

# PROBLEMY EKOROZWOJU

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of Sustainable Development



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# PROBLEMY EKOROZWOJU

## PROBLEMS OF SUSTAINABLE DEVELOPMENT

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## Contribution to the UN Post-2015 Development Agenda Based on the Concept of Resilience

### Wkład koncepcji resilencji do Agendy Rozwojowej UN Post-2015

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#### Abstract

The authors of this paper suggest applying the concept of resilience in the process of setting up Sustainable Development Goals (SDGs) to be implemented in the United Nations Post-2015 Development Agenda. Referring to the synopsis of the scientific basis of resilience and sustainability presented by Bloesch et al., the proposed general goals and specific targets of sustainable development are introduced and discussed. The aims of the SDGs and the corresponding targets can only materialize when applying as guiding principles advanced knowledge (science), transfer of knowledge and skills (education and training), encouragement of creativity and ethical values (governance and policy). Moreover, the fundamental values of ecosystem function are to be acknowledged as well as the need to balance the three sub-systems of the eco-social triad. It appears necessary to focus on integrative resilience. The Post-2015 Development Agenda should stress the crucial role of self-regulation in ecosystems, and a corresponding cognitive regulation of social and economic systems with the aim to ensure system's stability within given thresholds.

**Key words:** Post-2015 Development Agenda, goals, targets, resilience, adaptive cycle, economy, society, ecosystems

#### Streszczenie

Autorzy sugerują zasadność włączenia koncepcji resilencji w proces tworzenia Celów Rozwoju Zrównoważonego (Sustainable Development Goals, SDGs) i dokumentu ONZ Agenda Rozwojowa Post-2015. Odwołując się do naukowych podstaw resilencji i zrównoważoności, przedstawionych przez Bloescha, zaproponowano i omówiono tak ogólne, jak i szczegółowe cele zrównoważonego rozwoju. Są one możliwe do osiągnięcia tylko wtedy, gdy za zasady przewodnie uznane zostaną wiedza (nauka), przekazywanie wiedzy i umiejętności (edukacja i szkolenia),



wzmacniania kreatywności i przestrzeganie zasad etycznych (zarządzanie i polityka). Co więcej, należy uwzględnić także podstawowe wartości funkcjonalne pełnione przez ekosystemy oraz potrzebę utrzymania równowagi pomiędzy trzema podsystemami eko-społecznej triady. Niezbędnym wydaje się skoncentrowanie na resiliencji. Agenda Rozwojowa Psot-2015 powinna podkreślać decydującą rolę samo-regulacji ekosystemów i analogicznych regulacji systemów społecznych i ekonomicznych, gdzie celem jest zapewnienie stabilności systemów w danych warunkach.

**Słowa kluczowe:** Agenda Rozwojowa Post-2015, cele ogólne, cele szczegółowe, resiliencja, cykl adaptacyjny, ekonomia, społeczeństwo, ekosystemy

## Introduction

At the turn of the 21<sup>st</sup> century the General Assembly of the United Nations ratified the Millennium Development Goals (MDGs) encompassing eight goals, 21 targets and a series of measurable indicators in the areas of poverty alleviation, education, gender equality and empowerment of women, child and maternal health, environmental sustainability, reducing HIV/AIDS and communicable diseases, and building a global partnership for development. It was agreed to meet these targets by 2015 at the latest. As this date is approaching and some targets are likely not to be met a debate on the framework of the international development beyond 2015 (Post-2015 Development Agenda) has started. At the Rio+20 summit held in June 2012 the 192 UN member states agreed to initiate a process of designing Sustainable Development Goals (SDGs), which are *action-oriented, concise and easy to communicate, limited in number, inspirational, global in nature and universally applicable to all countries while taking into account different national realities, capacities and levels of development and respecting national policies and priorities* (UN, 2012). It was further agreed to launch a process to develop a series of SDGs which should be treated as guidelines for the Post-2015 Development Agenda (Sachs, 2012).

An inclusive and transparent intergovernmental process on SDGs, open to all stakeholders was established by the UN Member States. The aim was to develop global SDGs upon which the UN General Assembly could agree. The outcome document mandated the creation of an intergovernmental Open Working Group (OWG) that will submit a report containing a proposal for SDGs for consideration and appropriate action to the 68<sup>th</sup> session of the General Assembly. It specifies that the process leading to the SDGs needs to be coordinated and coherent with the processes considering the Post-2015 Development Agenda and that initial input to the work of the OWG will be provided by the UN Secretary General in consultation with national governments. Whether consensus will be reached and whether planetary boundaries, the role of good governance and environmental goals will be reasonably well addressed is subject to hope and speculation (Galaz, 2014).

Several authors of this paper participated in the OWG process and used the concept of resilience for

the development of SDGs to be considered in the process of defining the Post-2015 Development Agenda. The purpose of this paper is to show how the practical integration of the resilience theory results in a promising approach to the complex system dynamics of the so-called *eco-social triad* (Adams, 2006).

## Proposed Goals and Targets

In formulating SDGs there is need to learn from past attempts while considering the essentials of existing scientific concepts, the present situation as well as the projection into the future. This is, of course, a difficult and controversial endeavor, and not easy to accomplish. It might even be impossible to match with and influence existing mainstream policy – driven mostly by national interests, governance deficits including corruption and nepotism, as well as human egoism, greed and angst (Schirrmacher, 2013). We recommend a pragmatic approach considering the eco-social triad concept as a guiding principle (Bloesch et al., 2015). The economy as a subsystem should play a role, equal to the role of the ecology. This requires compromises and tradeoffs. The proposed SDGs are presented in a goals and targets format. The targets are listed in the shaded boxes; the respective explanations are given below the boxes. The principle message is that humankind ought to take readily understandable and applicable measures capable of keeping societies, economies and ecosystems resilient.

### Goal 1: Maintain self-regulation processes, resilience and integrity of ecosystems

This goal contributes to the conservation of natural ecosystems and their services as well as to the strengthening of regulations for their protection. In this context the authors recommend taking into account the following targets:

- Abandon or decrease the clear-cutting of tropical and boreal forests as well as the drainage of wetlands and peat bogs.
- Preserve and monitor marine and freshwater ecosystems and increase awareness of the importance of their protection.
- Strengthen the implementation of measures that truly protect ecosystems and interlink the protected areas.

- **Develop regulations and international agreements to protect sensitive glacier regions (Arctic, Antarctic, Alps, Himalayan and others) from economic exploitation.**
- **Banish the discharge of untreated sewage as well as gaseous and solid waste materials into the environment (soil, water, atmosphere).**
- **Advance organic farming to further develop sustainable agriculture.**

#### *Explanations:*

Many natural terrestrial ecosystems have been replaced by monocultures to provide food, fiber and fuel to people. Due to the loss of biodiversity, such systems lack the resilience of natural ecosystems. Currently there still remain vast ecosystems on Earth including boreal and tropical forests, large wetlands and peat bogs that operate in a near natural regime, retain much of their integrity and continue to provide regional and global ecosystem services. These systems have to be protected and intensively studied to better understand their role in keeping the Earth system resilient.

Ecologically sensitive regions and nature parks must receive rigorous protection because of their important ecological and cultural values. However, protection and conservation of natural ecosystems in the form of nature parks is often insufficient (Watson et al., 2014). Ecosystems may not be treated as a *museum*. Protected areas are rather scarce, often isolated and not well managed or even threatened by exploitation and mass tourism. Ecosystem services are often misinterpreted as human common (e.g. by the Millennium Ecosystem Assessment, MEA 2005) and mostly not used adequately.

Preservation of marine ecosystems should focus on reduction of human-induced damage (e.g. overexploitation of fish stocks, discharge of micro-pollutants, plastic debris, and noise). As important is the restoration of degraded shores. Concerning inland water bodies, the physical destruction of rivers by dams and embankments, the disconnection of floodplains, and eutrophication of surface waters should be stopped or mitigated. Conservation programs should be based on scientifically sound principles. Restoration and conservation of *pristine* ecosystems need respect for naturally occurring dynamics; hence, unconventional, non-passive management should be taken in consideration (Galaz, 2014).

Glaciers, the Earth's largest freshwater reservoir, have begun melting at high rates in recent decades. In general, climate change has made mountainous areas extremely vulnerable. Due to the loss of permafrost various negative consequences are threatening the surrounding and downstream region. A large number of plants and animals are likely to become extinct. Preservation of glacial ecosystems functions is crucial to avoid disastrous consequences for these fragile ecosystems and most likely for the global sys-

tem as a whole. Drastic reduction of greenhouse gas emission needs to be supplemented with measures at the local scale (*Think globally – Act locally*).

Discharge of excess amounts of untreated sewage into rivers, lakes and coastal waters not only raises human health risks. Moreover, it damages the self-regulation capacity of aquatic ecosystems. To maintain ecosystem's resilience, both innovative wastewater treatment technologies and the development and dissemination of public awareness programs are needed. In principle, the causes rather than the effects of pollution should be tackled (i.e. no end-of-pipe solutions), which applies specifically to toxic and persistent organic substances.

Further development and implementation of sustainable agriculture is important concerning both, terrestrial ecosystems and societies. The excessive use of fertilizers, herbicides and pesticides through intensive agricultural practices has resulted in negative environmental impacts such as soil degradation, groundwater pollution and biodiversity reduction. Although organic farming is debated its ecological and social advantages seemingly exceed the disadvantages of conventional farming. Sustainable farming practices need to be further developed and implemented. An outstanding example is the Foundation Biovision, awarded with the alternate Nobel Prize in 2013, which applies biological methods in Africa to control plant diseases, propagates planting methods adjusted to the existing soil quality, and adapts the local farmer societies to local markets to sell their products ([www.biovision.ch](http://www.biovision.ch)).

#### **Goal 2: Foster the resilience of societies**

This goal includes targets on mitigating poverty and enhancing equality. Following the concept of adaptive cycles (Walker and Salt, 2006) efforts in building readiness to deal with environmental and socioeconomic changes are likely to foster societal resilience, and promote advances in sustainable development. The authors recommend taking into account the following targets that contribute to strengthening the resilience and stability of human societies:

- **Eradicate poverty and guarantee equal rights and social justice independent of gender, race, religion or ethnicity.**
- **Implement on the global scale the Human Right to Water and Sanitation.**
- **Develop ethically sound methods of population growth reduction.**
- **Improve the understanding of the dynamics of societal systems.**
- **Develop and communicate innovative methods of building capacity to overcome global threats.**
- **Develop guidelines for human behavior in respect to exploitation of natural resources causing impacts on environmental function.**



### *Explanations:*

Satisfaction of essential human needs and elimination of poverty and inequality is to be understood as a prerequisite to societal resilience. The process of materializing these goals requires encouragement of site-specific solutions. In response to global, regional and local changes societal, economic and political actors are called upon favoring substitution of established practices by solutions based on contemporary scientific knowledge and technical innovations.

Basic services such as supply of potable water and sanitation are considered to be best provided or at least controlled by the public sector (public service). The required technical systems should be further developed and consequently established step-by-step in relation to economic conditions at the location under consideration (Grambow, 2013).

In this context, the question arises, whether indigenous and developing societies are living sustainably, and whether sustainable development requires the economy of developed countries to pay for mitigating environmental degradation. To present clear answers to these questions solid research is necessary. If industrialized countries share their financial assets with developing countries, they will benefit from reduced economic and social discrepancies, less armed conflicts and lower number of refugees.

Design and enforcement of water management concepts should respect not only the regional geographic, economic and climatic conditions but also the inherited way of living. Meeting the rising demand for decent and affordable water supply and sanitation is to be considered not only a challenge. It certainly is also a chance to overcome the widespread throw-away mentality in the densely populated areas of the world, in rural and urban areas as well as in informal cities alike. Thus, sustainable water management should include the concept of recovery of valuable substances from wastewater (including potable water and energy), reuse and recharge of groundwater reservoirs.

The tremendous growth of the human population in the last decades has led to increasing demands for food, water, land and raw materials, but also for education and job opportunities. Using standards set in the high income countries as guidelines to satisfy all those needs might exceed the carrying capacity of the Earth (Meadows et al., 1972, 2004). It appears inevitable to search and implement farsighted and ethically sound measures that lead to a significant decrease of the global population growth. Rigorous enforcement of female equality of opportunities is suggested as one of the measures to be considered. Investment in research at the interface between social, economic, physical and biological sciences will presumably improve the understanding of the complexity and dynamics of ecosystems and human civilizations. The gain of knowledge and skills to mas-

ter complex ecological, societal and economic problems is considered the key for truly sustainable development (von Hauff, 2012). Innovative modeling of non-linear complex systems using advanced parallel computing provides the chance to gain important insights into systemic risks and uncertainties. Results of computer-aided evaluations permit a better understanding of the vulnerability of societies and for choosing the most promising steps that keep the adaptive cycles rotating (Bloesch et al., 2015). A high level of adaptability to changes at the global as well as at the very local level is necessary to keep complex social structures and networks in the state of resilience.

Such targets focus also on making advanced knowledge and innovative methods available to the general public and to decision makers at large. Educational programs in schools and universities have to include specific onsite training and eventually solve problems peculiar to local and regional situations (Sterling, 2001).

### **Goal 3: Foster the resilience of economies**

This goal contributes to the development of alternative economic models balancing private and social interests, hence strengthening the resilience and stability of the eco-social triad. We recommend replacing the Gross Domestic Product (GDP) as an indicator of economic performance by the Index of Sustainable Economic Welfare (ISEW) proposed by Daly and Cobb (1989). Global challenges such as meeting energy, water and food demands, mitigating climate change impacts and protecting ecosystems have to be addressed by the global community. Intensified international efforts have to be understood as a key measure in keeping economies resilient. It is important to develop awareness programs highlighting the role of each individual person in counteracting climate change and environmental destruction. The authors recommend taking into account the following targets:

- **Improve international cooperation and develop a new economic paradigm that favors sufficiency and farsighted qualitative growth.**
- **Finance the development of innovative technologies for water conservation, pollution reduction and recycling.**
- **Enhance the resilience of farming and food supply systems while respecting cultural traditions.**
- **Implement incentives favoring economic diversity of small and medium size enterprises with the aim to reduce vulnerability against unforeseen changes of ambient conditions.**
- **Stop land grabbing and exploiting natural resources of developing countries.**

- **Stop the artificial restrictions of export/import of agricultural products imposed by developed economies and foster self-determination of developing countries.**
- **Implement rigid controls and regulation of stock exchange and investment banking as well as commodity traders.**
- **Encourage individual understanding and responsibility for reducing environmental and ecosystem degradation.**
- **Improve modeling of economic and financial systems for the purpose of early warning and managing undesirable developments.**

#### *Explanations:*

Despite the continuing global economic crisis a proper economic paradigm has not yet been established. In contrast to the many existing economic theories, the *post growth economy* propagated by Paech (2012) can be seen as a guideline in the attempt toward a sustainable economic development. For that, the primacy of economy should be broken through ethical regulation of banks, stock markets and tax systems. From a sociological point of view, the economy should serve the people and not vice versa.

Because water is essential for life and for the production of virtually all goods and services, the investment in water management and water usage is key in planning future development. The global demand for water, food and energy is likely to increase in the 21<sup>st</sup> century and water scarcity is considered to become a global threat. To meet the projected growth of demand without undermining our planets carrying capacity, it is critical to make significant improvements in water supply to domestic, industrial and agricultural operations.

Large-scale farming often serves the economic interests of industries and foreign markets while vital requirements of local communities (clean water, fertile soil, healthy environment, well-being of local people) are disregarded. As a result, local economic and environmental systems become tremendously vulnerable. New production and distribution schemes (e.g. eco-labels and fair trade) need to be implemented that serve local consumers and preserve local land use.

Public funds have to be invested in research and development of technologies applicable for rural areas creating job opportunities and long-term economic development. Effective tax planning is a prerequisite in the current economic situation, for diverting tax incentives towards the renewable energy sector. This will safeguard sustainable development at large (KPMG report, 2012).

#### **Goal 4: Safeguard and strengthen the resilience of the eco-social triad**

This goal addresses the importance of balancing vital interests and limits of the three sub-systems of the eco-social triad (society, economy, ecosystems). The balance and resilience of the triad should be supported from the earliest stage of decision making. The authors recommend taking into account the following targets:

- **Invest in research focused on the interdependencies between the sub-systems of the eco-social triad.**
- **Maintain and enhance the resilience of human societies by developing and applying new inter- and transdisciplinary approaches and methods.**
- **Develop cross-sectoral approaches to water, food, energy production, and ecosystem management as a basis of advanced basin wide water resources management.**
- **Enhance the resilience of the eco-social triad to mitigate impacts of droughts and floods.**
- **Create awareness of the value and significance of natural resources, namely ecosystems and their services.**
- **Improve the handling of huge amounts of complex data (Big Data) as well as information and communication networks.**

#### *Explanations:*

Transdisciplinary research is likely to provide a sound basis for implementing sustainable political measures to keep the eco-social triad resilient. It is necessary to build the capacity to solve ecological problems and to extend the qualitative and quantitative knowledge about the nexus between natural and anthropogenic environments to find leverage points for effective intervention (Capra, 1982). Consensus should be achieved that sustainable development strategies serve ecosystem health, business opportunities and the well-being of people alike. The evaluation of different approaches that encourage individual responsibility towards the environment is necessary.

Finding the right balance between the bottom-line concerns of people in society, between different players in economy and species diversity in ecosystems is key to safeguarding the eco-social triad's resilience and subsequent sustainable development. The conflicting interests must be recognized and taken into account while respecting the vital interests of the actors in each sub-system of the triad. For example, substituting clear-cutting of forests by paper recycling and use of recycled paper requires information and knowledge transfer across the social and economic sub-systems. It also needs a change of consumer behavior, advances in pulp and paper making, infrastructural and technical investment, change

of forestry and land-use practices, and incentives provided by governments. In essence, empathy, introspection, tolerance, innovation, courage and education are needed to contribute to societal, economic and ecological resilience, and thus sustainability.

Management of river basins requires a cross-sectoral and often transboundary approach to identify and overcome challenges around water, food and energy provision (Hayward, 2013). Innovative measures and tools are to be developed which enhance functionality and sustainability while balancing environmental, social and economic situations peculiar for the region to be served.

Water-related disasters (floods, droughts) are the worst and most recurrent of all natural and anthropogenic adversities, posing major obstacles to human security and sustainable development (Weisman, 2013). Sustainable development of the eco-social triad is a key factor in lowering the exposure to water risks.

Safeguarding and strengthening the resilience of the eco-social triad requires novel methods of managing large-scale information and infrastructures. In this context, the development of the Internet of Things (IoT) needs to be critically evaluated. In the IoT large-scale infrastructures observe the public space by sensors, process this information and influence people. Self-organizing digital networks often associated with cloud-computing allow IoT systems to increase adaptability, autonomy, reliability and usability. The IoT generates an exponential growth of data and signals (Big Data) which can no longer be handled by standard algorithms and data bases. Efficient algorithms are needed in, e.g., network traffic monitoring, machine learning, scientific computing, and signal processing (Mayer-Schönberger and Cukier, 2013). In parallel processing, fast Big Data algorithms search for data correlations to predict future trends and profiles of products and consumers. Fast and powerful algorithms are applied to detect data correlations. But, without interpretations, explanations, models and theories, data are blind and cannot automatically support sustainable development (Mainzer, 2014). Thus, IoT requires guidance and control by the scientific and social society.

### Summary and Conclusions

The function of natural ecosystems provides the fundamental needs of human life, and the resilience theory is a promising basis for making progress in sustainable development (Bloesch et al., 2015). However, the present policy around the globe shows some major drawbacks reflected e.g. in excessive growth of the human population and the economy, continuous pollution and exploitation of natural resources, and still increasing emissions of greenhouse gases. The suggested sustainable development goals and targets reflect sound management and response-

ble governance and should help finding adequate and feasible measures to mitigate such impacts.

If the SDGs are to be successfully implemented in the UN Post-2015 Development Agenda, then we should consider the governing postulate that humankind ought to take readily applicable actions to keep ecosystems, societies and economies resilient. At the beginning of the 21<sup>st</sup> century it has become obvious, however, that the anthropocentric worldview needs to be corrected by granting the ecosystem function the same importance as the function of societal and economic systems. The favored eco-social triad refers to this change of paradigm. Taking into account and respecting the basic requirements of ecosystems in combination with empathy for all human beings and providing basic services to everyone is the magic formula that can help make societies more resilient and sustainable.

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## Social Sozophilosophy and the Care for Sustainability of Some Areas of the Social Reality

### Sozofilozofia społeczna i troska o zrównoważony rozwój niektórych obszarów rzeczywistości społecznej

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#### Abstract

In Anthropocene, the natural and social environment of human life has been degrading more significantly than ever before, especially for the past 70 years. The negative changes of the natural environment are well known and clearly felt. Therefore, the environmental awareness usually refers to the degradation of nature as a result of the human engineering activity. Due to their economic, political and ideological activities, people are aware of the degradation of social, cultural and spiritual environments to a much lesser extent. They distort the functioning of social systems and their sustainability, worsen the interpersonal relations, and devastate the personality. Hence, the issue of social environment protection, taken by sozology – complementary to the eco-philosophy – is crucial, as is the sozophilosophical reflection about it. The article presents threats to the sustainable development of selected fields of the social environment – knowledge, faith, social space, freedom, privacy, social time, and work – as well as their causes and possibilities of reduction.

**Key words:** social environment, ecophilosophy, sozophilosophy, sustainability

#### Streszczenie

W epoce antropocenu przyrodnicze i społeczne środowisko życia człowieka ulega degradacji o wiele bardziej niż w poprzednich epokach, zwłaszcza od około 70 lat. Negatywne zmiany środowiska przyrodniczego są powszechnie znane i wyraźnie odczuwane. Dlatego świadomość ekologiczna odnosi się przeważnie do degradacji przyrody w wyniku inżynierskiej aktywności ludzi. W o wiele mniejszym stopniu ludzie zdają sobie sprawę z degradacji środowiska społecznego, kulturowego i duchowego w wyniku aktywności ekonomicznej, politycznej i ideologicznej. Zakłóca ona funkcjonowanie systemów społecznych i ich zrównoważony rozwój, pogarsza relacje międzyludzkie i pustoszy osobowość. Dlatego ważna jest kwestia ochrony środowiska społecznego podejmowana przez sozologię i związana z tym refleksja filozoficzna w ramach sozofilozofii, która jest komplementarna do ekofilozofii. Artykuł ukazuje zagrożenia dla zrównoważonego rozwoju wybranych obszarów środowiska społecznego – wiedzy, wiary, przestrzeni społecznej, wolności, prywatności, czasu społecznego i pracy – oraz ich przyczyny i możliwości redukcji.

**Słowa kluczowe:** środowisko społeczne, ekofilozofia, sozofilozofia, rozwój zrównoważony

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#### 1. Anthropocene – a drastic imbalance in the environment

People, like any other living beings, live at the expense of their environment. By taking food, air, water, and other components, they destroy it. Thus the devastation of environment is the natural and

inevitable process that is proportional to the growth of population and to their comfort of life. In the past, no attention was paid to it at all, because there were less people in the world and the degradation of environment was an insignificant danger for them. However, the situation changed drastically when a new geological era started, which was

called Anthropocene by Paul Crutzen, a Dutch Nobel Prize winner, an atmospheric chemist and meteorologist. In his opinion, this era occurred as a result of:

- Growing urbanization.
- Rapid depletion of non-renewable energy sources (fossil fuels).
- Progressive contamination of the environment by various types of waste, toxins, greenhouse gases, etc.

Earlier, it was thought that this era dates back two hundred years.

Later, different dates were proposed depending on the scientific discipline, and which criteria were assumed in determining the dates when people first started to significantly shape the Earth's ecosystem (Smith, Zeder, 2013). Presently, Jan Zalasiewicz – senior lecturer of palaeobiology at the University Leicester – suggests, that Anthropocene began on July 16, 1945, when the US army conducted the first tests of nuclear weapons in Alamogordo, New Mexico (Zalasiewicz, 2015).

Since the mid-twentieth century, when people possessed an extraordinary power to destroy and to handle powerful energy sources thanks to the knowledge and technological development, environmental degradation began to increasingly threaten people and raised serious concerns about their status and survival. Then, various environmental organizations and mass social movements related to environmental protection emerged. Their activity increases along with the environmental contamination. Some economists, politicians and environmentalists, so-called *eco-pragmatists*, oppose them. They argue that human ingenuity and technology can overcome the limits of our ecosystem and skip the turning points (critical moments) in its development and that such environmental actions do more harm than good to the environment. They follow the controversial rule that technology can fix any damage it has done. Most environmentalists do not agree with this. For instance, Clive Hamilton, professor of ethics at Charles Sturt University in Canberra, believes that eco-pragmatists make the fatal mistake of believing that humanity is able to create a *good* Anthropocene. Indeed, the term *Anthropocene* was clearly defined negatively by its creator P. Crutzen. It is in fact the era of sole environmental destruction by humans, whose detrimental impact on the global environment is comparable with the most destructive forces of nature. However, despite this, eco-pragmatists accept this new geological era as a chance for humanity. For example, US experts in the field of environmental policy, Michael Shellenberger and Ted Nordhaus promise that by the end of this century the life of people will be healthy, free and creative (Shellenberger, Nordhaus, 2009). In their opinion, there is no need for any pro-ecological action or environmentally-friendly economics and politics, for that to

happen, but rather the further development of the technology and its modernization. Their view corresponds to the interests of conservative politicians, and Anthropocene is compatible with the contemporary liberal system (this is one of many examples of calming public opinion by the ruling elite in a situation of a real threat). Opponents of the environmental movement argue that the ideology of environmentalists can be summarized in three words: limit, reuse, renew; in other words, everyone should settle for the least. However, such reduction of needs would inhibit further economic growth as well as technological and civilizational development, and the majority of people living in wealth do not want that (Smallman, 2014). Therefore, mankind stands before a serious dilemma: either not to interfere in the course of events – let everything go on as before (which will lead to a collapse with a high degree of probability – to the self-destruction of our and other species) or do something to prevent it. The first option corresponds to the views of presentism and is good for only one – the current – generation, which wants to live in the best possible conditions, and does not care about the fate of future generations. It calms their conscience, provides the psychic comfort and delegates responsibility for the future of mankind to something indefinite. Should it be this way? Should not the current generation care for the chance of survival for the next generation and for the future of the human race and act sensibly and responsibly? After all, the care for the future is somehow encoded in the survival instinct of all living beings. Do people – intelligent beings – have to act contrary to this instinct and replace it with a calculated economic rationality and continue to modify the nature, not always wisely? Then as Richard Heinberg, an American journalist and educator, predicts *nature will finally do it for us by very unpleasant means: famine, epidemics, war* (Heinberg, 2014). Unfortunately, as of yet, economy still dominates over ecology. It probably will keep its advantage as long as the ideology of consumerism, focused on continuous and unsustainable economic growth and on the unlimited multiplication of profit and wealth, will rule and as long as people fooled by it will worship the omnipotent god Mammon.

## 2. Degradation of the social environment is as dangerous as the one of natural environment

Environmental awareness regarding the natural environment is sufficiently developed, but not always and not everywhere reflected in the pro-ecological behavior of people in their daily life. However, few people realize that the social environment is also degraded much faster and to a greater extent than natural, and that the effects are no less harmful than in the case of the degradation

of natural environment. Even the Catholic Church, represented by Pope Francis mainly deals with matter of natural environment threats. This is reflected, for example, in the message about the spring workshop, organized by the Vatican Academy of Sciences in 2014<sup>1</sup>. People underestimate every day matters of degradation of their environment, if they do not touch them directly, because *in general, they do not realize in the full extent the danger and the possibility of a real disaster. The awareness of total threat, which approaches quickly and is not delayed by anything and anyone, reaches only a few people. The vast majority live in an incomplete awareness of it, they remain in a state of semi-conscious realization about its sinister approximations and destructive force or they only have selective knowledge about this process – mainly owing to the mass media which are generally unprepared* (Szymid, 2004, p. 14).

Several reasons for this nonchalance in relation to real and unavoidable threats generated by the degraded environment can be pointed out. One cause is psychological; on the one hand, people are very reluctant to relate to threats, because they prefer to think about pleasant things, rather than about unpleasant ones. On the other hand, they willingly delude themselves thinking that there will be no environmental disaster and that people were scared by many apocalyptic visions not once in the history, and therefore they trust the eco-pragmatists. The second cause comes from the insane pace of life –

there is no time for philosophical reflection, in particular, to thinking about the distant consequences of environmental devastation. The third cause is the intentional stupefying of people and the developing of presentivist thinking focused on *here and now*, rather than futuristic thinking focused on *there and then*. Here, the important role is played by mass media, which are subservient to the ruling elites, insatiable in their greediness and in the pursuit of getting rich at any cost.

### 3. Philosophy of the environment

Not many people are interested in environmental issues in a broader sense, i.e. in the philosophical aspect, and in the context of increasing environmental threats which have impact on the future of humanity. Thinking in terms of the philosophy of the environment, *ecophilosophy* in short, is spreading to a limited extent. These issues are studied by ecophilosophers, who deal with practical applications of philosophy rather than with speculations. The starting point for their thinking was the increasingly knowledge about the deteriorating state of the environment. The data provided by specialists indicate increasing and alarming devastation as well as toxication of the natural environment, which hampers the proper functioning of humans, animals and plants, posing a serious threat to their lives. Since this separate subdomain of philosophy has appeared, many books, dissertations and articles were written, which present and popularize its achievements. Many seminars and conferences on its issues took place. Ecophilosophy could consolidate quite quickly thanks to the involvement and achievements of researchers. It has already got its own history and extensive structure. However, it is not interested in protection of the environment, although ecophilosophers sometimes also discuss this matter, but their main subjects are deliberations about the relationship between man and his natural and social surroundings. While philosophy of the environment (ecophilosophy) grew up on the ground of ecology, the philosophy of environmental protection was created on the basis of zoology, which deals with issues of environmental protection. Unfortunately, few people have heard that such science exists, what it deals with, what is its purpose, and what it is used for. Recently, I began developing the philosophy of environmental protection and I called it *sozophilosophy* (see Sztumski, 2014). This name is completely new.

Sozophilosophy develops gradually from the stage of an idea to the stage of implementation: it has already exceeded the *statu nascendi* and the *statu potentiae*, but it is still in the *statu crescendi*. Therefore, it is impossible to present it fully or in some ordered form or system, but rather in the propaedeutic form. Sozophilosophy and ecophilosophy are separate but complementary parts of phi-

<sup>1</sup> Pope Francis, as well as 58 scientists and clergymen from around the world participated in this workshop. In the final communiqué it is mentioned, among others, that the measure of GDP, previously used as the main indicator of economic development is incomplete, because it does not include, amongst others, the condition of the environment. *The massive use of fossil fuels by the power sector deeply disturbs Earth's climate and acidifies oceans. Warming and extreme weather conditions associated with it have reached unprecedented levels, affecting the life of our children, while 40% of the poorest, who have a minimal role in the generation of global pollution, probably suffer the most* – wrote the signatories of the appeal, calling, among others, to develop renewable energy sources and reduce dependence on fossil fuels. Participants of the meeting, Partha Dasgupta and Veerabhadran Ramanathan, presented a list of the most important problems in the journal *Science*, which may be solved with the help of Vatican. They are very specific. The authors, an economist and oceanographer, note that a well-developed network of religious institutions can mobilize the public opinion, organize effective actions and rapidly reach those who need the most. As one example, they provide activities that both reduce the dependence of the poor on the dirty technology and improve the environment: *Humanity needs to reduce emissions of methane, ozone, soot, and fluorocarbon, which are currently generated during production of up to one third of the heat energy. Certain pollutants are emitted due to deep poverty. Majority of the 3 billion poor people situate themselves at the bottom of the 'energy pyramid'.*

losophy of the environment. Both should mobilize people to reflect on the state of their life environment, protect it, and make their efforts to stop further devastation of it.

Contemporary social environment became peculiar due to the accelerated development of Anthropocene, huge progress of knowledge and technology, and rapid growth of population. It is quite different than those present in the history of mankind. Its peculiarity is the consequence of the following phenomena, which intensified in recent decades:

- Excessive destruction of nature;
- Rapid degradation of social environment;
- Growing social space condensation;
- Increasing pace of life;
- Diminishing ability to foresee the forthcoming events;
- Increased risk;
- Escalating web of various types of network;
- Increasing chaos and decomposition in its structure.

All these phenomena imply increasing threats for proper functioning, of people, for their health and life in today's social environment.

