a new techno–economic paradigm shift began due to take place the expansion of information and communication technologies (ICT). The development of information technology, electronics, and mobile

[1] The relevance of technology in economic growth and income inequalities is emphasized in e.g. Solow (1956), Fagerberg (1987), Barro & Sala-i-Martin (1997), Hall-Jones (1999), Easterly-Levine (2001), Mokyr (2003) and Caselli (2004).

communications provide a basis for the information society. The role of knowledge is increasingly important to implement innovation in economy. Employees of the knowledge economy have to face new challenges such as the continuous development of their skills and competences, i.e. participating in lifelong learning.

In Hungary, following the regime change, the economic restructuring processes increased regional differences. The regional policy of the EU aims at reducing territorial and socio-economic disparities among European regions. Except for Central Hungary, the Hungarian regions belong to the less competitive regions of the EU, but their economic performance can be improved by exploiting the benefits of the knowledge economy. ICT has the potential to improve economic efficiency and facilitate the diffusion of technologies. In recent years, the knowledge became the source of sustainable competitive advantage (Karvalics & Kollányi, 2006). High-quality education or skilled human capital is a basic requirement for successful economic performance. In the 21st century the knowledge-based economy makes it possible for the less developed regions to catch up.

This paper focuses sustainable regional development and emphasises the role of technology. Long-term growth is influenced by technological progress which can be sustainable in external and internal economic balance without environmental damages (Erdős, 2004, p. 389). This study evaluates the economic situation of Northern Hungary, which is one of the least developed regions in Hungary.

The Economic Situation of Hungarian Regions in the EU

The establishment of regions was necessary for Hungary's accession to the EU in 2004. In line with the NUTS[2] system, 7 planning regions – Central Hungary, Central Transdanubia, Western Transdanubia, Southern Transdanubia, Northern Hungary, Northern Great Plain, and Southern Great Plain – have been created in Hungary. The regional GDP is used for comparing the economic performance of regions (Pukli, 2000). To evaluate the economic situation of Hungarian regions in the EU, the GDP per capita (PPS) in percentage of the EU–27 average is examined (Figure 1).

[2] The NUTS (Nomenclature of Territorial Units for Statistics) classification is a hierarchical system for dividing up the territory of European Union at different levels. At NUTS 2 level, there are the planning and statistical regions which support the realization of the EU's regional policy which targets catching up of underdeveloped regions.

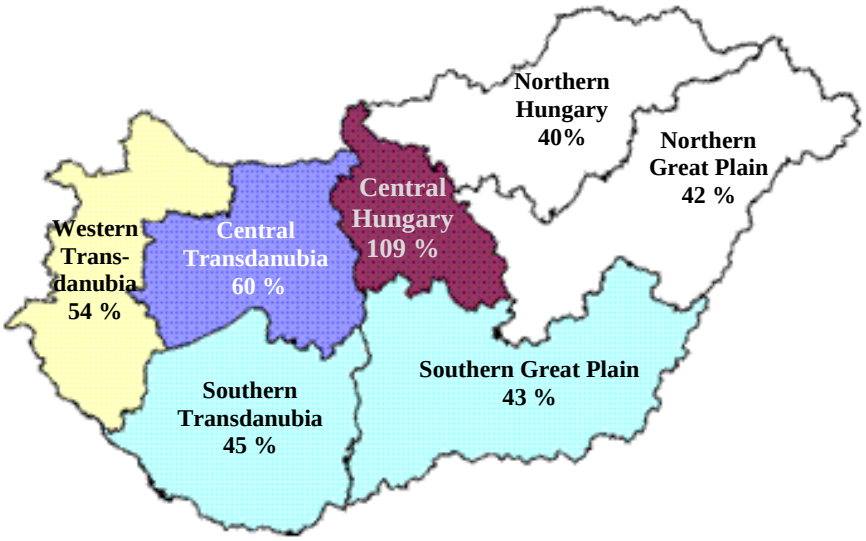

Figure 1. GDP per capita (PPS) in Hungarian regions. Data obtained from Eurostat.
Note. Percentage of the EU–27 average (2009).

The data show all regions are significantly below the EU average, except for Central Hungary. In 2009, the Hungarian GDP per capita was 65% of the EU–27 average, while four regions produced less than half of the EU average, these are in the last third of the EU rankings. The overall economic position of Hungary in the EU is improved by the performance of Budapest and Transdanubia, where the level of employment and labour productivity is much better than the country average. The eastern and southern parts of Hungary are less developed.

According to Lengyel (2003), there are three parts of Hungary, each in a different developing stage. Central Hungary and Budapest are innovation-driven, Western and Central Transdanubia are investment-driven with large companies, and the others that produce for domestic market and have less competitive industries are factor-driven (ibid). In recent years the performance could have been better, but there is no real convergence across regions. The observed improvement in economic indicators is due to the EU's financial support and the accession of new member states, which considerably lower the EU-average. A fundamental question emerges, however, whether the European financial resources are being spent on appropriate, long-term sustainable and remunerative developments or the present practice of investments. Esteeming human resource development, as of secondary in importance, being not really effective and hardly resulting in anything positive on socio-economic development, will be continued (Kovács, 2009b). However, the human resources development is the most important field of all developments, without qualified

employees there is no social and economic development, and especially no knowledge-based society (Kovács, 2009a). To better illustrate regional disparities in Hungary, Figure 2 shows the GDP of the Hungarian regions as a percentage of the national average in the year of accession (2004) and in 2010 (latest data found).

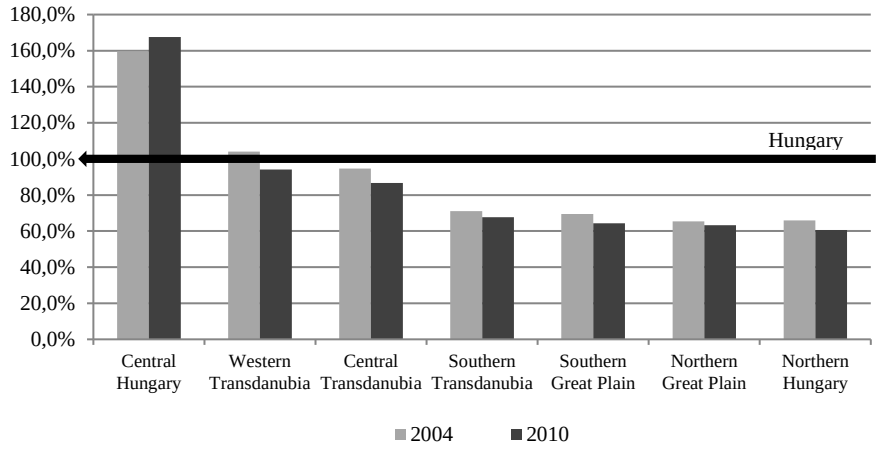

Figure 2. Per capita GDP as a percentage of the national average by NUTS 2 regions in 2004 and 2010 (Hungary=100%). Adapted from the Hungarian Central Statistical Office.

Figure 2 shows that the economic performance of Central Hungary has improved since the EU's accession, but that of other regions became worse. The differences between regions grew larger every year. Northern Hungary is the most lagging region; its performance is 61.18% of the national average, while Central Hungary is more than double the average. Zsúgyel (2006) analysed Northern Hungary's situation in the European economic integration and found that this region is underdeveloped in several fields such as demographic situation, health, agriculture, tourism and labour market which contributes to poor economic performance.

Summarising the economic development level of Hungarian regions, we can say they are lagging behind average of the EU, except for Central Hungary. The differences within the country are growing, thus it is vital to take advantage of the knowledge economy. Whether it will be possible or not, it depends on the demographic process, the solutions of labour market problems and the quality of human resources[3].

[3] In this respect, the *moral deficit* of the Hungarian society is an important question. Hungary today does not appreciate convertible and extendable knowledge gained by tenacious and hard

Sources of Sustainable Regional Development

Technology plays an important role in cross-country income variance because it increases efficiency and influences productivity. The technological potential of a country is related to the availability of physical and human factors. Technology or knowledge is the accumulation of ideas which improve the productivity of an economy (Jones 1995, pp. 764−765). As Dedák (2000) pointed out, in terms of economic growth human capital, including skills, competences, and knowledge is as important as physical capital. Human resources linked to physical factors are necessary but not sufficient to realise technological progress, as according to Fagerberg (1994), social capability and technological congruence are required for a country to adopt new technologies[4]. Fagerberg, Shrolec and Knell (2007, p. 1597) pinpointed three sets of factors that determine the growth rate of a country: (1) the potential for exploiting *knowledge developed elsewhere;* (2) the creation of *new knowledge* within the country; and (3) the *growth in the capacity to exploit* or absorb *knowledge*. Technological progress is the process realised by the combination of physical and human capital in a suitable institutional environment.

At the end of 20th century, the diffusion of ICT induced revolutionary changes in the economy[5]. Examining the industrial revolution, Mokyr (1990) concluded that the unprecedented macro-inventions and incremental micro-inventions have significant impact on income; technological change is the result of human creativity. Improvements require human resources in quality rather than in quantity. Skilled labour is only valuable for the economy if the labour market can utilize these skills. On the other hand, ICT provides opportunities to activate inactive population to work in flexible working hours or other types of atypical employment.

In Europe, technological change influenced countries' income in a different way, which caused significant territorial disparities. During the period of socialism, there is a lack of technological progress (Kornai, 2010). Cross-country differences can be explained by several factors, most importantly geography and culture[6]. Geography includes climate, ecology, and natural resources as well as the geographical conditions of a region. Culture affects

learning by which society basically underestimates its economic relevance, i.e. by this inevitably negative, short-sighted approach also paralysing the possibility of its own ascent (Kovács 2009b)

[4] Social capability depending human factors, is the ability of a country to import a technology or create a new one. Technological congruence related to physical factors, is compatibility requirement i.e. new or accepted technology can fit to the existing system (Fagerberg, 1994)

[5] The ICT paradigm is called third industrial revolution, e. g. Freeman and Louça (2001), Perez (2004)

[6] Acemoglu (2009) classified the fundamental causes of economic growth into four categories such as institutions, geography, culture and luck.

characteristics of human resources, including innovation skills. The environment described by geography and culture creates opportunities for the society that determine technologies available (Acemoglu, Johnson, & Robinson, 2005).

Technological progress is the driving force of economic growth which contributes to better economic performance. The regional concentration of economic activities facilitates technology and knowledge transfer, which requires innovativeness and ability to successfully compete in markets. The role of informal institutions is essential because they create the basis of development. The regional policy of the EU aims to reduce territorial disparities between European regions. According to Tabellini (2010) calculations, culture is strongly correlated with current regional economic development, examining education, urbanization and national effects. In Hungary, regional differences mainly owing to the different economic structure, infrastructure, human capital and innovation. Sustainable development requires that a country applies appropriate technology in energy efficient ways without harming nature and society.

A Case Study of Northern Hungary

Northern Hungary lies in the north-eastern part of Hungary, bordered by the Slovak Republic from the north, Central Hungary from the west and the Northern Great Plain from the south and east. In terms of geographical and natural endowments, tourism has an important role in the economy of the region. The region is rich in natural and historical attractions. World Heritage Sites can also be found within the region, such as Hollókő, the Caves of Aggtelek Karst and the Historical Wine Region of Tokaj. Northern Hungary is the fourth largest region with one of the highest population density in the country. It is a geographically well–situated region which is rich in natural resources. The economic structure is unfavourable, because the industry is dominant but non-competitive. After transition, in the 90's, there was a great decline in heavy industry and primarily in mining and machinery, which caused high unemployment, but the industrial nature of the region has been preserved as yet. In Northern Hungary there are only few large companies with strong market position, mostly in the chemical and the machine industry. The small and medium-sized enterprises suffer from lack of capital and of liquidity problems. There are few investors and insufficient investment capital to develop. The R&D activity and the technological level are low. The state of the infrastructure improved during the last years. The competitiveness of the region is weak as a result of demographic and labour market problems (Figure 3).

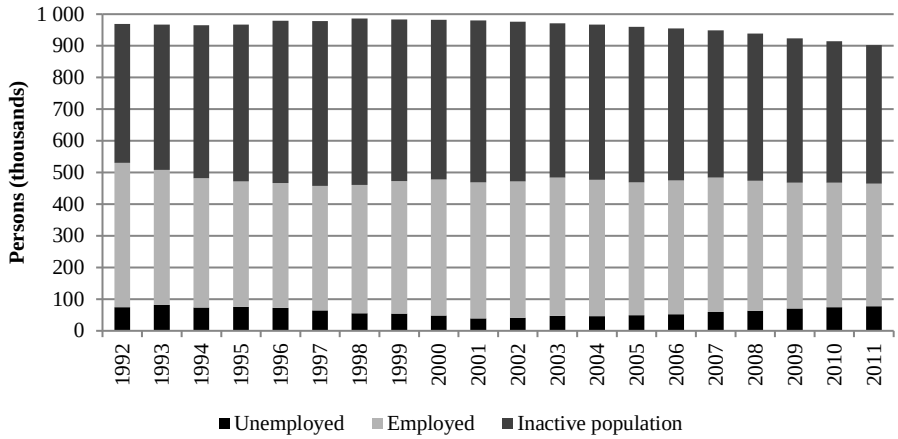

Figure 3. The economic activity of the population (aged 15–74) in Northern Hungary 1992–2011 adapted from Hungarian Central Statistical Office

Figure 3 shows the demographic trends in Northern Hungary in the last two decades. The population was decreasing in the 2000s, which is a general trend in the country for several years. There is a significant increase in the unemployment rate and a decrease in the activity rate. In the region the unemployment rate was the highest one in Hungary (16.7%) and the activity rate was the lowest (51.5%) in 2011[7]. The decreasing activity rate and the increasing unemployment rate result effective demand reduction. The dominance of Budapest in the country's labour market causes intense migration towards the capital.

Northern Hungary suffers from certain problems in the field of the quality of human resources too, but there is potential to improve. The lack of motivation and historically evolved work-culture are the worst problems in the labour market. According to the PISA report (OECD, 2004) test in Hungary the lack of basic knowledge (even problems with reading and writing) is a problem which prevents employment. There are few well-paid jobs so emigration threatens the region because qualified graduates tend to move to Budapest, the Transdanubia region or abroad. The development, based on ICT and higher education, can realise mostly in the region's core cities only (Miskolc, Eger, Gyöngyös, and Hatvan). The role of university research in (regional) economic development is examined with increasing intensity by the literature focusing on the "third" or "entrepreneurial" mission of higher education institutions. Novotny (forthcoming) shows that Hungarian university scientists are not less active in

[7] In Hungary the activity rate is about 10% lower than in European Union and 20% lower than in USA. This is the major weakness of Hungarian labour market.

transferring technology to the business sphere (regarding the ratio of faculty members taking part in technology transfer) than their American colleagues, however, motivations for entrepreneurial behaviour are not entirely identical in the two regions.

As Kocziszky (2007) pointed out, the development program of Northern Hungary for the 2007-2013 period aims to strengthen the competitiveness of the region and to reduce the regional, social, and economic differences in the region at the same time (Norda, 2006). The competitiveness of the region mainly depends on innovation, the transformation of the economic structure, good transport, and the quality of human resources. All these can create an investment-friendly environment, which supports R&D activity and innovation coupled with well-qualified workforce and can eventually realise technological progress.