#### 4. Progressing degradation of social environment

In principle, all areas of culture in our social environment degrade progressively and rapidly. Relationships and functioning of institutions are perturbed and degenerated. Our language is becoming increasingly vulgar. Traditional ethical and aesthetic canons and values depreciated. Legal and educational systems break down. Traditional authorities, family and morality lose power. The ways, forms and means of communication are increasingly primitive despite the improvement of communication technology. These phenomena are quite well-known, experienced every day and therefore, we do not pay attention to them. Unfavorable changes in the social and cultural environment are reflected in the internal environment of a man. This environment consists of personality, psyche, consciousness, spirituality and personal culture of a man as well as his bodily structure.

Degraded social environment affects negatively the physical and mental health of people. Degradation of personality and psyche manifests itself in:

- the loss of empathy;
- spreading intolerance, hostility, conflicts and moral dilemmas;
- shaping of egoistic and individualistic attitudes (Nees, 2015);
- mass imitation of machines (robots);
- reduced critical thinking and rationality;
- vulgarization of language;
- deepening psychological discomfort;

- limited common sense due to the increasing thoughtlessness and stupidity<sup>2</sup>;

Disproportion between the good and evil in different spheres of life, which contributes to their unsustainable development, is growing in the degraded social environment. The most endangered spheres of social life and social environment, which I call *the landscapes of social reality*, include: knowledge, faith, social space, freedom, privacy, social time, acoustic environment, language, education, politics, ethics (axiological sphere), reason, and dignity. Predominance of negative phenomena increases everywhere. Consequently, the degradation contributes to the deepening imbalances in all areas of social reality. All social landscapes are threatened by unsustainable development.

In this article, I limit myself to showing the events that lead to disharmony, internal contradictions and destruction, thus defying the idea of sustainable development, only in a few landscapes: knowledge, faith, social space, freedom, privacy, social time, and work.

#### 5. Degradation of the environment of knowledge

Knowledge is the driving force of many human activities, especially the cognitive ones. It has always been an effective tool in the struggle for existence and survival. Therefore, it is constantly developed and increasingly appreciated. However, its development also causes well-known negative effects, and it is accompanied by internal contradictions that contribute to the degradation of science. Firstly, the development of human knowledge does not provide greater security, but rather increasingly threatens his or her health and life. As knowledge progresses, the number of lifestyle diseases, which are difficult to treat, increases as well, including: stress, cancers, allergies, etc. Moreover, increasingly complicated devices are produced. Despite various safety measures, they are more and more prone to breakdowns, even resulting in ecological disasters. Secondly, the products of knowledge – discoveries and inventions – alienate, like other products of people's activities. Therefore, they transform into instruments which are no longer controlled by their creators. Eventually, these are used not only for the good purposes, but also for the wrong ones – such as destroying and killing. Appealing to the conscience and responsibility of scientists does not help much. Application of knowledge for a wrong purpose does not depend on them, but rather on those who implement it. As Einstein wrote: *The*

<sup>2</sup> *Stupidity is a phenomenon that we encounter everywhere in the human environment, in all of its many forms. It is a mass phenomenon. Despite all the efforts, stupidity will remain a faithful companion of man through history* (Reutterer, 2005).

*responsibility falls on those who make use of the new tools, and not on those who contribute to the advancement of science, and therefore on the politicians, not the scientists.* Thirdly, in a market economy we have to deal with commodification, commercialization and privatization of knowledge. Political and financial elite have appropriated knowledge. This contradicts the essence of knowledge, because it should be the common property of the whole society. The market economy has made harmed knowledge by making it a commodity for sale. Commodification of knowledge contributes to its depreciation and to the declining trust in science, as a result of unreliable knowledge acquisition, falsification of data, biased interpretation of the theory and corrupt scientists. Lying and deception thrive in science. Additionally, knowledge becomes increasingly expensive; we have to pay for the acquisition, development and success in research. Not every person and not every country can afford it. The poor are left only with mass education, which is at an increasingly lower level. This contributes to the mass stupefying of people.

### 5. Collapse of faith

Faith is a relatively autonomous component of culture and an important part of the social environment. It has a significant impact on the attitudes, actions and personality of people and on the relationship between them. Throughout the history of mankind it has played an important role in the life of individuals, communities, and nations. Everything seems to indicate that its importance will continue to increase. A specific network of relations of mutual trust – interpersonal and institutional forms thanks to the faith. It is also an essential component of the external and internal spiritual environment. For this reason, one ought to prevent its degradation. It should be the subject of research for ecology and social zoology. There is a place for faith within the system of environmental science; ecology of faith and zoology of faith are two closely related, but separate subdisciplines of environmentalology. The object of the zoology of faith is the protection of faith in secular and religious dimensions, as well as the protection of the mutual trust from the harmful effects of the civilization of lies and the ideology of consumerism, which generate distrust, hostility, hypocrisy, and limit the spiritual world.

Faith means trust, confidence and belief in the truth or validity of one's own or other people's judgments, opinions, evaluations and proceedings which do not need a proof. It also means trust in someone or something, regardless of whether it is a physical object – a concrete, tangible, accessible to the senses, or immaterial – abstract, invented, designed, imaginary or fantastic. Thus understood faith is the foundation, which supports the identity of social

groups and their community. Along with the social progress, faith complicates and modifies; it changes its subject, the way of experiencing and of manifestation. Degradation of faith, like in the case of other components of contemporary cultural environment, progresses with the development of Western civilization. This occurs mainly in the countries developed both economically and in regard to civilization, with a high level of consumption and quality of life. There, people gradually lose their faith in what has previously been sacred and indisputable for them: the gods, leaders, great ideas, authority, ethical values, science, politics, standard slogans etc., and, finally, in the meaning of the world, the possibility of taking effective actions, controlling their own destinies, lives and themselves. Symptoms of losing faith occur in different spheres of social life. These include the growing skepticism, significant (or even complete) lack of trust in individuals, groups, elites, organizations, institutions and social systems.

### 6. Degradation of the social and individual space

The concept of physical space is commonly understood and it is easily defined on the basis of various sciences. It is usually understood as all the events, processes and phenomena which surround us; they occupy specific places and they are in certain distance from each other. We imagine it as a three-dimensional space, because people are able to perceive so many dimensions directly through their senses (in subatomic physics there are spaces of over a dozen dimensions; however, we are not able to directly experience them with our senses). People transform physical space into social one through various activities. Hence, the social space is like a hyperspace constructed on the physical space, but it differs from it substantially. First of all, it is a space typical for meso-world, where the sizes of the objects are comparable to the size of human. Physical interactions or geographical conditions have a lesser influence on the geometry of the social space than social, cultural, demographic, psychological, and other conditionings. The objects of the social space objects include people (individual and communities), institutions, organizations and products of knowledge, technology and culture, which – when present in the materialized form – simultaneously, also belong to the physical space. In short, social space includes humans, products of their activities and social relations. Social space is much more dynamic compared to the physical space, because society changes much faster than nature, and their pace increases proportionally to the progress of civilization. Two values are important for the social space: social distance and social density. Social density is expressed by the number of its various components per unit of area: people, institu-



tions, organizations, and inter-institutional relationships, communication and transportation networks, buildings, symbols, etc. Social distance is the physical or geometrical distance felt due to the time needed by people to communicate with each other and with other components of the social space. It is reduced along with the shortening of time required to traverse it or to make contact with other people. While the physical space is a product of nature, the social space is a product of people and culture. Social space is like a scenography introduced to the physical space, shaped by cultural factors, in which people develop their activity. Social space is multi-dimensional. The number of its real dimensions corresponds to the number of types of interactions between objects in it, that is, the number of areas of human activity. These areas are subject to gradual degradation – mostly under the influence of rapid industrialization, commercialization and growth of population. Due to the growth of population, the social space becomes denser and the social distances are reduced. These unfavorable effects are experienced especially by residents of megacities, where the social distances are shortening. These negative effects occur because of:

1. More frequent conflicts of interests between individuals and groups.
2. Increasing danger of staying in them.
3. Difficulty in managing them.
4. Greater susceptibility to breakdowns.

Public space – one of the components of the social space – degrades as well.

Organization of public space is generally unpunished and arbitrary, and for various reasons, it meets with discontent. The devastation of the virtual space and media space, which are parts of the public space, is a separate matter.

Degradation of the social space in urban areas occurs to a greater degree. Soon, there will be more of them due to a mass influx of people to the cities. This may cause an *urban disaster* because:

1. Crime in cities grows proportionally to their population.
2. Management of a megacity is very difficult. Various elements of their infrastructure are dysfunctional, especially the transport.
3. Physical and mental health of urban residents deteriorates due to toxins and smog.
4. The feeling of enslavement intensifies as a result of reducing free living space of the individuals.
5. Architecture of big cities overwhelms people.
6. Individuals feel uncomfortable being in a crowded big city.
7. Mixing of different cultures and sub-cultures, languages, religions and habits, particularly as a result of growing global and mass transmigration, weakens their identity; the population of the city is a disintegrated and highly dynamic system in which everything – residents,

shops, infrastructure, etc. – changes increasingly faster and more turbulently.

8. Cities become similar to each other and thus, less distinguishable, along with the progress of globalization and of the mixing of cultures in them.
9. The phenomena of architectural boredom and architectural dissonance are characteristic for megacities.
10. Life in a degraded social space becomes increasingly arduous every day. Therefore, preventing further degradation of the social space, or at least preventing the destruction of the remaining un-degraded fragments is an urgent task, so that the future generations could enjoy them.

## 7. Reduction of freedom – a neo-slavery

One can be free, i.e. behave, think and act as one wishes, only within the limits set by the dependency relationships and mutual conditions between people. This is true even if our sense of freedom is based on something perceived as free will. Besides, the existence of free will is a controversial matter. However, new research in neurophysiology of brain increasingly confirms the belief that everything that affects human decisions, including those of the *free will*, is determined by the structure and functioning of the brain and central nervous system (Müller, Schmidt, 2011). No one is born free, but gradually becomes free during his biological and social development thanks to the participation in the socialization process. Standards, sizes, borders and areas of freedom of an individual are established during the life in a community. As a result, they realize their own freedom, i.e. they acquire the sense of freedom and they can use it. The need to be free comes from the mere fact of life and from the instinctive desire to survive. This requires decisions and actions which oppose the threats. One can only act effectively when one is free, and with force that is proportional to the degree of freedom. Freedom can not only be felt subjectively in different ways, but also measured objectively, e.g. using the number of choices that can be made in a given quandary: the more alternative choices, possible decisions the exits there are, the higher the degree of the freedom is. Objectively measured degree of freedom does not always coincide with its subjective perception. Various factors limit the degree of freedom; above all, the external prohibitions from his natural and social environment, as well as the ethical imperatives of his consciousness. The number of prohibitions established by nature practically does not change; instead, the number of the prohibitions increases rapidly in the social environment, proportionally to the progress of civilization. Freedom is a multi-dimensional feature; therefore, one is free only in some of them. There are as many

dimensions of freedom as there are spheres of life or areas of human activity: thinking, learning, creativity, technology, production, economy, politics, religion, culture, art, science, communication and so on. Therefore, discussion about *freedom in general*, without any reference to a specific sphere of activities, is idle and has no practical sense.

Man as a social being is subject to pressure from other people, groups, organizations, institutions, laws, rules and different standards resulting from interpersonal relationships, co-existence, and co-operation in all areas of social life – economy, politics and culture. This pressure increases, and so does the enslavement by social factors. It increases proportionally to the desire of having more freedom which was, is and will be the leitmotif of political, economic, and cultural activity. Its power and efficiency increases with the development of knowledge, technology and civilization.

However, for some time, the new slavery has been increasing at a rate proportional to the level of civilization. This new slavery is different from the one in the ancient times. In the past, it was limited above all to the enslavement of a class of people in the economic and legal aspects and manifested in a clear division of society into masters and slaves. The latter were treated as things or instruments of production, with all the negative social and personal consequences. Now, there is no clear, legally sanctioned distinction between masters and slaves. This division is hidden and informal. There is no place where slavery is an official social system or a structure sanctioned by law. Modern slavery – the neo-slavery – is much more complex, because the today's masters (the ruling elites) are smarter, have better knowledge about enslavement and possess better means and ways of enslaving. It is a multidimensional phenomenon which operates at various levels and manifests itself in many forms, above all in treating people like objects. Neoslavery operates secretly, even in the neo-liberal regime, where freedom and equality are the keywords of programs of various political parties, and where the maximization of freedom is considered to be an objective trend of the social evolution, or even a historical necessity: in a free and democratic world, everyone should enjoy formal and real freedom and be happy about it. Unfortunately, the reality is different: enslavement of people progresses in a disguised way. They become increasingly informal, but actual slaves in the modern "free world" and are dissatisfied with this situation. Neoliberalism generates neoslavery in different forms and in different ways. Thus, Cicero's known quote *Extreme freedom leads nations and individuals to extreme slavery*, is confirmed. Actions which aim at enslavement are taken discreetly. Successful enslavement of people should occur without them realizing that they are already in captivity. This requires the use of sophisticated and perfidious methods, means and techniques of

manipulation that ultimately boil down to a simple fraud on freedom and to the blurring of borders between freedom and slavery. Often, even those, who participate in the global mechanism of enslaving others, imperceptibly, fall in the trap of slavery themselves. Enslavement is not an objective necessity of the social evolution, but rather the effect of the activities of social groups driven by economic reasons, and probably also of over-ambitious, egoistic individuals who are eager to rule others. Therefore, there is no sharp distinction between free people and slaves in neo-slavery, because – in fact – everyone is enslaved to a certain, greater or lesser, degree. People, who frantically run their errands, related not only to their existence and survival, but also to other less important issues, which are artificially (by manipulation) made important, are so busy that they do not know when they lose freedom, acquired so painstakingly through the ages. Unfortunately, when they realize it, it is already too late to become free again. While in the ancient times it was possible to redeem oneself from slavery, liberation is now virtually impossible. Knowing this fact overshadows the euphoria connected with striving for the desired freedom, increasingly giving way to disillusionment which results from the growing enslavement.

There are different forms, harbingers, and manifestations of neo-slavery. Neo-slavery is present on political, legal, economic, psychological, technological, religious and moral planes. There is also the enslavement in the social space and time.

One of the forms of modern slavery is the technological enslavement. It mainly results from the impossibility to live without modern technical equipment, due to transferring our functions connected with the work and life to them, as well as excessive reliance on the safety systems. The second form of neo-slavery is the psychological enslavement. It manifests itself in the form of behavioral, functional and ambition enslavement<sup>3</sup>. The first form is the compulsion to submit to the manner of behavior, dressing, speech, writing, etc., dictated by various pressure groups and fashion designers. Uniformed global styles conquered the world, so that everyone dresses, speaks and behaves in the same way. The second form is the slavery of rudeness and vulgarity. The third form – characteristic of the consumer society – results from the greed of possession and getting rich. It encourages pursuing career at any price and triggers an unhealthy ambition not only to be somebody who surrounds himself with genuine respect because of his personality qualities – knowledge, wisdom, honesty, etc., but to have something expensive which causes envy in others (a great house, car, job, clothing, power, etc.), impresses people, elevating themselves above

<sup>3</sup> I define the functional enslavement as subordination to all external orders which enable people to function in different areas of social activity.

the average social standards. The unhealthy ambition to make a career and to be equal to the riches, celebrities or people in the higher positions of the social hierarchy, increases.

This generates other forms of slavery: the slavery of ugliness, tastelessness (careless clothing, hideous tattoos, idiotic hairstyles, decorating face on the model of ancient savage peoples etc.) as well as the slavery of the clock time. The first one results from the widespread violation of the traditional concept of beauty and of the classic aesthetic canons by various pseudo-creators and artistic mediocrity which – motivated by commercial objectives – makes up the lack of talent by nonchalance, excess, extravagance and shocking ugliness. The other one results from limiting the concept of time to reading the watch. This proceeds with the development of the capitalist formation connected with the tendency to accelerate the productivity of people and machines. The slavery of the lie is a form of functional enslavement. More and more often people have to lie for different reasons – not always voluntarily – and everywhere they are faced with lies because they live in a civilization of lie and deceit (see: Sztumski, 2010; Sztumski, 2008; Sztumski, 2009 a; Sztumski, 2013). The preservation of social harmony requires complex legal and moral regulations. Therefore, the law and ethics must intervene in an increasing number of situations and define the behavior and proceedings of people in a more detailed way. Hence, more and more prohibitions are created, which contribute to the enslavement of people.

In another form of neo-slavery, people are enslaved by producers and wholesalers. Manufacturers of goods (food, medicines, cosmetics, clothing, shoes, etc.) and wholesalers are intermediaries between producers and consumers. On the so called *free market*, we are forced to buy what the producers and wholesalers supply on the market, and not what we would like to buy. The freedom of shopping is limited to what is produced by the industry – even ugly and poor quality goods – and what sellers want to distribute. Only producers and traders are free. At present, it is traders, rather than consumers, who shape the needs of consumers, create the demands and dictate manufacturers what they ought to produce. As a rule, goods are produced at the lowest cost, are of increasingly lower quality and from cheap synthetic materials or substitutes.

Today, we are faced with another kind of slavery – the slavery of inactivity. The development of technology and work organization runs parallel to the process of liberation of people from work. However, it has negative effects. For example, automation, computerization and robotics contribute to the shortening of working time and the drastic elimination of jobs; fewer and fewer people have to be employed to produce the amount of goods needed by society. Therefore, structural, cyclical and functional unemployment increases rapidly. At the pre-

sent stage it is a mass phenomenon, which has become a real social plague; at least in countries with a high level of automation and robotics, but soon in other countries too, as they are catching up the technological delay fast. Unemployment is rising constantly with an upward trend. Boredom with professional and other inactivity (e.g. household work also requires much less time than in the past due to better appliances) increases as well. This has negative consequences for social life and psyche, thus driving people into slavery of inactivity and boredom.

Another manifestation of neo-slavery is the slavery of buildings. This concerns especially large cities, where the architecture and infrastructure restricts the free living space of their inhabitants.

## 8. Reduction of privacy

Privacy is still a controversial and highly unlikely concept. It consists in being aware of having *personal space*, free from the interference of other persons and organizations, and remaining only at one's disposal (see Clarke, 2006). I call it *an individual living space*. Privacy can be understood simply as clamming up, freeing oneself from the presence of other people or as hiding from them. However, there are other more or less complex definitions functioning in different spheres of life and human sciences<sup>4</sup>. Privacy is the liberation of an individual from the interference of other people in their life and affairs, regardless of whether they are prohibited by law or not and whether they have good or bad consequences. The concept of privacy reflects a strong sense of *ego*, being an important part of everyone's life and their personal world, which should be none of someone's business, and into which no one should interfere under any circumstances. Everyone has the right to have their world and do what they please, without considering other people. It is a world where one can do whatever they want, without being guided, spied or eavesdropped on – directly, through the senses or indirectly through plethora of various smart spyware devices – by anyone. Privacy has at least four dimensions:

- Physical: expressed in preserving our physical differences in relation to other physical objects, including people, in space and time.
- Expressive: expressed in the autonomous decision-making.
- Informative: expressed in the determination of the information about oneself which are not to be disclosed to any third party.

<sup>4</sup> For example: Slan Westin defines privacy as the right of an individual to control, publish, manage and dispose of information about oneself and decide when, how and to what extent such information can be communicated to others (Westin, 1967).

- Virtual: expressed in the protection of our data in the virtual world (see Proshansky, Ittelson, Rivlin, 1978).

Therefore, privacy is a multidisciplinary research subject. Each of the exact sciences defines it differently and studies in specific terms, specifies different aspect of privacy in several dimensions. For this reason, there are following spaces of privacy:

- Psychological
- Political
- Ethical
- Legal
- Sociological.

The privacy of individuals is being increasingly threatened in all its spaces and dimensions. While it has always been violated, restricted and threatened, never to such an extent as now, so intrusively and cleverly. People have always been tapped, watched and pursued (predominantly in government and business circles) by various informants, detectives, spies and informers. However, firstly, they acted secretly, sometimes even with a courtesy, secondly, they did not act on a mass scale, and thirdly, they had no such sensitive, microscopic and amazing equipment. Besides, spies were generally unwelcome in social circles, not accepted by the society and at the risk of ostracism. Therefore, they did not boast about it. Now, the situation is quite different. Bands of voyeurs, paparazzi, spies, detectives and secret agents prowl everywhere openly and with impunity, and they even boast about this with pride and arrogance. The society, which is already accustomed to the various exhibitionist excesses, does not react defensively, oppose or stigmatize, as if there was nothing wrong in depriving people of their privacy or intimacy. Some people actually want it, and even provoke to publish intimate facts from their personal lives because they want to show themselves in the media and thus be recognizable and famous. Sometimes, spies are even considered national heroes, and voyeurs are often lavishly rewarded. Even worse, as a result of various manipulations and advertising, the public demand for information about what should be hidden or better left unsaid is growing. In order to justify the development of the market of spies and voyeurs which denude people literally and figuratively – likely, a market worth several billion dollars – so-called ideology of transparency in public life, was conceived, which allegedly is essential for democracy. Unfortunately, transparency is confused with denudation. The progressive reduction of privacy accompanies the growing global crisis of confidence, especially since the fateful day of September 11, 2001. Henceforth, *supervised society* is being formed for fear of attacks from the outside and the inside, even in the most democratic countries. Citizens and foreigners are monitored more and more thoroughly and their private sphere is subjected to a

far-reaching invigilation<sup>5</sup>. Development of civilization reduces the sphere of privacy and contributes to its absorption by the public sphere. Modern technologies enable the supervision of society to a greater extent. New spying devices as if encourage people to encroach into the private life of others, to watch them in different situations, to record their behavior on storage media and to transmit the information gained illegally (see Schaar, 2009). The sphere of privacy is a part of an individual human living space. It constantly decreases as a result of the growing population and its density, as well as development of networking, urbanization, various kinds of infrastructure (roads, shopping and services, communications, etc.), legal and administrative restrictions, and as a result of increasing number of orders, prohibitions, norms and standards that limit independent and free choices. Therefore, the question about the limits of privacy reduction of an individual arises: how far one can reduce their privacy, so as not to endanger their health and proper functioning in the society? This question should be considered in the broader context of the relation between the human as an autonomous being and as a social being, as well as the relation between individualism and collectivism. Human autonomy requires isolation from the public sphere in favor of his private sphere. One must also determine why and to what extent one should protect their privacy, as well as when and in the name of what one should resign from it. There are many reasons why people do not want others to know something about them and why they want to keep something secret from others. Two experts in the field of information security, Philips Schumann and Christian Reiser, indicate the following reasons:

- Some data may cause shame or distress, e.g. in the field of intimacy, sexuality, weaknesses, etc.
- One's personal information in possession of others can be used in order to gain control or power over them or to exert pressure on them, which could harm their professional or political career.
- Sometimes one wants to keep something secret, so as not to arouse negative emotions in others (jealousy, envy, desire).
- Sometimes one believes that the possession of certain information (e.g. about diseases, political or religious affiliation) by others could discriminate them.

<sup>5</sup> As part of the phone hacking scandal in the UK, up to six thousand people could have been intercepted – says the British police. Illegal taps have been installed in the telephone voice mail of almost 5800 people. That is almost 2000 more than the number stated by the Committee of Inquiry in July. The exact number of taps is unknown. The police claimed that accurate data will be verified with the influx of evidence (Gazeta Wyborcza, 4.11.2011).

- One may want to keep something secret to surprise somebody (see Schumann, Reiser, 2011).

Following reasons speak in favor of protection of privacy:

- Psychological (human demands privacy, both in the public space and alone, to hide from others and to behave in an uncontrolled manner – go crazy with anger or jump from joy).
- Sociological (the man must be able to behave freely and to choose friends among other people without fear of being watched).
- Economic (the man should have the right to free economic activities).
- Political (in a democratic country people should have the freedom of thought, ideas, social activities and argumentation).

Everything indicates that privacy will be further reduced. That is why one has to start defending their privacy as soon as possible and in every way, in addition to learning to live in the conditions of increasing transparency, voyeurism and invigilation.

## 9. Social and individual time

One of the effects of the cultural impact on nature is the evolution of the concept of social time. That is why people experience time in two separate ways: as a change in the natural and in the social environment. Natural and social time are in principle objective, because both are independent of individual persons. Subjective is only the perception of natural and social time by an individual; this is what we name the psychological time. It is one of the other categories of time we know, as e.g. physical, biological, economic, religious, artistic etc. Each one is a function of two variables: nature and culture. Their common feature is that they can be quantitatively determined, and that the flow of each time can be measured by periodically recurring phenomena in nature, society and man. Therefore, each time can be reduced to the physical one. There are as many concepts of time and ways of experiencing it, as there are cultures.

We determine our pace of life by psychological time. It increases proportionally to the technological development – to the increasing speed of the technical devices used by people use in everyday life and to the number of inventions, which allow us to move more rapidly, communicate information faster and shorten the time to perform various actions. Initially, the time of technological operations was shortened for economic reasons. Then, the time of various non-productive activities was shortened, even in the areas of entertainment and recreation. With the development of civilization people always want to save time; they are constantly in hurry somewhere and they speed up what is possible. Today, we live in a very *galloping society* ruled by

the principle of acceleration. People produce, provide services, eat, drink, play, use their free time, think, learn, teach, read, speak, listen, watch, move, communicate, are with each other, experience life, decide, choose, rest, love and even pray faster and faster. The pursuit of *the fleeing time* is getting quicker and seems to have no end. The increasing pace of our life is also caused by the more accurate measurement of time. However, only people, and nothing else, are responsible for accelerating the pace of their life and for the harmful effects of this phenomenon. The principle of acceleration is in fact a consequence of the ideology of consumerism created by humans. This ideology drives people into the insane pursuit of profit and material goods and forces people to chase faster them. The increased of the pace of life has constantly accompanied the progress of civilization, but it was felt most severely in the second half of the twentieth century. It seems that the acceleration of pace of work and life is now approaching the critical point because of physiological and psychological reasons.

As the civilization develops, culture interferes in the natural consciousness of time and deforms it. It distorts the natural rhythms of time and contributes to the deregulation of biological clocks in humans. The natural rhythm of human life depends mostly on the time of day and year. Biological and physiological processes periodically intensify depending on circadian rhythms and on seasons. Such physiological parameters as body temperature, blood pressure, breathing, food time, resistance, hormone levels, heart rate, the exchange of substances, and the brain activity depend on circadian rhythms. Chronobiology also confirmed that the functioning of our nervous system and psyche (the concentration of attention, memory, reaction time to external stimuli, irritability, etc.) depends on the rotation of the Earth around its axis and around the Sun. Unfortunately, seventy countries have introduced seasonal time change from winter to summer and vice versa, guided by economic reasons. This affects people adversely, because it disturbs their internal biological clocks which respond to light more so than to the indication of physical clocks. These changes negatively impact the functioning of the human body. Putting the clock back or forward by an hour has the effect of *time shock* similarly to a mini jet lag, as in the case of crossing several time zones in a plane. Research conducted in Germany at the University of Würzburg by Charlotte Forster, a professor of neurobiology, specialist in the field of the functioning of internal clocks at the molecular and neuronal level, as well as by researchers in the US and other countries have confirmed that in the first days after the change of time, the risk of heart attack increases, while the ability to focus attention decreases, and office workers are prone to cyberloafing: surfing the Internet sites unrelated to their work (see Zeibig, 2014).



Today, people neglect their chronotypes and deregulate their internal clocks. That is why they live in a constant conflict between what they should do in accordance with their internal, biological clocks, and what they must do due to the cultural requirements of culture, guided by external clocks. This, of course, exerts a negative influence on their health and causes permanent stress. For years, the rhythms of life, tuned to the internal clocks, were in line with the rhythms of nature, as a result of the good synchronization of endogenous and exogenous clocks. This synchronization occurred spontaneously and involuntarily, because it was one of the necessary conditions for the survival of the human species. However, for some time, people have become obsessed with improving the nature in accordance with their criteria of perfection. We increasingly oppose bio-standards and natural conditions of life and surrender to the artificial rhythms. As a result of this, we observe an undergoing desynchronization of natural rhythms with artificial rhythms. The progress of civilization disrupts our internal clocks. Social environment enforces constant acceleration of the rhythms of life, which increasingly diverge from the ones established for centuries by the natural environment. Mainly due to economic reasons, people need to change their circadian rhythm – adjust, shorten or lengthen the phase of its activity, also to the night hours, which the nature has earmarked for sleep. As Peter Spork, a neuroscientist, rightly warns, *sooner or later, the constant turning of night into the day or the day into night will get back at us* (see Spork, 2014).

The original polychronic culture has been replaced by the monochronic culture which triumphs in the modern world, because it better reflects the *spirit of our times*, i.e. the requirements of free market economy, the competitive struggle, the pursuit of profit, desire to get rich, the pursuit of maximum efficiency and the cult of money. Monochronic culture is based on the physical, clock time. It raised people who are not allowed to be late, and who must count every second (in sports, even thousandths of a second) and that is why they want to be as accurate as their watches. Every moment, a man called *homo horologicus* reads the watch unconsciously. The *man-watch* who wants to be punctual at any cost and for whom *time is money*, voluntarily subjects to the pressure of time. Some of these people are so addicted to the watch that they can even relax by looking at the rapidly changing numbers on the display of the watch. The watch has become the instrument of terror of time and its effects are felt very acutely.

Monochronic culture is essentially the one of tradesmen, because time plays an increasingly important role in the merchant-banking and stock exchange operations, which require shortening the

execution time to a minimum. When the operation time is extended or delayed, it causes a financial loss or a loss in the fight against the competition. For this reason, time is of economic importance and it ceased to be a free or public good, such as air or water. It is non-renewable. Time was subordinated to the market mechanisms and transformed into a quasi-public good, a commodity with steadily increasing market price. The more we pay for it, the less we have. Time is fundamentally different from other goods, because it cannot be put on the counter, store or save.

The necessary condition for the survival in monochronic culture is to be in a constant hurry. Life in the modern world is like running on a treadmill, which moves faster and faster. When one steps on it, one must run faster to keep up on it. But when, for various reasons one cannot, then one begins to fall behind and eventually out of it, which usually ends unpleasantly. Many people – despite their best intentions – cannot keep up with the increasing pace of life (the speed of movement of capital, labor, goods, information, etc.). Who does not participate in the insane race or who is not able to keep up on the *treadmill of social life*, falls out. In other words, they are excluded from the galloping society, increase the margins of society and gradually lose their chance of survival. The potential of human adaptation to the increasing pace is limited by anatomical, physiological and psychological factors. Everything seems to indicate that this potential will quickly be exhausted. Therefore, in the future, it will be increasingly difficult for people to adapt to the increasing pace of life by accelerating their bodily and intellectual activities. Already, more and more people cannot cope with it, despite augmenting their bodies with technological devices and psychotropic drugs. These people live in an ever deepening stress and succumb to various kinds of civilizational diseases. In short, humanity fell into the trap of acceleration and does not know how to get out of it. Perhaps some meaningful solution could be found on the basis of the ecology of time. Finding the right measure of time and gradual deceleration of the pace of life would be the way out of the trap. Therefore, one of the assumptions of the ecology of time is to stop the race of people with increasingly faster technical devices and to return to the natural rhythms of life. However, this would require a cultural revolution (Glotz, 2001, p. 47). At first, the old paradigm of slowness should be restored, according to the classical Roman adage *Festina lente* (*Make haste slowly*). Especially, as such slowdown would not harm the economy. Conversely, research has shown that the people who adjust their pace of life and work to own biological clock and to their chronotypes, work better and are more efficient (*Die biologische Uhr...*, 2001).

## 10. Degradation of work environment

The work environment includes following components:

1. Material elements of workplace (equipment, infrastructure), organization and management system.
2. The crew (groups of employees, work teams, brigades).
3. The relationship between employees (horizontal: *employer-employee* and vertical: *employee-supervisors*).
4. Work awareness formed under the influence of the concept of working conditions, work climate, and evaluation of work.

Equipment and material conditions in the workplace significantly improved under the influence of the idea of humanization of work, carried out in the developed countries since the mid-twentieth century. These include: the aesthetics of the interior, ergonomic tools and equipment, internal transport and communication, auxiliary equipment to reduce the physical effort. Humanization of work involves the creation of increasingly better working conditions, a favorable work climate, and human treatment of workers by adherence to safety rules, following the recommendations of the psychology of work, labor law and the fulfillment of norms of professional ethics. It should be kept in mind that the humanization of work is not dictated by authentic care for the welfare of the worker on and did not emerge on moral grounds, but out of economic reasons. In capitalism, there is nothing for free. Every employer knows that people work more productively, if they are cared for and work in better conditions. Thus, humanization seems to be a cleverly camouflaged tool to increase productivity, profit and exploitation. Be that as it may, humanization undoubtedly contributes to the improvement of the work environment.

However, it did not occur due to the subjective factors – interpersonal relations and work awareness, but mainly as a result of the chase for profit or the desire of employers and workers to become rich. The desire of employers to achieve the maximum profit exerts a constant pressure on cutting the costs of production, especially through increasing the work efficiency and accelerating the pace of work. This negatively impacts the health of workers and their attitudes towards the work. It also contributes to the increasing imbalance between the production costs, wages, and prices of products: production costs are dropping, sale prices are raising, while the wages remain unchanged or increase with great delay and to a lesser extent than the profits of employers.

This escalates the social conflicts concerning the unjust wages. Therefore, we deal more often with the strikes which are increasingly severe and on a larger scale. Conflicts between employers and em-

ployees worsen the mutual relations between them and spoil the atmosphere at workplaces. The employees also want to get rich. Thus, they agree to raise the standards of efficiency and the pace of work. They are aware that the more they are productive, the more they can earn, and that they will be more valuable for employers; in this way they hope to avoid being made redundant and unemployment. Competitive struggle between employees increases along with the growth of unemployment. It disrupts interpersonal relations among the crew, and has a negative impact on the work environment.

The deterioration of the work climate is also caused by the conflict between production workers and others, in particular office workers. This results from the anachronistic notion of work. The understanding of labor, rooted in the consciousness of the masses, increasingly deviates from what, in fact, work is today. It derives from the times when people used primitive tools, machines and endosomatic energy of their muscles. Now, we use highly complicated tools and various forms of exosomatic energy. In consequence, our physical effort in the vast majority of work is reduced to the proverbial pressing of a computer button. Today's work requires more mental than physical effort. Despite this obviousness, people understand the work as a physical effort, and on this basis they still perpetuate the old stereotype of a working man. The work is associated with the *sweat of their brow*. This stereotype has not changed despite automation, computerization and robotization. Work is also defined as a paid activity which ensures our existence, provides goods and wealth, and allows us to realize our life goals. Therefore, the notion of work is reduced to its economic (earning money), and partly to the physical (energy consumption) dimensions. However, there are as many dimensions of work, as there are aspects and areas of human activity. The notion of work is dynamic and should be determined adequately to the historical conditions and to the technological progress levels. However, this is not the case. In accordance with the prevailing stereotype of work, people think that, in fact, the only employees who work are employed directly in the areas of production and material services and that the growth of national income is only due to their contribution; for this reason they should be the paid best and adored. Unfortunately, economists think so too. This generates pathological demanding attitudes and underlies the unjust pay system. On average, workers earn more than the officials, despite the fact that mental work often causes more fatigue than physical work. Generally, it does not count the increased stress and mental fatigue the white-collar workers are subjected to. In addition, the animosities between the workers and officials are increasing due to the growing disproportion – often unjustified by economic or organizational

rationality – the number of officials constantly grows, while the number of manual workers dwindles. This disproportion will increase despite the fact that automation and robotization reduce manufacturing and office operations. The future will belong to the intellectual work. The traditional *economic* and *physical* notions of work do not include the unpaid activities which are socially necessary, e.g. upbringing of children in the family or home management, as if they were no less important or hard than paid activities<sup>6</sup>. Society and the state do not want to pay for such kinds of work. Even if one wanted to pay for these activities, it is unknown what quantitative criteria of wages one should be applied. This problem could be solved by econometricians. These jobs are underestimated, because, allegedly, they do not contribute to the growth of national income. This is true, but only when it does not include the so-called human capital. We do not know what the obstacles are: either the laziness of economists guided by nineteenth-century categories of economics, or something else. In times of universal commodification, the final outcome of the parents' work – the care for survival of their children – are persons well brought up, healthy and able to work for the benefit of society, i.e. as the labor force, and should have a specific price. It is high time to redefine the basic categories of economics – labor, capital, national income, etc., in order to better fit them to the contemporary conditions and to avoid unnecessary social conflicts. The negative work awareness is formed mainly because people know many negative effects of work, mostly the increasing exploitation by employers. Workers know that their work brings huge profits derived from the overt or covert forms of exploitation only to a handful people, the rest receive only a small income which ensures their survival and revolves around the social minimum or poverty threshold<sup>7</sup>. Hence, more and more people

prefer to work in the service sectors and in professions that do not require a lot of effort. They do not want to be wage-workers and, therefore, they set up their own companies or even sole proprietorships. They think that in this way no one will exploit them. Of course, they are wrong because they are being exploited anyway. Exploitation is the inseparable companion of capitalism. People are becoming more and more convinced that they are not created to work, and the concept of *homo faber* is a work of culture, rather than nature. That is true, because so far, no gene of work was found in the human genome (Groll, 2011).

Negative awareness of work also stems from the fact that the paid work has begun generating a lot more harmful than beneficial effects for individuals, society and the human species. The constructive role of work is changing to a destructive one. While in the past work perfected people – their body and intellect – and along with the development of science and technology, it made them more human and free, at present, work degenerates people, making them less human and more enslaved. Work began to bring more evil than good (see Sztumski, 2009 b), not only to people, but also to the social and natural environment, because:

- It objectifies and dehumanizes people as the consequence of the progressive alienation of labor<sup>8</sup> and of the mechanomorphization of people (see Sztumski, 2005).
- More efficient work causes physical and mental wear and premature professional burnout proportionally to the intensity and pace of the work<sup>9</sup>.

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to the World Bank approximately 1.2 billion people in the world live below this level. Relative poverty threshold depends on the country, culture, and other economic and social factors. WHO and OECD determine the poverty threshold as the average of 50% of net income per capita in the country. In Germany, where the poverty threshold for a single person is the monthly income of 979 Euro, and for a family of two adults and two children under 14 years of age – 2 065 Euro, today (2014) approximately 13 million people live below the poverty level (16% of the population). In the US, this level amounts to \$ 975 for a single person, and \$ 1962 for a 4-person family (<http://www.cec.eu.de/armutsgrenze.html>; 12/02/2014). In Poland, where the average monthly net salary in the corporate sector in October 2014 was \$ 945 net, the poverty threshold is \$ 473, and therefore, supposedly ca 60% of people in Poland live on the edge of poverty, (see Bissio, 2013).

<sup>8</sup> About one hundred and fifty years ago, Karl Marx proved that the alienated work causes the estrangement of man from: nature, himself (the most important feature of human life), and the human species (see Marx, 1848). In the present capitalism, work further alienates and dehumanizes people: they become enemies for themselves, relate to each other objectively and they gradually transform to irrational cyborgs.

<sup>9</sup> Each work intensifies tiredness by increasing productivity and its pace. Continuous improvement of performance by employers, driven by their desire to maximize profit,

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<sup>6</sup> It is not about giving alms to mothers in the form of child-raising allowances – but to pay for the toil of pregnancy, childbirth and childcare with at least the minimum national wage and by adding the so-called one year contributory period of employment for pension purposes. Undoubtedly, this would be beneficial both for mothers and for the state. Mother would feel appreciated by the state, which would give them psychological comfort, especially as they could concentrate more on the proper care for good upbringing, no longer having to deal with financial difficulties. The state would benefit from this too, as the main educational obligations would fall on the mother; therefore, the state would not have resort to the deficit nurseries, orphanages, and other institutions financed from the budget and probably would spend less on the treatment of children, paying for curators and various care and education organizations.

<sup>7</sup> World Bank President Robert Mc Namara has first defined the absolute threshold of poverty as living on the edge of existence. It is achieved when the amount of money a person has for one day equals \$ 1.25. According

- Work, which should enrich employees, contributes to their increasing impoverishment.
- The accelerating pace of work also implies the acceleration of other activities in non-productive areas of life, thus generating a certain psychosis of acceleration.
- Formal and informal extension of working time increasingly limits the free time<sup>10</sup>. At present, there is no clear division between working time and free time (see Morgenthaler, 2014).
- Growth of productivity leads to an excessive increase in demand and consequently to wastefulness<sup>11</sup>.
- Modern work creates unemployment and becomes a luxury good<sup>12</sup>.

requires a constant increase of the pace of work, multi-machines operations, increasing physical and intellectual effort, as well as overtime work. This causes a rapid professional burnout. On the other hand, due to the *organizational deficiencies* many people spend time in the workplace not working; they do not want to laze around, but they are forced to, because simply they do not have anything to do. Therefore – as stated by Roland Paulsen, a sociologist at the University of Lund (Sweden) – office workers in the United States, Sweden, Germany and Singapore deal with their private matters at work for an average of two to three hours a day (see Paulsen, 2014).

<sup>10</sup> People have less and less time for everything: recreation, entertainment, regeneration of the body and mind. As a result, they are less resistant physically and mentally. Reducing time to develop the intellect and thinking results in progressive stupidity.

<sup>11</sup> With the increase in work productivity, the production of goods grows much faster than the demand for them. As a result of the overproduction, the balance between supply and demand is disrupted. To alleviate it, one creates artificial demand and stimulates the overconsumption. However, the growth in demand requires a further increase in supply of products and more productive work. Hence, there is a self-reinforcing spiral of overproduction, overconsumption, and over-demand. Thanks to the work, one satisfies their needs and creates new ones, above the standard. Satisfying them causes overproduction, overconsumption and increasingly faster rotation of goods requiring increased exploitation of raw materials and energy; this causes wastefulness. The work that earlier impelled people to rational management and made them economical, now makes them spendthrifts. In this way *homo rationalis* transforms itself in *homo prodigus*.

<sup>12</sup> This is the paradox of work. On the one hand, the progress of civilization, overproduction, oversupply and fast rotation of goods contribute to the creation of new jobs – work creates jobs. At the same time, as a result of technological progress, increased efficiency and improvement of technology, less and less people are required to work. Thus, the number of workers and working hours needed to produce the amount of goods to satisfy the current demand and the needs of people is lowered. In addition, due to the lengthening of the average lifespan, the number of people in the working age increases rapidly and significantly. Therefore, it deepens the imbalance between the number of people able to work and the number of jobs. Thus, the prospect of rising

- Work environment is becoming more stressful and the work climate generates neurosis<sup>13</sup>.

Work environment requires protection and rehabilitation from decision-makers, employers and employees. Its improvement depends on economists and politicians – their involvement in the eliminating the causes of disharmony in the work environment. First of all, their task is to maintain jobs at a relatively constant and sustainable level, permitted by the state of the economy of a country, to ensure fair remuneration and to shape interpersonal relations favorable to a proper work climate. The task of the employers' activity is to improve the work environment, while the one of employees – to change their attitudes towards work, not treating it as obligation or punishment, but also as satisfaction and benefaction: *Work does not just be painful. It is also valuable and perhaps the key to heaven* (see Kittner, 2005).

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unemployment with all its negative consequences for individuals, communities, countries and the world becomes increasingly plausible. In such conditions, work becomes a luxury item and a deficit good for which one has to fight for on the unbalanced labor market. This market is shrinking steadily and proportionally to automation, computerization (robotics), improvement of technology, management, and reducing production costs. Soon, perhaps only a few chosen ones – particularly gifted, creative, productive, or those who accidentally succeed in finding a job – will be able to enjoy work. Work becomes something attractive, an object of admiration and envy, a determinant of human happiness.

<sup>13</sup> The pressure of time, media overload and increasing number of tasks overlap each other. Competitive pressure and mobbing are some of the consequences. The stress in the workplace resulting from competitive pressures and mobbing often contributes to mental illnesses. Therefore, for example in Germany the number of disability cases due to psychological complaints increased by about 70 percent in the period from 1997 to 2004 (Gaebel, 2014).

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## Sustainable Development as a Single Measure: Case Study of Some Developing Asian Countries

### Zrównoważony rozwój jako kompleksowe narzędzie pomiarowe: Przykład wybranych azjatyckich krajów rozwijających

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#### Abstract

The Rio Earth Summit of 1992 had emphasized on the development of suitable indicators for the measurement of sustainable development, as aids for decision-making at all levels. In this paper, the authors demonstrate how a Holistic National Sustainability Index can be constructed, by taking into consideration four dimensions of sustainability – Social, Economic, Environmental and Infrastructural. The methodology is applied to 12 developing Asian countries, where sustainable development is vital in the years to come. Comparison among countries using their respective Indices would be meaningless; it is not the *states* the countries are at a given point in time, but the *paths* which they follow over time, on the sustainability curve, which are comparable. Limitations and subjectivity notwithstanding, such an Index when used on its merit (with complete understanding of its deficiencies), can be a good planning tool for decision-makers at all levels of government.

**Keywords:** sustainability, economic, environmental, social, infrastructural, low-income, lower middle income, upper middle income, trade, agriculture, services, export-import ratio, life-expectancy

#### Streszczenie

Podczas Szczytu Ziemi w Rio w 1992 podkreślono konieczność sformułowania wskaźników rozwoju zrównoważonego, które stanowiłyby istotną pomoc dla decydentów na wszystkich szczeblach.

W niniejszym artykule, autorzy pokazują, jak skonstruować Holistyczny Krajowy Indeks Zrównoważoności, uwzględniając cztery filary zrównoważonego rozwoju – społeczny, ekonomiczny, ochronę środowiska i infrastrukturę. Badania odnoszą się do 12 azjatyckich krajów rozwijających, gdzie możliwość wprowadzenia rozwoju zrównoważonego będzie w nadchodzących latach kluczowym zagadnieniem. Porównanie krajów stosujących swoje własne indeksy nie miałoby sensu, nie chodzi tu o *stany*, w których kraje się znajdują w danym momencie, ale o *ścieżki*, którymi podążają w kierunku zrównoważoności.

Mimo ograniczeń i pewnej subiektywności, taki Indeks (z uwzględnieniem jego braków), może być dobrym narzędziem planowania dla decydentów na wszystkich poziomach zarządzania.

**Słowa kluczowe:** zrównoważoność, ekonomia, środowisko, społeczeństwo, infrastruktura, dochód, handel, rolnictwo, usługi, relacja eksport-import, oczekiwana długość życia

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#### 1. Introduction

Sustainability is a condition or a state, while sustainable development is a process or a set of strategies which when implemented, is supposed to take one towards that state. Being a moving target, sustaina-

bility needs to be pursued anew every time the factors influencing it keep changing. European Communities (2007) is one of the many publications in which this distinction is brought out clearly. As Kallio, et al. (2007) has said, the phenomenon we label as sustainable development can never be exhaust-

ively defined; it would constantly change with time, interpreters and their needs. We thus have an elusive, impermanent end-goal, which is pursued with a changeable set of ways and means. Quental, et al. (2011) has stated that the introduction of sustainable development as a concept was an intellectual answer to reconcile the conflicting goals of environmental protection and economic growth. Pawlowski (2008) emphasizes on the fact that technology alone cannot solve the problems which the world encounters in the 21<sup>st</sup> century. The social and economic aspects of sustainable development need to be factored in. Ehrenfeld (2009) has said that when one talks about sustainability, one is usually expressing a desire to maintain some emergent property over long periods of time. The paper refers to it as a *meta-quality*. Guha (1992, p. 60) has talked about *orderly growth; not growth at the expense of order or for that matter, order at the expense of growth*. The abstractness associated with it can be concretised to some extent by identifying and defining certain indicators – by following the processes of conceptualisation and operationalisation commonly used in the social sciences (Singhirunnusorn and Stenstrom, 2009). An indicator, as an OECD report defined it (Keirstead and Leach, 2008), is a parameter or a value derived from parameters, which points to, provides information about, and describes the state of a phenomenon/environment/area, with a significance extending beyond that directly associated with the parameter value.

To understand the status quo that prevails at the time of writing, one would need to relate it to the past for what obtains now is the sum total of all that has been and occurred in the past. It is here that a time-series analysis – a peep into history so to say – becomes important. Having seen and understood the present with respect to the past, the future course of action (course corrections in other words) can be planned. As Cameron and Neal (2003) believe, *a correct diagnosis of the origins of a problem does not in itself guarantee an effective prescription but without such a diagnosis one can scarcely hope to remedy the problem*. Singhirunnusorn and Stenstrom (2009) have defined seven principles at the top of the hierarchy. Sustainability – considered as an environmental aspect – is one of them. On the second rung are criteria and on the last, measurable indicators.

In 2009, the Economist Intelligence Unit (London, UK), sponsored by Siemens (Germany), published the European Green City Index report (Economist Intelligence Unit, London 2009). A total of 30 cities (most of them capital cities of European countries) were studied under eight different categories: Carbon dioxide; Energy; Transport; Water; Environmental Governance; Waste and land use; Air quality; and Buildings. In total, these eight categories were composed of 30 indicators. As Venkatesh (2012) advocates, a blind pursuit of a higher Green City Index

is certainly not to be recommended, but rather an integration of the Green City Index with a Socio-Economic Index. City authorities could use the knowledge of the inter-linkages and correlations among the different indicators (and Indices) to chart the course ahead, while ensuring that complementarities and synergies are fully harnessed. In Venkatesh and Brattebø (2012), the authors have recommended the classification of cities into city types based on specific attributes and identification of relevant environmental sustainability indicators – for urban water and wastewater systems in particular – from a pool of 13 indicators, for these different city types. There is the Multi-dimensional Poverty Index (MPI) developed by Sabina Alkire and her colleagues at the Oxford Poverty and Human Development Initiative (The Economist, 2013A, p. 71). MPI considers poverty to be three-dimensional – Health, Education and Living Standards equally-weighted – and defines ten indicators in all. The Index's defenders point out that the weighting factors may be arbitrary, but at least they are explicit. Otherwise, priorities are set implicitly, and sometimes inadvertently, by the push and pull of politics. Combining these dimensions into a single score by which countries can be compared, also concentrates minds. Alkire says that when the MPI is adopted, countries like Uganda and Rwanda seem to show marked development as far as reduction of multi-dimensional poverty is concerned; while the simplistic USD 1.25 per day measure paints them in a relatively poorer light.

Five indicators – maternal health, children's well-being, educational status (of mothers), economic status (of mothers) and political status (of mothers) – are aggregated together by the NGO Save the Children in State of the World's Mothers – 2013 (Save the Children, 2013), to arrive at a Mother's Index for 176 countries of the world. The United Nations Development Programme has its Inequality-adjusted Human Development Index (UNDP), which takes into account Income, Life-Expectancy and Education.

The World Bank also developed the Logistics Performance Index (LPI) in 2010, with the criteria being Customs, Infrastructure, International shipping, Logistics, Tracking & Tracing and Timeliness. Among Asian countries, Singapore and Japan figured in the top 10, with scores of 4.09 and 3.86, out of a maximum of 5. China's LPI was 7<sup>th</sup> in Asia and 27<sup>th</sup> in the world, while Malaysia was 8<sup>th</sup> and 29<sup>th</sup> respectively (Venkatesh, 2011). Talking of infrastructure and the role it plays in sustainable development, it is apt to mention at this juncture that the value of the infrastructure stock in China and India, in year-2012, was 75% and 58% of their respective GDPs in the said year (the average of big economies is around 71%, The Economist, 2013B).

In this paper, the authors demonstrate how a Total (National) Sustainability Index (TSI) can be con-

structed, by taking into consideration four dimensions of sustainability – Social, Economic, Environmental and Infrastructural. The methodology is applied to (tested on) 12 developing Asian countries, where sustainable development is vital in the years to come. The total population of these countries (which include China, India and Indonesia) accounts for nearly 50% of the total global population. These countries have been categorised into three groups – Low Income (3 – Nepal, Cambodia and Bangladesh), Lower-Middle Income (6 – India, Sri Lanka, The Philippines, Vietnam, Indonesia and Bhutan ) and Upper-Middle Income (3 – China, Malaysia and Thailand), based on the classification scheme adopted by the World Bank (also refer Appendix I). It should also be noted at this juncture that comparison among countries using their respective Indices would be meaningless; it is not the *states* the countries are at a given point in time, but the *paths* which they follow over time, on the sustainability curve, which are comparable.

## 2. Methodology

It is in keeping with the need for an integrated approach referred to in the previous section, that this paper takes a holistic approach to defining sustainability and calculating a Total Sustainability Index (TSI). Infrastructure development is the key to social welfare and economic growth. It may have both positive and negative impacts on the environment. Investments in infrastructure development are primarily policy-decisions at the level of national and provincial governments. It thus follows that good governance and effective policymaking are *sine qua non* for sustainable development. The four dimensions considered for the purpose of this paper are Economic (E), Social (S), Environmental (EN) and Infrastructural (I). The indicators selected under each of these, are numbered as E1, S1, EN1, I1 and so on. In order to differentiate among the values of the same indicator for different years, the year is added on as a subscript to the notation. For the reference year, the values of all the indicators equal 1 (actual value in baseline year divided by itself). The values of the suitably-subscripted indicators for the years following the reference year are obtained by dividing the actual value for the year under consideration by the value in the reference year. Table 1 lists the 18 selected indicators under the four dimensions considered, with their notations, and also categorises them on the basis of whether an increase in the normalised indicator value is desirable for sustainability or not. Primary, secondary and tertiary sectors, in addition to trade-balance are accounted for under the economic dimension. Household consumption, literacy, access to water and sanitation facilities, life-expectancy at birth (males and females) are considered under the social dimension to encompass health, education, and well-being. Quite contrary to the usual

hackneyed focus on GHG emissions when it comes to environmental performance, the canvas is spread out a little wider to include water (fertiliser consumption which influences eutrophication of water bodies, serving as a proxy), atmosphere (GHG emissions), flora and fauna (terrestrial and marine protected areas) and renewable content of the electricity mix (which has far-reaching effects on land, water, soil in general). As far as infrastructure is concerned, electricity generation (which influences economic development and social welfare; while possibly having a negative impact on the environment depending on the sources availed of), transport and communication (motorable roads and telecommunication facilities, which are extremely vital in present-day Asia to connect seller to buyer, labour to worksites, supply to demand) are taken into account. The authors are of the contention that this selection of 18 indicators lends, by and large, a degree of holism to the definition of *sustainable development*.

Table 1. Listing and categorisation of the indicators selected

Increase in normalised indicator value desirable	
Notation	
E1	Economic value added by primary sector (agriculture, fishing, forestry etc.)
E2	Economic value added by secondary sector (manufacturing etc.)
E3	Economic value added by tertiary sector (services)
E4	Export-import ratio
I1	Electricity generation per capita
I2	Percentage of paved roads
I3	Mobile cellular subscriptions per 100 people
I4	Telephone lines per 100 people
EN2	Percentage of renewable content in electricity mix
EN4	Percentage of terrestrial and marine protected areas
S1	Household final consumption per capita
S2	Adult literacy rate
S3	Percentage of population with access to improved water source
S4	Percentage of population with access to sanitation facilities
S5	Life expectancy at birth (female)
S6	Life expectancy at birth (male)
Decrease in normalised indicator value desirable	
Notation	
EN1	Specific fertiliser consumption (per hectare of arable land)
EN3	Carbon dioxide emissions per capita

Quite obviously, an increase in the value of an indicator like GHG emissions per capita, is unsustainable, while an increase in the literacy rate is very much desirable for sustainable development (refer Appendix II). The data were sourced from the website of the World Bank in March 2013, by accessing each individual country page and downloading the Excel file with the time series of data for a long list

of indicators. The time period to which the authors restricted themselves was 2003 to 2010. For some countries, owing to non-availability of comprehensive data, the time period was contracted a little to 2003-2009. Gaps in the data streams were filled up by resorting to other sources/contacts – *indexmundi.com*, for instance. Some simple assumptions had to be made. For instance, if the data for the percentage of paved roads is available for year-2004 and year-2008, and there are gaps for the 3 years in between, a linear change is assumed from the 2004-2008 period (increase or decrease as the case may be). Also, for example, if data are not available for the last 2 years of the time period, years 2009 and 2010, then the value for year 2008 is assumed to hold for these years. Likewise, in cases of non-availability of data for say years 2003, 2004 and 2005, the value for year-2006 is assumed to hold for them. Data for the adult literacy rate (% of population above the age of 15) are quite scarce. In cases where there are no responses to data-requests made to government agencies in the respective countries, a similar approach as described above is adopted. This, no doubt, reduces the accuracy of the final results gleaned from the analysis. The assumptions are resorted to, for want of a better way to confront these data gaps. However, this approach is adopted for only those indicators which are measured as percentages.

The author despatched an e-mail questionnaire to researchers and other professionals originating from some of the countries analysed, in October 2013. The purpose was to collect opinions from the respondents about the weighting factors – intra-dimensional and inter-dimensional. Policymakers in the Asian governments, needless to mention, were not accessible to the authors. Policymakers in democracies are elected by the people – directly or indirectly. However, it is not always so, that they represent the will or opinions of the electorate faithfully. Hence, this exercise of reaching out to educated people to collect sets of weighting factors is tantamount to a *direct-democracy* approach, through which decisions can be made and policies formulated on the basis of the knowledge of what the people opine. In order to render more meaning to the rationale of this approach, it would ideally be necessary to reach out to vast swathes of the populations of the countries studied. That, needless to say, is difficult. Besides, the possibility that some or most of the requests sent (by e-mail) will go unanswered also has to be accepted. All the respondents have spent 20 years or more in their country of origin and thereby have the credentials to opine about the relative weighting of the different indicators, keeping the state of affairs in their respective countries in mind. **Appendix III** lists the names, nationalities, ages and years-resident-in-country-of-origin of the respondents. Some admitted that it was very difficult to assign the weightages, thus reflect-

ing the inevitable difficulty which policymakers find themselves in, if asked to do so.

For the purpose of this paper, one response per group (Low Income, Low-middle income and Upper-middle income) is deemed to be sufficient. If multiple responses are received, per group, averages are considered (the respondents have been acknowledged at the end of the paper). Often, one debates and discusses the relevance of one set of weighting factors prescribed for one particular country, to another one. But it is often widely believed that an aggregation of the weighted scores is a more convenient way of comparing and contrasting, when decisions need to be based on a very wide range of criteria.

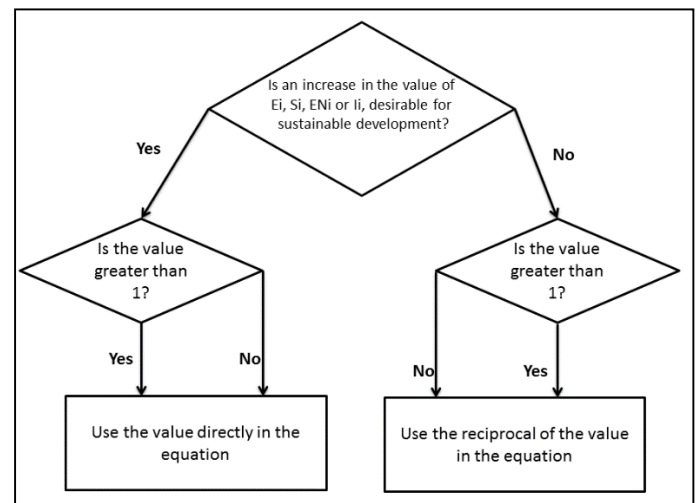


Figure 1. Flowchart to explain the choice between the quotient or its reciprocal in Eq 1

Equation 1 adopts weighted arithmetic averaging of the normalized indicators within each dimension, followed by weighted arithmetic averaging again of the component indices of the total sustainability index (abbreviated as TSI earlier). It must be mentioned at this juncture that whether to use the normalized indicator ( $E_i$ ,  $S_i$ ,  $EN_i$  or  $I_i$ ) or its reciprocal ( $1/E_i$ ,  $1/S_i$ ,  $1/EN_i$  or  $1/I_i$ ) in the summation is to be decided with reference to Table 1 and the flowchart in Figure 2.

$$\begin{aligned}
 TSI = W_E \sum_{i=1}^n w_{Ei} * E_i \left( \text{or } \frac{1}{E_i} \right) \\
 + W_S \sum_{i=1}^m w_{Si} * S_i \left( \text{or } \frac{1}{S_i} \right) \\
 + W_{EN} \sum_{i=1}^j w_{ENi} * EN_i \left( \text{or } \frac{1}{EN_i} \right) \\
 + W_I \sum_{i=1}^k w_{Ii} * I_i \left( \text{or } \frac{1}{I_i} \right)
 \end{aligned}$$

- Equation 1.

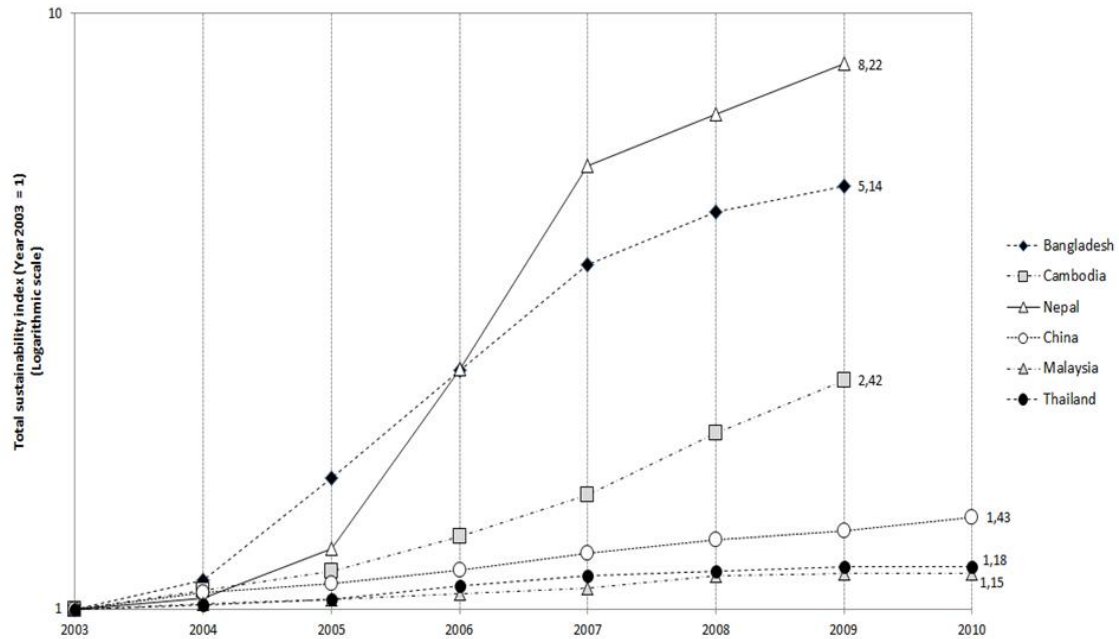


Figure 2. TSI for the Low Income and High-Middle Income countries considered in this study (with respect to year-2003, for each country)

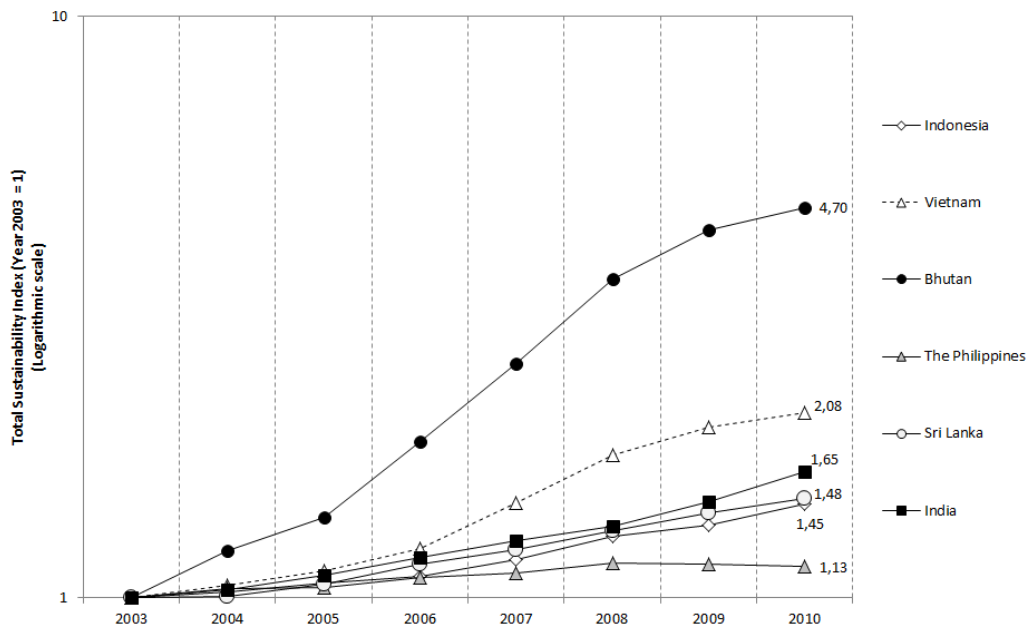


Figure 3. TSI for the Low-Middle Income countries considered in this study (with respect to year-2003, for each country)

In Equation 1, TSI is the Total Sustainability Index for a given year.  $W_E$ ,  $W_S$ ,  $W_{EN}$  and  $W_I$  are the weighting factors for the four component indices – economic, social, environmental and infrastructure respectively, such that the sum of these four equals 1. The notations  $n$ ,  $m$ ,  $j$  and  $k$  (the limits of the four summations), stand for the numbers of indicators within the Economic, Social, Environmental and Infrastructural dimensions respectively.  $E_i$ ,  $S_i$ ,  $EN_i$  and  $I_i$ , as mentioned above are the normalized  $i^{th}$  indicator values for the given year. The weighting factors for these indicator values are  $w_{Ei}$ ,  $w_{Si}$ ,  $w_{ENi}$  and

$w_{Ii}$  respectively, such that the weighting factors in each of the four dimensions ( $n$ ,  $m$ ,  $j$  and  $k$  in number) sum up to 1.