Conclusion

Technological progress is the driving force of economic growth. It can be realised in innovation coupled with qualified human capital as well as physical capital in a suitable institutional environment. In the 21st century the ICT began a new technological wave, where the importance of knowledge is emphasized. The ICT induced knowledge-based economy makes possibilities to mitigate regional differences. European regional policy aims to reduce territorial disparities and ICT is a potential tool to achieve this.

Northern Hungary is one of the least developed regions in Europe. The economic structure is unfavourable. Industry is dominant, the RDI activity is low, and the infrastructure is below par. The region suffers from several problems mainly concerning human resources which should be improved in quality. The activity rate of the region is the lowest, while the unemployment rate is the highest in the country. The quality of human capital is low. The first step to take in the technological progress is developing human resources. Nowadays the learning-knowledge-innovation triangle gives the fundaments of a successful region. There is a potential in human resources to make Northern Hungary a competitive region. In a sustainable region innovation and technology dominates coupled with qualified human resources protecting natural environment.

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FIVE ASPECTS OF CLIMATE CHANGE REGARDING SUSTAINABILITY

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Selected aspects of global and regional climate change, including response by society and education are tackled. They answer to the following five questions: Does climate system respect the GAIA-hypothesis? Shall we expect more extreme events? Has energy- and carbon efficiency been increasing in Hungary? Does global warming affect our renewable energy potential? Can we support sustainability educating of and by climate change? The answers given by the study are: Several processes do not. Not all, for sure. Yes, considerably. Yes, but not too strongly. Yes, in both directions. Eight figures and three tables are included.

Keywords: GAIA-hypothesis, extreme events, Kaya-identity, renewable energy, education

Introduction

Recent climatic changes enhance the challenges of sustainability. Any long-term change would do so, but, as the scientific climate projections indicate, they will hardly be either advantageous, or quantitatively predictable, especially at the regional and local scales. The present study will tackle the following eight aspects of climate and sustainability:

- Does climate system respect the GAIA-hypothesis?
- Shall we expect more extreme climate events?
- Does global warming affect our renewable energy sources?
- Is energy- and carbon efficiency increasing in Hungary?
- Can we support sustainability by education of and by climate change?

The first two questions deal with climate science, followed by two ones related to the response by society. The last question is special, as education establishes the basis for the next generation's response. The paper is an essay, reflecting the authors' ideas in the questions.

Does Climate System Respect the GAIA-hypothesis?

The Gaia-hypothesis (Lovelock, 1972) postulates that the Earth is a self-regulating *system*, called Gaia (the ancient Greek goddess of the Earth), which tries to keep the physical and chemical environment optimal for contemporary life via biological and geological processes.

However, there are several processes in the climate system, which do not support this hypothesis in case of the present and future global warming. For example, cloudiness was considered as key regulator of our climate, for many years, keeping it stable through its effects on the atmospheric radiation balance. But, as *Figure 1* indicates, cloudiness expresses positive, i.e. enhancing feedback on the global mean temperature.

Spatial details of this behavior are seen in *Figure 2*, showing the expected changes of cloudiness. At the law and lower temperate latitudes, where the solar radiation is larger than the outgoing long-wave irradiation by the surfaces and clouds, decrease of cloudiness means even more radiation income, i.e. further warming the surface-atmosphere system. On the other hand, at the high and higher temperate latitudes, where cloudiness is increasing according to the models, steep rays of the Sun and the high initial amount of cloudiness make the incoming radiation smaller than the outgoing radiation. Hence, in these regions the increasing cloudiness means more energy retained by the system, i.e. further warming, again.

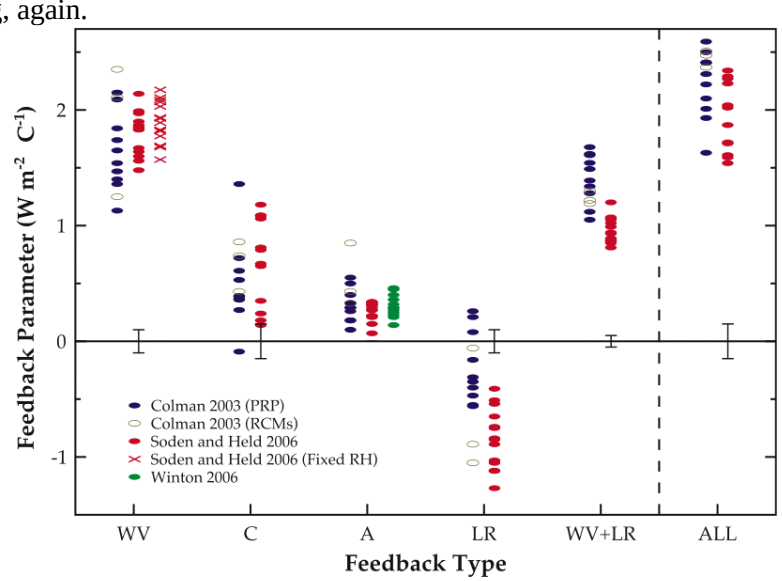

Figure 1. Effects of the key feedback mechanisms on the sensitivity parameter of climate. Data obtained from IPCC, 2007: Fig. 8.14.

Note. (λ) in the equation $\Delta Q = - \lambda \Delta T$, where ΔT is the change of the global mean temperature caused by the ΔQ modification of the Earth's radiation balance. Without any atmospheric feedback mechanisms, $\lambda = -3.2$ W $m^{-2}C^{-1}$. The involved feedbacks are the so called water vapor- (WV), cloud- (C), surface albedo- (A) and lapse rate (LR) feedbacks.

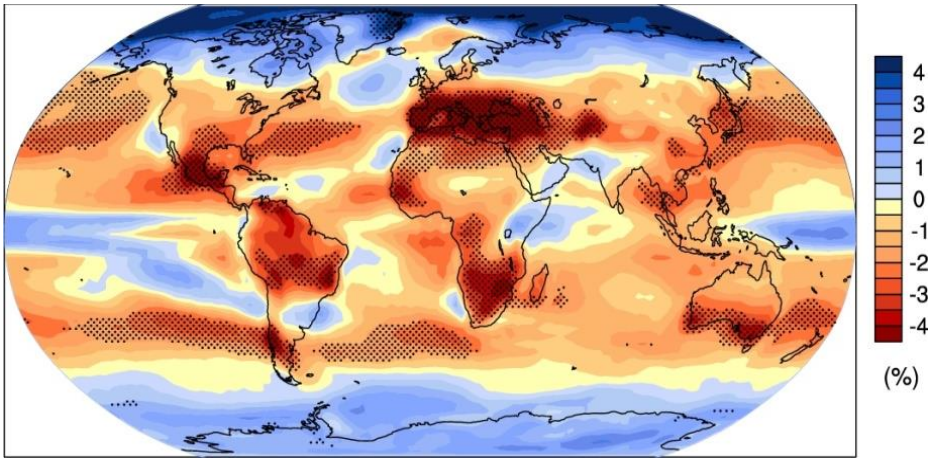

Figure 2. Average the projected changes in cloudiness (%) derived from the GCM results. Data obtained from IPCC, 2007: Ch. 10, Supplement.
Note. Areas of significant changes, compared to the inter-model variance, are marked by points.

Both figures exposing cloudiness are results of global climate models. But, are we sure that they are convincingly good to support so complex questions? *Fig. 3* shows the strongest argument for this statement. The observed variations of the global mean temperature are successfully simulated by the 14 global climate models, reproducing the past changes under influence of all known anthropogenic and natural climate forcing factors. But, if leaving out the anthropogenic ones, i.e. allowing just natural factors, like volcanic eruptions and solar activity to act, this simulation clearly departs from the fact. So, warming of the recent half-century was mainly driven by the anthropogenic factors.

Correspondence between the observed and simulated curves proves that global climate models simulate the climate changes fairly well at the global and continental scales. This is also the basis for further considerations on regional features and effects of future warming, as well as for the response by the society, i.e. adaptation to and mitigation of the changes. The IPCC (2007) states that anthropogenic origin of the recent 50 years is "very likely".

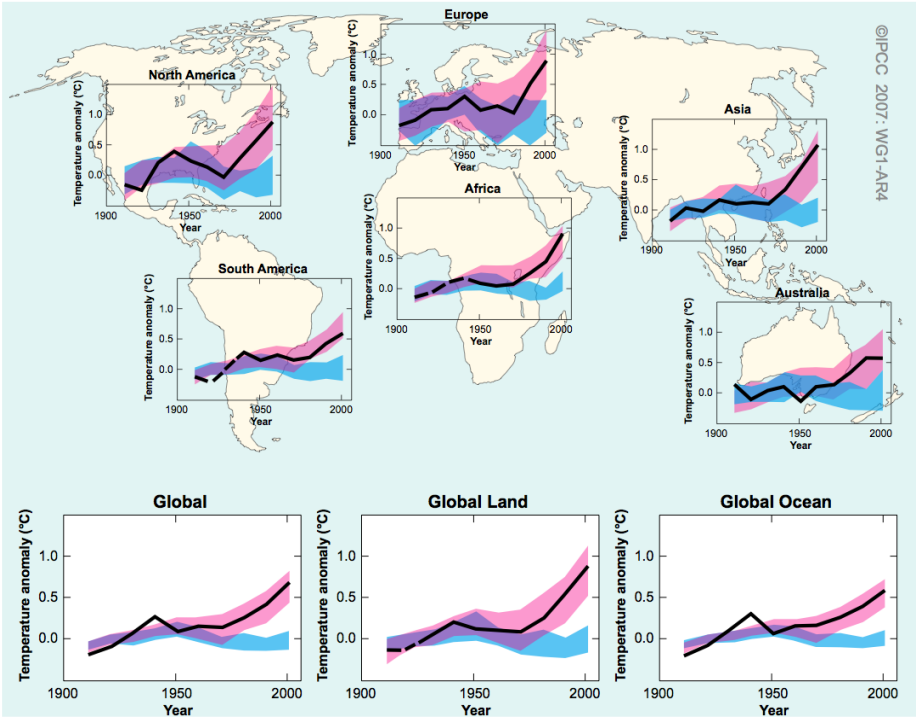

Figure 3. Comparison of observed continental- and global-scale changes in surface temperature with results simulated by the climate models. Data obtained from IPCC, 2007: FAQ 9.2, Figure 1.
Note. Decadal averages of observations for the period 1906–2005 (black line) run parallel to the model runs using both natural and anthropogenic factors, but they definitely depart from those using only the natural forcing factors.

Of course, effect of cloudiness is neither biological, nor geological process, but after the recent IPCC (2007), two further positive feedback mechanisms of these categories became known. Weakening biological (and oceanic) sinks has lead to higher airborne fraction of the emitted CO_2, as it is seen in the right part of *Figure 4*. At the same time, the land-use changes have not contributed to stronger emission (*Figure 4b)*, as they are slightly decreasing since 1990. The emission is dominated by the fossil fuels.

For the counter-GAIA geological processes, we can refer to the melting of permafrost, locking huge frozen carbon reservoirs (Bloom, et al., 2010). As large parts of permafrost became melted in the recent years over the Northern Hemisphere, the methane emission have been increasing, again, from ca. 2007, after a few years' stagnation since the turn of centuries.

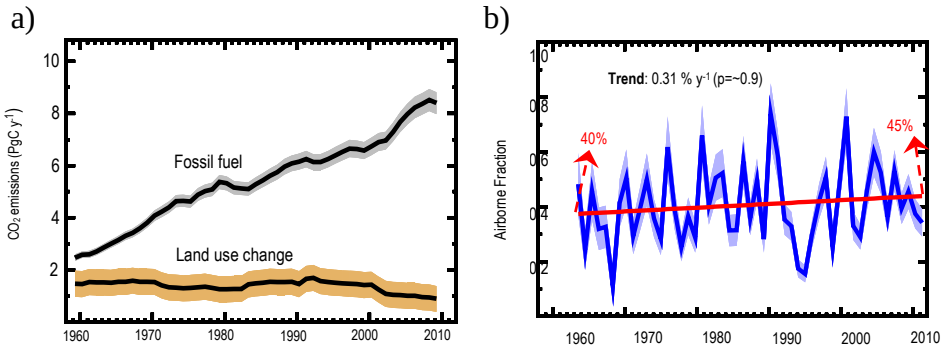

Figure 4. Trends in fossil fuel vs. land-use forms of anthropogenic CO_2 emission (a) and the fraction of CO_2 remained in the atmosphere (b) in 1960-2009. Data obtained from Global Carbon Project, 2010.

Shall We Expect More Extreme Climate Events?

There is little doubt that society has become more sensitive to extreme weather, since population and infrastructure continues to grow in areas vulnerable to weather and climate extremes. As it is seen in *Figure 5*, weather extremes play a sorrowful important role: The reasons not related to meteorology cause 31% of economical losses, but 55% of fatalities at the global scale. In Europe these numbers are 20 and 23%. Globally wet storms are the most dangerous (25% in the losses, i.e. equally dangerous with the floods, and 34% considering the deaths), whereas in Europe the storms (32%) and the hydrological extremes (25%) cause the most losses, but 55% of the fatalities were caused by the heat waves.

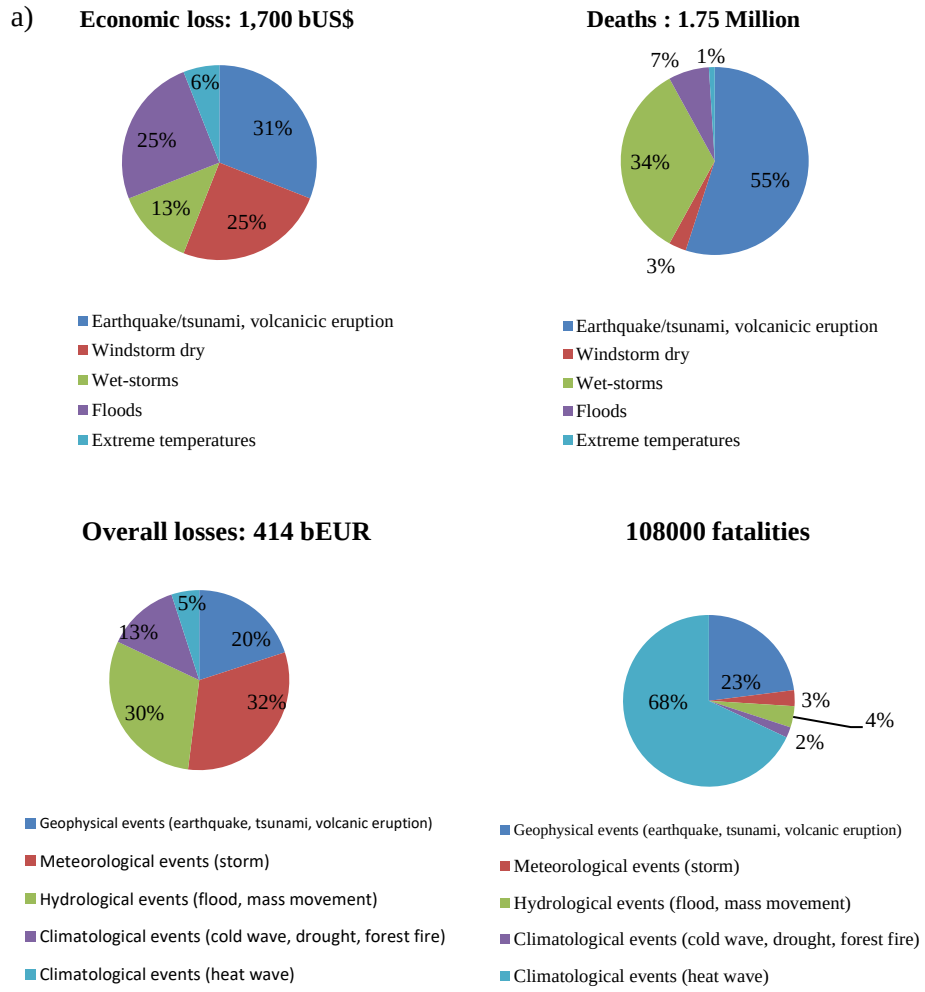

Figure 5. Relative distribution of economical loss (left) and number of fatalities (right) caused by natural disasters: a) Global mean in 1950-2005 (Hoeppe at al., 2006); b) Europe-mean (EU+5 countries) 1980-2009 (EEA, 2010).
Note. The grey-scaled colors, arranged in clock-wise order in the diagrams, correspond to left-to-right and up-to-down order in the legends.