As the concept of a total sustainability index (TSI) is relatively new, there is scope in this paper to suggest the use of a geometric weighted averaging approach instead of an arithmetic weighted averaging one. In fact, one could adopt a hybrid averaging approach. The individual indices for the criteria can be obtained by geometric/arithmetic averaging and the final holistic sustainability index may be calculated thereafter by arithmetic/geometric averaging. How-

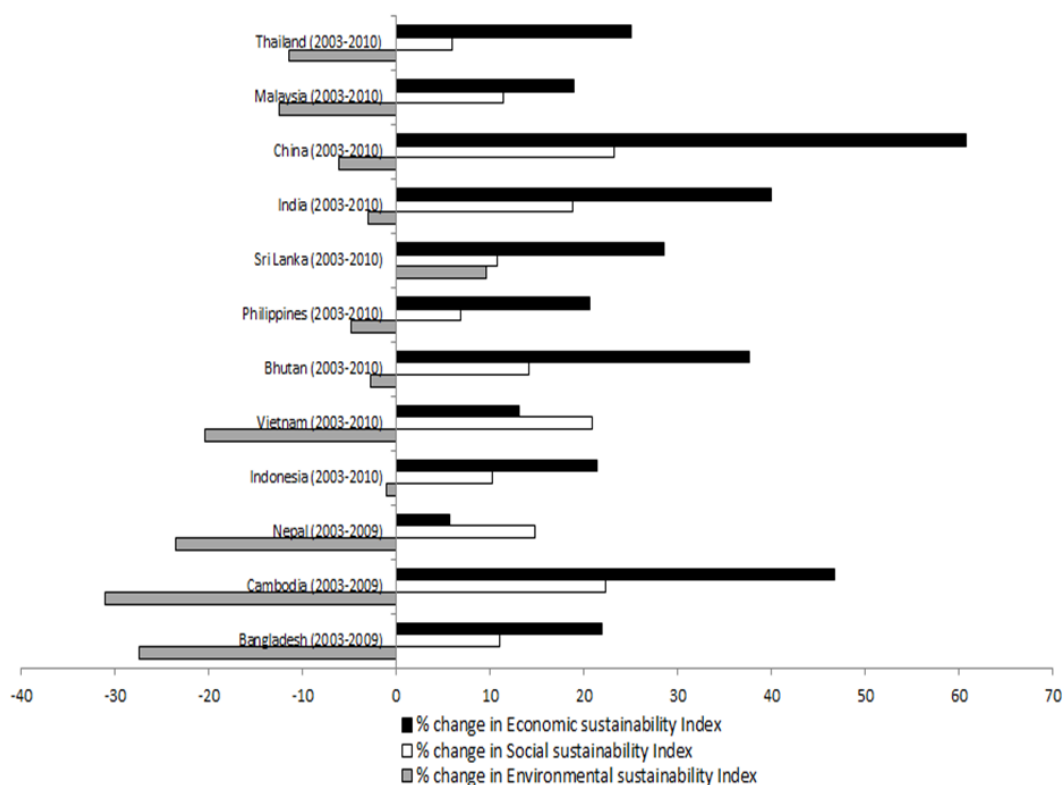


Figure 4. Changes in the sustainability indices for three of the four criteria, for all the 12 countries, over the specified time period for each of them

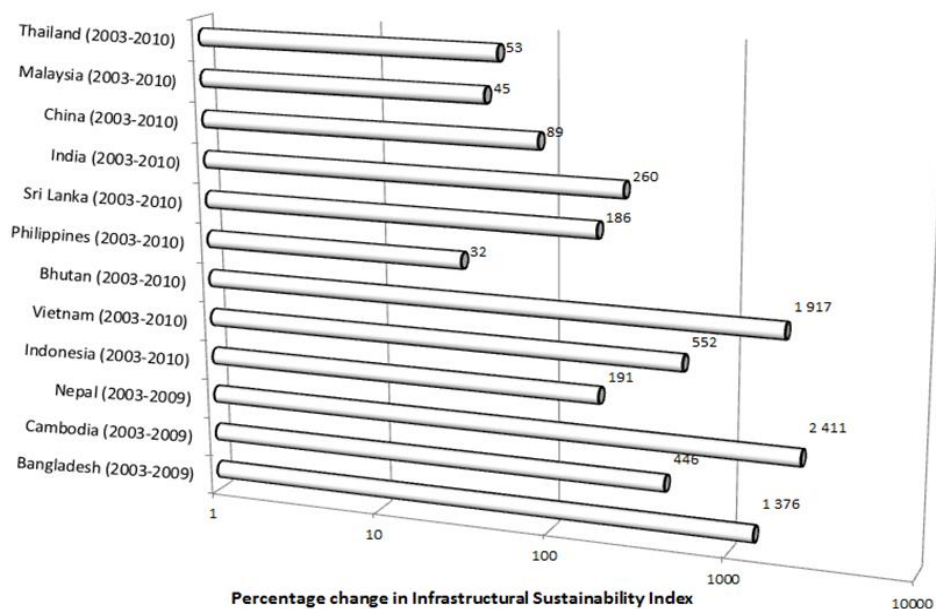


Figure 5. Changes in the Infrastructural Sustainability Index for all the 12 countries, over the specified time period for each of them

ever, the authors would like to leave these at this juncture as suggestions and not venture into calculating the TSI using these three alternate methods.

### 3. Results and discussion

Tables 2, 3 and 4 tabulate the weighting factors received in response to e-mails sent, for each of the three groups of countries. The average and standard deviation of the factors have also been included. The average is used for the calculation of the TSI. The respondents' ages fall in the range of 25-45 (average being close to 33). They are representative of the generation which will strongly influence (and be influenced by) changes happening in the world in the next two decades. Their prioritisation thereby can be considered to be quite realistic for the near future.

Table 2. Weighting factors for Low Income countries

Weighting factor	Values from responses (in %), separated by commas
W <sub>E</sub>	25
W <sub>EN</sub>	25
W <sub>S</sub>	20
W <sub>I</sub>	30
W <sub>E1</sub>	60
W <sub>E2</sub>	20
W <sub>E3</sub>	10
W <sub>E4</sub>	10
W <sub>S1</sub>	20
W <sub>S2</sub>	25
W <sub>S3</sub>	15
W <sub>S4</sub>	20
W <sub>S5</sub>	10
W <sub>S6</sub>	10
W <sub>I1</sub>	10
W <sub>I2</sub>	30
W <sub>I3</sub>	40
W <sub>I4</sub>	20
W <sub>EN1</sub>	30
W <sub>EN2</sub>	30
W <sub>EN3</sub>	20
W <sub>EN4</sub>	20

On average, for the Low-Middle Income group of countries (for which there were many responses), respondents value the socio-economic over the environmental and infrastructural. The primary sector gets a greater weighting vis-à-vis the secondary, tertiary and the trade balance; the last three being weighted almost equal to each other. Renewable energy (as percentage of total electricity generation), the percentage of paved roads and the per-capita total electricity generation itself are more important indicators. Access to water supply, quite obviously, gets 3 percentage points more than access to sanitation;

for the latter ideally ought to follow the former. For the High-Middle Income group (all respondents were incidentally of Chinese provenance), the environment is weighted over the social, economic and infrastructural. Within the environmental sustainability criterion, the *percentage of terrestrial and marine protected areas* is weighted the highest. The export/import ratio and the growth in the tertiary sector are prioritised over the growth in the primary and secondary sector, within the economic sustainability criterion.

Table 3. Weighting factors for Low-Middle Income countries

Weighting factor	Values from responses (in %), separated by commas	Average	Standard deviation
W <sub>E</sub>	60, 20, 30, 20, 40, 30, 25, 25, 25, 20	29.5	12.3
W <sub>EN</sub>	5, 20, 30, 40, 10, 20, 25, 15, 20, 30	21.5	10.3
W <sub>S</sub>	30, 40, 30, 10, 40, 35, 25, 35, 35, 25	30.5	8.9
W <sub>I</sub>	5, 20, 10, 30, 10, 15, 25, 25, 20, 25,	18.5	8.1
W <sub>E1</sub>	25, 50, 20, 20, 20, 50, 40, 30, 25, 25	30.5	11.8
W <sub>E2</sub>	25, 15, 30, 20, 20, 30, 20, 25, 30, 30	23.5	5.3
W <sub>E3</sub>	25, 15, 30, 30, 40, 10, 20, 15, 20, 20	23.5	9.1
W <sub>E4</sub>	25, 20, 20, 30, 20, 10, 20, 30, 25, 25	22.5	5.9
W <sub>S1</sub>	20, 20, 20, 10, 45, 20, 60, 10, 20, 10	23.5	16.3
W <sub>S2</sub>	15, 25, 20, 20, 5, 10, 5, 10, 15, 25	15	7.45
W <sub>S3</sub>	20, 5, 20, 30, 20, 20, 20, 20, 25, 15	20	7.1
W <sub>S4</sub>	15, 5, 20, 30, 20, 20, 5, 20, 20, 20	17	7.5
W <sub>S5</sub>	15, 15, 10, 10, 5, 15, 5, 20, 10, 15	12	4.8
W <sub>S6</sub>	15, 20, 10, 10, 5, 15, 5, 20, 10, 15	12.5	5.4
W <sub>I1</sub>	25, 30, 50, 20, 40, 40, 60, 35, 30, 30	36	9
W <sub>I2</sub>	25, 50, 30, 40, 40, 25, 20, 30, 60, 40	36	12.9
W <sub>I3</sub>	25, 10, 10, 20, 10, 15, 5, 15, 5, 10	13	5.8
W <sub>I4</sub>	25, 10, 10, 20, 10, 20, 5, 20, 5, 20	15	6.6
W <sub>EN1</sub>	25, 20, 0, 30, 10, 20, 30, 25, 15, 15	19	9.3
W <sub>EN2</sub>	25, 20, 50, 40, 40, 40, 50, 30, 40, 40	37.5	9.7
W <sub>EN3</sub>	25, 10, 20, 15, 40, 25, 10, 15, 30, 5	19.5	10.6
W <sub>EN4</sub>	25, 50, 30, 15, 10, 15, 10, 30, 15, 40	24	13.4



Table 4. Weighting factors for High-Middle Income countries

Weighting factor	Values from responses (in %), separated by commas	Average	Standard deviation
W <sub>E</sub>	30, 20, 20, 30	25	5.8
W <sub>EN</sub>	20, 30, 40, 30	30	8.2
W <sub>S</sub>	20, 15, 20, 20	18.75	2.5
W <sub>I</sub>	30, 35, 20, 20	26.25	7.5
W <sub>E1</sub>	25, 30, 20, 10	21.25	8.5
W <sub>E2</sub>	25, 15, 30, 20	22.50	6.4
W <sub>E3</sub>	25, 15, 30, 40	27.50	10.4
W <sub>E4</sub>	25, 40, 20, 30	28.75	8.5
W <sub>S1</sub>	20, 25, 10, 25	20	7.1
W <sub>S2</sub>	10, 20, 20, 20	17.50	5
W <sub>S3</sub>	20, 10, 35, 10	18.75	11.8
W <sub>S4</sub>	20, 20, 15, 25	20	4.1
W <sub>S5</sub>	15, 15, 10, 10	12.50	2.5
W <sub>S6</sub>	15, 10, 10, 10	11.25	2.9
W <sub>I1</sub>	30, 40, 30, 30	32.50	5
W <sub>I2</sub>	30, 10, 40, 40	30	14.1
W <sub>I3</sub>	20, 25, 20, 15	20	4.1
W <sub>I4</sub>	20, 25, 10, 15	17.50	6.4
W <sub>EN1</sub>	30, 15, 20, 20	22.25	6.3
W <sub>EN2</sub>	25, 35, 20, 40	30	9.1
W <sub>EN3</sub>	20, 10, 10, 20	15	5.7
W <sub>EN4</sub>	25, 40, 50, 20	33.75	13.7

Figure 2 and Figure 3 depict the trends in the TSI for each of the twelve countries. For each country, the values for years 2004 and later, are normalised with respect to the state of each country in year-2003. As mentioned before in the paper, care should be exercised in interpreting the graphs. They are not intended for comparing the states of different countries at any point in time; but rather the relative sustainability performance over time, with respect to year-2003. The TSI of Nepal increased by 822% over the seven-year period 2003-2009. During the same period, Cambodia and Bangladesh registered increases

of 242% and 514% respectively. These increases were largely courtesy the rapid rise in the value of the infrastructural indicator – Mobile subscriptions per 100 people – over the said period (refer Figure 5). The high-middle income countries registered modest increases in TSI of 43% (China; at a CAGR of close to 5%), 18% (Thailand; at a CAGR of 2.4%) and 15% (Malaysia; at a CAGR of 1.9%). Among the Low-middle income countries, Bhutan's TSI grew fastest and stood at 4.7 in 2010 (with respect to 1 in year-2003). The others recorded increases in the range of 13% to 108%. It must be pointed out at this juncture that the TSI for the Philippines rose from year-2003 and peaked in year-2008 before dropping down slightly to its relative value of 1.13 in 2010.

Figure 4 depicts the changes in the social, economic and environmental indices for the 12 countries, while Figure 5 does the same for the infrastructural. Among the Low Income countries, over the period 2003-2009, the changes in the Economic, Environmental and Social Sustainability Indices were the greatest for Cambodia at 46.6%, -31% and 22.4% respectively; while Nepal registered the highest increase in the Infrastructural Sustainability Index (2411%). Bangladesh, Nepal and Cambodia – countries in the lower stratum of the developing world, register relatively faster increases in their respective TSIs vis-à-vis those in the Low Middle Income and High-Middle Income groups. This is courtesy the harnessing of the *low-hanging fruit* in this case – especially the rapid growth in the value of the indicator *mobile subscriptions per 100 people*. Of course, results obtained in this paper are sensitive to (and dependent on) the choice of indicators as well as the weighting factors.

As far as the Low-Middle Income countries are concerned, over the period 2003-2010, the corresponding countries and the percentages of increase were India (40%), Vietnam (-20.5%) Vietnam again (21%) and Bhutan (1917%). For the three High-Middle Income countries in the fray, over the time period 2003-2010, China was the leader of the pack in all categories expect one. While the Environmental Sustainability Index dropped for all three countries, Malaysia recorded the highest drop (-11.9%). Among all the 12 countries, it was only Sri Lanka whose Environmental Sustainability Index improved over the 8-year period, by 9.55%.

It is seen that a drop in the environmental sustainability index (or a relatively slow growth in the same), is a price to be paid to effect improvements in the other three indices. The environmental sustainability index, thus tends to retard the rise in the TSI. A growth in the Gross Domestic Product per-capita is most welcome, but what is more important is what it entails for social sustainability, and at what cost to the environment such growth happens.

#### 4. Conclusions and recommendations

Ideally, different countries would adopt different sets of indicators. Weighting factors also may usually not be the same for different countries. They would also not be constant over time. Such factors are usually aligned closely with the realities-on-the-ground and policies formulated by governing bodies. Thus, it follows that they need to re-examined from time to time – both the indicators themselves and their weighting factors. Re-evaluation is necessary as some indicators may cease to be of importance after some time (and may have to be excluded or down-weighted). New challenges would then call for reformulation in the policies and thereby the definition of new indicators.

Weighting factors are subjective but as mentioned in the Literature Review section, *at least they are explicit. Otherwise, priorities are set implicitly, and sometimes inadvertently, by the push and pull of politics. Combining these dimensions into a single score by which countries can be compared, also concentrates minds.* The comparison referred to in the previous sentence is not one among the *states* of countries at any given period of time, but rather among the *paths* from the starting point on their respective curves of sustainable development. Comparing the *states* is meaningless as the starting points are not the same, and some countries are endowed with geographical and/or natural and/or historical advantages – more so than the others.

Some countries measure and record data systematically and make them available to the World Bank. Many do not. Further, apart from the data gaps, there is also some uncertainty as regards the accuracy of the data recorded (or measured and submitted to the recording authority – the World Bank in this case). As reported in The Economist (2013C, p 47), if activity in the informal sector and rural areas were properly measured in India, its GDP would look bigger and more stable. The new head of the Reserve Bank of India – Raghuram Rajan – is quoted in the same news item, as saying that the GDP could be revised by as much as 10%.

The applicability of this method is highly dependent on the availability of reliable, and reasonably-accurate data; also comprehensive to boot. Governments may be encouraged to invest more resources in data gathering in this era of *Big Data*, where robust decisions can be taken by crunching numbers using models like the one developed in this paper.

#### Acknowledgements

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#### Appendices

##### I. World Bank classification of the 19 Asian countries considered (July 2012)

Low income	Lower Middle income	Upper middle income
Bangladesh Cambodia Nepal	Bhutan Indonesia The Philippines Vietnam Sri Lanka India	China Malaysia Thailand

##### II. Explanations of the fields selected from the World Bank database, for direct use as indicators or as primary data for derived indicators

#### ECONOMIC

- **Imports of goods and services (% of GDP):** Imports of goods and services represent the value of all goods and other market services received from the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments. Data are in constant 2000 U.S. dollars.
- **Trade (% of GDP):** Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.
- **Agriculture, value added (% of GDP):** Agriculture includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources.
- **Industry, value added (% of GDP):** Industry corresponds to ISIC divisions 10-45 and includes manufacturing (ISIC divisions 15-37). It comprises value added in mining, manufacturing (also reported as a separate subgroup), construction, electricity, water, and gas. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources.
- **Services, value added (% of GDP):** Services correspond to ISIC divisions 50-99 and they include value added in wholesale and retail trade

(including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services. Also included are imputed bank service charges, import duties, and any statistical discrepancies noted by national compilers as well as discrepancies arising from rescaling

- **GDP (constant USD):** GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2000 U.S. dollars. Dollar figures for GDP are converted from domestic currencies using 2000 official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used.
- **GDP per capita (constant USD):** GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2005 U.S. dollars.

## SOCIAL

- **Household final consumption expenditure, etc.:** Household final consumption expenditure (formerly private consumption) is the market value of all goods and services, including durable products (such as cars, washing machines, and home computers), purchased by households. It excludes purchases of dwellings but includes imputed rent for owner-occupied dwellings. It also includes payments and fees to governments to obtain permits and licenses. Here, household consumption expenditure includes the expenditures of nonprofit institutions serving households, even when reported separately by the country. This item also includes any statistical discrepancy in the use of resources relative to the supply of resources. Data are in constant 2005 U.S. dollars.
- **Literacy rate, adult total:** Adult (15+) literacy rate (%). Total is the percentage of the population age 15 and above who can, with understanding, read and write a short, simple statement on their everyday life. Generally, literacy also encompasses numeracy, the ability

to make simple arithmetic calculations. This indicator is calculated by dividing the number of literates aged 15 years and over by the corresponding age group population and multiplying the result by 100.

- **Improved water source (% population with access):** Access to an improved water source refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source, such as a household connection, public standpipe, borehole, protected well or spring, and rainwater collection. Unimproved sources include vendors, tanker trucks, and unprotected wells and springs. Reasonable access is defined as the availability of at least 20 liters a person a day from a source within one kilometer of the dwelling.
- **Improved sanitation facilities (% population with access):** Access to improved sanitation facilities refers to the percentage of the population with at least adequate access to excreta disposal facilities that can effectively prevent human, animal, and insect contact with excreta. Improved facilities range from simple but protected pit latrines to flush toilets with a sewerage connection. To be effective, facilities must be correctly constructed and properly maintained.
- **Life expectancy at birth (years):** Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.

## ENVIRONMENTAL

- **Fertiliser consumption (kg/hectare of arable land):** Fertilizer consumption measures the quantity of plant nutrients used per unit of arable land. Fertilizer products cover nitrogenous, potash, and phosphate fertilizers (including ground rock phosphate). Traditional nutrients – animal and plant manures – are not included. For the purpose of data dissemination, FAO has adopted the concept of a calendar year (January to December). Some countries compile fertilizer data on a calendar year basis, while others are on a split-year basis. Arable land includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.
- **Electricity production from renewable sources (kWh):** Electricity production from renewable sources includes hydropower, geothermal, solar, tides, wind, biomass, and biofuels.
- **Carbon dioxide emissions (metric tons per capita):** Carbon dioxide emissions are those

stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.

- **Terrestrial and marine protected areas (% of total territorial area):** Terrestrial protected areas are totally or partially protected areas of at least 1,000 hectares that are designated by national authorities as scientific reserves with limited public access, national parks, natural monuments, nature reserves or wildlife sanctuaries, protected landscapes, and areas managed mainly for sustainable use. Marine protected areas are areas of intertidal or sub-tidal terrain – and overlying water and associated flora and fauna and historical and cultural features – that have been reserved by law or other effective means to protect part or all of the enclosed environment. Sites protected under local or provincial law are excluded.

#### INFRASTRUCTURAL

- **Electricity production (kWh):** Electricity production is measured at the terminals of all alternator sets in a station. In addition to hydropower, coal, oil, gas, and nuclear power generation, it covers generation by geothermal, solar, wind, and tide and wave energy, as well as that from combustible renewables and waste. Production includes the output of electricity plants that are designed to produce electricity only as well as that of combined heat and power plants.
- **Roads, paved (% of total roads):** Paved roads are those surfaced with crushed stone (macadam) and hydrocarbon binder or bituminized agents, with concrete, or with cobblestones, as a percentage of all the country's roads, measured in length.
- **Mobile cellular subscriptions (per 100 people):** Mobile cellular telephone subscriptions are subscriptions to a public mobile telephone service using cellular technology, which provide access to the public switched telephone network. Post-paid and prepaid subscriptions are included.
- **Telephone lines (per 100 people):** Telephone lines are fixed telephone lines that connect a subscriber's terminal equipment to the public switched telephone network and that have a port on a telephone exchange. Integrated services digital network channels and fixed wireless subscribers are included.

#### III. Respondents who opined about weighting factors

Name	Age	Country of origin	Years resident in country of origin	Gender
Bertha Maya Sopha	36	Indonesia	25	Female
Bhawna Singh	32	India	24	Female
Chao Fu	30	China	25	Male
Citra Prase-tyo	26	Indonesia	22	Female
G Venka-tesh (au-thor)	41	India	32	Male
Gang Liu	31	China	26	Male
Gema Sakti Raspati	36	Indonesia	28	Male
Juan Tan	30	China	25	Female
Kamna Sachdeva	34	India	34	Female
Netra Ti-malsina	35	Nepal	30	Male
Sunand Sre-eramachan-dran	33	India	22	Male
Ushanth Navaratnam	29	Sri Lanka	26	Male
Vera Guna-wan	40	Indonesia	25	Female
Xinxin Wang	31	China	26	Female
	Ave- rage age: 33		Average: 26	

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## Delinquency Hostile to Women – a Hurdle for Sustainable Development in Multidimensional Outlook

### Przemoc wobec kobiet – wyzwaniem dla zrównoważonego rozwoju

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#### Abstract

Violence against women is partly a result of gender relations that assumes men to be superior to women. Given the subordinate status of women, much of gender violence is considered normal and enjoys social sanction. Violence against women has been clearly defined as a form of discrimination in numerous documents. Cultural and social factors are interlinked with the development and propagation of violent behaviour. With different processes of socialization that men and women undergo, men take up stereotyped gender roles of domination and control, whereas women take up that of submission, dependence and respect for authority. A female child grows up with a constant sense of being weak and in need of protection, whether physical social or economic. This helplessness has led to her exploitation at almost every stage of life which remains a hurdle for the sustainable development of the nation. With almost half the population feeling insecure can a nation really progress towards development? Can women be called safe in any part of the world? Be it within the boundaries of the State or beyond? Cross-border crimes not just affect the women of the particular Nations at war but it travels beyond the borders and becomes an issue of global concern.

This paper discusses the crime against women comparing and relating it with various aspects of sustainable development like literacy rate, political participation of women, unemployment and sex ratio with solutions to bring a change and development towards a better tomorrow.

**Key words:** violence, women, sustainability, literacy, politics, unemployment

#### Streszczenie

Przemoc wobec kobiet poniekąd wynika z tradycyjnego podejścia do płci, które zakłada że mężczyzna dominuje nad kobietą. Wobec statusu podrzędności przemoc często uznawana jest za normę i nie spotyka się ze sprzeciwem. Tymczasem przemoc wobec kobiet w wielu dokumentach jednoznacznie określono jako dyskryminację. Czynniki kulturowe i społeczne mają bezpośredni związek z narastaniem problemu agresywnego zachowania. W ramach procesów socjalizacji mężczyźni podejmują stereotypową rolę dominatora i władcy, podczas gdy kobiety charakteryzuje uległość, zależność i szacunek. Dziewczynki dorastają w poczuciu bycia słabymi, którym potrzebna jest ochrona fizyczna, społeczna i ekonomiczna. W istocie to postawa bezsilności, która sprzyja ich wykorzystywaniu na niemal każdym etapie życia, co jest istotną przeszkodą na drodze do zrównoważonego rozwoju społecznego. Czy w sytuacji, gdy niemal połowa populacji nie czuje się bezpiecznie, możemy mówić o jakimkolwiek prawdziwym rozwoju? Czy kobiety mogą czuć się bezpiecznie? Tak w granicach swego kraju, jak i poza nimi? Przestępstwa dokonywane przez międzynarodowe mafie odnoszą się nie tylko do poszczególnych krajów, ale stają się problemem globalnym.

Ten artykuł podejmuje kwestię przemocy wobec kobiet w powiązaniu z problematyką rozwoju zrównoważonego, uwzględniając zagadnienia takie, jak: poziom analfabetyzmu, udział w procesach politycznych czy poziom bezrobocia w ramach obu płci. Celem jest poszukiwanie rozwiązań prowadzących w kierunku poprawy sytuacji dla lepszego jutra.

**Słowa kluczowe:** przemoc, zrównoważoność, umiejętność czytania i pisanie, polityka, bezrobocie

## Introduction

The UN Secretary General's High-Level Panel on Global Sustainability once pointed out the lack of success on the road to sustainable development. The two main reasons cited were: first, lack of access to resources and energy, and secondly, discrimination against women. The link between women's rights and the planet's future is too often elapsing.

India's current model of development which focuses on growth is incapable of solving the problems of poverty, inequality and sustainability. In times of peace and war there have been articles in magazines and newspaper about the violence against women in India. Crimes and violence against women were being perpetuated right from time immemorial. Female-foeticide, Satipratha, child marriage, dowry, social boycott of the widows, etc. are just a few examples of these atrocities. Right from their womb to the tomb, women are made to pay extreme for the only reason that they are women.

Development of the society cannot be constrained to a particular segment of the society and the country has age old histories witnessing vast gender inequalities. Development and progress come hand in hand, which includes the society as a whole i.e. both men and women. Economic progress and growth of a nation is directly related to the course of revolution of a society heading to its advancement.

Religion, customs, age-old prejudices, etc. have put Indian women in an acquiescent and vulnerable position in many domains of life. Low rates of participation in education, lack of economic independence, value biases operating against them, etc., have resulted in the women being dependent on men folk and other institutions of authority like the family, neighbourhood and the society. They are usually ignorant of their rights and even if they are not, they do not have easy access to justice. The rate of human rights violation is increasing day-by-day. The people are besieged by human rights violation in all fields, both internal and external (Shamsi, 2004).

The human race is most inequitable for women and girls; they are beaten, tortured and raped at the hands of male chauvinism. And sadly it not only exists within the boundaries of the nation rather it is in its most brutal form in the *no man's land*. In a country like India where the present-modern society is still under the control of patriarchal male supremacy, focusing only on laws protecting women within the territorial boundaries of the State is not sufficient to aim towards global sustainability and development. The most atrocious crimes against women take place where the State boundaries end.

The issues related to women are being raised and discussed in various forums, in the recent times. Of these, *violence against women* is gaining more and more support and recognition, the world over. But

despite the enactment of laws, formulation of reformative legal processes, provision of legal aid to the needy, extensive use of the provision of Public Interest Litigation, conduct of Family Courts, Women/Family counselling centres etc., women in India have a long way to go in concretizing their Constitutional Goals into reality.

Sustainable human development is the key to fulfilling social and economic progress. Social sustainability includes social environment. It also includes individual freedom, participation, community cohesion, healthcare, and maintenance of law and order. In India, there has been a continuous rise in the total incidence of crimes committed against women over the years. Incidence of torture and molestation top the list, followed by the cases of kidnapping/abduction and rape. Violence against women is extremely common. Kaur (2011) has commented that *violence against women and girls is one of the most widespread violations of human rights. It can include physical, sexual, psychological and economic abuse, and it cuts across boundaries of age, race, culture, wealth and geography* a statement that is amply justified by the events taking place in India every day. It takes place everywhere in the home, on the streets, in schools, the workplace, in farm fields, refugee camps, and in some places such as red light areas and prisons it is exceedingly common (Golden, 2004). The semantic meaning of *crime against women* is direct or indirect physical or mental cruelty to women. Crimes which are *directed specifically against women* and in which *only women are victims* are characterized as *crime against Women*. It is equally important to clarify the concept of *violence against women*. Violence is also known as abuse and include any sort of physical aggression or misbehave. When violence is committed at home it becomes domestic violence and involves family members such as children, spouse, parents or servants.

Women's active participation in cities through their inclusion in the economy, their safe and unrestricted right to movement, and access to all forms of mobilities and urban public spaces are important indicators of sustainable cities for women (Narayanan, 2012). Domestic violence may involve different means such as hitting, kicking, biting, shoving, restraining and throwing objects. In broad terms, it includes threats, sexual abuse, emotional abuse, controlling or domineering, intimidation, stalking, passive/covert abuse and economic deprivation, rape, abduction, kidnapping, murder (all cases of criminal violence, dowry death, wife battering, sexual abuse, maltreatment of a widow and for an elderly women (all cases of domestic violence) and eve-teasing, forcing wife/daughter-in-law to go for foeticide, forcing a young widow to commit sati, etc. (all cases of social violence), are issues which affect a large section of

society. Literature on Violence against women in India has focused on spousal violence and familial violence, with some attention to political and communal violence. There are three aspects of this crime which the society needs to take care of, the first being prevention of rape. The second important responsibility of the society is sensitive management of victim after the crime (Azikiwe, Wright, Cheng and D'Angelo, 2005), and lastly punishment of the perpetrator of the crime.

Violence against women remains as a chief hindrance in achieving the sustainability. When one half of the population is incapacitated by the circumstances, baffling the administrative and executive functions of a state, the achievement of sustainability becomes a question. Women possess potential to be as a driver for a sustainable development. Hence it is the mindset of the people that has to be balanced providing the gender equality.

Following the rape and murder of the Delhi student on December 16, 2012, there have been debates and discussions on the causes, remedies and punishments for crimes against women. For weeks, news concerning the rape and agitations that followed reigned supreme on the country's news channels. Active in these debates were law makers, lawyers, jurists, police officers, celebrities, and women's activists, but striking by their absence were criminal psychologists who have studied rape as a phenomenon and examined the methods or modus operandi of rapists. The debates were fuelled more by passion, emotion and law, but what was lacking was expertise on criminal behaviour or psychology. Rape of women by men has occurred throughout recorded history and across cultures. McKibbin, Shackelford, Goetz and Starratt (2007) have studied rape from an evolutionary psychological perspective. Evolutionary psychology is a powerful heuristic that allows researchers to develop and test novel hypotheses about complex behaviours such as rape. And the focus has now shifted to reevaluating and reframing protection of women under present laws.

### Methodology

Due to the difficulties involved in obtaining data, especially on a nation-wide basis, statistical studies of domestic violence have been limited. This is particularly true for developing countries, including India, where gender discrimination is deeply entrenched. The study is based on the number of crime cases and incidents reported as violence against women in various states, political participation of women in the states and the economic background of the states. This study draws on data from one of the only current sources of nationwide information about violence against women in India, the Indian National Crime Records Bureau, Census survey 2011, Electoral Statistics 2014, from election commission of India. For the state wise analysis, the sample states

are selected based on the rate of crime against women in the states. The states are selected and respective socio-economic grounds are analysed and discussed.

### Data Analysis

As per the National Crime Records Bureau, West Bengal tops the chart in reporting 12.7% of Crime rate of total such cases in the country (30942 out of 2,44277). Kolkata is the third most unsafe metropolis for women, while Delhi and Bangalore engaging the first and second position.