The main question concerning the meteorological extremes is if the extremes become more frequent and more severe parallel to the global warming. Some statistical and physical considerations suggest that a warmer climate bears more meteorological extremes than the present one. Let us briefly survey these arguments (Mika, 2012).

Statistical considerations concerning the extremes: Frequency of an extreme event can generally be enhanced under climate change for two reasons. When the whole distribution is shifted to one direction, with no change in its variance, then the extremes of this direction become more frequent, whereas the opposite extremes become rarer. In the second case, when variance of the distribution changes with no shift in the mean, frequency of extremes on both sides moves in the same direction. Parallel occurrence of the two causes is of course, possible.

Physical considerations. Some physical processes support the hypothesis of increasing extremities parallel to global warming, but some others definitely question that. The most frequent argument for the more intense extremes is the increased energy content of the climate system, including the atmosphere. Having more thermodynamic energy in the whole system, the energy may be more easily cumulated in a given atmospheric object and region. Another reasonable assumption is that in a warmer world, water vapor content of the air is increasing, hence more latent heat may turn into kinetic energy. A third experience is that in a warmer world the average lapse rate is higher, which in turn supports formation of convective systems. Other considerations, however, may lead to less intensive extremes. For example, the experience that the high-latitudes warm faster than the lower latitudes project smaller horizontal temperature- and pressure-gradients in the process of global warming-up.

Both modeling and statistical approaches of estimating present or future trends of one or the other kinds of meteorological extremes have various methodological problems (Mika, 2012). However, there are some extremes tendency of which is generally accepted by the climate scientists. *Table 1* displays these major extreme events, indicating the 20th century tendencies and likelihood of the future trends. It indicates „warmer and fewer cold days and nights", as well, as „warmer and more frequent hot days and nights", over most land areas. Both statements are assessed "very likely" with over 90% of probability concerning their 20th century trends. For the future, continuation of the trends is virtually certain (99%). Heavy precipitation events at the temperate latitudes and increase of drought affected area are likely in many regions since the 1970s. Continuation of this process in the 21st century is "likely".

Recently, the IPCC SREX Report (2011) mainly approved these statements. E.g., for Central Europe they indicate 4-6 times more frequent occurrence in the thermal and ca. 1,5x in the precipitation extreme by 2045-2065, depending on the assumed emission scenario.

Table 1
Recent trends and projections of extreme weather events.

Phenomenon and direction of trend	Likelihood that trend occurred in late 20th century	Likelihood of trends projected for 21st century)
Warmer and fewer cold days and nights over most land areas	*Very likely*	*Virtually certain*
Warmer and more frequent hot days and nights over most land areas	*Very likely*	*Virtually certain*
Warm spells/heat waves. Frequency increases over most land areas	*Likely*	*Very likely*
Heavy precipitation events. Frequency mostly increases	*Likely*	*Very likely*
Area affected by droughts increases	*Likely* in many regions since 1970s	*Likely*
Intense tropical cyclone activity increases	*Likely* in some regions since 1970	*Likely*
Increased incidence of extreme high sea level (excludes tsunamis)	*Likely*	*Likely*

Note. Table adapted from IPCC(2007) Tab. SPM-2.

Is Energy- and Carbon Efficiency Increasing in Hungary?

Emission of CO_2 is a product of four general components according to identity by Kaya (1990):

$$CO2 = Pop \times (GDP/capita) \times (TPES/GDP) \times (CO2/TPES) \qquad (1)$$

They are: number of people on the Earth *(Pop);* average well being of humans (*GDP/capita)*; mean energy required to create one USD *(TPES/GDP)* and mean CO_2 emission required to produce a unit amount of energy *(CO2/TPES).*

As it is seen in *Figure 6*, the product of the first two components is increasing much faster than the already ongoing decrease of the third and fourth components. Though, it is also interesting, that the latter two components started to decrease far before climate-, or environment-awareness, due to technological development.

The options for reducing the CO_2 emissions include: reduction of energy use through increased end-use energy efficiency; replacement of fossil fuel with renewable energy sources; reversal of the current deforestation trend; shift of the fossil fuel mix from high- to low- CO_2 emitting fuels; and disposal of CO_2 beneath the Earth surface.

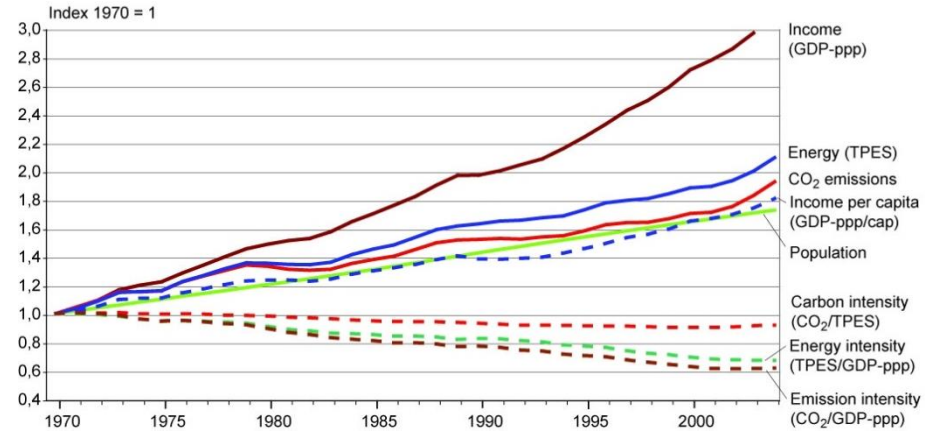

Figure 6. Trends in the components of CO_2 emission, according to Eq. 1, 1970-2004. Adapted from IPCC WG-III (2007) Fig. 1.5.
Note. In the right-side subscripts ppp stands for 'Purchasing power parity' at 2000 prices.

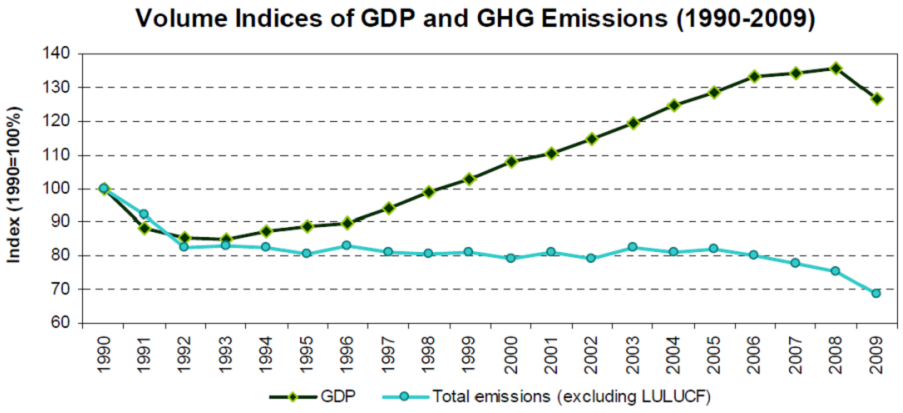

Figure 7. Comparison of trends in GDP and GHG emissions in Hungary in 1990-2009. National Greenhouse Gas Inventory (2011) Retrieved from http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php)

We do not know data on these possible factors for Hungary, but, as *Figure 7* indicates, the latter two factors of Eq. (1), i.e. product of energy intensity and carbon-intensity have been improved since the mid-1990s. The Figure shows strong decoupling between the GDP (1-2. components of Eq. 1) and GHG-emissions. One must add that in 2009 proportion of CO_2 was 75 % in the total greenhouse-gas emission, even excluding the biospheric emission.

Does Global Warming Affect Our Renewable Energy Potential?

The ongoing climate change and some other environmental considerations lead to enhanced interest in exploitation of renewable energy. One aspect of this process relates to the natural availability of these energy sources parallel to the climate change, itself.

In *Figure 8* the average changes in runoff, soil-moisture content sea-level pressure are presented. Except the pressure changes, all maps are related to the annual averages. Together with projected changes in the annual cloudiness (see above in Figure 2), they are the key meteorological parameters that help answering the question in the title of the present section.

The projected changes in cloudiness exhibit rather simple structure: With the exclusion of a few smaller low-latitude areas, the cloudiness is decreasing between the ca. 60th latitudes of both Hemispheres with increasing cloudiness in the rest of the Globe. The decreased cloudiness at the low and temperate latitudes contributes to enhanced solar energy. In Hungary the surplus is a few percent, as one may judge from Figure 2.

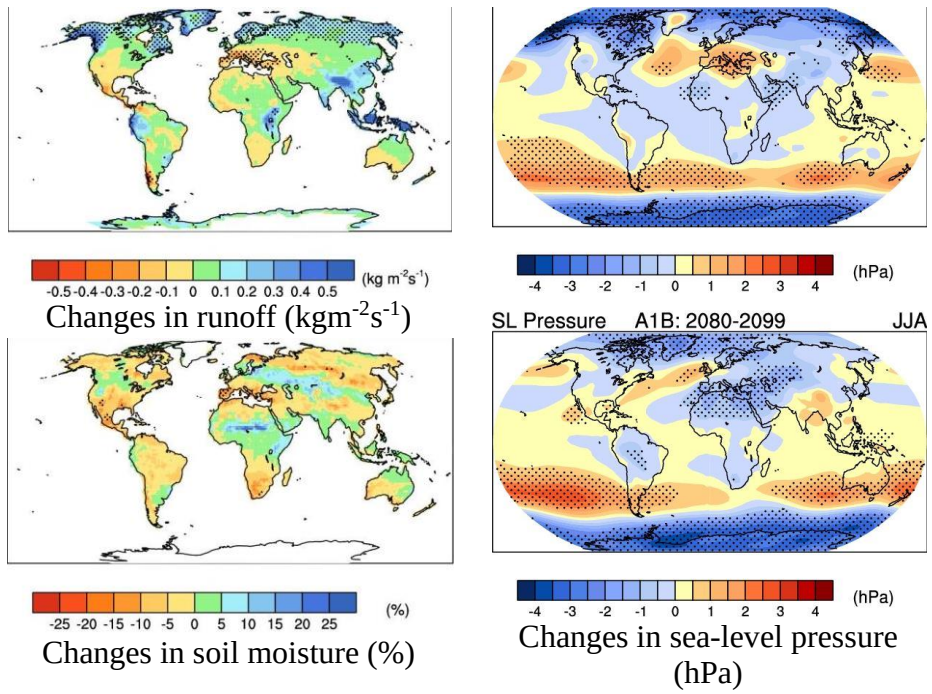

Figure 8. Averages of the projected changes in the selected indicators related to potential renewable energy sources derived from the model means. Data obtained from IPCC, 2007: Figures of Ch. 10, Supplement.
Note. In a part of the Figures area of significant changes are marked by points.

Patterns of changes in the sea-level pressure show complex structure. As expected from the law of mass conservation, there should be a spatial balance between the increasing and decreasing sectors of pressure over the Globe. For wide areas of Europe the significant increase of the pressure indicates more frequent anticyclones in winter. However, in summer the pressure is decreasing over most of the continent. The more anticyclones in winter imply weaker wind from the large-scale circulation and less intense convective activity, but in summer the tendencies are the opposite. Hence, over majority of Europe, including Hungary, the wind-energy potential will likely increase in summer, but decrease in winter.

Patterns of changes in runoff are patchy. Decrease of runoff is projected at the lower temperate latitudes expressed in decrease in the western and increase in the eastern parts of both Eurasia and Northern America. In Europe a clear zonal structure with increase in the northern and decrease in the southern parts of the continent is distinguishable. The decrease of runoff indicates even lower availability of water energy for Hungary than today.

Patterns of soil moisture changes are more or less of zonal structure with some tilt towards the lower latitudes in the middle of the continents. In Europe this means decrease of the soil moisture in majority of the area including Central Europe, as well. For the vegetation, it means decreasing water availability, which is the main limiting factor of plant development in Hungary, enjoying enough sunshine and sufficient temperature in the growing season. Hence, lower amount of green-mass, i.e. less source of biological energy can be expected.

From the above changes in available renewable energy sources in Hungary, one may conclude that only the solar energy would win from the expected warming, but none of the changes would be too strong in either direction. Hence, distribution of renewable energy will likely be determined by other factors than changes of resources caused by the global warming.

Education of and by Climate Change

Climate change is an exciting scientific and practical challenge of our era. The interest of pupils in climate change also provides good opportunity to present the related problems of environment, stemmed from the same anthropogenic over-consumption of the natural resources. There are two aspects which can not be expressed in detail due to space limitations, but which are important connections between school and everyday life. They are (a) *the intelligent adaptation to weather*, as ever-changing risk and resource for everyone and everywhere; and (b) *the energy-conserving way of life* in our homes, including motivations for using renewable energy. Both topics are good examples on those cases when fresh knowledge of the youngsters can guide the elder generation. (Note again,

that weather extremes are not direct consequences of climate change, as it was already mentioned above.)

Besides that, the interest in climate change may also be used for bringing closer to pupils many topics of the various school subjects. Pajtók-Tari et al. (2011) collected a detailed list of such possibilities with their relation to broader topics of the subject, the reason for emphasis and relation to climate. Two examples from each subject are indicated in *Table 2*.

Table 2
Selected phenomena in various subjects, possibly educated by climate change

Phenomenon/process	Broader topic	Reason for emphasis	Relation to climate
		Physics	
Melting and freezing	Phase transitions	Melting of the ice caps, increase of the sea-level.	Global warming
Space-born images	Artificial planets, meteorological satellites	Monitoring of the climate changes.	Changing climate zones.
		Chemistry	
Photochemical reactions	Inorganic chemistry (oxygen)	Atmospheric processes	Ozone formation and decomposition
Gaseous air contaminants	Materials of the environment	Environmental pollution	Dry and wet deposition, ozone depletion.
		Biology	
CO_2 level in air, CO_2 absorption of plants	Plant physiology, assimilation	Assimilation processes, big cycles of Earth.	The effect of the increasing CO_2 level
High temperature, flood, drought, new diseases	Human Health	Exotic & native diseases, effect on human body	Extreme weather, higher temperature averages
		Geography	
Soil erosion, zonal and non-zonal soil's shift	Pedology (Soil Geography)	Soil degradation process and consequences	Intensive rains, likely more frequent in future
Population distribution. environmental migration	Population Geography	Requirements to sustain, inc. natural resources	Desertification, loss of Himalaya glaciers.

Note. Data based on Pajtok-Tari et al. (2011).