The table values reveals that only women political participation has the distribution sharper than a normal distribution with values concentrated around the mean. All the other factors are flatter than the normal distribution since the values are wider spread around the mean which shows there is more difference in the distribution of the rates in crime, literacy, unemployment and sex ratio in different states.

### State-wise analysis and discussions

#### *Bihar*

Cultural discrimination, isolation and disempowerment are the shared experience of the women of Bihar. According to 2011 census Bihar has the lowest literacy rate in India which rates to 63.82%, It is also one of the state which has the female literacy rate (53.33) which is almost 12% lower than the nation's average female literacy rate. The state has 11,229 incidences of crime against women which rates to 4.60% contribution to All-India total. It is to be noted that the state stands second in total female population (479.59 lakhs) next to Uttar Pradesh. The figures look depressing. Number of cases of gang-rape, sexual assault and eve-teasing are reported now and then. The crime rates have been constantly increasing in the state from 6186 cases in 2008 to 10231 cases in 2011 and to 11229 cases in 2012. It has recorded almost 82 percentage point increase in just four years. It has been reported that totally 4456882 women are missing in the state owing to its sex-ratio of 918. Whereas political participation of women contested in general election to legislative assembly is 8.71% and percentage of seats won by women is 14% which is the highest percentage of seats among the states of nation, but the state has poorest women voters polled as percentage of registered women electors which is 54.5% which is lower than the nation's average. Though the women contestants and women winners in politics are high the crime rate against women still stands high in the state which is substantiated by the poor percentage of women voters polled against the registered women electors. Considering the economic situation, the state has the lowest *per capita* income in the country which accounts to Rs. 24,681 at current prices and Rs. 15268 at constant prices. The gross state domestic product



Table 1. Descriptive analysis, source: *National Crime Records Bureau 2012, Census survey 2011, Electoral Statistics 2014*

State	Rate of Crime 2012	Literacy rate 2011	Female literacy rate 2011	Women political participation rate	Unemployment rate	Sex ratio
Andhra Pradesh	66.05	67.66	59.74	11.6	30	993
Arunachal Pradesh	33.67	66.95	59.57	3.3	65	938
Assam	89.54	73.18	67.27	33.1	63	958
Bihar	23.41	63.82	53.33	14	83	918
Chhattisgarh	34.38	71.04	60.59	11.1	12	991
Goa	23.01	87.4	87.4	2.5	179	973
Gujarat	33.58	79.31	70.73	8.8	10	919
Haryana	50.31	76.64	66.77	10	32	879
Himachal Pradesh	27.13	83.78	76.6	4.4	31	972
Jammu & Kashmir	58.6	68.74	58.01	3.4	56	889
Jharkhand	29.16	67.63	56.21	9.9	48	948
Karnataka	34.92	75.6	75.6	2.7	25	973
Kerala	61.21	93.91	93.91	5	99	1084
Madhya Pradesh	47.75	70.63	60.02	13	27	931
Maharashtra	29.87	82.91	82.91	3.8	28	929
Manipur	24.64	79.85	73.17	5	37	992
Meghalaya	19.38	75.48	73.78	6.7	36	989
Mizoram	40.2	91.58	89.4	0	19	976
Nagaland	4.7	80.11	76.69	0	60	931
Orissa	58.79	73.45	64.36	4.8	30	979
Punjab	24.98	76.68	71.34	12	18	895
Rajasthan	63.75	67.06	52.66	14	17	928
Sikkim	23.29	82.2	76.43	12.5	126	890
Tamil Nadu	21.23	80.33	80.33	7.3	22	996
Tripura	86.95	87.75	83.15	8.3	141	960
Uttar Pradesh	24.25	69.72	59.26	8.7	25	912
Uttaranchal	21.5	79.63	70.7	7.1	52	963
West Bengal	70.3	77.08	71.16	11.6	78	950
<i>Mean</i>	<i>40.233</i>	<i>76.79</i>	<i>70.396</i>	<i>8.378</i>	<i>51.75</i>	<i>952.00</i>
<i>Median</i>	<i>33.625</i>	<i>76.66</i>	<i>70.945</i>	<i>7.800</i>	<i>34.00</i>	<i>954.00</i>
<i>Std. Deviation</i>	<i>21.581</i>	<i>7.81</i>	<i>11.158</i>	<i>6.368</i>	<i>41.47</i>	<i>43.366</i>
<i>Skewness</i>	<i>.807</i>	<i>.39</i>	<i>.264</i>	<i>2.111</i>	<i>1.65</i>	<i>.705</i>
<i>Kurtosis</i>	<i>-.121</i>	<i>-.43</i>	<i>-.685</i>	<i>7.639</i>	<i>2.50</i>	<i>1.789</i>

accounts to Rs.262230 crores at constant prices for the year 2011-12 which has 13.13% growth over the previous years.

#### *West Bengal*

The incidence and rate of crime against women in the state stands top in the country with 30942 incidences and 12.67 percentage contribution in the country's total. The rate of total cognizable crimes

also rates to 70.30%, highest among the nation. Looking at the literacy rate of the state (77.08) it is quite above the country's average literacy rate (74.04). It is to be noted that the female literacy rate of the state (71.16) is far greater than the nation's average female literacy rate (65.46). Though the state has a decent literacy rate, it shows no big difference. The incidences of crime under the category *Cruelty by husband or his relatives* stands top with 19865 in-

cidences with the crime rate of 45.13 and holds the percentage share of 18.65 in the nation. The state also holds the larger percentage share in rape and kidnapping and abduction which is 8.21% and 10.89% respectively. On having a glimpse at the trends in political participation of women in the state 9.71% of women contestants in general elections to legislative assembly, 11.6% of seats are won by women. The state has the reasonable women voters polled (84.5%) against the percentage of registered women electors. Looking into the economic position of the state, the *per capita* is Rs.34229 at constant prices which almost 9.9% lesser than the nation's average *per capita* income at constant prices.

#### *Uttar Pradesh*

The state is one of the world's poorest regions and has largely missed out on the economic boom that swept much of India over the past decade. Its population of over 200 million is larger than that of Russia. The state has the crime rate of 24.25 and holds the percentage share of the state accounts to 69.72% which is almost 50% less than the country's total literacy rate. Female literacy rate still stands below 60% where as the country's average female literacy rate is 65.46%. Looking into the political participation of women in the state, it has the 8.52% of women contestants and about 8.7% of seats are won by women. Women voters polled as percentage of registered women electors falls low to 60.3%. The state's per capita income stands at Rs. 16374 at constant prices, the Gross state domestic product contributes about Rs.350258 crores which is almost 7.77% of the total GDP of the nation. The state occupies the major percentage share in the crimes such as kidnapping and abduction and dowry deaths which are 20.67% and 27.26% respectively. The state's name is heard now and then in the news mainly for the violence against women.

#### *Andhra Pradesh*

The state has the major percentage share in the incidences of crime committed against women in nation 11.53%, the rate of crime (66.05) was reported from the state. 12.6% of the total nation's torture of women were reported from Andhra Pradesh. Literacy rate for the state (67.66) remains almost 7% less than the nation's average (74.04). It is to be noted that the women literacy rate is below 60%. Looking into the political participation of women, there are 8.21% of women contestants and 11.6% of the seats are won by women. 71.5% of the women votes are polled as per the registered women electors. A glance at the major type of crime committed in the state is the cruelty by husband or his relatives, crime rate stands at 31.39% and it holds the percentage share of 12.57%. The state holds the major share of about 40.49% of total cases at national level in the crime of insulting the modesty of women with the crime rate of 10.62. Giving the fleeting look at the

economic status of the state, it has the GSDP at constant prices at Rs.407949; it has the *per capita* income of Rs.42710 at constant prices which is almost 12.38% greater than nation's average *per capita* income.

#### *Rajasthan*

There has been a significant rise in crimes including dowry deaths, harassment by husband and relatives, molestations and sexual harassment in the state. The art of crime in the state accounts to 63.75%. 8.64% of total crimes reported in the country were reported from Rajasthan. On giving a glimpse on the literacy rate of the state, it has 67.06% of literacy rate. But the saddest part is that the state has the lowest female literacy rate in the country which stands at 52.66% almost 13% lesser than the country's average female literacy rate. On account of the political participation of women in the state, there are 7.92% of women contestants in the general election to legislative assembly and 14% of the seats are won by women. 75.4% of the registered women electors have polled in the general elections. The state stands second in the percentage share under the crime *rape* with 8.22% of share. It stands third in the percentage share under the crime *cruelty by husband or his relatives* with 12.50% and its crime rate stands to 40.21%. Taking a look into the economic position of the state, the state gross domestic product stands at Rs.196045 whereas *per capita* income. It shows that the state is economically still backward.

### **Crime against women and Literacy**

Literacy is an important indicator of socio-economic and cultural development. It is regarded as both a means and an end of development (Azim, 2005, p. 1647). Literacy is an essential means for eradicating poverty and mental isolation, for cultivating peaceful and friendly international relations and for permitting the free play of demographic process (Chandna and Sidhu, 1980, p. 98). The ability to code and decode written text constitutes the basic technical aspect of literacy (Perfetti, 1998, p. 15). The Census of India (2011) defines literacy as ratio between literate population and total population excluding seven years children. In other words, a person aged 7 years and above who can both read and write with understanding in any language has been taken as literate. The inability to read and write well may not be a direct cause of criminal behaviour, but low literacy and crime are related. Day today life is harder for people with low literacy, so they are more likely to feel frustrated and dissatisfied. People with low literacy skills usually have equally inadequate problem-solving skills. People who have low literacy skills tend to be less active citizens than other people. They are less likely to get involved in community activities like sports, school groups, community groups and so on. As a result, they often feel isolated and vulnerable

and many of them feel like outcasts. This may partly explain why people who have low literacy are statistically more likely to be involved in crime, either as the offender or as the victim. It may also help to explain why crime rates are higher in places where a high percentage of people have low literacy.

### Crime against women and Political participation of women

There is no gender equity in family, social, economic, political and administrative life for the women in India. Participation of women in large numbers takes place in most elections to parliament and state assemblies; their exercise of the right to contest for the seats in the country's lawmaking bodies is very insignificant. The number of women parliamentarians in India has never exceeded 10 percent and that of women administrators has never exceeded 12 percent. Crimes against women are a persistent and even a growing problem in many developing countries. In India, research suggests that having female political representatives can be an effective tool to empower women in the battle against gender crime. Although it also results in higher rates of documented crime against women, this reflects the fact that a greater number of gender crimes are being reported. Police responsiveness to documenting and dealing with gender crimes is higher in areas with female politicians. Research shows that victims are more willing to come forward because they anticipate they are more likely to be heard.

Women politicians have the biggest impact on giving a voice to female victims when they are present at the local government level, where they live in greater proximity to them (Anandi, 2014). Reporting of crimes against women, especially domestic violence is also a problem in developed countries, but institutional responses often discourage reporting and do little to reduce rates of domestic abuse. Political participation rates for women generally are low in both developing and developed countries. Reserved seats, followed by legislative candidate quotas, may be the most effective ways of encouraging more women to enter politics.

### Crime against women and unemployment

Unemployment is being viewed as a pan-Indian social phenomenon that sets into motion the wheels of crime. To add to this, the skewed sex ratio and singlehood are very simplistically written-off as driving factors for the crime rate. According to Census 2011, the total population of India is 1.21 billion (male: 623.72 million and female: 586.47 million). This does not mean 37.25 million *extra* young men in the country are single and sexually frustrated. The figures are inclusive of males and females belonging to all age groups.

In the same way, it needs to be pointed out that the positive association between unemployment and crime in general, and crimes against women in particular, has not been established the way it has between poverty and crime in empirical studies. For instance, the people implicated in the Delhi gang rape case, were not unemployed. Nor were those involved in other crimes reported widely in the mass media since that incident took place.

The esteemed editor of a popular Indian weekly magazine who was recently in news for all the wrong reasons was anything but a victim of unemployment. It would, therefore, be wrong to categorize men into watertight compartments on the basis of their state of employment.

Table 2. Multiple Correlation

Variables	CR	LR	FLR	WPP	UR	SR
CR	1					
LR	-0.041	1				
FLR	-0.095	0.965**	1			
WPP	0.481**	-0.386*	-0.403*	1		
UR	0.138	0.367	0.368	-0.014	1	
SR	0.134	0.410*	0.458*	-0.176	0.078	1

Notes: \*P<.05; \*\* P<.01; CR = Crime Rate; LR= Literacy Rate; FLR= Female Literacy rate; WPP= Women Political Participation rate; UR= Unemployment Rate; SR= Sex ratio

The table represents the negative correlation between crime rate of the states in the nation and its literacy rate which stands to -0.041. It is depicted from the table that both the Total literacy rate of the states and the female literacy rates have the poor negative correlation. The crime rate has the significant correlation only with the variable rate of women political participation. Female literacy rate is significantly correlated with the sex ratios of the states and its women political participation rate. If the perceived reasonable independent variables like literacy rate, female literacy rate, unemployment rate and sex ratio have no relationship on the dependent and study variable crime rate against women, then it is understandable that situations, conditions, positions, attitudes and behaviours paves the way for these commit of crimes. It is notable that women political participation rate is highly correlated with the crime rate with the rate of 0.481, it do not mean that where there is low women political participation there is low crime against women, it is just that women political participation facilitates women to report crimes rather in many places it go unreported and unrecorded.

### Implications

The cumulative outcome is that India has one of the largest incidents of female foeticide. The country has

the dubious distinction of having one of the biggest girl-child prostitution in the world. In the list of annual missing (abducted) children (estimated to be around 70,000 each year) girl children are the majority. The irony is that there is not even a semblance of a pro-active step from governments, human rights organisations, women's organisations or women politicians to bring a visible major policy shift in respect of administration of justice, law and order and change in the functioning of police which has a mindset tilted against working or *liberated women*. Violence against women occurs in all social and economic classes, but women living in poverty are more likely to experience violence. Although more research is needed to fully understand the connections between poverty and violence against women, it is clear that poverty and its associated stressors are important contributors. A number of theories about why this is so have been explored. Men in difficult economic circumstances (e.g. unemployment, low socioeconomic status or blocked advancement due to lack of education) may resort to violence out of frustration, and a sense of hopelessness. At the same time, poor women who experience violence may have fewer resources to escape violence in the home. Women's organisations or government bodies step into the scene only if a rich or a celebrity is involved or if media continues to focus on the issue that is *en-cashable*. The concerns of these *professional bodies* fade-out swiftly once the electronic media in particular switches off its camera on the victim. Women, otherwise, portrayed in hyperbole terms in religious texts, literature and traditions of the country remain prisoners of time, traditions, political games and the rising consumerist web. There is no *safe exit* for her even though she may be a city-based working woman or an uneducated village woman drawing water from a pond.

Just five percent of the Indian police force are women, an especially worrying statistic given the fact that many crimes against women go unreported because they don't feel safe reporting them to a man. Building concrete responses to violence against women will help to ensure that the new millennium is the time when women no longer endure violence solely because they are women. Increased attention must be paid to addressing the risk factors for violent behaviour of men towards women as well as the risk factors for violence shared by men and women. Unless prevention and awareness of violence against women is integrated and educated sustainable development will continue to suffer and the ambitious goals for global sustainability agreed to by the international community will remain unattainable.

The most significant thing is the mindset to see women with respect. Crimes like rape are being committed due to the sick mindset and this should be changed through social awareness and social awakening. It would also be wise to train the female students in Martial arts for self-defense. The training

can be provided to the girls in all schools and colleges to aid them to take on the anti-socials. Only legislation and law enforcement agencies cannot prevent the incident of crime against women. There is need of social awakening and change in the attitude of masses, so that due respect and equal status is given to women. It is time when the women need to be given her due. This awakening can be brought by education campaign among youth making them aware of existing social evils and the means to eradicate same. Mass media can play an active role here as in the present days it has reached every corner of the nation. Various NGOs can hold a responsible position here by assigning them with the task of highlighting socio-economic causes leading to such crimes and by disseminating information about their catastrophic effect on the womanhood and the society at large.

### Conclusion

For a society to reach its true potential and the optimum level of growth, it is imperative for them to give equal stature and importance to women in the society. Further, from the global perspective, giving equal importance to women and protecting their rights in the society becomes even more important in order to achieve sustainable growth and development. From what has been presented above it is clear that violence against women is endemic in India. The reason is women in the country are highly vulnerable because of poor quality of life indicated by rampant poverty, lack of education, high under five mortality, poor health status, high fertility rate and high maternal mortality rate. Also contributing to the violence against women is societal mindset about women that has not changed much. Violence is perpetrated on women both inside and outside her home. The government and voluntary organisations are making efforts towards ending/minimizing violence against women. The efforts of the government are in the shape of enacting relevant legislations, issuing orders and launching various women welfare schemes. But their implementation remains tardy, as the lower level government functionaries are not gender sensitive. On the other had the voluntary organisations are taking both preventive as well as reactionary measures. But efforts of the voluntary organisations suffer from paucity of funds and infrastructure. Yet in this rather bleak scenario, many voluntary organisations have devised several innovative strategies to combat the menace and been successful in wiping tears of hapless women. Advocacy for sustainable development should emphasize its importance in preventing violent conflict, thereby protecting non-combatant women and children.

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## Sustainable Development of Middle East Region

### Zrównoważony rozwój krajów Środkowego Wschodu

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#### Abstract

The Middle East is one of the most important regions of the world. The United Arab Emirates act as the leader in ensuring a sustainable and safe future for that area, and the whole planet. The economic development of the UAE is driven by securing clean energy, development of new technologies, access to water, stimulating employment of high-value specialists, safeguarding social welfare and combating poverty. An exemplar of a global model of sustainable development in urban areas is Abu Dhabi Masdar City – one of the most eco-friendly communities in the world. The ground-breaking projects that have been implemented in Abu Dhabi prove that the UAE set trends when it comes to utilisation of renewable energy sources and mitigation of the effects of climate changes in the region. The Middle East countries, including the UAE, recognise the tremendous role played by the society in protecting the environment and preserving it for the generations to come. The governments of those states believe that it is just as important as the activity of business leaders and the public administration. Educational programmes aim to instruct and inspire children and teenagers so that the environment could have a sustainable future. This article presents some aspects of the UAE's economic development as well as the controversial social context and pro-environmental initiatives in the field of renewable energy sources, saving water and waste management.

**Key words:** sustainable development, Middle East, United Arab Emirates

#### Streszczenie

Środkowy Wschód jest ważnym regionem na scenie światowej. Zjednoczone Emiraty Arabskie pełnią rolę lidera w zapewnieniu zrównoważonej i bezpiecznej przyszłości dla regionu i dla świata. Rozwój gospodarczy ZEA opiera się na pozyskiwaniu czystej energii, rozwoju nowych technologii, dostępie do wody, tworzeniu miejsc pracy o wysokiej wartości, bezpieczeństwie socjalnym i walce z ubóstwem. Przykładem globalnego modelu zrównoważonego rozwoju obszarów miejskich jest jedna z najbardziej ekologicznych społeczności na naszej planecie, Abu Dhabi Masdar City. Przełomowe przedsięwzięcia w Abu Dhabi wskazują na to, że ZEA są pionierem w wykorzystaniu odnawialnych źródeł energii i łagodzeniu skutków zmian klimatycznych w regionie. Kraje Środkowego Wschodu, w tym Zjednoczone Emiraty Arabskie, zwracają uwagę na ogromną rolę społeczeństwa w ochronie środowiska i zachowania go dla przyszłych pokoleń. Rządy tych państw uważają, że jest to równie ważne jak znaczenie liderów biznesu i administracji publicznej. Program edukacyjny zakłada wykształcenie i inspirowanie młodych generacji w celu zapewnienia środowisku zrównoważonej przyszłości.

W artykule przedstawiono aspekty rozwoju gospodarczego ZEA, kontrowersyjny aspekt społeczny i inicjatywy proekologiczne na polu wykorzystania odnawialnych źródeł energii, oszczędności wody i gospodarki odpadami.

**Słowa kluczowe:** zrównoważony rozwój, Środkowy Wschód, Zjednoczone Emiraty Arabskie

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## Introduction

The main objectives of sustainable development are making sure that the needs of the present are met without compromising the ability of future generations to meet their own needs, but also providing the society with a long-term perspective on development prospects (United Nations, 1987). This concept is often presented graphically as three overlapping circles (Figure 1).

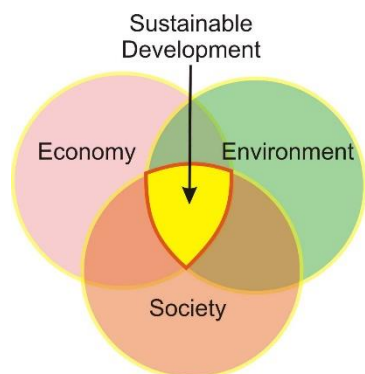


Figure 1. Three pillars of sustainable development: environment, economy and society (own study).

Seeking harmony, the effect of which is sustainability of development, is achieved through paying special attention to protecting the natural environment and ensuring social growth potential that follows economic growth. Protection means care for the natural environment and its resources so that they could be used – in an undeteriorated state – by future generations (Biedrawa, Sobczyk, 2011). This means focus on education, healthcare, safety and proper living conditions of human beings so that the social growth potential of future generations is preserved. In this way one can provide protection of rare assets and resources, thus making it possible to maintain sustainability of development.

What are the prospects for ensuring such form of development in the United Arab Emirates? To begin the discussion the author will give some general information about this country.

### 1. Description of the United Arab Emirates

The state of the United Arab Emirates (UAE) has a surface area of 83,000 square km. The dynamic development of the UAE began in the late 1960s, when abundant deposits of crude oil were found there. It was when its small, rather unimportant cities turned into powerful metropolises. The country, established in December 1971, once the Brits left its territory, is a federation of seven emirates. The decade of 1970-1980 witnessed rapid industrialisation of the cities: a network of motorways was built along with airports and numerous industrial facilities, such as aluminum works in Dubai. The location of Dubai on the route

linking Europe and the Middle East with the countries of Southern and South-Eastern Asia helped to augment its commercial strength, e.g. by promoting re-exportation.

The demographic growth in the cities has been outstanding. Since the 1950s the population doubled every decade. This rapid change results from the influx of people attracted by job offers and availability of consumer goods. There are three times as many men as women. This is because many foreigners are hired as factory and construction workers.

In 2013, there were 9.2 million people living in the UAE, of whom 1.4 million are local residents and the rest – foreigners. The UAE are highly diversified nationality-wise: over 50% of the population are Hindu, while the rest comprises immigrants from Pakistan, Bangladesh, Sri Lanka, and the Philippines (Czopek, 2012). The country's migration balance is 21.7 – the highest in the world. Approx. 88% of the population lives in the cities. The average life span is 77 years, which is longer than in any other Arabic country.

Islam is the most popular, official state religion. The government supports the policy of religious tolerance and does not interfere with the activity of non-Muslims. 76% of the population are Muslims, 9% – Christians, 15% are followers of other religions (mostly Hinduism).

### 2. Sustainable development in the United Arab Emirates

As explained above, the concept of sustainable development is based on three pillars: economic, social, and environmental. Therefore, we should analyse each of them in the context of the situations that can be observed in the UAE.

#### 2.1. Economic pillar

The economic development is primarily based on GDP growth, improving the situation of the society and increased cultural activity. A unique feature of the policies of the federal government and the emirates is implementation of a new vision of state's economic development. It mostly focuses on two objectives: modern technologies and raising the importance of science and education, necessary to implement advanced technologies and management methods. The UAE strive to develop their processing industry (petrochemicals, iron and aluminum, building materials industry), using domestic energy resources and raw materials. In not so distant future their power industry will use only renewable energy sources. Just as important are tourism and financial services – their level meets the most stringent global requirements (Ministerstwo..., 2012).

The UAE ranks fourth globally in terms of oil deposit abundance and 17<sup>th</sup> in terms of natural gas. Despite a succession of oil price drops, global loan crises and limited sources of investment funding, the



UAE witness a diminishing inflation risk combined with dynamic investment-construction activity, especially in the transport sector (underground, bridges, motorways, communication nodes, bus rolling stock, airports and ports, special economic zones) and the power sector (power plants and transmission lines). Abu Dhabi – the most powerful emirate in the economic sense – generates 56% of domestic product. This is where 95% of UAE's oil and gas extraction takes place. The wealth of Abu Dhabi is the foundation of the entire economic system of the emirates and of the state's economic policy.

The enormous deposits of oil and gas located in Abu Dhabi, in conjunction with its capital reserves, which the financial bodies of the emirate transfer abroad, are positive factors when it comes to the UAE's creditworthiness as a state. Since 2009 the budget has had a fully sustainable form: no surplus and no deficit either, which is an indicator of strong economic foundations. If an assessment was made of UAE's economic prospects, it would be a moderately optimistic one. The value of the gross domestic product is mostly composed of the oil and gas industry (30%), processing industry (15%), services (14%) and construction (11%).

Foreign trade is a key component of the UAE's economic development. Almost half of the value of export is oil, natural gas and petroleum products. Oil is exported mostly to Japan, South Korea and China. 30% accounts for re-export of imported goods, which the remaining percentage value is fish and dates. The emirates are the leading exporter of primary aluminum in the world (Trade Promotion, 2014).

The UAE's position as one of the largest trade hubs in the Near and Middle East is a result of their liberal trade policies, especially with respect to import and export. The excise on most products is only 5%. Customs procedures are easy; they are handled by computer systems. They reflect the policy aimed at supporting export, and in particular – re-export, which is so important for the emirates (10% of global gold trade goes through Dubai and there are over 600 jewellery shops in the city selling gold products).

A characteristic feature of the UAE's export policy is foreign trade in the so-called free zones. Almost 80% of exported products other than hydrocarbons come from such zones. The economic function of large urban centres in the UAE has been continuously growing. The level of local economic development manifests itself in investment attractiveness, number of international companies that have their branches in the cities, the number of foreign investments, development of new technologies. To meet those challenges the Dubai Silicon Oasis was established – a special zone intended for hi-tech companies manufacturing electronics and semiconductors. Each of the companies active in the field of new technologies is entitled to tax reliefs and exemptions.

The construction industry is the fastest growing industry sector. Apart from apartment buildings, skyscrapers and new motorways, a particularly impressive project is the construction of artificial islands (Palm Jumeirah, Palm Jebel Ali, Palm Deira, The World). A striking feature of the large cities in the UAE is their flamboyance: there are no architectural rules and limitations that cannot be broken. Buildings and projects amaze tourists with their unprecedented luxury (Photo 1) and originality (Photos 2, 3).



Photo 1. 7-star Emirates Palace Hotel in Abu Dhabi (photo by W. Sobczyk)



Photo 2. Address Downtown Dubai (photo by J. Niedzielski)



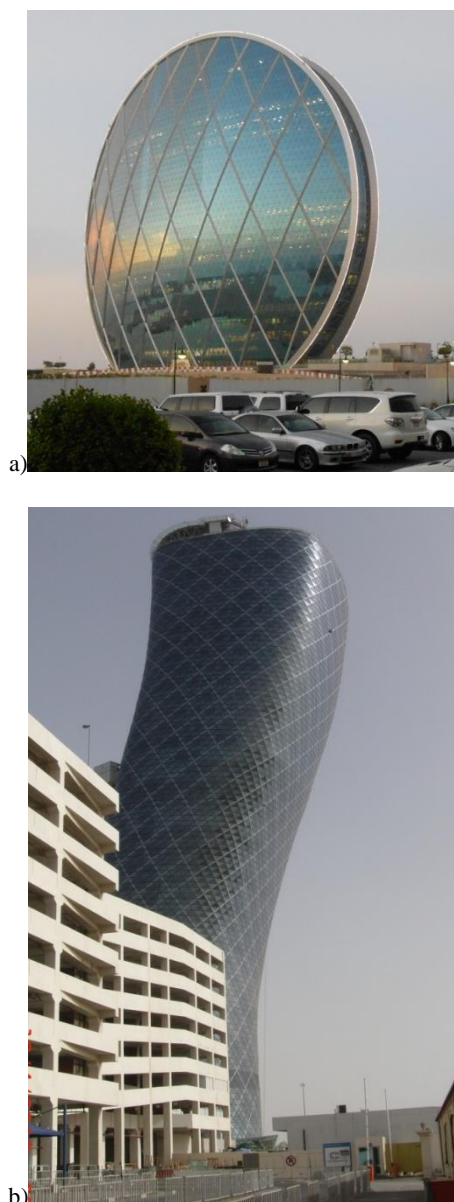


Photo 3. Architecture of Abu Dhabi, a. Aldar Headquarters Building (photo by W. Sobczyk); b. Capital Gate (photo by J. Niedzielski)

In 2011, the UAE ranked 14<sup>th</sup> in the World Bank's Ease of Doing Business ranking (report by the *World Bank Group*). According to *MasterCard Global Destination Cities Index* Dubai is the 5<sup>th</sup> most popular tourist destination in the world (in 2013, 10 million tourists visited the city). Since 1980 the UAE have spent billions of dollars on infrastructure. The changes are particularly noticeable in the two large Arabic cities: Abu Dhabi and Dubai. In 2014, the Dubai Airport was ranked as the busiest airport in the world with respect to international traffic.

## 2.2. Social pillar

The first president of the UAE, the ruler of Abu Dhabi Sheikh Zayed Bin Sultan Al Nahyan, supervised the development of the Emirates and ear-

marked part of the profits from the sale of oil for education, healthcare and infrastructure (United Arab Emirates).

### 2.2.1. Education

From the 1960s, even before state's independence was proclaimed, a number of primary and secondary schools were built. The teachers were mainly immigrants from Egypt. Currently, the *New School Model* is the obligatory form of education, offering modern programmes and teaching standards. As part of the *New School Model*, thousands of licensed teachers were hired from English-speaking countries (USA, UK, Canada, Australia, New Zealand, and South Africa).

The education system comprises primary schools, junior high schools, and high schools. Arabic is the language of instruction, but English has special importance as the second language. There are very many licensed private schools operating as well. Since 2005, the Abu Dhabi Education Council (ADEC) has been in charge of issuing licences and supervising private schools. In the Abu Dhabi emirate itself there are 265 public schools, 185 private schools and 18 universities (Abu Dhabi Education Council). Public schools in the UAE are free of charge only for the country's citizens. Sex segregation is obligatory in all public schools.

Even in 2007, there was a surprisingly high percentage of the illiterate in UAE (91%). Currently, thousands of citizens are receiving informal instruction in 90 adult education centres spread across the country. The government of the UAE is very concerned with improving the level of education and scientific activity. A number of influential research centres have been established, e.g. CERT Research Centres, Masdar Institute of Science and Technology, and Institute for Enterprise Development.

### 2.2.2. Healthcare

One of the initial pro-social steps was opening the first hospital in 1950 with the help of the Brits. It was a momentous event for the local community, as until then it had been virtually impossible to see a doctor, while many patients were forced to travel hundreds of kilometres to receive medical help (Czopek, 2012). However, a great number of health centres have been built, and many initiatives have been launched to alleviate this problem. A common vaccination programme has been implemented along with health-oriented education.

In 2008, the local Ministry of Health announced a new strategy for the healthcare sector. The main objective of the healthcare programme is unification of health policies and improving availability of doctors at affordable prices. Plans assume the construction of even more hospitals and health centres. Foreigners and their families are obliged to have health insurance. The UAE's healthcare system boasts a very

high standard – superior to anything else that is offered in other Arabic countries in the Persian Gulf. It is a strong incentive for many tourists who come there specifically to undergo plastic surgery, cardiac surgery, spine treatments and dental services.

### 2.2.3. Labour law

The provisions of law applying to the recruitment of foreigners are obligatory across the country. 91% of the local workforce are foreigners. Citizenship is available to individuals who have lived in the UAE for 20 years, have a clean criminal record, and speak fluent Arabic. However, today the process of granting citizenship is a complex one. For this reason many foreigners are considered *bidoon*, that is *stateless*. Very few foreigners have received full citizenship – some have lived in the UAE over 50 years. Since immigrants are not recognised as legitimate citizens, they receive no state benefits and are entitled to no workers' rights. The locals appreciate positive discrimination during recruitment – they are to be offered jobs as the first ones. This is the result of the governmental programme that obliges companies to reduce the number of foreign employees. This is meant to stabilise the labour market and protect the rights of the Emirati citizens who are a minority in their own homeland. On the other hand, the highly accommodating social welfare and benefits offered by the government discourage many locals from taking low-paying jobs, especially in the private sector (Human rights).

A prerequisite for being employed in the UAE is obtaining a work visa. Your future employer, or the party commissioning you a specific job, acts as your sponsor. An employer or ordering party may only be an Emirati citizen or a company registered according to the local law. The resident visa provided by the employer is valid through 2 years. Service provision requires having an Emirati majority shareholder as well as buying out a renewable 12-month license (*Ministry...*, 2012).