Finally, let us show another aspect of teaching, i.e. the so called key competences which mean ability to solve various problems of life, including response to climate change and sustainability. Development of nine key competences, established by the subsequent National Core Curricula (NCC,

2007; 2012), is a parallel and important goal for education. *Table 3* gives a list of possibilities to improve the competences in relation with climate change.

Table 3
Climate change to improve the key competences: examples

Key competence (KC)	Example of using climate change to develop the KC
Communication in the Mother Tongue	learn new words of climate, effect and responses
Communication in Foreign Languages	find extra motivation in understanding the CC disputes
Mathematical Competence	use CC as motivation to understand usefulness of math
Competences in Natural Science and Technology*	use CC to teach and integrate Natural Sciences
Digital Competence	besides the Internet, compilations and calculations in CC
Learning to Learn	use CC as a fast developing topic to learn for learning
Social and Civic Competences	weather extremes are good examples of cooperation
Sense of Initiative and Entrepreneurship	renewable- and low-carbon industry are good examples
Aesthetic and Artistic Awareness and Expression	nature itself provides picturesque examples in storms

Note. Competence in technology is added to the key competences by the new National Core Curriculum (2012).

Conclusion

The five investigated questions have been answered by study as follows:

Unfortunately, there are processes in the climate system, which work against the GAIA-hypothesis, i.e. they strengthen the global warming. It is not surprising, since the present, very likely anthropogenic warming is faster than the previous ones by 1-2 orders of magnitude. Hence, new and more effective mechanisms would be needed to counteract the warming and the corresponding changes of the environment.

Despite the common stereotype in the media, no unequivocal intensification of meteorological extremes should be expected. There are pros and cons to this assumption. Extreme events will likely change with the global warming, but as regional details of the changes are rather uncertain, projection of the extreme events' frequency and intensity distribution is unsettled at present stand of science.

Having studied the recent tendencies of greenhouse-gas emission in Hungary, a clear de-coupling between the GDP and the greenhouse-gas emission is established in Hungary since the economical recovery in mid-1990-s, after the transition.

From the projected changes of available renewable energy sources in Hungary, one may conclude that only solar energy would win from the expected warming, but none of the changes would be too strong in either direction. Hence, distribution of renewable energy will likely be determined by other factors than changes of resources caused by the global warming.

Finally, a few examples were shown to demonstrate, that enhanced interest of pupils in climate change and related aspects, including weather sensitivity and mitigation can be used both for teaching various topics of sciences and for developing the key competences.

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INTEGRATING REGIONAL INNOVATION AND SUSTAINABLE DEVELOPMENT: EXAMPLES FROM THE ESZTERHÁZY KÁROLY COLLEGE

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Eger is located in Northern Hungary, where decision makers constantly struggle with social and economic problems caused by the challenges of non-sustainable development. This paper presents two examples of how higher education organizations, through market-oriented innovation, can facilitate the economy of the region in getting back on the sustainable orbit. The first part of the paper reports an innovation in tourism education that embraces the renewal of the curriculum and the establishment of an internship hotel, while the second part discusses the successes and difficulties of technology transfer from the Egerfood Regional Knowledge Centre to the food industry.

***Keywords*: tourism education, internship hotel, health food, new product development, technology transfer**

Introduction: Northern Hungary

Northern Hungary (NH) is one of the seven NUTS II level statistical regions in Hungary. It is located at the Eastern border of the EU and is part of the so-called Eastern Wall. After the failure of forced industrialization this region became *one of the least developed territories in Hungary* and also in Europe. Although NH's development level is low, its economic growth remains slow as well, i.e. there is no catching up process (Figure 1).

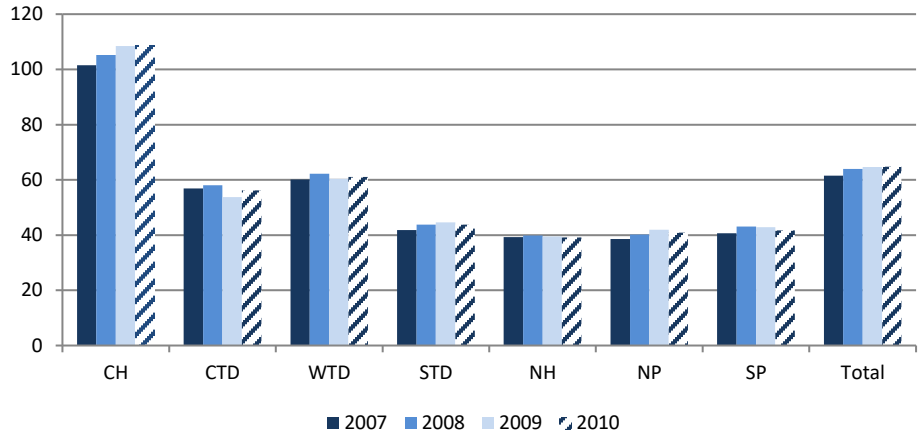

Figure 1. GDP/capita 2007-2010. EU27=100%. Data obtained from KSH, 2012. Figure No. 4.
Note. NUTS II level regions of Hungary: CH=Central Hungary, CTD = Central Transdanubia, WTD =Western Transdanubia, STD = Southern Transdanubia, NH = Northern Hungary, NP=Northern Great Plain, SP = Southern Great Plain.

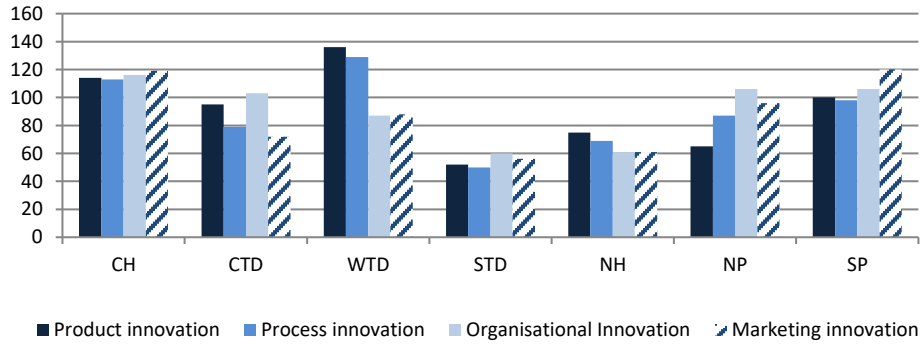

Figure 2. Proportion of innovative firms by region in 2010. National average = 100%. Data obtained from Grosz (2011), p. 219.
Note. CH=Central Hungary, CTD = Central Transdanubia, WTD =Western Transdanubia, STD = Southern Transdanubia, NH = Northern Hungary, NP=Northern Great Plain, SP = Southern Great Plain.

The proportion of innovative firms located in the NH region is also moderate (see Figure 2). According to quantitative analyses (Papanek, Borsi & Tompa, 2007; Borsi & Papanek, 2006), *the main causes of the region's technology lag can be found in the sphere of the human resources*: the proportion of unskilled labor is high, entrepreneurship spirit is low, and the number of qualified

managers is small. During the last decades abandoned facilities of many traditional industrial enterprises have become brownfield sites. Skilled workforce continues to migrate away from the region, while non-skilled people move in the deserted houses of villages. Investors also tend to divest their capital.

As a result of the described socio-economic situation, *the present development path of NH is not sustainable*. Today, higher education institutions are said to have three missions: teaching, research, and the so-called third or entrepreneurial mission, which is sometimes interpreted as community engagement. This broad interpretation of the third mission embraces social, economic, environmental, and cultural dimensions of capacity development. In what follows we present two innovative initiatives of faculty members at the Eszterházy Károly College in Eger (*hereinafter*: EKF), to show how teachers and researchers can better contribute to the economy of a region.

Education for Sustainability: Training Tourism Professionals

Realizing the non-sustainable processes of the region's economy, the faculty of EKF seeks ways to tackle regional backwardness. The primary mission of higher education institutions is education, thus the most important contribution of universities to the economy should be *preparing undergraduates for the current and future needs of the labor market* by constantly monitoring the content and effectiveness of training programs. Considering NH's abundant touristic attractions (four world heritage sites, mountains, forests, historical monuments, etc.), EKF decided to increase focus on the tourism sector. By training tourism professionals, it aims at raising the share of the tourism and catering industry in the region's value-added.

To determine the specific steps to be taken, the faculty at the Institute of Economic Science (*hereinafter*: GTI) conducted 20 interviews to identify the potential discrepancy between the skills and competences of young tourism graduates and the expectations of employers.[1] The research concluded that employers were not satisfied with graduates' skills; they complained of their weak knowledge of basic housekeeping chores (e.g. cleaning materials and methods), tourism law, hotel management softwares, and foreign languages (Farkas & Katonáné, 2011; Kovács, 2011; Nagy & Papanek, 2011; Román, 2011; Vas, 2011).

[1] The idea of the research originated from a previous analysis, which showed that employers in several industries were not fully satisfied with young graduates' skills (see: Kádek & Zám, 2008).

To better satisfy market requirements, EKF has introduced *organizational innovations* in the field of tourism education.[2] (1) The first one of these innovations was the creation of a new organization, *EKF's own internship hotel* (Hotel E*Stella), in 2008. This hotel type is well-known internationally, but exceptional in Hungary. Internship hotels enable trainees to improve their hotel management skills following the principles of learning by doing: students can apply the knowledge gained during the academic semesters, develop real-life awareness of industry standards, discover their personal strengths and weaknesses, and deepen their knowledge of this dynamic field (Glion, 2012).[3]

In autumn 2011, GTI monitored how the hotel completes its tasks. The monitoring gave a good picture of the results. It became clear that students enthused over the practical tasks they encountered in the hotel on a daily basis. They especially found the work at the reception desk interesting, but also gladly learnt about how waitpersons serve wines, and realized that mastering room-cleaning technics is a must. During their internship, students made considerable developments in the following knowledge areas:

- *Cleaning* – students got to know the up-to-date cleaning materials.
- *Serving* – students learnt the hygienic rules of running a restaurant as well as the standards of preparing and serving food.
- *Reception* – students learnt about various hotel management softwares, and could practice their foreign language skills.
- *Labor market rules and laws* – students gained experience on current legislation about employment in the tourism sector at first hand.

In addition, observing trainees' at work, GTI faculty could diagnose the lack of basic knowledge elements that hampered students' effective learning. An important additional benefit was that students realized the link between customer satisfaction and profit.

(2) Besides investing in infrastructure, *the content of the tourism training program was also reviewed and modified.* This is also exceptional in Hungarian higher education, and thus can be considered an innovation, as program contents are generally based on teachers' preference rather than on true labor market

[2] "Innovation activities are all scientific, technological, organizational, financial and commercial steps which actually, or are intended to, lead to the implementation of innovations. (…) A common feature of an innovation is that it must have been implemented. An *innovative firm* is one that has implemented an innovation during the period under review. (…) An *organizational innovation* is the implementation of a new organizational method in the (firm's) business practices, workplace organization or external relations." (OECD-EUROSTAT, 2005; p. 47)

[3] Students can also complement their explicit knowledge by acquiring tacit information (Polányi, 1958) about tourism management.

requirements[4]. The idea of the curriculum development came from the aforementioned monitoring, which necessitated for the inclusion of several practice-oriented elements in the program. The monitoring identified a lot of parallelisms, meaningless generalities, and obsolete principles within course contents. On the basis of these observations GTI rationalized the curricula by

- reducing the amount of theoretical knowledge with little potential for application,
- increasing the amount of practical knowledge (e.g. protocol, tourism law, and Central European tourist destinations[5]),
- introducing new courses on food standards and cleaning materials, and
- increasing focus on communication in foreign languages.

Sometimes these modifications were welcomed by both professors and students; in this case their realization was easy and rapid. In other cases the implementation needed more efforts and time. For example, teaching and learning voluminous tourism laws and food standards can be a nuisance.

EKF hopes that the presented actions can raise the competitiveness of NH's tourism sector – and accordingly, with the creation of stable workplaces, they can enhance the region's ability to retain its population, and thus support the sustainability of the region's economy.

But there is still a lot to do, and faculty try to go on with their work. For example, it was also found that managers of tourist offices are dissatisfied with graduates' knowledge on regional tourist attractions. Therefore GTI is planning to set up an internship tourism information office, to give students real-life motivation to extend their knowledge on regional tourist attractions, and to gain feedback from tourists about the sites visited and the accompanying services.

Finally, the authors believe it would be of high importance to regularly collect industry feedback on graduates' performance and modernize course contents accordingly, in order to raise the sustainability of higher education in the region and in the whole country as well.

Innovation for Sustainability: Developing Safe and Healthy Food Products

The second part of our paper focuses on the *interaction between sustainability and innovation in the food industry*, which results in new or improved products,

[4] As J. Swift in Gulliver or Voltaire in Candide ironically wrote, sometimes the ideas of professors about the most important pieces of knowledge are not identical with those of other people.

[5] Kovács, Papanek, and Papanek (2012) exemplify the new learnings on regional destinations.

production processes, consumption patterns, and eventually a healthier society. Food consumption is an important aspect of sustainability for at least two reasons. First, the environmental impact of consumed food and beverages exceed the impacts of other areas (e.g. transport) and amount to about one-third of the total environment impact of households (Tukker, Huppes, Geerken & Nielsen, 2006). Second, good health including healthy diet is vital for maintaining an active workforce and society, and thus fundamental for sustainable economic development.

Health awareness has increased in the Hungarian society for various reasons, such as decreasing trust in the national health care system or consumers' deteriorating perceptions about their own state of health. According to a 2011 survey, 35% of the population is willing to pay an extra for products with health benefits including food, while 28% believes it is wise to increase expenditure on health (GfK, 2011). Consumers show a growing tendency to regard healthy diet as an investment to their general wellbeing, while health became an important criterion in purchasing decisions (GfK, 2012a). In 2007, the top five food buying criteria were good quality, good value for the money, (Hungarian) origin, lack of artificial ingredients and preservatives, and low price (GfK, 2007). A subsequent survey found preparation time, health effects, and taste to be the deciding factors in food shopping (GfK, 2012b).

Changes in buying criteria and the emergence of a new, health conscious consumer segment present new opportunities to innovation in the food sector. Accordingly, a plethora of new type of food products occurred in the western world, such as fair-trade, organic food, products with little processing, or functional food often with national or regional specialties. While innovation mostly takes place in the business sector, the required knowledge is often created in the higher education sector and the related transfers originate from here as well.

The Egerfood Regional Knowledge Centre at EKF (*henceforth*: Egerfood), which has been developing rapidly since its launch in 2004, is an important source of new knowledge, technologies, and even products in the food industry of Northern Hungary. Egerfood promotes the development of the agro-food sector in the region by planning and implementing product, process, and marketing innovations in order to provide safe and healthy food to consumers (Egerfood, 2012a, 2012b).[6] Its operation is mainly financed by competitive EU grants channeled through national bureaus in line with the goals of the revised Lisbon Strategy. With an annual budget of about EUR 1 million, they work on R&D projects related to food traceability, origin protection, and analytics in

[6] To learn about the economic rationale behind the so-called Regional Knowledge Centers in Hungary see Novotny (2008).

collaboration with more than 20 food producers and agribusinesses.[7] Based on the theory of regional specialization of industries (see Krugman, 1991) Egerfood's original strategy was to colligate frittered research initiatives in the food industry of the region. Nevertheless, the cluster has expanded to more distant regions of the country, while today Egerfood provides research services to foreign clients as well.

Besides satisfying *ad hoc* development needs of business partners (e.g. reducing production costs, increasing storage life, improving product quality and safety) they are also engaged in comprehensive R&D projects, such as a food traceability system designed for mobile phones. Their research output is impressive, it includes 15 patents, six biosensors, 37 production process innovations, 22 know-hows, 33 analytical methods to determine food origin, six food traceability models, and a complex food safety database (Egerfood, 2012a, 2012b). By disseminating research results through informal ways of technology transfer (food safety training programs, conferences, research papers, books, and textbooks), they promote the culture of health and environment conscious consumption and production to a wide public.

Difficulties of New Product Development: The Case of Functional Biscuits

Attila Kiss, the managing director and a Ph.D. in chemistry believes that R&D in the area of functional food holds for the highest market potential (A. Kiss, personal communication, December 18, 2012). Accordingly, in the first years of its establishment, Egerfood came up with a three-member family of functional biscuits, namely *Inukeksz*, *Liziner*, and *Metikeksz*. In the case of functional food the value added is created at the R&D phase: the biscuits are enriched with health-promoting ingredients, with antioxidants and amino acids, such as inulin, lysine, and methionine as reflected by their brand names. Later, a tea product made from purple corn was added to the functional product range.[8] Egerfood's latest product development is a wine-like beverage made from grapes and fortified with bee propolis, of which only prototypes have been made.

The production and related marketing activities of the functional biscuits were assumed by a cluster member, a local biscuit manufacturer, but as sales have not reached the anticipated level production was discontinued. In case the expected sales volume (HUF 40 million) had been reached, profits would have

[7] Cluster members cover many areas of the food industry including producers of confectionery, dairy products, tea, wine, canned food, meat, bakery, and mushroom, as well as distributors and retailers of health food.

[8] The *Peru gyöngye* ('Pearl of Peru') tea has been commercialized by a functional product retailer and can be bought online through web-shops specialized in health products.

been shared evenly among the manufacturer, Egerfood, and EKF. Why Egerfood's high quality, high value added biscuits have not been able to set foot in the market yet can be attributed, in part, to the most frequent bottleneck of university-industry technology transfer, insufficient marketing planning.

A recent Harvard Business Review article by Schneider and Hall (2011) emphasizes that organizations are often so enthusiastic about designing and manufacturing new products that they tend to procrastinate the hard work of marketing planning until it is too late. The authors list 40 possible flaws of new product launch, but we only recite some of them to structure our observations regarding the market entry of Egerfood's functional biscuits (we base our comments on the personal communication with A. Kiss, December 18, 2012).

1. *Most of the budget was used to create the product; little is left for launching, marketing, and selling it.*
   It is only a myth that the most challenging stage of technology transfer is the scientific discovery, and the rest is only a routine job. Still, R&D grants and teams tend to allocate a disproportionately low amount of funds to marketing activities, which often leads to the loose alignment of research capabilities to consumer needs. Researchers in general are not marketers and should not be expected to professionally manage their products outside the laboratory. They are more motivated by academic success (measured by publications and impact factors) than market success. Therefore drawing on the knowledge and experience of marketing professionals (e.g. from the business faculty of the university, the industry partner, or an independent technology transfer organization) is a must.

   In the instance of functional biscuits, research and product ideas were selected on the basis of researchers' and industry partners' knowledge and perceptions about food market trends. Consumers were not directly involved at the idea development phase; more emphasis was placed on the technological feasibility of the project.

2. *The product is interesting but lacks a precise market. Because the target audience is unclear, the marketing campaign is unfocused.*
   To have a seemingly great idea is far from having a successful new product. Companies create hundreds of ideas and dozens of new products a year, but only few will stay on the market for years: A US study found that 90% of new food and beverage products fail within the first three months (Goffin, 2011). To increase the chances of success, marketeres should make sure consumers understand the offering and react to it as expected. Concept testing can help to answer questions like (Kotler & Keller, 2012): Are the benefits clear and believable to consumers? Do they see the product solving a problem for them? Do other products currently meet this need and satisfy them? Is the price reasonable as compared to value? Would consumers buy the product? If answers are all positive, one can define the target market, position the product accordingly, and prepare profit projections. Only following *concept testing*, *marketing strategy* and *business analyis* it is advisable to move to the *product development* stage. Revisions are always possible and necessary as we learn new information about consumers and competitiors.

As for the functional biscuits, idea generation was almost immediately followed by product development. Somewhat later, in 2010, Egerfood conducted a survey with the help of a market research firm on a sample of 1,000 Hungarian consumers. They found that (1) consumers were unfamiliar with the term of functional food, (2) women and people with permanent health problems were more prone to buy health food, (3) most respondents were willing to pay an extra 5-10% for functional products, and (4) price had a stronger influence on buying decision than health benefits (Soós, Biacs & Kiss, 2013). Although the results suggest that women with health problems would be the ideal target group for the biscuits, we recommend the study of some other possible determinants of buying behavior (e.g. geographic region, city size, family life cycle, psychographics, personal and social norms, behavioral occasions, benefits sought, user rate, loyalty status, readiness stage, etc.) to identify new target groups.

3. *The product's key differentiators and advantages are not easily articulated. It defines a new category, so consumers or customers will need considerable education before it can be sold.*
   Differentiation in the food market is based on several factors including quality and other attributes (e.g. price, taste, nutritional value, etc.), geographic origin, or method of production or processing. Positioning confectionary products with health benefits is not that obvious anymore, as many easily understandable advantages are widely used by competitors (e.g. organic/natural, reduced calorie, added vitamins, whole-grain, etc. – see Figure 3). The global CPG market is highly competitive due to high market saturation and low consumer switching cots. On the orther hand, the fact that an important share of consumers actively look for new products to try, it provides great opportunities for new product development.

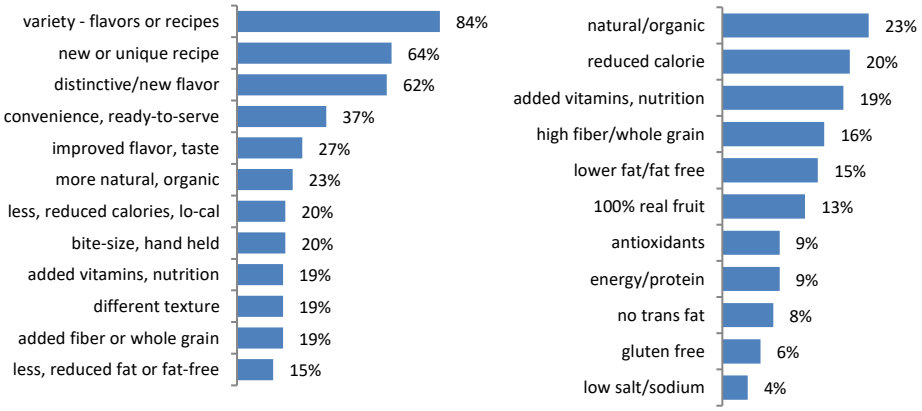

Figure 3. Food & Beverage New Product Pacesetters in the U.S. (2011): (Left) Top Benefits offered by the most progressive companies – % offering benefit; (Right) Top Health & Wellness Benefits – % offering benefit. Obtained from *SymphonyIRI Group (2012).*

Note. The most popular health-related benefit in 2011 is natural and/or organic ingredients, while the gluten-free attribute is the newest one, offered by an increasing number of producers.

Egerfood tried to make consumers aware and responsive to the term "functional", but the concept proved to be too broad, ambigous, and technical. The prebiotic characteritic of inulin and *Inukeksz* would be an easier benefit to communicate, as many dairy product manufacturers already introduced its twin concept of probiotics to public awareness. Lyzine and methionine have plenty of health benefits, but emphasizing only one or two is ideal for positioning.[9] When product developers choose the most promising benefit or value added, they are recommended to take buyers' expectations and reactions, as well as costs and competing products into consideration (Vágási, 2001). If there are several possible benefits, according to Crawford (1994), it is advisable to pick the one that (1) targets the largest market segment, (2) is the most competitive in comparison to rivals' offers, and (3) the most convincing to consumers (as cited in Vágási, 2001).

4. *The sales force doesn't believe in the product and isn't committed to selling it.*
If the product does not sell well in the beginning, the business partner may lose commitment without intensifying marketing efforts. For long term cooperation, it is essential to develop mutual trust with project partners, understand each other's goals and motivations, share ideas and problems, ask for feedback, and to take corrective measures. Gibson (1997) also pinpoints that transferring technologies from one sphere to another is a complex communication task, since the parties involved usually differ in several organizational characteristics including goals, motivations, strategy, and culture. Good communication between partners is essential as the technology transfer process is rarely linear: ideas often return to the laboratory or to an earlier development stage (e.g. to concept testing, marketing strategy, product development, or test marketing) to make improvements before moving forward.

Seeing the industry partner's fading enthusiasm, Egerfood is planning to take over the marketing and manufacturing of *Inukeksz* and thus becoming responsible for the whole process of technology transfer. Another difficulty Egerfood had to face was making royalty agreements, since partners tried to avoid paying regular license fees and rather contributed a lump sum for the new technologies. This attitude can undermine trust and long term cooperation.

[9] *Liziner* could be sold as a treat that "supports bones and muscles" or "protects you against cold sores". *Metitkesz* as "a strong antioxidant treat", a biscuit that "helps you in getting a lean body" or which "keeps your nails, hair and skin healthy while you enjoy a special taste". To avoid self-competition, the biscuits could be positioned to different target groups: *Inukeksz* to active adults and students as a healthy snack on-the-go that nurtures the immune system; *Liziner* mainly to third age consumers by emphasizing its bone, muscle, and mental skills strengthening properties; while *Metikeksz* primarily to women, because it helps to maintain a healthy tone, skin, hair, and nails.

5. *The launch campaign depends solely on PR to sell the product.*
   Egerfood's functional biscuits get relatively intensive PR as Egerfood regularly publishes scientific papers as well as news about project launches and closures, newly established partnerships, and conference appearances in local media. They also have a monthly bulletin distributed online to EKF faculty members. However, to make a stronger influence in local markets, other cost-effective tools of promotion such as social media, word-of-mouth, or guerilla marketing could be better utilized. EKF students and teachers should be first targeted with the campaign, as they are easily accessible and could identify themselves with EKF-made products, thus playing a key role in word-of-mouth advertising too.

Egerfood is a fine exemplar of the multitude of channels how technology developed within higher education institutions can be transferred to the market. In many cases, patenting and licensing is not applicable, so spin-off companies, especially to provide R&D services to clients, can be flexible alternatives. Egerfood has started two spin-off ventures: *Eger Innovations* is not-for-profit and fully owned by EKF, whereas *Egerfood Kft.* is for-profit, its stakes are divided between Egerfood (25%) and EKF (75%). The management decided to set up two types of spinoffs to be able to meet grant application requirements flexibly.

As pointed out earlier, the most challenging stage of technology transfer is not necessarily the scientific discovery, but commercializing or selling new technologies. According to a common rule of thumb, 100 inventions will result in only one successful product (Blake, 1993). Other calculations are even more discouraging: Stevens and Burley (1997) assert that 3,000 new ideas will generate just one successful market offer. As goods with high value-added are the most difficult to sell, and researchers in general do not have sufficient marketing and sales skills, many universities established so-called technology transfer offices (TTO) to facilitate the commercialization of research results. Egerfood also estabished an internal unit with three staff members, the *Innovation and Technology Transfer Office*, which is reponsible for expanding industry relations and accelerating the market entry of new technolgies. But even in the US, where university resources for technology transfer are more abundant, TTOs' insufficient marketing expertise is blamed for the low commercialization rate of innovative ideas. To increase the success rate of new products launches, Egerfood intends to allocate more efforst and funds to marketing tasks, including the hiring of new staff members with marketing experience and expertise.

Introducing an unbrella brand such as "Egerfood" or even "EKF" to the food market and targeting local consumers in the first place might be a more effective strategy than creating several new, "unknown" brands in a market with fierce competition from multinational firms. Kraft Foods for example, who owns some of the leading biscuit brands in Hungary, operates a network of 3,300 food scientists in 15 major R&D centres around the world, with an R&D expenditure

of about USD 700 million a year (Kraft Foods, 2012). The company recently launched an Open Innovation website where consumers and other organizations can share their unsolicited ideas for new products, packaging, and business processes with the company. But market-creating innovations can also come from "newcomers". In the US, one of the most successful food products of 2010 was an unknown brand (*Chobani Greek Yogurts*) introduced by a small company with a purse-string advertising budget. Chobani was started in 2005 and made $150 million in sales in the first year the yoghurts hit the shelves. The company have grown from five employees to over 1,200 in its first five years. Kraft Foods' resources can hardly be compared to that of Egerfood, but if enthusiasm in research and high quality products couples with creative marketing work and a sharp focus on true consumer needs, Egerfood's new products will have a strong chance to become serious competitors to big players, just as Chobani did it in the field of dairy products.

Summary

In the form of follow-up studies, the authors presented two better practices of how higher education institutions, through their third arm, can contribute to the sustainable development of the region. The first example exhibited how faculty at the Institute of Economic Science has improved the quality and market-orientation of the tourism education program by means of organizational innovation: The launch of the internship hotel and the upgrading of the curriculum were welcomed by both students and teachers.

The second example focused on the Egerfood Regional Knowledge Centre, which promotes the culture of health and environment conscious consumption and production in the region by carrying out innovations in the food sector. The authors used the case of the functional biscuits developed by Egerfood to discuss some general bottlenecks of university-industry technology transfer. Hotel E*Stella and Egerfood set good examples for faculty at EKF and other Hungarian higher education institutions for two reasons. First, they show evidence on how innovation can foster sustainable development in the region; second, they themselves are sustainable: Both organizations have been operated with undiminished enthusiasm from faculty for five and nine years respectively.

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ENVIRONMENTAL PLANNING REGIME: REGIONALITY IN THE FOREGROUND

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This study deals with the regional aspect of the comprehensive environmental plan, which was prepared in the interest of safeguarding and sustainable use of natural resources. The study analyses its content from the aspect of the related laws, it deals with the duties of the local governments and the legal background of the National Environmental Geographical Information System.

Keywords: **environmental regionality, municipal, environmental planning**

National Environmental Program

The national (National Environmental Program) and the territorial (regional, county, community) environmental programs belong to the comprehensive environmental plans. The effective regulation contains the provisions of the processing of the programs, but the detailing is different related to the content.

Besides the processing of the common community environmental program of the local governments appears the possibility of the processing of the sub regional environmental program as a new element in the law. The processing of the sub regional environmental program depends on the decision of the affected community. Its purpose is –inter alia- to support the duties, which can be available more efficiently in a sub regional level.

According to the Environment Act[1] the basis for environmental planning shall be the National Environmental Program to be renewed every six years and approved by Parliament. When submitting its proposal for the renewal of the Program, the Government shall report to Parliament on the implementation of the Program and the experiences gained in the course of implementation. The contents of the Program shall be enforced while economic policy decisions are being made, during regional and community development and regional planning

[1] § 40 of Act LIII of 1995

as well as when the state's planning and execution activities are being carried out in any sector of the national economy. The Government, where deemed necessary on account of changes in the conditions existing at the time of drafting the Program, and to make adjustments depending on the status of implementation, may recommend to have the Program reviewed. In the course of a review the provisions pertaining to the planning of the Program shall apply.