### 2.2.4. Human rights

In 2005, a federal court system was introduced in the UAE. The court structure is composed of three divisions: civil, penal and Sharia. In all emirates there are first instance courts and appeal courts – both federal and local. The UAE are criticised for breaching human rights, and also for the role played by Sharia code in the state's legal system. In the UAE it is forbidden to criticise the government, state officials and members of the royal family. Mockery, criticisms or making fun of the state and religion are punishable with prison (under Sharia law). The citizens have no right to form political parties. Sharia courts have sole jurisdiction over criminal cases, including adultery, robbery, alcohol consumption, battery, drunk driving, and drug trafficking. The provisions of the Islamic law also cover the issue of compensation for a murdered family member (blood money), e.g. the

family of a victim of a car accident receives compensation from the perpetrator. The Sharia law regulates the civil status of people: family matters, marriages, divorces and childcare.

In all emirates (except for Dubai), a valid sentence for such offences as adultery, premarital sex and alcohol consumption is flogging (40 to 200 lashes). A few Muslims have been punished with 40 lashes for alcohol consumption in Abu Dhabi. The penalty for kissing in public places is 80 lashes or in some cases – deportation. In 2007-2013, quite a few persons were punished with 100 lashes for pre-marital sex in the UAE. A part of the local laws is the dress code, which is the obligation to wear modest clothes. In the UAE there are regulations on proper outfits fixed near the doors to most shopping malls. Women are obligated to cover their arm and knees, while sleeveless blouses and shorts are prohibited. Visitors to a mosque are expected to wear inconspicuous clothes. It is forbidden to dance in public area.

Stoning to death is a legal punishment in the UAE. In 2006-2014, a few persons were sentenced to death by stoning for adultery. Apostasy (public and complete denunciation of Islam) is also punishable by death. Likewise, homosexuality is another *crime* that results in a death sentence. An Emirati person is not even allowed to shake hands with a homosexual. A penalty for sodomy is up to 14 years in prison. According to Sharia law, limb amputation and crucifixion are valid penalties in the UAE.

During Ramadan, eating, drinking, and smoking in public are forbidden between sunrise and sunset. This does not apply to pregnant women and children who are allowed to eat. Under Sharia law, the provision applies to both Muslims and followers of other religions (Sharia Law).

Human Rights Watch claims that civil courts apply elements of law that discriminate against women (United Arab Emirates). Emirati women need permission of their male guardians to marry or remarry. Means of public transport have separate areas for women and men (Photo 4). The same goes for state offices. In any other situation a woman must accompany a man walking behind him (Photo 5).



Photo 4. Separate zones for men and women on a public bus (photo by W. Sobczyk)

The author of this paper will not comment on the merits of Sharia law. She is of the opinion that discussing issues related to religion calls for extreme subtlety and prudence.



Photo 5. In Arabic countries women follow men (photo by W. Sobczyk)

According to the Freedom House annual report, every year since 1999 (when the report was first published online) the UAE have been assessed as a country without freedom and in 2013 Amnesty International accused the UAE of restrictive approach to freedom, however the UAE have not yet witnessed riots, religious tension and social unrest motivated by a desire for a change of the economic and political system.

Another problem is the way the UAE treat wage workers, mostly immigrants from South Asia – often described as a modern version of slavery. The foreigners have no employee rights; they may not form trade unions, organise themselves or go on a strike. Although the local Constitution provides for fair treatment of all individuals regardless of their race, nationality, religion or social status, there are very few rules of law in the UAE that would prevent discrimination within labour law.

### 2.3. Sustainable environmental development

The economic development of the UAE is accompanied by intensive activity in the area of environmental protection, which is reflected in the organisation of regional conference addressing this issue. As part of the Sustainable Development Week in Abu Dhabi (January 2015), the country was the host of the World Future Energy Summit (WFES), the International Water Summit as well as of the EcoWaste 2015 conference.

#### 2.3.1. Sustainable energy management

The Middle East is a region boasting enormous potential in terms of renewable energy, which has not been utilised to date. With the abundance of crude oil and natural gas, the UAE got involved in the development of modern solar power technologies. This commitment only proves the understanding of the importance of investing in sustainable future.

The International Renewable Energy Agency (IRENA) has its headquarters in Abu Dhabi; it is the first inter-governmental organisation of this kind in the Middle and Near East. The Agency started tackling environmental issues with its own headquarters. The building of IRENA headquarters uses 64% less energy and 48% less water than a typical building in Abu Dhabi. The air-conditioning system recuperates 75% of energy and uses it to cool the air coming from the outside. The building structure was made from recycled materials (steel, aluminum). The aluminum facade reduces solar flares and absorbs heat. With durable construction materials and energy-efficient technologies, energy consumption is substantially lower.

The Abu Dhabi authorities decided to earmark USD 15 billion for reduction of CO<sub>2</sub> emission and for the construction of Masdar City, i.e. a green, pedestrian-friendly city. All these efforts are part of the objective to reach a 7% share of renewable energy by 2020. Moreover, the objective of the Dubai emirate is to have a 1% share of solar energy in its total power production by 2020, while 5% in 2030. Similar objectives in the area of renewable energy were established by other Middle East states: Saudi Arabia, Kuwait, Oman, and Bahrain.

All newly-built structures and residential buildings must comply with stringent requirements with respect to energy and water efficiency as well as sustainable construction.

Extreme temperatures and high humidity in the UAE pose a challenge for both real estate owners and the environment. In the last decade the demand for electricity in the UAE doubled (from 35 billion kWh to over 70 billion kWh). The costs of air-conditioning amount to 70% of the total power consumption in the UAE. That is why the search for alternative cooling solutions is a top priority (*Sustainable summer*, 2014).

Air conditioning units require constant maintenance and regular cleaning to be able to operate at their maximum capacity and to prevent health problems of their users.

Architects today use the solutions typical of the traditional Emirati architecture in conjunction with natural ways of keeping buildings cooled (awnings and blinds). They apply insulating materials, such as stone and ground, which absorb significant heat amounts throughout the day. They also introduce innovative ideas which help sunlight reach buildings in winter, but block it in summer. The east-west orientation of buildings is an effective way of avoiding heat surplus whilst simultaneously increasing wind flows.

The interiors of the apartments in the Al Bahr skyscrapers remain cool due to the largest computerised elevation ventilation system in the world (Photo 6). The solution was inspired by the traditional Arab architecture from the 14th century with its dominant, geometrically designed wooden screens called



*mashrabiya*, which means to drink or to absorb. The cluster system on the Al Bahr Tower, powered with a tracking system, opens the shaded area and closes the exposed area following the Sun's path (Al Bahr Towers, 2014).



Photo 6. Al Bahr Towers. A view of the buildings from the north (photo by W. Sobczyk)

Given the Abu Dhabi longitude, sunrays can heat the external surface of windows to approx. 90°C. By shielding window panes from the sun, the screens keep the building cool, reduce flare emissions and maintain dispersed natural light. If this method is used, buildings require less artificial lighting while the costs of air-conditioning are lower by 50%.

Solar energy is used in many solutions. Even waste bins have photomodules to light advertisements at night.

In 2006, in one of Abu Dhabi districts, the construction of Masdar City commenced – a solar city of the future (Photo 7). At present there is a research institute and university there which serve as the centre of education for young scientists and engineers specialising in clean and sustainable technologies.

On a 22 ha plot in Masdar City, a photovoltaic solar power plant is located comprising almost 88,000 polycrystal modules (Photo 8). It is the largest network of solar power plants in the Near and Middle East (Masdar City, 2014). The solar panels installed on building roofs generated electricity already at the stage of Masdar City construction.

In some buildings on the university campus, elements of traditional Arab architecture were employed to facilitate effective ventilation and cooling of building interiors.

In Masdar City the maximum distance to the nearest transport node is never longer than 200 metres. The residents have additional comforts at their disposal, such as shaded streets, promenades, and paths. Centres of work, entertainment and recreation are near

residential buildings to minimise the use of transport modes. The only vehicles that are run along established routes in Masdar City are eco-friendly cars operating with solar-powered lithium batteries (Photo 9). The vehicles ride along predetermined routes thanks to a magnet installed in their floors. Sensors ensure collision-free ride.



Photo 7. A model of Masdar City (photo by W. Sobczyk)



Photo 8. Solar panels on building roofs (photo by T. Niedzielska)



Photo 9. Station of eco-friendly vehicles in Masdar City (photo by W. Sobczyk)

Also wind power is employed in Masdar City. The wind tower (Photo 10 a, b) sucks hot air in, transports it upwards and releases it through chimney-like structures (Sustainable summer, 2014). The system facilitates building ventilation. This idea, based on traditional ventilation concepts, is used in both historical buildings and in modern architecture. An up-to-date version of the system is used in Masdar City:

the wind tower features sensors to maximise efficiency of capturing wind.

Once the investment is ready (2016), there will be 40,000 people living in Masdar City, while another 50,000 will commute to work or study there, learning about power solutions, green technologies and other aspects of environmental protection.

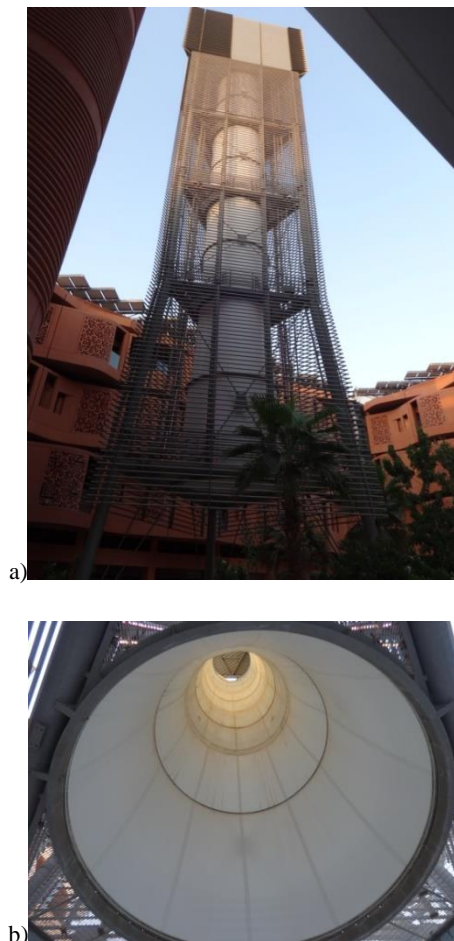


Photo 10. Wind well (a) and its inside from the bottom (b), Masdar City (photo by W. Sobczyk)

### 2.3.2. Sustainable water management

For the UAE water is more important than crude oil. About 50 years ago, in Abu Dhabi groundwater extracted with traditional methods was enough to meet water demand. The traditional methods of water extraction and transport were, and still are, energy-intensive, but they were used in a sustainable way in line with the local demand.

Now water is produced and consumed on a much greater scale. In 2012, the annual water consumption in the Abu Dhabi emirate was 3.4 billion cubic meters. Of this 62% was groundwater, 30% – desalted water, 8% – recycled water. Water is used primarily in agriculture, forestry and landscape irrigation (over 70% of general consumption).

The total demand by far exceeds the capacity of underground water supplies. In some cases, groundwater extraction is 25 times the natural production. If this does not change, the resources deposited during

the most recent ice age (over 10,000 years ago), will soon be depleted (Facts, 2014).

Only 18% of groundwater can be used directly; a mere 3% is fresh water, under strict protection. As much as 79% of groundwater is saline water that must be treated before use. Desalting systems are primarily based on the thermal desalination technology (93%) through multi-step distillation (MSF); the remaining 7% of fresh water is produced with the reversed osmosis technology (<http://rsb.gov.ae>).

The processes of desalination and preliminary chlorination of seawater, along with the transport of concentrated brine, lead to serious disturbances in the sea ecosystem. Brine contains ions of copper, nickel and chromium, migrating from the distiller walls. Polyphosphate added as a descaling agent acts as a nutrient for algae, contributing to their blooming, resulting in water eutrophication (Shams, Aziz, Makawi, 1994).

The share of groundwater resources is on the wane, salination is increasing, while the demand for water is growing. In Abu Dhabi the share of desalinated water in the total balance of used waters will be growing substantially. But the desalination technology is not a sustainable process and it poses a great economic and environmental challenge. Desalination is very energy-consuming, which is reflected in higher CO<sub>2</sub> emission. Brine from chemical desalination plants is pumped into the sea, becoming a threat to many organisms living in this ecosystem.

The countries of Middle East have other problems as well, namely the traditional methods of farmland irrigation are frequently ineffective and the use of desalted water contributes to enhanced salination of groundwater. This, along with excessive use of artificial fertilisers and pesticides in agriculture, decreases the productivity of already barren soil.

Given too intensive use of the Persian Gulf water, the use of municipal sewage as a source of fresh water is being considered. Sewage from households, offices and plants must undergo a multi-step treatment to eliminate hazardous chemical substances and bacteria so that the processed water could conform to stringent standards (Photo 11, 12) (Arafat, Ro'il Bilad, Kharraz, 2014).



Photo 11. Modern municipal sewage treatment plant on the Reem Island. Abu Dhabi (photo by W. Sobczyk)



Photo 12. Mafrq sewage treatment plant. Closed sedimentation fermentation chambers (anaerobic digesters). UAE (photo by W. Sobczyk)

There are many sewage treatment technologies available worldwide; however, they are very time- and capital-consuming (Borkowski J., Sutowska, Borkowski P., 2014). The United Arab Emirates are working on effective, high-performing and affordable systems of sewage treatment. At the Masdar Institute there is a research team developing a membrane for new generation membrane bioreactors (MBR). MBRs will offer a compact system for the production of high quality water in combination with biogas recovery. But the technology still needs further development. The biggest problem is the membranes which easily get clogged with growing microorganisms and algae. It is a continuous process preventing proper functioning of the membrane, which must be cleaned or replaced on a regular basis. This entails loss of membrane capacity, costs of chemicals use and the need to replace membranes. A MBR membrane which would not be prone to overgrowing would be a much more attractive alternative for water treatment, but it is still only a design. Currently the research focuses on the construction of a membrane of greater porousness and proper surface. The technology was tested on municipal sewage collected from Masdar City. The effect was fantastic: after one month the MBR membranes were still free from biological contaminants and in working order. It is enough to mention that traditional membranes in a membrane bioreactor must be cleaned or replaced once a day (Sabah, 2007).

The research results look very promising. This could be an interesting solution for the market of technologies of processing sewage into a source of fresh water in countries with low water resources.

Groundwater protection is one of the priority tasks in the countries of Middle East. The Environmental Agency of the Abu Dhabi emirate emphasises cooperation with partners to develop and implement pro-environmental policies and legal framework regulations. Monitoring and assessment of groundwater condition is performed on a regular basis. Permits for drilling groundwater wells are issued by a competent office in line with strict regulations (Law no. 6). Farms are subject to periodic controls with respect to the use and sale of groundwater and law observance.

In the UAE a number of projects are being implemented to manage water resources in a more effective way, e.g. construction of experimental sun-powered desalination plants, increasing surface areas of forests which are retention bodies for water resources, etc.

### 2.3.3. Sustainable waste management

The UAE government pays much attention to environmental protection and sustainable development issues, including integrated management of waste as well as production and sale of recycled products. The Tadweer Centre of Waste Management in Abu Dhabi implements the assumptions of the UAE environmental policy: Abu Dhabi Vision 2030. In particular it strives to maintain a safe and clean environment for future generations, while taking care of proper living conditions of the present generation. In 2010, a new system of municipal waste collection and management was implemented in Abu Dhabi. It was installed underground in 115 places within the city (*Abu Dhabi launches*, 2014). The criteria for selecting those places included population density and weight of generated waste. Pedestrians, cleaners and owners of small shops on a given street may deposit their waste in the established spots. The system operation is based on electro-hydraulic replacement of huge, 20 cubic meter containers. There are eight smaller containers within them, fixed in a metal frame. The container is placed in an underground concrete chamber. The only element of the system that can be seen from the ground level is a steel receiving tank, i.e. a container where waste is placed. The underground container features sensors which send the signal to the control room when the container is filled in 75%. With this, it is possible to collect waste in an effective and timely manner. Special waste collection vehicles pick the container up from the ground and replace it with an empty one. The monitoring system is a method of ensuring waste collection by approved users only, and it prevents unlicensed waste disposal. The system boasts many advantages: it eliminates odour, scavengers (including insects and rodents), and prevents accumulation of waste around the collection points. This, in turn, improves aesthetics of the surrounding area and creates a clean environment for the residents. Most certainly it also contributes to the reduction of the number of truck rides (lower fuel consumption).

A major problem of modern civilisation is electronic waste. The Enviroserve Corporation, based in Dubai, is the first and the largest service company in the Middle and Near East that manages electronic waste (e-waste). The company assets include the most cutting edge, environment-friendly technologies. It is a source of know-how and competence in the field of e-waste recycling in the Near East (Fleming, 2014). From the time – a decade ago – when the company collected 150,000 mobile phones in three months until this very day, when hundreds of tonnes of e-waste



are stored on landfills, Environserve has been consistently introducing technologies that make it possible for the countries in the Middle East to meet the requirements of environmental accountability. The E-waste Department offers professional, clean recycling of all types of e-waste: mobiles, cameras, laptops, servers, batteries, cartridges, etc.

Mobile phones are among the most prevalent modern technologies of the contemporary world. According to the studies of the International Telecommunications Union, over 5 billion subscribers use mobile phones all over the world (<http://twojepc.pl>). Each year a billion of mobiles are produced, but less than 20% of them are recycled in line with the United States Environmental Protection Agency ([www.epa.gov](http://www.epa.gov)). On average the length of using a mobile is 12 months; then they are discarded as new technologies offer improved functions and accessories. Mobile phones are a huge burden for the environment.

When stored on landfills, they may cause a leakage of substances containing heavy metals (lead, mercury, cadmium, nickel, arsenic), lithium and persistent bioaccumulative toxins. If they penetrate groundwater, adverse effects can be caused in human beings, including damaging the nervous system, infertility, cancer and disorders of the genetic code. Lithium in large amounts may initiate underground fires. In the countries of the Middle East all producers, vendors and sellers of mobiles are required to inform the buyer about the programme of used equipment collection.

### 3. Environmental education for sustainable development

Our planet, along with all countries and nations on it, is not able to sustain the level of consumption, emission and production of waste of the last 50 years. Each of us has their own role to play in these changes. Promoting a sustainable lifestyle of a society and development of clean technologies is an important task of environmental education. The survival of our planet is only possible if we can change our old habits into environment-friendly behaviour (Piecuch, Hewelt, 2013). Much is being done in terms of education to raise environmental awareness among the society members with respect to protection of groundwater; they are also being encouraged to abandon their wasteful attitudes towards the environment. The objective here is to preserve and protect shrinking water resources.

In the countries of the Middle East, one can observe a growing need for waste management know-how. Integrated waste management solutions are of crucial importance for the implementation of the sustainable development concept. Widespread environmental initiatives in waste segregation and recycling, combined with recycling optimisation, will timely help us reduce the weight of generated waste.

The Waste Management Centre (Tadweer) offers educational programmes to a large number of students from various schools and universities as well as informs the entire society about the key actions the Centre takes. The educators of Tadweer organise workshops for the youth on public hygiene, environmental safety and effective use of colourful containers for waste segregation (Photo 13).



Photo 13. Examples of environmental education of the society: a key to bringing about a behavioural change – encouragement to segregate waste (photo by W. Sobczyk)

During the EcoWaste 2015 event, the Tadweer organisation presented an environmentally-friendly stand, 100% of which was made from recycled raw materials. To build the stand old steel structures were used, as well as containers collected from different regions of the UAE. The stand ceiling was crowned with 2,000 empty aluminum cans collected at shopping malls and schools; also, various 100% recyclable materials were used in the construction of the floor (Ecowaste, 2015).

Waste management is used in many sectors of domestic economic activity. The biggest amount of waste in the UAE is generated by tourism and retail trade. For this reason the UAE is introducing a policy on auditing the economy branches where the volumes of generated waste (usually transported to landfills) may be significantly reduced. A wealth of guidelines is provided as well, covering such aspects as effective waste segregation. Discounts are offered to companies which collect and neutralise waste. Some companies have already introduced substantial changes to the way they manage their waste. For instance, the Farnek Company introduced the first binless office in the region, which is conducive to improving office culture and forms the sense of accountability among the staff for environmental advantages brought by recycling (Farnek, 2015).

In 2009, a strategic Master Plan was developed on water consumption. Actions were taken to reduce water consumption, which is one of the highest per resident in the world (The National, 2009). The government has launched a media campaign to encourage people to save water. This also applies to reasonable water use in free-of-charge toilets and showers (which are a very popular amenity). The emirates are

striving to maximise the use of water recovered from sewage.

The Ministry of Environmental Protection in the UAE initiates regional and international actions and networks to support learning and exchanging best practices (Environmental education, 2015). As a result of this, the desired standards of environmental education are reached. The projects are supported by introduction at schools and universities of award-winning environmental education programmes (for example: Enviro-Spellathon, Annual Environment Competition and Sustainable Campus Initiative). Enviro-Spellathon is one of the longest-running educational programmes in the UAE. The objective of the programme is to create an environmentally-aware generation. The point of this initiative is long-term education: from the youngest generations to university students – they should all be equipped with know-how and skills that will make them the leaders of sustainable development.

The Sustainable Campus Initiative is a federation of students-volunteers. It provides many environmental services on the premises of the Waterloo University campus in Dubai and outside. Its primary activity is education and issuing expert opinions. The main objective of SCI is to bring about behavioural changes in the society. SCI organises workshops, carries out fundraising, and offers consulting services to students and various environmental organisations.

### Summary

The Middle East is an important region in global terms. The United Arab Emirates act as a leader in ensuring sustainable and safe future for the region and the world. The future-oriented projects implemented in Abu Dhabi and Masdar City prove that the UAE are a pioneer in using renewable energy sources and mitigating the effects of climate changes in the region. The utilisation of clean energy sources and new technologies, as well as creation of high-value jobs, testifies to the country's leading role in ensuring sustainable future for the region and world. In the first decade of the 21st century, environmental protection became a priority in the UAE. Rich countries invest in environmental education. Educational programmes provide instruction and inspiration to young generations to ensure sustainable future for the environment and preserve it for the future generations. Less well-off countries are striving to get rich, but forget that their greatest treasure is people, society, nation. A well-educated society, boasting high personal and environmental culture, guarantees economic development (Sobczyk, 2014). Environmental education, through adequate instruction, helps develop proper attitudes, behaviours and sensitivities; it promotes a sustainable lifestyle of the society and brings about a change of old bad habits. The governments of the countries in the Middle East,

including the UAE, are aware of the fact that environmental education is just as important as business leadership and public administration.

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## How We Think: How it Affects Sustainable Thinking

### W jaki sposób myślimy i jak to wpływa na nasze postrzeganie problematyki zrównoważonego rozwoju

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#### Abstract

Our present model related to Sustainable Development has followed our current day *way of thinking*, that is, it depends heavily on the use of rational and logical thinking. With this dominant system of thinking we have been having only limited success in the whole world of Sustainable Development. Following the new research by Iain McGilchrist, related to Right and Left Hemisphere brain thinking processes, and its long history we are now being able to see more clearly the actual work of each hemisphere.

In the conventional process to date most right hemisphere brain thinking in organizations has somehow become excluded over many generations, and in society as a whole only left brain logical, rational thinking has been accepted as valid.

Now we have new research that reveals some incredible and different abilities that indicate clearly the Genuine Value of our right brain in our overall thinking about Life and Work in our society in general.

This new research *turns the table* as such, allowing the right hemisphere of our brain its true and indispensable role for ALL sustainable development work.

This short paper develops these revelations and their benefits for humanity and our organizations in all we attempt to do every day everywhere. As a result, we will then truly begin to accept that the right hemisphere of our brain is our *Master* and the left hemisphere is our *Emissary*. This new research forms a genuine and careful place for the Right hemisphere in all that we plan in life and work every day as well as the importance of the left hemisphere as its Emissary, (not the Master as is presently the case), as well as a new viable Balance between all Right and Left brain thinking in all dimensions of business, community development and everyday life.

**Key words:** Right and Left Hemisphere, way of thinking, sustainable development

#### Streszczenie

Obecny model zrównoważonego rozwoju jest rezultatem współczesnego *sposobu myślenia*, co oznacza, że mocno opiera się na racjonalnym i logicznym podejściu. Jednak to podejście nie w pełni spełnia pokładane w nim oczekiwania. Pomocą mogą być nowe badania Iaina McGilchrista odnoszące się do procesów myślowych zachodzących w półkulach ludzkiego mózgu, dzięki którym coraz lepiej je rozumiemy.

W tradycyjnej analizie procesy myślowe, przeprowadzane w prawej półkuli, od dawna są marginalizowane, czy wręcz wykluczane z dyskusji. Społeczeństwo akceptuje tylko logiczne i racjonalne myślenie, za które odpowiada lewa półkula.

Ale nowe badania pozwalają poznać niezwykle zdolności, które wskazują na Oryginalną Wartość prawej półkuli, w kontekście postrzegania miejsca, które zajmujemy w świecie.

Te badania wskazują na prawą półkulę naszego mózgu jako na tę właściwą i niezbędną dla całej pracy na rzecz zrównoważonego rozwoju.

Niniejszy artykuł rozwija to nowe podejście wskazując na korzyści, które odnoszą się do każdego z nas w naszym codziennym życiu. W rezultacie możliwe będzie obronienie tezy, według której to prawa półkula naszego mózgu jest *Mistrzem* a lewa *Posłannikiem*.

Te badania pozwalają zająć prawej półkuli należne miejsce w naszym planowaniu, a także podkreślić istotne znaczenie lewej półkuli jako Emisariusza, w kontekście na nowo zrozumianego bilansu pracy całego mózgu, odnoszącego się do ekonomii, rozwoju społecznego i codziennego życia.

**Słowa kluczowe:** półkule mózgu, sposób myślenia, rozwój zrównoważony

## Introduction

At present we seem to be facing stiff resistance to any approach for business management that does not include **FIRSTLY** logical and rational thinking as key and prominent in all sectors related to Sustainability. This affects everything from all business, to governments, and all the way to educational institutions and community development. As has been said many times, business has become the most powerful influence of any sector related to how even governments can act and react, and as a result the way in which all society is affected.

Now it appears, that in the study of Sustainable Thinking, our human nature can accept learning something new about ourselves, and *how we think* at all levels. This new thinking can affect dramatically how Sustainability in general is received, and can realistically move us from placing dominant emphasis on human capacities for logical and rational thinking, to a **NEW** balance in thinking between the two hemispheres of our brain – that is, accepting that the right hemisphere is vital for genuine long term Sustainable thinking. Moving forward, based on new research, the right hemisphere of the brain appears now to be the *Master* in our thinking and the left hemisphere is the *Emissary* (McGilchrist, 2009).

However, throughout many generations, even very highly respected, thoughtful and influential visionaries have been aware that we as humans have both Right and Left hemisphere brain capacities, both of which are essential for genuine Sustainability. But these important visionaries have had difficulties in convincing especially the business community. They have also been faced with the usual interpretation of *that is fine for people who are spiritual* but do not solve the challenges in the **REAL** world of business. Now, that outlook is changing slowly with McGilchrist's work. We are now learning new facts related to *how we think*.

Very slowly we are all learning new information related to how our brain works, and how the functioning of all human beings involves usage of both right and left hemispheres, in a new way involving new research of the brain. With this new research, including the interpretations of the *spiritual aspects*, the right brain has been exposed as never before, through highly respected research, to look at *how we think* in general. This also provides new validity to many aspects of our new Sustainability picture.

These new findings by McGilchrist are having some broad acceptance in even scientific studies, in different parts of the world. These research results have the potential to change how we view Sustainability

and thus **ESTABLISHES THE CONCEPT OF SUSTAINABILITY ON A TOTALLY DIFFERENT BASE**. This places the right hemisphere of our brain into a new place of importance, as well as defining more clearly the important, but different function of the Left brain. As such it switches the places established by our society in general for right and left hemisphere brain thinking. The *master* becomes the right hemisphere of our brain and the *emissary* becomes the left hemisphere – exactly the opposite of what we now normally see in business especially. However, the left hemisphere (which has for many generations been the master in our thinking), now fulfills a very important but different role – that is, putting the long term visions and ideas of the right hemisphere into daily practice (this involves an area that the right hemisphere is not capable of doing – that is, putting things into practice). Right and Left hemispheres in fact begin to work very closely together.

This paper relies heavily on this subject of *right and left hemisphere functions*, and it has been very controversial for many years. Now we finally have some key science based facts related to Right/Left thinking, by Iain McGilchrist, and we see how it affects everything we think and do every day.

Firstly, the Yale University Press, that published McGilchrist's book, summarizes the book as follows:

*Why is the brain divided? In this groundbreaking book, based on a vast body of recent experimental research, Iain McGilchrist argues that the left and right hemispheres have different insights, values and priorities. Each has a distinct 'take' on the world – mostly strikingly, the right hemisphere sees itself as connected to the world, whereas the left hemisphere stands aloof from it. This affects our understanding not just of language and reason, music and time, but of all living things: our bodies, ourselves and the world in which we live.*

*We need both hemispheres; but, McGilchrist argues, the left hemisphere has become so far dominant that we're in danger of forgetting everything that makes us human. Taking the reader on an extraordinary journey through western history and culture, he traces how the left hemisphere has grabbed more than its fair share of power, resulting in a society where a rigid and bureaucratic obsession with structure, narrow self-interest and a mechanistic view of the world holds sway, at an enormous cost to human happiness and the world around us.*

To quote a few words from the author himself, McGilchrist states in his book:

*Self awareness, empathy, identification with others, and more generally inter-subjective processes, are all largely dependent upon (...) right hemisphere resources (p. 57).*

*Despite the right hemisphere's overwhelmingly important role in emotion, the popular stereotype that the left hemisphere has a monopoly on reason, like the view that it has a monopoly on language, is mistaken. As always it is not a question of 'what', but of 'in what way'. In fact reasoning is of different kinds, and though linear, sequential argument is clearly better executed by the left hemisphere, some types of reasoning, including deduction, and some types of mathematical reasoning are mainly dependent on the right hemisphere (p. 64/65).*

*Despite the left hemisphere's conviction of its own self-sufficiency everything about the relationships to one another and to reality suggests the primacy of the right hemisphere, both in grounding experience (at the bottom level) and in reconstituting, left-hemisphere-processed experience once again as living (at the top level). We have also seen that many important aspects of experience, those that the right hemisphere is particularly well equipped to deal with – our passions, our sense of humour, all metaphoric and symbolic understanding (...) all religious sense, imaginative and intuitive processes – are denatured by becoming the object of focussed attention, which renders them explicit, therefore mechanical, lifeless (p. 209).*

These changes mean new responsibilities for all business organizations as well as societies as a whole, including what we are being taught, especially in universities.

The *human element* in this new research will then begin to occupy its new place in society for human development. This has become extremely important, as it is a subject that has experienced much controversy over the years. Up until the present, we have tended to place unlimited importance on logical and rational thinking (left brain thinking) and have at the same time discounted the importance for our future of taking seriously the key role of the right hemisphere. This has resulted in a series of new challenges related to Sustainability in general, and especially longer term planning.

The big question is: WHEN HAVE WE EVER IN MODERN TIMES THOUGHT OF THE RIGHT HEMISPHERE OF OUR MIND BEING *THE MASTER* AND THE LEFT HEMISPHERE BEING OUR *EMISSARY*? (McGilchrist, 2009).

This is what we are learning, in spite of the fact that the two hemispheres are apparently in close communication. *THE RIGHT HEMISPHERE* (based on McGilchrist's important new work) *sees the big, long term picture* of the world, and *THE LEFT HEMISPHERE* finds ways of putting these ideas gained from the right hemisphere, into practice. (As indicated previously, this process of putting ideas into practice the right hemisphere cannot do). Both

hemispheres are important, but the sad part is that we have discounted the very hemisphere that is our *master*. This changes our way of thinking completely, and much of our problem with Sustainability has kept us still thinking that the left hemisphere can do EVERYTHING, when it apparently cannot. Both need to be considered and we need to relearn basically *how we think*, using both hemispheres.

One may realistically ask: How many *experts in Sustainability* do you know who have basically changed their way of thinking completely concerning the introduction of sustainability and keeping logical thinking in every task we touch? In other words, are we still basically left brain logical, rational thinkers first, but try to implement changes towards sustainability, and wonder why it is so difficult? Do we feel that we can have genuine sustainability while still thinking in the conventional logical fashion in almost everything without realizing it? After all we have mostly all been brought up and educated thinking about almost everything through logical eyes – and many feel that has been OK? Are we now seeing the beginning of questioning, where the knowledge we have gained throughout our work and life has always been accepted as *of course, as it is based on good logic and rational thinking*? After all, have we always needed logical thinking as the important basic criteria to have what is considered positive results in everything we do?