Environmental Planning Regime in Regionality

Act on the general rules of the environmental and Act on the protection of nature have been amended[2] significantly regarding to the environmental planning since 2009[3]. The substance of the amendment and the change: Having regard to the protection of human health, and to the safeguarding and sustainable use of natural resources, a master plan shall be prepared relating to the environment and the protection of the environment, and to the effects which may be harmful to the environment *(comprehensive environmental plan)*, as well as a specific plan relating to the various environmental media and to their protection, and to the various effects which may be harmful to such environmental media *(thematic environmental plan)* and a plan addressing unique environmental characteristics or problems *(specific environmental plan)*.

In the process of planning: environmental plans of lower territorial level shall be coordinated with environmental plans of higher territorial level, thematic and specific environmental plans shall be coordinated with the comprehensive environmental plan of the territorial level in question. The author of the environmental plan shall submit the plan to public debate before it is completed. The comprehensive environmental plan shall comprise the national and territorial (regional, county and community) environmental program. The law articulates separately the national and the territorial (regional, county and community) environmental programs within the frame of the comprehensive environmental plan. Accordingly the following differences can be revealed considering the plans:

The comprehensive environmental plan shall contain:

- an assessment building on the presentation of the condition of the various environmental media and on the analysis of the related key factors;
- environmental objectives and environmental considerations set out in relation to sustainable development;

[2] § 48/A- § 48/F of Act LIII of 1995

[3] Act XCI of 2008

- the major programs of measures aimed at achieving the objectives and considerations in particular, the functions related to developments in progress and those envisaged, and the timetable for their implementation;
- the regulatory, supervisory and evaluation means for the implementation of the objectives to be pursued;
- the foreseeable costs of carrying out the measures and for the application of the means referred to in the previous point, also indicating the proposed sources of funds.

The goals set out in community environmental programs shall be enforced in the process of drawing up the development concept and policy of the community to which it pertains, including the related plans, as well as in the decision-making and implementation process, and in sectoral planning pertaining to the community in question. Community environmental programs shall be reviewed as deemed necessary, but at least upon the renewal or review of the Program.

The regional development council shall prepare a regional environmental program in respect of the relevant planning and statistical district following consultation with the county governments affected. The regional environmental program shall contain - in accordance with the comprehensive environmental plan - those objectives and measures, which are to be attained and carried out, respectively, at the regional level. The regional development council shall provide for the implementation of the regional environmental program, and shall report to the body designated not less than once every second year. The regional development council, in the process of adopting decisions relating to aids conferred under its competence, shall promote the support of developments comprised in the program.

The county environmental program shall contain – in accordance with the comprehensive environmrntal plan - those objectives and measures, which are to be attained and carried out, respectively, at the county level. The county assembly shall provide for the implementation of the functions contained in the county environmental program, ensure the conditions for implementation, and shall monitor the completion of those functions. The county assembly shall report to the body designated not less than once every second year. The county government shall give account, at the time of closing its annual budget, on the progress made in the implementation of the county environmental program during the previous year. The county development council, in the process of adopting decisions relating to aids conferred under its competence, shall promote the support of developments comprised in the environmental program.

The municipal environmental program shall, in tune with the community's characteristics, circumstances and economic possibilities, contain the following in addition to what is contained the comprehensive environmental plan:

- an air pollution control action plan, and the tasks and provisions relating to air pollution;
- protection against noise and vibration, and the action plan devised around the strategic noise map prepared by the local authorities subject to the obligation of strategic noise mapping by virtue of specific other legislation;
- management of green areas;
- hygiene of the community environment and public areas;
- drinking water supply;
- rainwater drainage systems of the community;
- urban waste-water treatment;
- treatment of municipal wastes;
- energy management;
- municipal transportation systems;
- prevention of potential risks to the environment and the mitigation of environmental damage.

In addition, the municipal environmental program may, in tune with the community's characteristics, circumstances and economic possibilities, contain the following tasks and provisions relating - with a view to improving the quality of the community environment, environmental safety and environmental health status, and to the safeguarding and sustainable use of natural resources - to:

- the use of land,
- the protection of geological strata,
- the protection of soil and agricultural land,
- the protection of surface and underground waters and water resources,
- recultivation and rehabilitation,
- nature and landscape protection,
- the protection of the man-made environment,
- flood and inland water control,
- the reduction of greenhouse gas emission, by meeting climate change commitments,
- environmental education and training programs, and public participation.

The municipal local government shall provide for the implementation of the functions contained in the municipal environmental program, ensure the conditions for implementation, and shall monitor the completion of those functions. The City Council of Budapest shall report to the body designated not less than once every second year concerning the implementation of its environmental program. According to one of the last amendments of the

Environmental Act municipal local governments[4] – in addition to or instead of drawing up separate municipal environmental programs - shall have the option to work out a municipal environmental program collectively.

Its reason is that the sub regional environmental program is also dissolved - which was able to be processed by them before- with the amendment of the environmental protection law. It related to the dissolving multipurpose sub regional association and the sub regional development council. At the same time, there is possibility the municipal governments - in addition to or instead of drawing up separate municipal environmental programs - shall have the option to work out a municipal environmental program collectively[5].

The author of the community environmental program shall send a copy of the draft version to the competent: environmental protection authority, soil protection authority, real estate supervisory authority, and government body in charge of the healthcare system, for assessment.

The environmental protection authority shall also consult the competent administrative bodies for environmental protection, the body in charge of the management and protection of nature preservation areas, and the agencies functioning as the nature preservation and water control authorities, and they shall submit their opinions to the authority within thirty days. The drafts of municipal and micro-region environmental programs shall be sent - in addition to the above mentioned bodies - to the competent county government, and the draft of the county environmental program shall be sent to the competent regional development council as well for assessment. The opining bodies shall present their expert assessments to the author of the environmental program within sixty days. A copy of the approved community environmental program shall be sent to the aforementioned assessment bodies. A copy of the approved regional and county environmental program shall be sent to the body designated as well for information purposes. The general public shall be informed of the progress made in the implementation of the community environmental program at regular intervals.

Municipal Environmental Protection Funds

In order to promote the fulfillment of their responsibilities in environmental protection, the local governments may establish municipal environmental funds through municipal bylaws. It has to make the funds maintainable, so it has to

[4] § 48/E (5) of Act LIII of 1995

[5] Act CXL of 2004 on the General Rules of Public Administrative Procedures and Services, and laws on the operation of the capital and county government agencies, and the argument of Act CCX of 2012 on the amendment of certain laws related to it.

depose of its revenues. The revenues of the municipal environmental protection funds shall be the following:

- the full amount of environmental fines definitively imposed by the local government,
- 30 per cent of the amount of the environmental fines imposed by final decision of the competent environmental protection authority in the area of the municipal government, with the exception of environmental fines imposed by final decision in connection with an incident based on which the emergency is declared,
- part of the environmental load charges and utilization contributions specified in specific other legislation,
- the amount of local government revenues earmarked for environmental protection purposes, and
- other revenues.

The municipal environmental protection fund shall be used for environmental protection purposes. The local government does not establish a municipal environmental protection fund, the revenue shall not be due to it. The representative body shall annually provide for the use of the municipal environmental protection fund simultaneously with the adoption of the bylaw on the budget and the closing of accounts. Local governments affected by the utilization, loading and pollution of the environment may initiate - with the local government authorized to dispose of the revenues - the proportionate division of revenues among the local governments in the impact area. They shall provide data to substantiate the extent of their needs. If no agreement is reached among the affected local governments on this issue and extent of the division, the local government initiating it may submit a statement of claim to the town court operating in the seat of the general court and, in Budapest, to the Pest Central District Court. The procedure shall be free of duty. The court has already decided in these types of cases, the local governments in the impact area have to prove for the proportionate division of the imposed fine by the environmental authority that the pollution exceeds the limit - prescribed in law - in their area, or the pollution will be able to occur exceeding the limit[6]. The court has also stated the condition of the division of the environmental fine the pollution occurred or can occur in the area of the applicant local government. The extent of the pollution has to be reached the limit prescribed in the law[7].

[6] BH.2010.218.

[7] EBH.2009.1964.

The National Environmental Geographical Information System

According to the regulation of the Environmental Act[8], with a view to setting out the environmental objectives and to promoting the implementation of environmental functions, the Minister - jointly with the sectoral ministers supervising the geographic information management bodies - shall establish and maintain an integrated electronic network, the National Environmental Geographical Information System accessible through the Government website. This completion and amendment of the Environmental Act are based on the guidelines of INSPIRE[9].

Therefore, The National Environmental Geographical Information System consists of the Information System and the information systems of the geographic information management bodies, with view to achieving interoperability. The National Environmental Geographical Information System shall provide a direct link to the Community website for geographical information systems. Where a natural or legal person, other than a geographic information management body, has any spatial data and is able to meet the technical requirements laid down in the legislation on the creation and operation of the National Environmental Geographical Information System, such person shall be provided - upon request - access to link up with the National Environmental Geographical Information System. The network website of the National Environmental Geographical Information System shall offer the following spatial data services to the general public:

- discovery services making it possible to search for spatial data sets and services on the basis of the content of the corresponding metadata and to display the content of the metadata;
- view services making it possible, as a minimum, to display metadata, spatial data sets and legend information, to navigate, zoom in and out, pan or overlay viewable metadata, spatial data sets and legend information, and to display legend information and any relevant content of metadata;
- download services, enabling copies of spatial data sets, or parts of such sets, to be downloaded and, where practicable by way of electronic means, accessed directly;
- transformation services, enabling spatial data sets to be transformed - in accordance with the user's requirements - with a view to achieving interoperability;
- services allowing spatial data services to be invoked.

[8] § 48/G and § 48/H of Act LIII of 1995

[9] Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 on establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

The geographic information management body shall have the right to charge a fee for the spatial data services described in the law. To this end, the geographic information management body shall enter into an agreement with the user, specifying the fees chargeable as "data service agreement". Users shall be permitted to conclude the data service agreement via the internet. By way of derogation, spatial data sets and spatial data services shall be provided free of charge to the institutions and bodies of the European Community as required for the fulfillment of reporting obligations under Community legislation relating to the environment. The fees and the conditions of access shall be established without any discrimination, such as in particular, where data is requested by a public administration body or natural or legal persons performing public administrative functions, when acting outside their official capacity in discharging their respective public functions, in respect of data supplied for the purposes of such activities, the same fees and conditions shall be applied as to any other user. The charges applied should not exceed the cost of collection, production, updating, reproduction, transformation and dissemination of data. The level charges shall be kept to the minimum required to ensure the necessary quality and supply of spatial data sets and services together with a reasonable return on investment, while respecting the self-financing requirements of public authorities supplying spatial data sets and services, where applicable.

Thus it can be stated, the spatial data services have to be collected once, the distribution of the spatial data services – originated from the different geographic information management bodies - have to be available among the different geographic information management authorities. The spatial data services have to be handled easily. The spatial data services are certified for example the data – available in electronic form – related to some places or geographical area in connection with the condition of the environmental components, the cadastral registration, the land tenure or the traffic infrastructure. The directive defines the technical rules of procedure and the provisions, which are necessary to establish and operate the mentioned system[10].

Conclusion

As a result of the statutory amendments, the limits of the national and the territorial (regional, county and community) environmental program have been appointed exactly. The limitation of the planning levels can be followed up well in the regulation of Environmental Act, from general to specific. The local legislation of the local governments is placed within authentic frames by the statutory regulation. This regulation can suit well the regulation which rests on EU directive related to the National Environmental Geographical Information System.

[10] The argument of Act LIII of 1995

References

§ 40 of Act LIII of 1995 on the General Rules of Environmental Protection

§ 48/A- § 48/F of Act LIII of 1995 on the General Rules of Environmental Protection

§ 48/E (5) of Act LIII of 1995 on the General Rules of Environmental Protection

§ 48/G and § 48/H of Act LIII of 1995 on the General Rules of Environmental Protection

The argument of Act LIII of 1995 on the General Rules of Environmental Protection

Act CXL of 2004 on the General Rules of Public Administrative Procedures and Services, and laws on the operation of the capital and county government agencies, and the argument of Act CCX of 2012 on the amendment of certain laws related to it.

Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 on establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

Act XCI of 2008 on the amendment of General Rules of Environmental Protection

EBH.2009.1964. Court Decisions

BH.2010.218. Court Decisions

CORPORATE SOCIAL RESPONSIBILITY AS A TOOL FOR SUSTAINABLE REGIONAL DEVELOPMENT IN NORTHERN HUNGARY

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The purpose of our paper is analyzing Corporate Social Responsibility (CSR) as a tool for sustainable economic and social development and reviewing CSR practices of the companies in the Northern Hungarian Region. In our empirical research (135 SMEs and 14 corporations had been surveyed) we explored the commitment, the implementation of CSR practices, the motivations and barriers of social and environmental activities in the Northern Hungarian Region, and we also analyzed how responsible business behavior of the companies influence regional competitiveness. In our research we assumed that there is a positive correlation between the voluntary socially and environmentally responsible business behavior and the business success, and a well-constructed CSR strategy is able to support the company in becoming more competitive besides being sustainable (Porter–Kramer, 2006).

***Keywords*: corporate social responsibility, business ethics, regional development, Hungary, CSR**

Introduction

Socially sensitive corporate activity entails a voluntary commitment to the public good demonstrated during the deployment of business resources in corporate or entrepreneurial business practice. Corporate Social Responsibility not simply means a mere following of certain set of rules and criteria, but refers to such business conduct, which provides benefits and advantages for the employees, for the immediate and macro environment, including the natural surroundings, thereby promoting overall well-being. This, however, cannot be restricted to financial support, as the concept of well-being is not exclusively measured in monetary terms demonstrated by the elaboration of such novel indicators as the ecological foot print, the human developmental index, and the complex environmental indicators (Szlávik, 2005, p. 132).

Any socially and environmentally sensitive enterprise strives to achieve business success, while preserving the options of the future and considering the

social, environmental, and business aspects and criteria interrelated and unseparable (Ligeti, 2007). Sustainability is a basic question of social responsibility, that is, meaning such business conduct and behaviour, which ensures the availability of the services and options provided by the respective business resources, natural environment, and society for future generations. The fact that today some large companies have more economic power than certain individual nation states justifies the development of a management perspective taking the above issues into consideration.

However the concept of corporate social responsibility was born in the United States already in 1953[1] and the American organisation research experts have begun to focus on the ethical aspects, social and environmental impact of business conduct from the 1970s (Bowen, 1953), CSR has been assigned a greater priority in Europe only since the early 1990s. By the definition of the European Commission CSR is "a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis" (Commission of the European Communities, 2001, p. 6). According to this European concept, the final long-term role of CSR of the companies is to get sustainable economic development by involving all the stakeholders from the governmental institutions through the civil organizations to the local communities. CSR is one of the tools which can help European countries to develop their competitiveness and to develop a dynamic knowledge based economy (Szlávik, 2005).

European business practices not only emphasize profitability, but strive for the development of such economic and social context, which assigns crucial priority to meeting social and environmental challenges (Román, 2008). This attitude is further reinforced by the 2006 European Commission statement: "The European Commission strongly believes that CSR matters to each and every European citizen, since it represents an aspect of the European social model. CSR can contribute to sustainable development, while enhancing Europe's innovative potential and competitiveness, thereby also contributing to employability and job creation" (Commission of the European Communities, 2006, p. 1).