#### **How do these changes in right/left hemisphere functions or *how we think* affect us?**

What does *how we think* really mean for everyday life?

It is obvious that any changes in the way we think have repercussions on everything we do and say. One important result appears clear: One begins to think about one's own position in society, and realizing that the whole world of competitiveness for personal gain is affected, and now we sometimes think *about the whole* instead of *me*. That means co-workers and neighbours in our community become very important for our own happiness in life as well – the *me* society tends to become a *we* society.

#### **How do we teach genuine Sustainability?**

It appears from all indications that the culture and previous education have a significant affect. One example I can quote briefly happened when I lived and worked in Latin America.

I was teaching at a university in Mexico at the time, and there began a lot of exchanges at Universities in teaching programs and as a result what we teach in Latin America and United States.

In this case it happened in the Engineering Department in an important university in Mexico. The Mexican university was using, as its main text, the same book as was being used in the US – but trans-

lated into Spanish. Therefore the student group in the US and Latin America were using the same book as their main text.

The surprise came following graduation. The 2 groups had completely different results. The cause finally appeared to be how the professor teaches a course is very much influenced by the culture and *way of thinking* of the country, and as a result how the professors *thought* and *taught* the same material. It appeared to be very influenced by *the way of thinking* even though both professors were considered very well qualified in both countries. In looking at *the way of thinking* in the two countries, the differences were significant, but that was not fully realized until the final results were analyzed.

Why were there differences in thinking?

The first reaction is of course related to cultural differences. However something else seemed to be involved related to *how we think*. In other words: what differs in the *concepts* of how the 2 groups were thinking? Both groups have obviously been affected strongly by how their two professors treated the material in the book, both in thought and demonstratively so, treated the material in a similar way according to how they viewed it – but here we see the distinct differences resulting in different results. Following that we see 2 different *takes* as such on the same book material.

The Left/Right upbringing, education and views of the 2 professors are important.

Some professors are more educated and experienced in a society for Left hemisphere prominence, with more specialization, rational/logical thinking and detailed analysis – more North American. Meanwhile the Latin American professor is more schooled generally on whole systems including human effects than on detailed rational thinking – more right hemisphere. In general, we then see that the North American professor more logical and rational in detailed specifics and the Latin American more specialized in relationships with the bigger picture (plus the human side).

Both approaches are viewed as necessary and important – but not one alone. The Left brain is important in all business studies, as it has the special job of putting right brain thinking into practice daily (Putting things into practice the right brain cannot do). On the other hand, the right brain is considered vital in the first place – it develops the long term planning for all our activities. But we need both, as we firstly need to plan for the *big long term picture* of our activities (right hemisphere), and secondly we need to put these long terms ideas or picture into practice. (left hemisphere). As has been indicated many times in this paper, our present problem is that we are actually using only the Left brain for everything – as Master and as Emissary. As indicated, we need to change this custom to achieve genuine sustainability. We now need the Right Hemisphere as first place in the planning and long term thinking in

everything we do. The Left Hemisphere then comes into number 2 place, and puts into practice the ideas and long term vision of the right hemisphere.

### What do we do first?

Firstly, we need to look carefully at ourselves, and how we Personally think, in spite of the books we use. It appears that whether we are aware of it or not, we will tend to put an *interpretation* on the material which shows our own interpretation. Therefore, especially when approaching new ideas it is very important to be sure how we ourselves have accepted these new ideas (especially right hemisphere new ideas related to Sustainability in its full sense).

It is also interesting to note that often we can continue to use the same books (with some new ones added). In the education field especially, some ideas will become a good source for student discussions. In the business field, it becomes more important than ever to listen closely to the ideas of participants at all levels, and to think long term before taking actions.

### What do visionaries think?

It seems that all these important visionaries (among many), both present and past, have already perceived our problem, and we need to heed their important insights if we hope to construct genuine Sustainability Thinking for the future. This need takes into account the full spectrum of our activities, including all business, education, governments and society as a whole.

#### ALBERT EINSTEIN:

*We cannot solve our problems by using the same kind of thinking that created them* (Einstein, Calaprise on Einstein, 2000).

It appears obvious that we have been trying to do just that. We use our well-developed logical/rational thinking to solve problems which using only these left hemisphere areas of our brain to understand. We often forget about also taking seriously consideration of the fact that we also need the right hemisphere, and giving it a true place, and not just cursory attention. In the statement by Einstein he obviously realized, that many years ago, that the left brain thinking alone cannot solve the problems of the 21<sup>st</sup> Century. *We are attempting to cope with the conditions of the 21<sup>st</sup> Century with the thinking of the 20<sup>th</sup> Century.*

It appears Einstein knew very well that we can never hope to really understand the present problems in all its dimensions if we do not consider a vital part of our thinking, that is, the right hemisphere where the full and long term picture of our reality lies.

#### IAIN MCGILCHRIST:

*The MASTER and his EMISSARY: The Divided Brain and the Making of the Modern World* (McGilchrist, 2009).

The title (above) of McGilchrist's book says everything. We have been mistaken in continuing to use only our logical/rational capacities of our brain, and clearly hope to have success with genuine Sustainability. We have left out the *Master*, our right hemisphere and felt we did not need it when we are so good at logical thinking, that society has taught us. How wrong we have been and still use this way of thinking. We naturally need the left hemisphere to put right hemisphere ideas into practice, but we have gone the step further and felt we can do it all, much to our continuing confusion when studying long term results. We need to learn how to use our marvellous brain to its fullest – that is, putting the right hemisphere in its true place as McGilchrist has said, as our MASTER, and the left hemisphere as its essential EMISSARY.

#### DAVID KORTEN:

*That which cannot be observed or measured. Such as spirit and consciousness, came to be excluded from consideration by science (objective thinking) and therefore from the scientific perspective, does not exist* (Korten, 1999).

The right hemisphere thinking which governs *the big picture and long term ideas* appears to either have been forgotten or purposefully left out of our consideration when thinking about or working towards genuine Sustainability. We apparently consider only the left hemisphere (which includes the science perspective as we have been taught), has any meaning. Korten indicates very clearly what we need to do in terms of *how we think*, as a key step: accept the need for the right hemisphere thinking as essential, plus place the left hemisphere in its Real Place – following its work once the right hemisphere has shown us the *big picture*. It appears absolutely essential, according to Korten, to actually firstly translate the *big picture* (of the Right Hemisphere) into practices that benefit the long term whole system. Then we have taken a key step in terms of accepting genuine sustainability. Without this step we continue on with the left hemisphere *still in charge* and methodologies, and practices that relate to only the left hemisphere – that is not genuine sustainability and we will be carrying on as we are at present – as Korten indicates, we are working *as if the right brain (where consciousness, amongst many other attributes) does not exist. The old economy of greed and dominion is dying. A new economy of life and partnership is struggling to be born. The outcome is ours to choose* (Korten, 2014).

#### WILLIS HARMAN:

*The key step to our bringing about change is eschewing the negative vision (purely objective, positivistic thinking) and choosing a vision that benefits our inner purpose and that of those around us* (Harman, 1998).

This statement once again brings us clearly to the forefront of the importance of the right hemisphere thinking. This hemisphere provides a positive foundation for all our development on which the left hemisphere can follow to construct practices which accomplish this transition to genuine sustainability.

***This emerging trans-modern worldview, involves a shift, in the locus of authority from external to 'inner knowing'. It has basically turned away from the older scientific view (...). The core of the current challenge to the scientific worldview can be taken to be 'consciousness'*** (Internet: <http://www.crossroad.to/Quotes/paradigm-shift/harmon-willis.htm>).

#### ERVIN LASZLO:

*Values and beliefs determine the ways we perceive the world and suggest the ways (...) we behave.*

*The Dis-ease of the Western Mind: Curing it involves blending the holistic world of the right brain with the pragmatic, skilful world of the left brain* (Internet: [www.huffingtonpost.com/ervin/laszlo/](http://www.huffingtonpost.com/ervin/laszlo/)).

In this article, Laszlo indicates clearly what he feels is the downfall in our thinking at present that is causing the *Dis-ease of the Western mind*. He also has a solution, related to the basic functions of our Right and Left hemispheres of the mind usage. This we hope will now be more easily recognized with the new research by McGilchrist.

These visionaries have shown us that their insights are an important key to future business related success. We obviously need to learn a lot, especially related to new research now available, and especially with reference to *how we think*, bearing in mind how the future will depend on how we perceive our RIGHT and LEFT hemispheres *real* function.

#### Changes to come

1. *Way of thinking* in organizations: We will see organizations that are still very dependent on the importance of Left hemisphere thinking, but will have a different basis. Left hemisphere work will be built on the basis of right hemisphere leadership. We will see a new balance in organizations. The right hemisphere becomes the true Master and the Left hemisphere will become extremely important in constructing new systems and procedures which satisfies this leadership of the right hemisphere.
2. Human Aspects: Take seriously into account the *welfare* of the *whole*, and a long overview in planning becomes necessary. TRUST for example becomes hugely important. Employees must feel their ideas, and they as people really count. Leaders need to emphasize. New skills in *leadership* that are human based, not just *managing* an area.

3. We will see a strong development of the concept of *community*, as the process of genuine Sustainability takes all people at all levels into account, especially as the importance of right hemisphere thinking becomes known in Leadership.
4. We will see a movement from very large to smaller, more local companies as the concepts of right hemisphere thinking (especially related to the human element) becomes more prominent.

5. Leadership: This area will develop in a new way, putting their right hemisphere thinking in its new and key place.

Following we find two overall schematic summaries which help to illustrate some of the new research by McGilchrist. Especially it should be emphasized that these summaries are only a simple assistance to the real research explanations provided in his book, the Master and his Emissary, but hopefully can help the reader in visualizing some of the new realities that we are facing in our everyday work and life.

HOW OUR BRAIN WORKS	
CONVENTIONAL THINKING	
LEFT BRAIN	RIGHT BRAIN
MASTER OF ALL BUSINESS AND PLANNING	SPIRITUALITY
MASTER OF ALL SOCIETAL ACTIVITIES	CONSCIOUSNESS AND EMOTIONS
ALL LOGICAL/RATIONAL THINKING THROUGHOUT, INCLUDING EDUCATION	NO CONNECTIONS TO LOGICAL/RATIONAL THINKING
SHORT TERM THINKING	LONG TERM THINKING (IE: NATURE)
GENUINE SUSTAINABLE THINKING	
LEFT BRAIN	RIGHT BRAIN
ACCEPTS POSITION AS EMISSARY OF RIGHT BRAIN <i>BIG PICTURE</i> THINKING	MASTER OF ALL <i>BIG PICTURE</i> DEVELOPMENT
BASIS FOR DEVELOPMENT OF ALL IDEAS: <i>RIGHT BRAIN</i> THINKING	EXPECTS LEFT BRAIN TO PLAN HOW TO PUT <i>BIG PICTURE</i> IDEAS INTO PRACTICE
RIGHT BRAIN CANNOT PUT ANYTHING INTO PRACTICE AND NEEDS LEFT BRAIN TO DO SO	SPIRITUALITY, CONSCIOUSNESS AND EMOTIONS
SHORT TERM THINKING	LONG TERM THINKING

### What do all these changes really involve?

Briefly, we are trying to provide some assistance for business and other organizations based on the new research concerning right and left hemisphere thinking. We cannot continue to rely solely on the left hemisphere for all guidelines, as we now know that the right hemisphere is in fact the only area that has the capability of *seeing the big picture*. We are in fact looking at the long term viability of Earth, based on

both Nature and incredible Human capacities. We are for the first time finally hopefully accepting that, as important as left hemisphere thinking is, we need something to provide the left hemisphere *direction*. TODAY WE HAVE A POSITIVE RESPONSE!

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## Evaluation of Sustainable Development in the Member States of the European Union

### Ocena poziomu zrównoważenia rozwoju krajów Unii Europejskiej

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#### Abstract

This study evaluates the level of sustainable development in 28 member states of the European Union in 2011-2013. Research was carried out based on the so-called Hellwig's development model method, which enabled the construction of a synthetic measure of sustainable development. It is based on indicators related to economic, social and environmental governance, as used in the European Union. The adopted method made it possible to evaluate the studied phenomenon as a whole, providing grounds for assigning the member states into four uniform groups characterised by a similar level of development. Group I, showing the highest level of sustainable development, comprised Sweden, Luxembourg, Slovenia, Denmark, Austria, and Finland. Conversely, Portugal, Bulgaria, Romania and Hungary were assigned to group IV.

**Key words:** the European Union, sustainable development, Hellwig development pattern

#### Streszczenie

W opracowaniu dokonano oceny poziomu rozwoju zrównoważonego w 28 krajach członkowskich Unii Europejskiej w latach 2011-2013. Badania przeprowadzono w oparciu o metodę tzw. wzorca rozwoju Hellwiga, która umożliwiła skonstruowanie syntetycznego miernika rozwoju zrównoważonego. Bazuje on na stosowanych w Unii Europejskiej wskaźnikach, dotyczących ładu gospodarczego, społecznego oraz środowiskowego. Zastosowana metoda pozwoliła na kompleksową ocenę badanego zjawiska, dając podstawę do podziału krajów członkowskich na cztery jednorodne grupy charakteryzujące się podobnym poziomem rozwoju. Do grupy I, o najwyższym poziomie rozwoju zrównoważonego zaklasyfikowano Szwecję, Luksemburg, Słowenię, Danię, Austrię i Finlandię. W grupie IV znalazły się natomiast Portugalia, Bułgaria, Rumunia i Węgry.

**Słowa kluczowe:** Unia Europejska, rozwój zrównoważony, wzorzec rozwoju Hellwiga

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#### Introduction

In 1987 the United Nations World Commission on Environment and Development published *Our Common Future*, also known as the Brundtland Report (WCED, 1987) containing a catalogue of risks and

challenges for the future desirable development of civilization (Mazur-Wierzbicka, 2005). According to a definition in the report: *sustainable development is development that meets the needs of the present*

*without compromising the ability of future generations to meet their own needs* (WCED, 1987).

In 1990 sustainable development became a political principle in the European Union. In 2001 in Gothenburg, the European Council established a sustainable development strategy (SDS) which was renewed in 2006 and aimed *to meet the needs of the present without compromising the ability of future generations to meet their needs*. This idea was also incorporated in the strategy *Europe 2020* proposed by the European Commission (2010). Apart from the above-mentioned strategies it is also present in many other Community documents and initiatives (Kryk, 2012).

This study aims at evaluating the level of sustainable development in the member states of the European Union. It was assumed, according to the definition of sustainable development, that improvement in the life quality and wellbeing of the present and future generations can be attained by an integrated approach to economic development, environmental protection and social justice. The starting point for the studies was the indicators covered by EU's methodology grouped into ten thematic areas.

### Materials and method of research

The level of sustainable development of 28 member states of the European Union was determined by means of one of the most popular taxonomic methods – Hellwig's taxonomic model. The study material was data from the Eurostat database. At the first stage of the study procedure, the indicators were initially selected based on literature research (Borys, 2005; Wskaźniki..., 2011; Bal-Domańska, Wilk, 2011; Sustainable..., 2013; Getting..., 2013). 52 diagnostic variables were selected and verified against compliance with formal criteria. Out of this group 46 variables eligible with the indicated criteria were classified for further investigation. At the next stage statistical criteria were taken into account and quasi-constants for which the coefficient of variation was lower than 10% were eliminated from the set of variables. Thus, the indicators removed from the set of indicators included, for instance: life expectancy in absolute value at birth – females ( $V=2,60\%$ ), life expectancy in absolute value at birth – males ( $V=4,80\%$ ), healthy life years at birth in percentage of the total life expectancy – males ( $V=5,60\%$ ), healthy life years at birth in percentage of the total life expectancy – females ( $V=6,90\%$ ), Net national income at market prices – % GDP ( $V=8,10\%$ ), duration of working life ( $V=8,40\%$ ), employment rate (20 to 64 years), employment rate by age and highest level of education attained (%) – 20-64 years ( $V=9,50\%$ ).

Afterwards, based on the statistical criteria, excessively correlated variables were eliminated from the set according to Pearson's correlation coefficients

matrix. They were not included in further investigation since they carried identical informational value. Ultimately 23 diagnostic variables were selected for the analysis evaluating the level of sustainable development in the member states of the EU. The variables were included in the following thematic groups:

#### 1. Socioeconomic development:

$x_1$  - GDP aggregates per capita (Euro),  
 $x_2$  - Real Effective Exchange Rate (deflator: unit labour costs in the total economy - 37 trading partners),

#### 2. Sustainable consumption and production:

$x_3$  - Waste generated - kg per capita,  
 $x_4$  - Passenger cars per 1 000 inhabitants,  
 $x_5$  - Share of total organic crop area out of total Utilised Agricultural Area (%)

#### 3. Social inclusion:

$x_6$  - Income quintile share ratio (in %),  
 $x_7$  - Long-term unemployment in % of active population,  
 $x_8$  - Gender pay gap in unadjusted form (in %),  
 $x_9$  - Early leavers from education and training - 18-24 years,  
 $x_{10}$  - Participation rate in education and training (last 4 weeks) - 25-64 years (in %),  
 $x_{11}$  - Expenditure on education as % of GDP (2011).

#### 4. Demographic changes:

$x_{12}$  - Employment rate of older workers (55 to 64 years) (in %),  
 $x_{13}$  - Fertility indicators - total fertility rate (in %),  
 $x_{14}$  - At-risk-of-poverty rate by poverty threshold, 65 years or older - % of total population (in %),  
 $x_{15}$  - Government consolidated gross debt (% of GDP).

#### 5. Public health:

$x_{16}$  - Death rate due to chronic diseases - per 100000 persons,  
 $x_{17}$  - Self-reported unmet needs for medical examination (%).

#### 6. Climate change & Energy, Natural resources, Sustainable transport:

$x_{18}$  - Greenhouse Gas Emissions (CO2 equivalent - thousand tones),  
 $x_{19}$  - Air pollution (Tonnes),  
 $x_{20}$  - Protected areas for biodiversity: Habitats Directive - Area - km<sup>2</sup> (2013),  
 $x_{21}$  - Share of renewable energy in transport (in %),  
 $x_{22}$  - Share of renewable energy in electricity (in %),  
 $x_{23}$  - Share of renewable energy in heating and cooling (in %).

Among the selected variables features such as  $x_3$ ,  $x_6$ ,  $x_7$ ,  $x_8$ ,  $x_9$ ,  $x_{14}$ ,  $x_{15}$ ,  $x_{16}$ ,  $x_{17}$ ,  $x_{18}$ ,  $x_{19}$ ,  $x_{20}$  were considered to be smaller-the-better (STB) characteri-

Table 1. Statistical characteristics of diagnostic variables for EU member states, source: own elaboration based on data from Eurostat pertaining to 2011-2013.

Variable	Mean	Minimum	Maksimum	Standard deviation	Coefficient of variation [%]
x <sub>1</sub>	25054	5600 (Bulgaria)	82400 (Luxembourg)	16533	65,99
x <sub>2</sub>	104,82	86,75 (United Kingdom)	141,11 (Bulgaria)	12,70	12,12
x <sub>3</sub>	469,39	271 (Romania)	668 (Denmark)	119,21	25,40
x <sub>4</sub>	463,93	224 (Romania)	665 (Luxembourg)	101,18	21,81
x <sub>5</sub>	6,56	0,3 (Malta)	18,6 (Austria)	4,80	73,21
x <sub>6</sub>	4,78	3,4 (Slovenia)	6,6 (Greece)	1,01	21,15
x <sub>7</sub>	5,10	1,1 (Austria)	14,5 (Greece)	3,40	66,59
x <sub>8</sub>	14,9	2,5 (Slovenia)	30 (Estonia)	6,54	43,87
x <sub>9</sub>	10,99	4,2 (Croatia)	24,7 (Spain)	5,18	47,10
x <sub>10</sub>	10,03	1,4 (Romania)	31,6 (Denmark)	7,63	76,09
x <sub>11</sub>	5,76	3,07 (Romania)	14,09 (Greece)	2,13	36,98
x <sub>12</sub>	47,50	32,9 (Slovenia)	73 (Sweden)	9,95	20,94
x <sub>13</sub>	1,58	1,28 (Portugal)	2,01 (Spain)	0,23	14,59
x <sub>14</sub>	15,5	5,5 (Netherlands)	29,3 (Cyprus)	6,11	39,41
x <sub>15</sub>	68,36	9,7 (Estonia)	156,9 (Greece)	35,10	51,35
x <sub>16</sub>	132,05	79,2 (Sweden)	257,3 (Hungary)	49,95	37,83
x <sub>17</sub>	4,94	0,1 (Slovenia, United Kingdom)	23,5 (Latvia)	5,98	121,11
x <sub>18</sub>	162294	3140 (Malta)	939083 (Germany)	222703	137,22
x <sub>19</sub>	192018	2066 (Luxembourg)	1082838 (Spain)	273556	142,46
x <sub>20</sub>	155241	316 (Malta)	549192 (France)	159506	102,75
x <sub>21</sub>	3,84	0 (Cyprus)	12,9 (Sweden)	2,96	77,04
x <sub>22</sub>	23,52	1 (Malta)	66,5 (Austria)	16,79	71,39
x <sub>23</sub>	22,66	2,3 (United Kingdom)	65,7 (Sweden)	15,57	68,71

stics<sup>1</sup>. Among the selected variables features such as x<sub>3</sub>, x<sub>6</sub>, x<sub>7</sub>, x<sub>8</sub>, x<sub>9</sub>, x<sub>14</sub>, x<sub>15</sub>, x<sub>16</sub>, x<sub>17</sub>, x<sub>18</sub>, x<sub>19</sub>, x<sub>20</sub> were considered to be smaller-the-better (STB) characteristics reducing the synthetic measure of sustainability, whereas the rest were regarded as larger-the-better (LTB) characteristics having a positive influence on the said measure.

For the selected features statistical characteristics were determined as illustrated in Table 1. The table presents a disparity regarding respective variables between different member states of the European Union, expressed as the minimum values, mean value and coefficient of variation. The coefficient of variation for the indicators used in the analysis ranged from 12% to more than 142%. The highest variation was recorded for factors characterising environmental aspects, e.g. air pollution (V=142.46%) and greenhouse gas emissions (V=137.22%). On the

other hand, the variable describing the actual exchange rate where the coefficient of variation was 12.12% showed the least variation.

#### Determination of the level of sustainable development in the member states of the EU by means of Hellwig's development model method

In the course of investigation 28 EU member states were classified according to the level of sustainable development. The classification was based on Hellwig's development model method<sup>2</sup> with regard to the fact that it synthesises factors of various nature (deriving from different sources) and assigns them a single synthetic aggregate measure (Mika, 1995). This method is also referred to as *guided recognition* (Kisielińska, 2008). Used in the performed analyses it allowed a comparison between all member states

<sup>1</sup> Smaller-the-better characteristic are variables for which low values are desirable from the point of view of a given phenomenon, whereas higher values are undesirable. By contrast, larger-the-better characteristics are variables for which low values are undesirable from the point of view

of a given phenomenon, whereas higher values are desirable.

<sup>2</sup> It is a model formula of aggregation of variables based on the constructed model object, the so-called development model created on the grounds of the optimum variables (the most favourable in the entire population).

of the European Union providing grounds for classifying them into uniform groups characterised by a similar level of sustainable development.

Prior to constructing the synthetic variables, the smaller-the-better characteristics were transformed into larger-the-better characteristics according to the following formula (Ostasiewicz, 1999):

$$x_{ij} = \frac{1}{x_{ij}} \text{ and then the features were standardised}$$

(Bąk, 2007) according to the formula:

$$z_{ij} = \frac{x_{ij} - \bar{x}_{ij}}{s_j}, \text{ where: } i - \text{object number, } j - \text{feature number.}$$

Such transformed features were subjected to the development model method which assumes the existence of a model (reference) object with reference to which the taxonomic distances between the investigated objects are determined.

This study determines the distance of each object from the set model by means of the taxicab metric,

$$\text{where: } d_i = \sum_{j=1}^m |z_{ij} - z_{0j}|,$$

The resulting  $d_i$  values were used for computing Hellwig's synthetic measure of development:

The  $z_i$  indicator assumes values within the range  $<0;1>$ , whereas values closer to one are closer to the model and so are associated with a high level of the investigated object. Next,  $z_i$  values were arranged in a linear manner in descending order and based on this arrangement typological unit classes were identified with four disjoint subsets of similar objects as follows (Mika, 1995):

Group I:  $z_i \geq \bar{z} + s_z$ ,

group II:  $\bar{z} \leq z_i < \bar{z} + s_z$ ,

group III:  $\bar{z} - s_z \leq z_i < \bar{z}$ ,

group IV:  $z_i < \bar{z} - s_z$

where:  $\bar{z}$  - arithmetic mean,  $s_z$  - standard deviation of the taxonomic measure of development.

According to the values of the  $z_i$  indicator the member states were assigned to one of the four groups with regard to their level of sustainable development. Group I consisted of member states with the highest while group IV was with the lowest level of sustainable development.

The level of sustainable development in the EU member states was evaluated based on all 23 variables, and the outcomes of the analysis were recorded in Table 2. The highest synthetic evaluation of the level of sustainability was awarded to 6 member states assigned to group I – Sweden, Luxembourg, Slovenia, Denmark, Austria and Finland. Group II consisted of 4 member states representing an out-

Table 2. Classification of EU member states according to the value of the synthetic measure describing the level of sustainable development, source: own elaboration based on data from Eurostat pertaining to 2011-2013.

Group number	The number of countries in the group	The level of measurement	The member states of the European Union
I	6	above 0,34274	Sweden, Luxembourg, Slovenia, Denmark, Austria, Finland
II	4	from 0,257055 to 0,342739	Malta, Estonia, Netherlands, Czech Republic
III	14	from 0,17137 to 0,257054	Latvia, United Kingdom, France, Slovakia, Germany, Belgium, Lithuania, Italy, Cyprus, Ireland, Poland, Croatia, Spain, Greece
IV	4	below 0,171369	Portugal, Bulgaria, Romania, Hungary

Table 3. Mean values of variables describing the level of sustainable development in terms of social and economic governance, source: own elaboration based on data from Eurostat pertaining to 2011-2013.

The level of sustainable development	Socioeconomic development	
	x <sub>1</sub>	x <sub>2</sub>
I group	43967	106,03
II group	21000	114,07
III group	22529	101,43
IV group	9575	105,59

standing level of sustainable development, i.e. Malta, Estonia, the Netherlands and the Czech Republic. Group III, displaying an average level of sustainable development, was at the same time the most numerous one as it consisted of 14 member states: Latvia, the United Kingdom, France, Slovakia, Germany, Belgium, Lithuania, Cyprus, Ireland, Poland, Croatia, Spain and Greece. Group IV, characterised by the lowest level of sustainable development among the member states of the European Union, consisted of 4 countries, i.e. Portugal, Bulgaria, Romania and Hungary.

Considering indicators which characterise social and economic governance in the area of the GDP per capita ( $x_1$ ) diagnostic variable, a significant inequality was observed between group I for which the mean value exceeded 43 967 euro, and groups II and III with income reaching the level of about 22 thousand euro. The lowest GDP per capita was recorded in the member states representing group IV characterised by the lowest level of sustainable development with

the grand mean<sup>3</sup> being 9575 euro per person only. It is worth emphasising that, according to economists, GDP is an unquestionable measure of the level of development of a country (Kaczyńska, 2001). On the other hand, sustainable development and an increase in welfare are not conflicting ideas but rather the first one emphasizes the necessity to optimise management in terms of reducing the consumption of raw materials, energy and water and minimising the negative impact of business activity on the environment and building up the spiritual dimension in the realm of human life (Kubiczek, 2014). Thus, a more than 4-fold difference in the mean value of the discussed measure between the two extreme typological groups points to a strong inequality in the sustainability of respective member states of the EU with respect to social and economic development.

No significant inequalities between respective groups were recorded for the actual exchange rate ( $x_2$ ) indicator facilitating the evaluation of whether a specific country is cost competitive in comparison to others. However, it is worth noting that the lowest total mean value (101.43) of that indicator was recorded in group III, while the highest (114.07) in group II. Groups I and IV both showed similar values – about 106.

Table 4. Mean values of variables describing the level of sustainable development in terms of sustainable production and consumption, source: own elaboration based on data from Eurostat pertaining to 2011-2013.

The level of sustainable development	Sustainable production and consumption		
	$x_3$	$x_4$	$x_5$
I group	535,33	533,83	10,07
II group	432,00	491,50	7,73
III group	472,64	464,64	5,78
IV group	396,50	329,00	2,85

According to the Eurostat methodology another group of indicators evaluating the level of sustainable development includes variables illustrating sustainable production and consumption (Table 4). The results of the investigation indicate that the increasing volume of production waste ( $x_3$ ) and the increasing number of passenger cars per 1000 citizens ( $x_4$ ) are accompanied by an increase in the level of sustainable development. A similar relationship is observed in case of the share of ecological crops in the overall cropland ( $x_5$ ) where an increase in such a share is connected with an increase in the level of sustainable development. At the same time it is worth noting that inequality in this area between group I and IV is nearly 350%.

In turn, the level of social integration fostering sustainable development was determined by means of 6 indicators (Table 5). The first indicator is the quintile share ( $x_6$ ), which, for the purposes of this study, is a smaller-the-better characteristic with regard to the fact that it characterises unequal distribution of income within the population. According to the research conducted the level of sustainable development of a specific member state is higher when the inequality of the citizens' income is lower. This means that reduction in related inequalities fosters sustainable development. A similar relationship was noted for a variable describing long-term unemployment in the economically active population ( $x_7$ ). This indicator reached the lowest value (2.03%) for citizens of member states from group I, often presenting the highest level of economic development, and its highest value (5.63%) was noted in group IV characterised by the lowest level of sustainable development. The problem of social inequality in the EU, including the disparity in the distribution of income, was raised in the document published by the European Commission (2010) entitled *Europe 2020: A strategy for smart, sustainable and inclusive growth*. The document sets three general priorities for the European Union: smart, sustainable and inclusive growth. This problem was also undertaken by I. Bal (2012) who claimed in her studies that there is a relationship between the level of income inequality and the share of citizens at risk of poverty in the population. The above-named author suggests that the largest internal variations in the level of income are observed in Portugal, Lithuania and Latvia.

Table 5. Mean values of variables describing the level of sustainable development in terms of social inclusion Source: own elaboration based on data from Eurostat pertaining to 2011-2013.

The level of sustainable development	Social inclusion					
	$x_6$	$x_7$	$x_8$	$x_9$	$x_{10}$	$x_{11}$
I group	3,93	2,03	14,43	7,60	20,77	6,16
II group	4,10	3,35	18,90	11,43	11,73	5,89
III group	5,11	6,77	13,98	11,04	6,66	5,98
IV group	5,55	5,63	14,83	15,48	4,05	4,22

The level of social integration is also expressed as the gender pay gap ( $x_8$ ). The results of investigation show that this feature had no strong influence on the distribution of the EU member states in terms of the synthetic measure of sustainable development. The highest (18.9%) pay inequalities were noted in group II, with the lowest in group III (13.98%).

Another feature determining the level of sustainable development with the highest mean value in group IV (15.48) is the share of early school leavers ( $x_9$ ). At the same time it must be emphasised that the lowest value (7.60%) was recorded for that indicator in

<sup>3</sup> The grand mean is computed based on the mean for 28 EU member states.

member states from group I. Related guidelines are included in the strategy Europe 2020 assuming a reduction in the number of early school leavers to 10%. Participation in education ( $x_{10}$ ) and share of expenditure on education expressed as a % GDP ( $x_{11}$ ) are subsequent variables in the social inclusion area. The studies under discussion found that a positive correlation exists between those variables and the synthetic measurement of the level of sustainable development. Higher expenditure on education and a wider range of participation of citizens in various forms of education positively translates into sustainable growth.

Table 6 presents four variables describing demographic changes which have a significant impact on the level of sustainable development: rate of unemployment among elderly people ( $x_{12}$ ), fertility rate ( $x_{13}$ ), at-risk-of-poverty rate ( $x_{14}$ ) and general government gross debt ( $x_{15}$ ).

Table 6. Mean values of variables describing the level of sustainable development in terms of demographic changes. Source: own elaboration based on data from Eurostat pertaining to 2011-2013.