Corporate social responsibility as one of the important prerequisites for sustainability and at the same time plays a significant role in the improvement of the competitiveness of the European enterprises as well. On the other hand, profit-orientation and CSR are often seen as conflicting (especially at times of economic crises), which implies that organizations will always have a tendency

[1] The actual notion was developed by Howard Bowen in his landmark book[1] titled *The Social Responsibility of the Businessman* (1953) – On the other hand many researchers assert that the concept of CSR was first introduced by E. Merrick Dodd's 1932 Harvard Law Review article titled "For Whom are Corporate Managers Trustees?" (Dodd, 1932)

to incorporate a social mission if it positively affects profit margins (Novotny, 2008).

In Hungary – as in other Eastern European countries – there is only a short past of corporate social responsibility. The concept is not well known by the companies, mainly large corporations and subsidiaries of multinational companies adopt CSR policies, which are mainly concerned with their reputation and image. They believe that "socially responsible activities" are linked to complying with existing regulations and behaving ethically with the stakeholders (UNDP-EC, 2007).

CSR in Practice in Northern Hungary: Summary of an Empirical Research

Background of the Empirical Research

In our empirical research we examined the development potential of corporate social responsibility in the Northern Hungarian Region. The expansion of corporate social responsibility not only improves the competitiveness of the principal actors of the business sector, but that of the whole region. The examination of options for the improvement of the competitiveness and the elimination of respective differences is specifically justified by the fact that said region is one of the least developed areas of the European Union (Kocziszky, 2006, p. 132) with long-range inner and outer peripheries (Kovács, 2012, p. 122). From a demographical perspective, the region is a shrinking area (the population decreases from year to year), which can cause serious problems in the local economy. Shrinking settlements and regions can be described by two main processes: on the one hand by the loss of population, while on the other by declining economic dynamics (Kovács, 2009, p. 37). Out of the EU25's 254 NUTS-2 regions of the European Union the per capita GDP established according to consumption power parity, showing a 37,3% value in 2002 as compared to the per capita GDP of the 25 EU countries, ranked the Northern Hungarian Region 249th. As the press release of the European Union issued in March 2012 reiterates, by 2009 the Northern Hungarian Region has already achieved the 39,5% average per capita output of the European Union, but it still belongs to the 15 least developed regions of the 27 EU countries (EUROSTAT, 2012). Unfortunately, the Northern Hungarian Region not only shows a major developmental gap to the other EU regions, but to the most developed Hungarian region as well. According to the above parameters its performance compared to the Central Hungarian Region shows the same difference as compared to the average of the EU regions (Kádek & Zám, 2007, p. 50). In 2005 the Northern Hungarian Region displayed the smallest economic activity and the highest unemployment rate in Hungary (Zám, 2008), which has not changed eversince.

In our study we deployed a conceptual apparatus used for the examination of corporate commitment to social responsibility, along with devices and instruments with a potential further use. Furthermore, by processing the obtained survey answers concerning success factors and limits of corporate social responsibility we attempted to examine such aspects of the very issue as environmental protection, the reduction of the impact of climate change, the limiting of risks associated with using chemicals, gender equality, and the struggle against corruption. We decided to focus on these factors because they significantly contribute to the social well-being of the region in addition to representing various dimensions of sustainability. We cannot emphasize enough that the acceptance of corporate social responsibility helps to achieve long term business advantages while providing directions for meeting the requirements of sustainability. Furthermore, several researchers and experts underline that only sustainable development can provide long term economic benefits while preserving the chances of future generations and offering real alternatives in the present (Prodi in Szlávik, 2005, p. 27).

The starting point of our hypothesis was that there had been a positive correlation between the level of voluntarily assumed corporate social responsibility and the success of the given enterprise, in addition to the recognition that a carefully selected CSR strategy can promote competitiveness on the long run (Porter & Kramer, 2006). While the examination of the most important ideological trends is crucial for the adoption of the Porterian perspective our thesis also explores concepts contradicting the above opinions and introduces such views, which do not exclusively espouse win-win solutions.

The empirical research effort has completed in 2009 and focused on the firms and enterprises of the Northern Hungarian Region. The questionnaire based survey examined the social and environmental commitment of firms, the actual practices of corporate social responsibility, and the motivational and limiting factors of the concept. Special attention was paid to the regional economy and business development function of corporate social responsibility, itself a guarantee of competitiveness in the region. The empirical examination's primarily regional focus aimed at the analysis of corporate social responsibility and at the potential developmental trends.

The Conceptual Framework of the Research

The target to be examined was selected by a systematic sample taking process. The required data was obtained from the representative agencies of the Hungarian Chamber of Commerce and Industry along with the records of the Business Registration Court. 1450 questionnaires have been sent out to firms. The total sample amounted to 149 completed questionnaires representing 14 large and 135 small and medium size enterprises.

Table 1
The sample taking process of the empirical research

County	Full sample population		Those questioned		Those responding	
	Firm/ number	Percentage distribution	Firm/ number	Percentage distribution	Firm/ number	Percentage distribution
Heves County	1067	24 %	400	27 %	74	50 %
BAZ County	2727	61 %	850	59 %	57	38 %
Nógrád County	666	15 %	200	14 %	18	12 %
Total	4460	100 %	1450	100 %	149	100 %

While the number of responses to the questionnaire appears to be satisfactory, some problems associated with the representative nature of the answers might positively bias the results of the research effort. However, the aforementioned deficiencies notwithstanding and in light of all these concerns the results of the survey, if handled with appropriate care and compared with research results of similar nature, can be expanded to the whole region as well.

While taking the already mentioned factors exerting a positive bias into consideration, the conclusions drawn from the results of the empirical research effort can be most applicable to the socially responsible business sector.

During the empirical research an indirect instrument, a business questionnaire was used. This research tool aimed to examine not the immediate phenomenon, that is the very concept of corporate social responsibility, but the thinking processes, views, attitudes and 'supposed'[2] performance of these firms.

The questionnaires containing 16 mostly close ended items can be divided into 5 thematic groups:

1. The extent of the commitment of the given business
2. The applied and currently available CSR apparatus
3. The role of CSR in strategic planning
4. Conditions promoting and preventing the introduction and implementation of CSR
5. General data

[2] Here I am using the term "supposed" because there is no specific method available for quantifying or controlling information on the social and environmental attitude of businesses. Enterprises, however, could be aware of what they should do and occasionally companies deliberately provide a more positive answer not specifically for actual performance but concerning commitment and attitude. While this can exert a positive bias on the research results, I have taken this issue into consideration during the evaluation of the questionnaires.

The Main Objectives of the Research

The starting hypothesis of our research effort entailed the recognition of Hungarian features of corporate social responsibility. The empirical research analyses are also aimed at the identification of these features.

The empirical research of the Hungarian business sector is directed at the following components:

1. the *commitment* of the firms of the region,
2. the *available CSR apparatus and the resources* already dedicated and scheduled to be used for the promotion of corporate social responsibility,
3. the *social pressure* exerted towards firms,
4. the *motivational and limiting factors* of responsible business activity and firms' expectations for the support of corporate social responsibility development efforts
5. the *correlation between corporate social responsibility and business success* in the region

The Main Findings of Research

Thesis No. 1

While a commitment to the solution of environmental and social problems tends to characterize enterprises, this mostly means adherence to regulations and mandatory recommendations in the North Hungarian Region. Social and environmental commitment only exists on a rhetorical level, appearing more in the form of theory than well-established practice.

The following empirical research results tend to substantiate the above thesis:

- Only few companies, mostly large size enterprises display more corporate social responsibility than warranted by regulations.
- All responding firms displayed an intention to meet the requirements of regulations and mandatory recommendations.

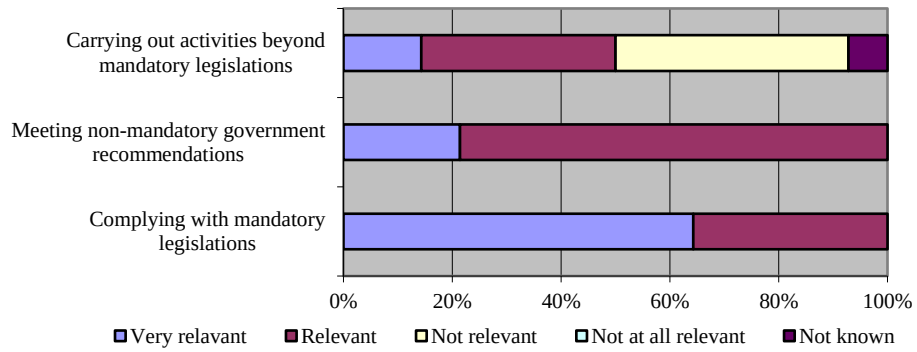

Figure 1. Social and Environmental Activities of Corporations

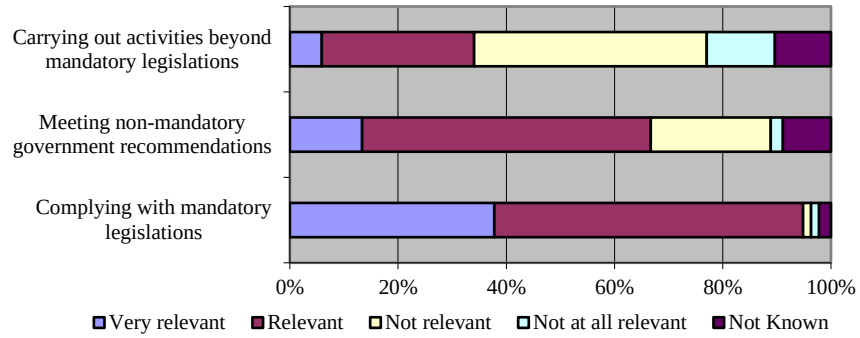

Figure 2. Social and Environmental Activities of SMEs

- Most large, small, and medium size enterprises assign strategic significance to the struggle against corruption and to the provision of gender equality. While 65% of large size enterprises consider the other aspects of CSR important, this can only be said about a few small and medium size enterprises.
- In case of most enterprises the positive answers concerning the significance of CSR strategy and the benefits provided to local communities. Were not substantiated by subsequent positive replies related to the use of specific CSR instruments and the respective community activity.

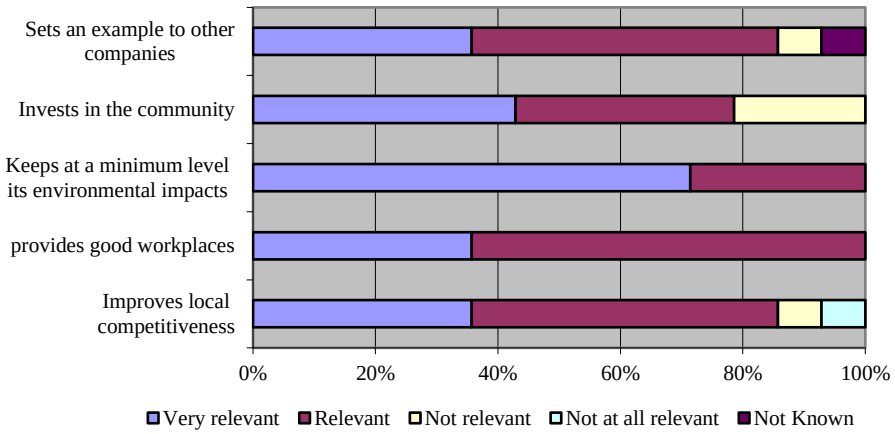

Figure 3. Benefits Provided to the Local Community by Corporations

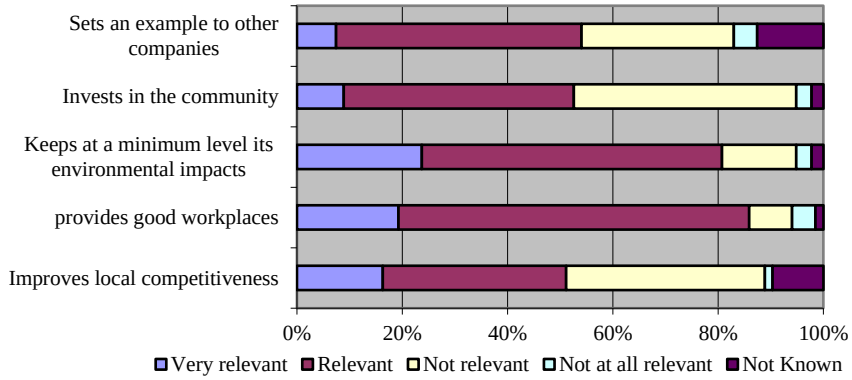

Figure 4. Benefits Provided to the Local Community by SMEs

- 17% of large firms and an overall 33% of enterprises indicated that they plan to limit their CSR expenditures implying that the potential commitment and optimistic outlook cannot be substantiated due to an unfavourable financial situation.
- While 37% of SMEs plan to improve their CSR activity, in a somewhat contradictory manner, only 12% intend to allocate more funds for this purpose. This demonstrates that due to limited financial resources in case of SMEs the commitment to CSR is greater on the theoretical level, than in practice.

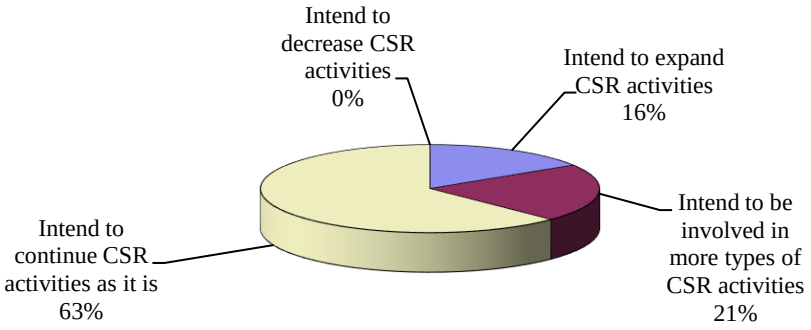

Figure 5. Intentions of SMEs for Continuing their CSR Activities

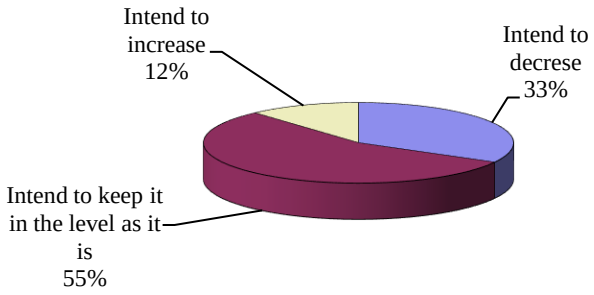

Figure 6. Intentions of SMEs about Costs of their CSR Activities in the near Future

Thesis No. 2

There are relatively few companies known for using a wide variety of CSR instruments applied in the EU as well while the continuation of community activities tends to be more characteristic. Firms are not familiar with a large number of conceptual tools and the prospective methodology tends to restrict CSR activities to quality culture, and to the implementation of management systems along with introducing various methods for maintaining connections with employees in the North Hungarian Region.

Businesses mostly wish to maintain the already existing scale of CSR tools, while planning to conduct socially responsible activities in the already established manner. Furthermore, only a small fraction of the business sector anticipates the increase of CSR application related expenditures.

The following empirical research results tend to substantiate the above thesis:

1. While the use of CSR tools and the respective variety is greater on the part of the large companies of the region as compared to small and medium size enterprises, still only a small portion of this sector deploys CSR conceptual instruments successfully applied in the European Union. Furthermore, large companies are in no better position than the SMEs as far as familiarity with the latest CSR tools and their future implementation is concerned. Generally SMEs tend to use such CSR tools as management systems and the monitoring of employee satisfaction.
2. Only 20% of enterprises are familiar with fees and product markings associated with environmental protection concerns.
3. More than half of the large companies surveyed support sport events or sport clubs either financially or with material donations.

4. 65% of large firms perform community activity locally and 95% of community support provided remains to be used in the local and regional level.
5. 82% of the SMEs examined participate in community activities at the local level.
6. Having compared the community support activities of the large firms and small and medium size enterprises we can conclude that prioritised support areas include sports, education, and culture, to be followed in order by health care and environmental protection.
7. 22% of large firms plan to improve their CSR activity, while 33% expressed an intent to allocate more funds for this purpose.

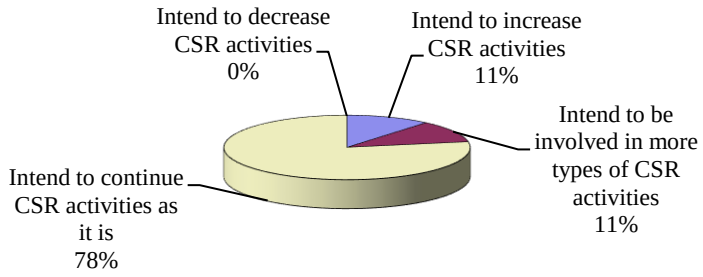

Figure 7. Intentions of Corporations for Continuing their CSR Activities

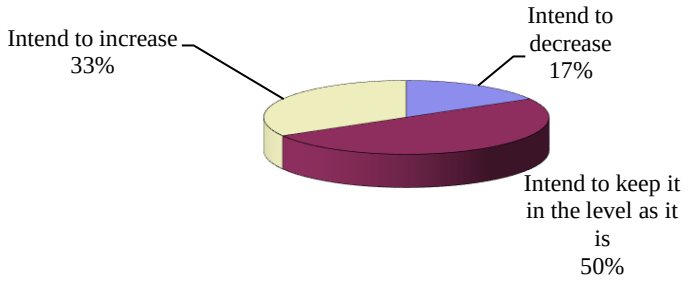

Figure 8. Intentions of Corporations about Costs of their CSR Activities in the near Future

Thesis No. 3

While in case of one third of the enterprises their clients and business partners appreciate social and environmental commitment, approximately the same amount of partners and clients do not consider socially responsible business activity valuable. This eventually demonstrates the

low social and environmental awareness in the Northern Hungarian Region. The lack of conscious consumers is a major obstacle in the development of social responsibility, thus the promotion of conscious consumer behaviour along with social and environmental awareness should be given a greater emphasis in the future.

The following empirical research results tend to substantiate the above thesis:

1. 35% of the firms report that their business partners and clients appreciate socially responsible business activity. This rate applies to all business types including large firms and small and medium size enterprises.
2. Research results reveal that the business partners and clients of 20% of large firms and more than 40% of SMEs do not appreciate or value socially responsible business conduct.
3. At the same time large enterprises and small and medium size enterprises share similarities as well. Namely, approximately 30% of them are required to produce information about their socially responsible activities to their clients and partners.
4. 15% of large companies surveyed reported that their partners and clients support corporate social responsibility development efforts, while only 7% impose requirements surpassing existing legal regulations.
5. 5% of SMEs surveyed reported that their partners and clients support corporate social responsibility development efforts, while less than 10% impose requirements surpassing existing legal regulations.

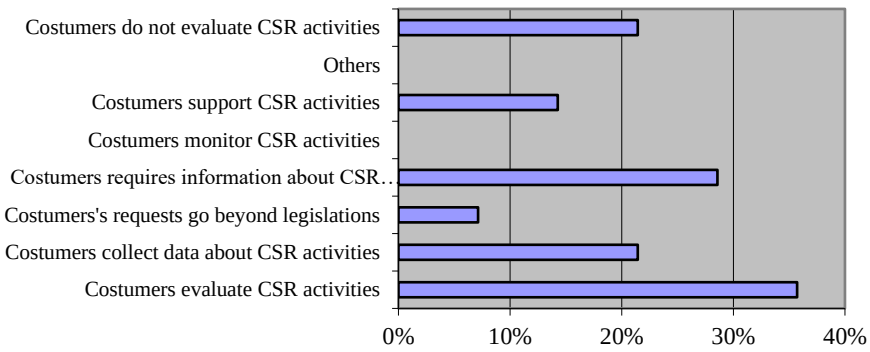

Figure 9. Reactions of the Costumers to CSR activities of Corporations

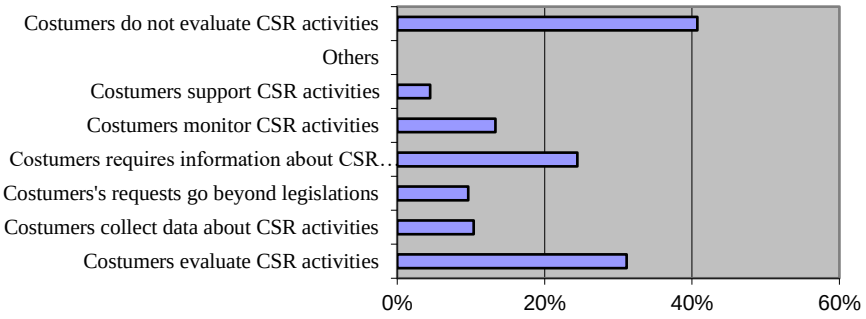

Figure 10. Reactions of the Costumers to CSR activities of SMEs

Thesis No. 4

While enterprises consider those components of socially responsible business conduct their most important objective and motivating factor, which can provide profitability in the short run, large firms tend to be motivated by real and actual CSR commitment in the North Hungarian Region.. The most significant obstacles to the promotion of responsible business conduct include the lack of financial resources, and the scarcity of governmental and professional support in addition to a mistaken view that socially responsible business conduct limits profitability. Consequently, the enterprise sector expects a more active support from the professional community and the decision makers as well.

The following empirical research results tend to substantiate the above thesis:

1. In case of large companies surveyed the most important motivation for the continuation of CSR activities is the intent to meet such criteria as *performing business activity corresponding to the basic value system of the firm* followed by *ethical business conduct*. Furthermore, all companies ranked equal in importance such considerations as '*contribution to sustainable development, the nurturing of the reputation of the business*, *the expansion of clientele*, and the *acquisition of new markets*.
2. In case of small and medium size enterprises the most important objective is the *expansion of clientele and the acquisition of new markets* to be followed by the r*eduction of expenses and the maintenance of the reputation of the firm.* The other considerations of lesser importance include *ethical business conduct*, *contribution to sustainable development*, and *meeting the expectations of buyers and suppliers*.
3. The answers support the conclusion that while SMEs are mostly motivated by *tangible elements* promoting short term profitability, large companies'

socially responsible behaviour reflects actual commitment and the realisation of long term business goals.

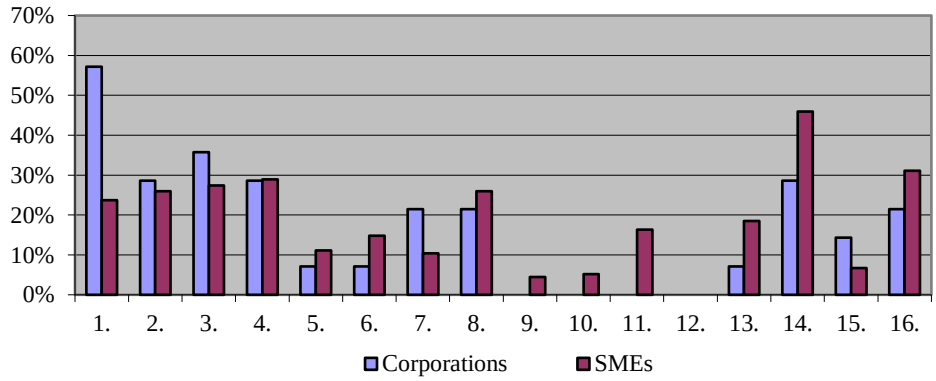

Figure 11. The Aims of CSR Activities of the Companies of the Northern Hungarian Region

Note. 1) Meet a fundamental value. 2) Improve access to capital. 3) Contribute to sustainable development. 4) Prevent or obviate anticipated legislations. 5) It's the right thing to do as an ethical company. 6) Benefit from public programs and subsidies. 7) Manage reputation. 8) Benefit from networking activities. 9) Reduce risks. 10) Trigger innovation of products and services. 11) Attract, retain and motivate employees. 12) Expand our costumer base. 13) Responsibility to stakeholders and the local community. Manage resource constraints. 14) Meet the expectations of costumers and supply chain. 15) Generate costs savings.

4. Large companies believe that the best help provided by decision-makers should include training and consultation in addition to providing financial resources. At the same time an equally important emphasis is placed on the development of investor and consumer awareness along with the preparation and dissemination of informational materials and case studies.
5. Most small and medium size enterprises expect decision makers to provide data for the preparation and dissemination of informational publications and case studies. However, a similar emphasis is placed on measures promoting consumer and investor awareness along with financial support.
6. Both large and small and medium size enterprises envision the role of decision-makers in supporting and promoting CSR activities in the same field. Shared concerns include the availability of financial resources, the promotion of consumer awareness, the dissemination of informational materials, and strengthening the importance of training and educational schemes.

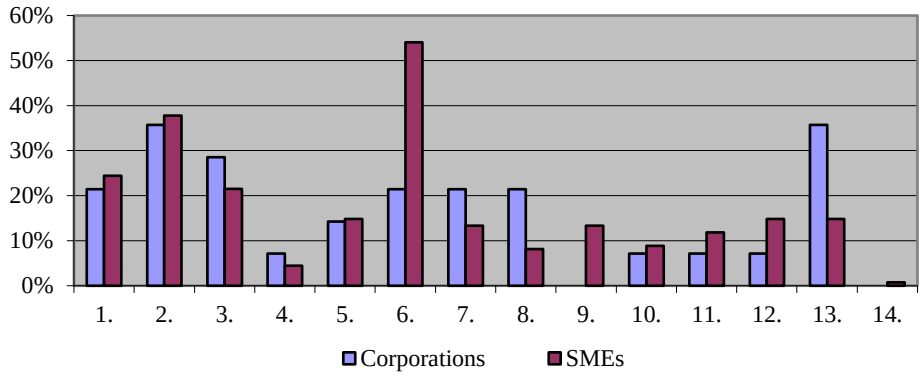

Figure 12. Opinion about Barriers to the Implementation of CSR Activities among Companies of the Northern Hungarian

Note. 1) No information about or little familiarity with such activities. 2) Lack of external support (government, sector associations). 3) The market does not recognize such commitment. 4) Frequently, the management is not committed. 5) No social/community benefits expected for the company. 6) Frequently, employees are not interested. 7) It is not relevant for the company from the beneficial aspect. 8) Frequently, business partners do not demand such commitment. 9) The activities are not related to companies' business fields. 10) They consider CSR as the task of only large corporations. 11) The activities cause costs, lack of financial and/or time resources. 12) The regulatory environment is not predictable. 13) Lack of expertise and/or organizational capacities. 14) Other reasons.

Thesis No. 5

The positive correlation between profitability and CSR activity of regional enterprises (social and environmental activity, advantages provided for local communities, the level of strategic significance attributed to CSR) appears to be weak, as the CSR activities of the firms do not depend on financial concerns, rather the general social conditions tend to prevent the wide spread application of CSR in the North Hungarian Region.

Table 2
Relations between profitability and CSR activity

Companies	Correlation coefficient between profitability and…		
	…social and environmental performance	…benefits given to local community	…strategic importance of CSR
Corporations	0,276	0,642	0,111
SMEs	0,026	0,243	0,220

The following empirical research results tend to substantiate the above thesis:

1. The positive correlation between profitability and CSR activity of regional enterprises (social and environmental activity, advantages provided for local communities, the level of strategic significance attributed to CSR) can mostly be discerned in case of large companies and in this instance the advantages provided to local communities are influenced more substantially.
2. The correlation between the profitability of SMEs and their CSR activity relevant to all factors is rather weak thus profitability cannot unequivocally be considered a decisive factor in the socially responsible activities of the SMEs.
3. The social and environmental activity of the large enterprises is mostly influenced positively by the rate of female executives, ranking before sales receipts the number of employees, and profitability, the latter concept having the least power in exerting a positive impact.
4. The research effort also revealed that the strategic importance of CSR is greatest in firms where the rate of female executives is highest in management.

Thesis No. 6

The social responsibility of regional firms lags behind the overall Hungarian enterprise sector along with the neighbouring Central and Eastern European countries with similar economic, social, and political background. The applied CSR apparatus to address the relevant social and environmental problems is of a narrower scale in the Northern Hungarian Region.

In our paper in order to explore the relevant similarities and differences we have performed a comparison between corporate social responsibility in Hungary and in the Northern Hungarian Region with that of the countries of the Carpathian Euroregion (Poland, Slovakia, Romania, Ukraine).

The comparative analysis of national corporate social responsibility practices was performed according to the following criteria: the interpretation of the CSR

concept, applied CSR tools in business practices, CSR reports and standards, the role of civil organisations and institutions, the role of the media, the function of instruction and CSR research projects, and the role of the government and public administration in the countries of the region.

The comparative analysis revealed that numerous social, economic, political and practice-based features nothwithstanding the extent and nature of corporate social responsibility tends to significantly vary throughout the aforementioned countries. Out of the 5 countries examined 2 shows the greatest differences as Slovakia stands out in a positive sense, while Ukraine is singled out due to the low level of CSR.

In certain sense the Northern Hungarian Region appears to stand out from the rest of the sample, mainly due to the deficiencies in the field of social responsibility, which not only reveals a significant lag in the context of neighbouring countries but demonstrates that social responsibility in Hungary is ranking below the national average.

Conclusions

The years after 2008 are kind of the years of truth for CSR in Europe and all over the World. The years of and after the Financial Crisis will show which companies CSR was a one season's fashion and which organizations build real strategies on it. All companies have to face with the crisis and they need to cut the budgets spending on CSR as well. Nevertheless these savings don't mean resigning from CSR, especially in companies that have integrated CSR in their strategy. This situation is able to make companies turn into activities such as resource saving programs that can also bring cost savings to the companies and may allow them to achieve interesting ecological results with a lower cost This period is also a challenge for innovation and creativity what can help companies in getting competitive advantage and stable position on the market (Owsianska, 2010).

The purpose of fostering companies to integrate CSR activities into their operations cannot be achieved without raising the awareness of society and without effective governmental support, but the most crucial question concerning the expansion of corporate social responsibility is whether players of the Economy of the countries will recognize those forms of CSR that can be beneficial and easily harmonized with their business interests.

The citizens have a significant role with making the companies do voluntary actions, because companies become responsible just in that business environment where this behavior is appreciated by the local community. This is the field where changes are required first. The behavior of the customers is the most important barrier of spreading CSR. While the man in the street doesn’t know the meaning of CSR and while he thinks that charity is the only tool of

CSR he won't understand its contribution to Sustainable Development and he won't be able to pressure the companies in the fields of green and social inventions, product quality, resource efficiency, and ecological production as well.

Research results, international CSR practices, and several examples of the respective professional literature appear to suggest that the level of social responsibility in various countries and regions is not only influenced by economic development but by the respective social, cultural, and other related conditions. Consequently, we cannot declare that the achievement of a certain economic output would result in the automatic increase of social responsibility, and it was proven that the abovementioned features determine the applicable apparatus and the potential developmental options. Thus, while there is a definite need for a comprehensive EU strategy, social responsibility objectives can only be implemented while taking the respective local conditions into consideration.

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