The level of sustainable development	Demographic changes			
	$x_{12}$	$x_{13}$	$x_{14}$	$x_{15}$
I group	51,50	1,67	15,17	48,58
II group	50,78	1,54	11,50	47,40
III group	46,25	1,60	16,43	83,89
IV group	42,63	1,41	16,75	64,65

Across typological groups an increase in the rate of economic activity of elderly people ( $x_{12}$ ) is observed. Another feature describing demographic changes is the rate of fertility ( $x_{13}$ ) reaching the highest value (1.67) in group I and the lowest (1.41) in group IV. This can be explained by the fact that an increase in development is also accompanied by an increase in the level of social welfare oriented at helping families and promoting safe maternity which fosters an increase in the rate of fertility within the specific community. Taking the at-risk-of-poverty rate ( $x_{14}$ ) into account, it is difficult to identify a clear relationship between this feature and the level of sustainable development. The lowest value of the discussed indicator (11.5%) was noted in group II and the highest in group IV (16.75%).

The last feature describing the demographic aspect is public expenditure on state-funded pensions which increases public debt ( $x_{15}$ ). The results of the investigation indicate that the above-mentioned indicator had no significant influence on the distribution of the member states across the identified typological groups. However, it is worth noting that in group I and II it is relatively low (ca. 48%), while in group III it was higher than 83%.

Variables describing the relationship between the evaluation of the level of sustainable development against the level of quality and access to health care services are presented in Table 7. According to the

analysis carried out, a downward trend in death rate due to chronic diseases ( $x_{16}$ ) is associated with an increase in the evaluation of the level of sustainable development and classification of the specific member state to a higher group. An identical relationship was noted for reported but not satisfied medical requirements ( $x_{17}$ ).

Table 7. Mean values of variables describing the level of sustainable development in terms of quality and access to health care services, source: own elaboration based on data from Eurostat pertaining to 2011-2013.

The level of sustainable development	Public health	
	$x_{16}$	$x_{17}$
I group	102,52	0,90
II group	121,63	1,28
III group	130,56	6,19
IV group	192	10,25

The last area characterising sustainable development comprised features describing climate change, natural resources and sustainable transport (Table 8). Due to the lack of many current figures allowing a description of sustainability characteristics for respective categories, the indicators were included in one group.

Table 8. Mean values of variables identifying the level of sustainable development in terms of climate change, natural resources and sustainable transport, source: own elaboration based on data from Eurostat pertaining to 2011-2013.

The level of sustainable development	Climate change & Energy, Natural resources, Sustainable transport					
	$x_{18}$	$x_{19}$	$x_{20}$	$x_{21}$	$x_{22}$	$x_{23}$
I group	46836	26365	150472	5,28	38,45	35,87
II group	86366	71389	41484	3,50	9,73	19,33
III group	257657	302747	195975	3,76	20,42	17,24
IV group	77636	173575	133580	2,33	25,78	25,15

These authors' own studies have shown that the highest greenhouse gas emissions (257557 thousand tonnes) ( $x_{18}$ ) were recorded in member states from group III, while the lowest emissions (46836 thousand tonnes) were found in member states from group I. Analogous relationships were noted in terms of air pollution ( $x_{19}$ ).

In turn, the distribution of the feature describing the size of areas protected for biodiversity conservation ( $x_{20}$ ) in respective typological groups is varied and does not allow stating a clear relationship between its level and the level of sustainable development. With reference to the share of renewable energy in transport ( $x_{21}$ ) it was observed that the share of RES in transport has a positive influence on a higher rating of sustainable development of the specific member state. Analysing the latter two variables, i.e. share of renewable energy in electricity generation

( $x_{22}$ ) and share of renewable energy in heating and cooling ( $x_{23}$ ), the highest level of these indicators was recorded in member states representing group I. This means that these member states are the fastest in reducing their dependency on fossil fuels, at the same time meeting the associated regulations of the European Commission.

## Conclusions

The investigation carried out made it possible to determine the level of sustainable development in 28 member states of the EU in 2011-2013. Three reasons must be indicated for which these studies make a significant contribution to literature concerning sustainable development. First, partial indicators used for the purposes of this study comprise a wide selection of variables describing social, economic and environmental aspects of sustainability. These variables are consistent with the Eurostat methodology used to evaluate the level of sustainable development. Secondly, the construction of a synthetic measure enabled a simultaneous evaluation of the level of sustainability of respective member states in all the main areas related to human life and activity. The third significant characteristic of these studies is their wide subjective range comprising 28 member states of the European Union.

The use of the taxonomic method (Hellwig's development model) allowed the classification of respective member states into one of four groups identified based on their sustainable development level. Group I representing the highest level of sustainable development consists of 6 EU member states, i.e. Sweden, Luxembourg, Slovenia, Denmark, Austria and Finland. Group II consisted of Malta, Estonia, the Netherlands and the Czech Republic. Group III was the most numerous as it consisted of 14 member states (Latvia, the United Kingdom, France, Slovakia, Germany, Belgium, Lithuania, Italy, Cyprus, Ireland, Poland, Croatia, Spain and Greece). In group IV, representing the lowest level of sustainable development, consisted of Portugal, Bulgaria, Romania and Hungary.

Analysing the mean values of respective factors in the member states representing the highest level of sustainable development, for 18 out of all 23 investigated variables they are the most favourable (the highest for the larger-the-better characteristics and the lowest for the smaller-the-better characteristics) compared to the grand mean.

The country characterised by the highest level of sustainable development is Sweden, which had the most favourable values for 4 out of all 23 features: rate of employment of elderly people – 72%, minimum values of death rate due to chronic diseases – per 100000 persons – only 79, maximum values of the share of renewable energy in transport (12.9%) and the share of renewable energy in heating and cooling (65.7%).

In group IV, representing the lowest level of sustainable development, 12 out of 23 investigated features had very unfavourable values compared to the grand mean. A country with the lowest evaluation of the level of sustainable development among all the investigated member states was Hungary for which  $z_i$  indicator amounted to 0.01373 only. That country recorded the highest (257.3%) rate of death due to chronic diseases.

The method applied revealed a significant disparity between sustainable development in the investigated member states of the EU. The results obtained support the usefulness of synthetic measures for evaluating the level of sustainable development. Nevertheless, limitations to their interpretation must be taken into account. The proposed approach to the evaluation of sustainable development must be considered as one of the many alternative methods of analysing the investigated issue which can add to a wide selection of instruments used so far. In addition, when analysing the presented results the specific characteristics of respective member states and their internal variation (territorial cohesion) must also be taken into consideration.

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## Beyond the North-South Debate: The Global Significance of Sustainable Development Debates in South Korea

### Wykraczając poza opozycję Północ – Południe: globalna rola debat o zrównoważonym rozwoju prowadzonych w Korei Południowej

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#### Abstract

While debates on sustainable development have traditionally pitted the developing countries of the global South against the industrialized countries of the North, this essay addresses possible new elements in the so-called North-South debate, mainly by examining it from the perspective of a former developing country that has recently succeeded in becoming a developed industrial economy. Having achieved rapid economic growth that has been described as *miraculous*, South Korea has come to enjoy the reputation of being a country that has also shown a firm commitment to sustainable development, and in 2012, was even chosen over Germany to host the headquarters of the UN Green Climate Fund. Yet within the country the Korean government has been subject to ongoing criticism as still placing a preponderant emphasis on economic growth, while largely ignoring the ecological and social aspects of sustainable development. While not disagreeing with the critics, this essay shifts the focus away from the local causes of the alleged inconsistencies and lapses in the Korean government's sustainable development policy, and uses the Korean case as a prism through which to view the global trends that since the early 1990s have emerged as major obstacles in making sustainable development possible in fact, not just in words. Building on Thomas Piketty's near definitive study of the rise of income inequality and *oligarchic* ownership of much of the world's wealth in the aftermath of the neoliberalist triumph of the 1980s, the essay identifies South Korea as the epitome of a country whose economy has come to be controlled to a large extent by the global financial elite, and suggests that beyond the rhetoric, its development policy has reflected the predominantly growth-oriented agenda of such elite. The implication throughout is that, should the current trends continue, the Korean case may well provide a good indication of what is further to come as today's rapidly industrializing economies also begin to mature.

**Key words:** environmentalism, sustainable development, the North-South debate, Rio, Green Climate Fund, South Korea, neoliberalism, inequality, oligarchy, chaebol

#### Streszczenie

Debaty odnoszące się do zrównoważonego rozwoju zwykle ustawiają kraje Południa w opozycji do zindustrializowanej Północy, jednak w tej pracy ukażemy możliwe nowe elementy w tej dyskusji. Przedstawimy przykład kraju, określanego jeszcze niedawno jako rozwijający się, a obecnie stanowiącego przykład udanej transformacji w kierunku gospodarki przemysłowej. Po osiągnięciu szybkiego wzrostu ekonomicznego, który został określony jako *czudowny*, Korea Południowa pokazuje teraz również zdecydowane zaangażowanie na rzecz zrównoważonego rozwoju. W 2012 roku, kraj ten przebił nawet ofertę Niemiec i to w nim wyznaczono siedzibę prowadzonego przez ONZ Green Climate Fund. Jednocześnie, w wymiarze wewnętrznym, koreański rząd jest krytykowany za nadmierny nacisk na wzrost gospodarczy i zaniedbywanie ekologicznych i społecznych aspektów zrównoważonego

rozwoju. W tej pracy jednak nie tyle prezentować będziemy przyczyny krajowych uchybień, ile zaproponujemy spojrzenie na Koreę przez pryzmat, w którym odzwierciedlają się globalne trendy widoczne od początku lat 90., stanowiące obecnie główne przeszkody we wdrożeniu rozwoju zrównoważonego.

Opierając się na badaniach Thomasa Piketty'ego, odnoszących się do wzrostu nierówności dochodów i zawładnięcia przez *oligarchię* większości światowych zasobów w następstwie triumfu neoliberalizmu z lat 80., przedstawimy Koreę Południową jako przykład kraju, w którym kontrola nad gospodarką w znacznym stopniu została przejęta przez globalną elitę finansową. Pokażemy, że – poza retoryką – polityka rozwojowa jest ukierunkowana głównie na wzrost interesów tej elity. Oznacza to, że jeżeli obecne tendencje się utrzymają, przykład Korei może być wskazówką co do przyszłości innych obecnych uprzemysłowionych gospodarek, które wkraczają w kolejną fazę rozwoju.

**Słowa kluczowe:** enwironmetalizm, zrównoważony rozwój, opozycja Północ – Południe, Rio, Green Climate Fund, Korea Południowa, neoliberalizm, nierówność, oligarchia, monopol

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## Introduction

Rio+20 celebrated in 2012 was in many ways nothing like the original event it was supposed to commemorate: the Earth Summit held twenty years earlier, in Rio de Janeiro, Brazil. Taking place five years after the publication of *Our Common Future* – the 1987 UN report that coined the term *sustainable development* and helped launch it as a new development paradigm – the Rio summit of 1992 secured its place in history by becoming the meeting ground where the government representatives of over 170 countries and thousands of NGO representatives congregated to hammer out concrete policy agenda that could help make sustainable development a reality. In contrast to the buoyant optimism that characterized Rio and its participants, Rio+20 of 2012 was a somber event indeed. It went barely noticed by the world community, and some of its participants likely felt relieved by the lack of publicity and attention, since there had been very little encouraging to report since Rio. If *Our Common Future* defined sustainable development generally as *development that meets the needs of the present without compromising the ability of future generations to meet their own needs* (WCED, 1987, p. 125), Rio and the discussions that followed helped further clarify the concept – at least on a theoretical level – more specifically as a balanced development where economic growth is accompanied by minimal to no environmental degradation and improvements in the social sector. Yet in 2012 news did not seem encouraging on any front, whether economic, ecological, or social. Since 2008 the global economy had been trying to cope with one of the most devastating financial crises in recent history, with many fearing the onset of another Great Depression. The Kyoto Protocol appeared to be in shambles, and the worldwide cooperation needed to tackle what some consider the most serious environmental problem of our time – carbon-emissions-induced climate change – seemed increasingly hopeless. Nor had the economic growth of the late twentieth and the early twenty-first century been particularly conducive to equity – considered to be among the most important indicators for the social pillar of sustainable development – with a disproportionate

share of the world's wealth increasingly in the hands of an elite minority.

Still, 2012 did not turn out to be a year of burial for sustainable development as a development paradigm. There were also events that provided some grounds for hope. Among them was the long-awaited launching of the UN Green Climate Fund, and not the least encouraging thing about its launching was that South Korea, a former developing country that had recently joined the ranks of the world's developed economies, was chosen over Germany to host its headquarters. Since the 1970s, the so-called North-South debate – the disagreement between the developed countries of the industrialized North and the developing countries of the global South over the priority of environmental protection versus economic development – had been one of the main stumbling blocks in the efforts to reach international agreements on environmental issues (Chasek et al., 2006). In the 1970s, influential voices of the North went so far as to propose severely limiting economic growth globally, if not halting it altogether, to protect the environment, only to be answered by the voices of reminder from the South that much of the world population still suffered from a lack of tolerable living conditions, for which more economic growth and development, not less, might be the only logical solution (Pak, 2014). As the name of the UN commission that produced *Our Common Future* reflected – World Commission on Environment and Development – the need to find a middle ground between such opposed viewpoints became one of the immediate contexts for introducing the concept of sustainable development: continued economic growth as demanded by the South, but one that is ecologically sustainable and hence acceptable to the North. The compromise was further worked out at Rio in the form of a set of principles, which the Green Climate Fund would attempt to embody. Its belated launching in 2012 meant the developed countries were finally given the opportunity to make good on their promise to contribute more than just words to an ecologically sustainable global development, by providing the developing countries with the funding necessary to implement green technologies and bypass less expensive but more carbon-intensive ones

(GCF, 2015a). In South Korea's being chosen to host the Fund, votes from the developing countries, plus the last-minute support from the United States, were reportedly decisive (Limb, 2012). While perhaps not equal to Germany in the actual implementation of sustainable development policy, South Korea seemed to have the advantages of momentum and location. Having achieved an economic growth that has been described as nothing short of *miraculous*, it joined the OECD in 1996, from which point on it has zealously sought to achieve visibility as a country dedicated to adopting sustainable development as its main development paradigm. Moreover, as a country geographically located between China and Japan, it is literally situated between the developing and the developed world, as well as straddling the two worlds temporally by virtue of its recent development history – in short, an ideally situated mediator. In 1996 Norman Eder already identified South Korea as *such an interesting case study* because it seemed to represent an experiment in progress for those concerned with the implications of the North-South debate for the successful adoption of sustainable development as a new global development paradigm (Eder, 1996, p. 168). The massive and swift industrialization South Korea experienced in the late twentieth century is reminiscent of the developments under way in other Asian countries like China and India today, and the question that framed Eder's study twenty years ago continues to be pertinent: at what stage of development does a developing country truly begin to embrace the protection of the environment as a priority as urgent as economic growth? While the denouement of South Korea's story may seem to offer grounds for resounding optimism, much about the country remains unknown to scholars of sustainable development elsewhere, except through the possibly distorting medium of official reports. The fact that the so-called sustainable development policy implemented by the Korean government has been subject to ongoing criticism within the country suggests that a great deal indeed might remain untold.

The remainder of this essay is devoted to exploring issues the Korean case raises for general debates on sustainable development and their broader implications. Since 2008, I have had the privilege of being invited to serve as an international faculty member at the Korea Advanced Institute of Science and Technology (KAIST). Through my own research and that of my graduate students, I have been able to collect data that may eventuate in a new book-length study to replace Eder's now outdated study twenty years ago. In this essay I argue that many of what the Korean critics identify as their government's shortcomings in its approach to sustainable development are actually reflective of the global trends we have been witnessing since Rio, and that their ultimate causes go well beyond local circumstances which are specific to South Korea. The advantage of looking at

such global trends through the prism of the Korean case is that it enables us to identify and explore a host of issues that have not received proper attention in the more general discussions of sustainable development, and ultimately provides us with a richer, more nuanced understanding of the looming obstacles we have begun to encounter on the way from Rio to Rio+20 and beyond.

### Debates on Development and Environment in South Korea

As late as the beginning of the 1960s, South Korea remained one of the poorest countries in the world, with a primarily agrarian economy, and still suffering from the devastations of the Korean War. The turning point arrived in 1961, when a military coup was staged by General Chung-hee Park. Under his dictatorship, the country began to transform itself into a successful industrial economy, eventually maintaining an average annual growth rate of 8 percent for over thirty years (Moon, 2006). With its economy maturing, South Korea has been recently ranked as having the 10<sup>th</sup> to 14<sup>th</sup> largest GDP in the world – the ranking has varied from year to year – and is classified by the World Bank as a High Income OECD country (World Bank, 2015a). Perhaps the clearest and most dramatic indicator of its transition from a developing to the developed country has been that, once a recipient of development aid, it is now a major donor, whose expenditure on foreign aid measured as a percentage of per capita income is approaching a level on par with Japan and the United States (Marx, Soares, 2013, paragraph 14). As Marx and Soares note (paragraph 63), the transition from a recipient to a donor of aid on such a scale has been unique to South Korea thus far.

How the *Korean miracle* was achieved and what lessons it can offer for the rest of the world have become today a subject well beyond the technical discourse of development economics. The divided opinion on this subject is in fact indicative of the ideological battle now taking place over the proper economic paradigm to lead the world. To a right-leaning economic historian and champion of the neoliberal order like Niall Ferguson, South Korea represents a clear case of the triumph of the principles that have made the *West* superior to the *Rest* (Ferguson, 2011). To economists critical of neoliberalism like Ha-joon Chang, however, South Korea provides a case in point demonstrating why developing countries might benefit from protectionism and state planning and much of what goes on today under the name of free trade and globalization is misguided and not supported by facts of economic history (Chang, 2007). So far as the country's efforts to address environmental problems are concerned, the Korean case more or less seems to fit the paradigm suggested by economist Simon Kuznets, who famously argued in the 1950s that while it is normal for would-be indus-

trialized countries to pass through a stage of serious environmental degradation in the beginning, once a certain level of development is reached, they begin to address environmental issues in earnest, as their citizens begin to demand not just a higher income but a better, more live-able lifestyle (Kuznets, 1955; Stern, 2004). For South Korea, the cusp of transition in this sense came in the 1990s. Though environmental legislations began to be adopted as early as the 1970s, it was not until the 90s, when its economic development was well under way, that the country began to pay a serious attention to environmental issues. In fact, when Eder published his study on development and environment in South Korea in 1996, he made a point of titling it *Poisoned Prosperity* to sum up his overall view that what the country had done by way of environmental protection up to that point had been still very inadequate, and he felt justified in making the generalization that though *green attitudes are being infused into world concerns under the banner of sustainable-development movement, (...) for many developing countries, environmentalism is perceived as a threat to further industrialization* (Eder, 1996, p. 169).

Yet as Eder also noted, by the 1990s there were signs that changes were stirring in South Korea. In retrospect, the public outrage in 1991 over the toxic chemical spill into the country's longest river – Nakdong – is generally regarded as the tipping point for the environmental movement in South Korea (Eder, 1996, p. 108-109; Kang, 2012, p. 14-21). The timing of the incident could not have been more fortunate. The Rio summit took place the following year, which the representatives of the Korean government attended, and which attracted a great deal of publicity and interest within the country. With the joining of the OECD in 1996, the country seemed to have reached a point of no return. Serious soul-searching took place, as it were, in the form of lively legislative and public debates: if the country was truly to achieve the status of a developed country, it was argued, it must also adopt more enlightened views and policy equal to the status on environmental issues (Kong, 2003). Four years earlier, in 1992, the country had also elected its first civilian president in thirty years; with the election of Dae-jung Kim in 1997, the former hero of dissident movement and soon to be a winner of the Nobel Peace Prize, the efforts to adopt sustainable development as the country's new official development paradigm really seemed to take off. The Presidential Commission on Sustainable Development (PCSD) was thus established in 2000, to oversee the paradigm shift during Kim's administration and thereafter. Scarcely a decade later, the OECD gave a resounding approval of the country's *green growth* policy (e.g., Jones, Yoo, 2011; OECD, 2015), and its being chosen in 2012 to host the Green Climate Fund headquarters was a capstone of the efforts and developments that had started twenty years earlier, about as the Rio summit of 1992.

Just as opinion remains divided on how to account for and interpret the country's rapid economic growth, there is considerable disagreement on how to assess its commitment to sustainable development. While South Korea has earned respect abroad for achieving so much in so short a time, that is in keeping with the so-called Kuznets curve, critics within the country have accused their government's commitment to sustainable development as being mere window-dressing designed to bolster its image, that beyond the rhetoric and propaganda, economic growth is still given far greater priority in South Korea, while the protection of the environment and the improvement of the social sector remain at best secondary (e.g., Yun, 2009).

As critics are wont to note, such tendencies became particularly pronounced during the administration of Myung-bak Lee, who served as the country's president from 2008 to 2013. A former CEO of Hyundai Engineering and Construction, Lee sought to achieve ever greater visibility for his country's commitment to sustainable development by adopting *green growth* as the official developmental slogan of his administration. It was this gesture that the OECD came to tout, and it was also Lee who campaigned hard to win for his country the distinction of hosting the Green Climate Fund headquarters. Yet to the environmental groups in Korea, Lee proved to be anathema. During his administration, he proposed and implemented a massive government-funded construction project named the *Four Great Rivers Project*, whereby the country's four largest rivers were *refurbished* with their riverbeds raked and flattened out to be made more even, their swamplands filled in, and their embankments paved with concrete, without much concern for the existing riparian ecosystems. So far as the environmental groups were concerned, this project was one of the greatest ecological disasters in the country's history, which only served to confirm the suspicion that there was in reality little that is green about Lee's so-called *green growth* policy (Cho, 2009; Lee, 2009; Yun, 2009). Beyond such highly indicative episodes, numeric indicators further supply evidence in support of the critics. For example, from 1990 to 2014, along with the country's per capita income, its per capita CO<sub>2</sub> emissions also grew, almost doubling from 6 metric tons per year to 11.5, to be on par with the High Income OECD average (World Bank, 2015b, 2015a). The same period also witnessed a steady rise in income inequality, to the point where even the OECD has recently issued a warning that growing inequality remains one of the most urgent issues the country needs to address (OECD, 2014).

As Kevin Murphy has noted, the social pillar has been the least adequately explored pillar of sustainable development (Murphy, 2012). While Murphy has identified equity to be thus far the foremost social issue addressed in sustainable development discourse, the next in importance have been *awareness*

for sustainability and participation. Some of the research I have directed at KAIST has been devoted to investigating how the awareness and participation issues have fared in the Korean context, and the conclusions have not been encouraging. Two researchers, for example, examined how the term *sustainable development* itself has been generally used and understood in South Korea (Baek, 2013; Ko, 2013). Their research – analysis of government reports, parliamentary debates, and major newspapers – revealed a hitherto unsuspected factor that has contributed in no small way to the economic pillar of sustainable development receiving preponderant emphasis in South Korea, at the expense of the ecological and social. And this factor turned out to be linguistic. Even in English, the word *sustainable* can mean *being able to continue*, as well as *being able to support*. In the standard translation for the term that came to be adopted in South Korea, *sustainable development* means essentially *development that can be continued*, which is understood by the majority of the public simply to mean *continuous economic growth*. Another researcher focused on the newspaper coverage of President Lee's infamous *Four Great Rivers Project* during its entire duration from 2008 to 2013 (Kim, 2012). In keeping with the findings of the other researchers, he discovered that the ecological consequences of the project received very little coverage in South Korea's major newspapers: the public debate reflected in the newspaper coverage was overwhelmingly about the economic logic behind the project, with its potential contributions to job creation and economic growth as the overriding concern. The issue of social justice received some coverage and attention in this case, since a substantial portion of the public was worried that, while financed with public funds, the project was largely a scheme to make construction companies richer, which were suspected of being headed by President Lee's former business associates.

### Issues and Implications

According to many Korean critics, the main cause of what they consider to be inconsistencies and even lapses in their government's implementation of sustainable development policy is the lingering legacy of the authoritarian regime that used to rule the country until 1992. This type of argument has been actually fairly typical in the developing countries of Asia. As studies have shown, numerous environmental movements in Asian countries originated in the 1970s primarily as anti-government movements, while strategically disguising themselves, as it were, as movements to protect the environment or related agrarian traditions or both in order not to seem directly confrontational toward their governments (Hsiao, 1999). Many early environmental activists in Korea in fact took up their causes primarily as a way of fighting against the authoritarian military regime.

Though a civilian government has been restored since 1993 and Korea is no longer a developing country, the brunt of environmentalist criticism continues to be directed against the government (Moon, 2006; Cho, 2009; Lee, 2009). Though it is no longer controlled by the military or overtly authoritarian, the government is not, the critics charge, as accountable to the people as it should be, and grassroots movements in general, environmental and otherwise, lack the proper mechanism to influence government policy in Korea (Kim, 2007; Yun, 2009).

As Miranda Schreurs has argued in her path-breaking comparative study, while powerful grassroots movement leading to fundamental changes in government policy accurately describes the growth pattern of environmentalism in the United States, such a pattern has not been necessarily typical (Schreurs, 2003). The growth of environmentalism in Germany has followed a somewhat different pattern, and in Japan a very different one. In fact, as the Japanese case in particular serves to show, strong grassroots participation in the government's decision-making process is not always a necessity in the making of a government regime committed to the protection of the environment. Indeed, history even provides examples of highly authoritarian regimes adopting very enlightened environmental policies for their time period, with Germany of the nineteenth century as a case in point, which, according to some, was the early birthplace of the concept of sustainable development, if not the term (Radkau, 2008). That my intention is not to defend the Korean government against its critics should be clear. My intention here is to make a general historical observation: that to what extent a country is committed to sustainable development policy and how faithful it is in carrying out the policy has not been simply a function of the type of government regime it happens to have.

The question thus remains: how to account for the seeming inconsistencies or perhaps even lapses in the implementation of sustainable development policy in South Korea? As we have seen, some contributing causes have been clearly local. But to return to the main argument of the essay, the developments in South Korea have to be placed in the context of what has been taking place globally since the 1990s, and seen thus, the greater contributing causes appear to have been global. Put differently, the inconsistencies or lapses in South Korea's sustainable development policy are a clear reflection of the time period in which the country became a developed economy, and are in fact reminiscent of what has been going on in many other countries in the developed world. And this is the reason why South Korea as a case study should be of interest even for those who are not particularly interested in learning about the country: it shows how the global trends can affect a country undergoing the transition from a developing to a developed country, and gives an indication of how the current global trends, should they continue, might

likewise affect today's rapidly industrializing countries.

The United States, Germany, and Japan – the three countries Scheurs focused on in her study – had this much in common: they were already developed countries when the current wave of modern environmentalism started – there had been a previous wave in the nineteenth century – and their environmental policy was profoundly shaped by the powerful trends of the 1960s and 70s that clearly favored a strong commitment in favor of environmental protection and social justice. As I have shown elsewhere, these were the decades where the public remained highly receptive – at least in the developed countries – to the persuasion of *Arcadian* environmentalists in particular, who questioned the very basis of modern industrial civilization and argued for the adoption of a viewpoint that is less anthropocentric, less technological, and less profit-oriented (Pak, 2011). It was against the backdrop of such an era that the advocates of *limits to growth* could present their case with the expectation of being taken seriously (Meadows et al., 1972), and they were. The United States, Germany, and Japan in the 1960s and 70s were all swept along by the trends of their time and similarly became countries highly committed to the protection of the environment – for the time being, at any rate – despite the differences in their governmental structures and the strength of their respective civil society.

By the time South Korea joined the OECD in 1996, the world had become, as it were, a much different place. The deregulation and privatization boom that began in the 1980s set new trends in motion. The onerous regulatory mechanisms and outdated apparatuses of state planning that used to cripple the economy in many countries came to be removed – but what also disappeared in the process were mechanisms and apparatuses to prevent and check corporate irresponsibility, the profligacy of the global financial elite, and increasingly debt-financed consumerism.

In the early 1990s, the consequences of such a paradigm shift were just beginning to be seen. One of the sources of the unbound optimism still shown at the Rio summit of 1992 was its timing. Taking place in the immediate aftermath of the fall of the Soviet Union and other communist regimes in Eastern and Central Europe, Rio reflected, among other things, the then prevailing view that humankind was about to enter a new era of unprecedented peace, prosperity, and social order based on enlightened and humane principles. Yet those looking at the developments in Eastern Europe with a skeptical eye sounded more ominous notes. Sir Brian Fall, the British ambassador to the Soviet Union, reportedly said, *how much easier it would have been for the Russians if the Soviet Union had collapsed in the 1960s or 1970s (...) because that was when government intervention loomed large in the West and na-*

*tional planning and state ownership were the methods of the day.* With such an economic paradigm still prevailing in the West, it would have been *much more acceptable for Russia to hold on to its huge state-owned companies* longer, and with a more gradual transition, its *move to a market economy would not have been so severe and traumatic* (Yergin, 2002, p. 10).

How much easier it would have been for South Korea, if it had become a developed country in the 1960s or 70s. There would have been no question then that it would be required to make a strong commitment in favor of environmental protection and social justice. But the 1990s – and the 2000s – were a time when many talked about sustainable development, but few followed it up with adequate action. It was indeed the case with most countries, not just South Korea, that action came to be nowhere equal to the rhetoric, and economic growth – for the benefit largely of the elite at that – became the overriding priority at the expense of everything else. The inconsistencies and lapses became especially glaring in the case of the United States, the country where the current wave of modern environmentalism originated, and which once showed arguably the strongest commitment to environmental protection. In the 1970s, economy-sized Japanese automobiles became enormously popular in the United States because consumers cared about conserving gas; by the 1990s, despite the growing warnings against the effects of carbon emissions on the climate, the car of the choice became the gas-guzzling SUV. Though Al Gore as vice-president in the Clinton administration was a major force behind the launching of the Kyoto Protocol, the United States pulled out after his botched bid for the presidency in 2000, and has remained a non-signatory nation. The inability of the developed countries to set the right example and exercise proper leadership in the global efforts toward sustainable development is further reflected in the Green Climate Fund's slow progress since its launching in 2012. Though the original plan was to be able to raise \$100 billion each year by 2020, as of November 2014 the total funding pledges since 2012 had yet to reach \$10 billion, with the GCF's own website at the time of this writing reporting \$2.3 billion (GCF, 2015b).

In his much acclaimed study of growing income inequality as a global phenomenon, Thomas Piketty observes that since the 1980s the forces of convergence and divergence have been simultaneously transforming the world. While the diffusion of knowledge has made it possible for more and more countries to catch up and converge toward advanced economies, such developments have also provided a context where those earning returns on investment capital have increasingly become considerably richer than those who simply work to earn a living. The two trends combined even make an extreme form of *oligarchic type of divergence* likely in the

future, in which all countries, including China and the petroleum exporters, would be owned more and more by the planet's billionaires and multimillionaires (Piketty, 2014, p. 463).

As a country that has recently joined the ranks of developed economies, South Korea has been the epitome of a country shaped by such forces. As Ezra Vogel has observed in his study of the *four little dragons* of East Asia, one of the key contributing factors to South Korea's economic *miracle* has been the educational zeal of its citizens, which has led so many of them to study abroad and bring back the latest advances in knowledge (Vogel, 1993). In short, it is a country that has been particularly adept at profiting from the diffusion of knowledge. Yet it is also a country where an *oligarchic type of divergence* has been very much and increasingly in evidence. The combined revenues of the country's top ten family-controlled conglomerates known as chaebol have been reported to be equal to as high as 84% of GDP as of 2012 (Bloomberg, 2014). As the names like Samsung, LG, and Hyundai that top of the list indicate, the chaebol's reach is not limited to Korea but global in the most extensive sense. The country is further exposed to the global trends in real-time, as it were, by the activities of foreign speculators who account for a significant portion of the transactions in its financial markets (daily stock summaries in Korea always report the activities of foreign speculators as a category to itself). With its economy and financial markets fully integrated into the international system, the national government of South Korea, like its counterparts elsewhere, has had increasingly diminished options at its disposal for resisting the broader global trends, should it choose to do so. If the economic pillar of sustainable development has been greatly emphasized at the expense of the ecological and social in South Korea, it is to a large extent because of the predominantly growth-oriented agenda of the global financial elite – in the form of the home-grown chaebol, as well as foreign speculators – that controls much of the country's economy, and also in part because the public has had reasons to be concerned about financial security despite the country's apparently growing wealth. In 2014, while the country's GDP grew by 3.3 percent (KOSTAT, 2015) and the top ten chaebol's surplus cash reserve reportedly by 8.1 percent (Hankyoreh, 2015), the average Korean family saw their debt increase by 2.8 percent, with the total household debt now equaling 81 percent of GDP (WSJ, 2015).

## Conclusion

Since the North-South debate of the 1970s, the world order has been shifting toward one where the very distinction between the industrialized North and the global South is likely becoming less and less meaningful for sustainable development debates. What the emergence of an *oligarchic type of divergence*

essentially implies is that the greater obstacle to globally sustainable development since the early 1990s has been, not the developing countries per se, but the agenda of the elite that controls an ever-increasing segment of the world economy. Barring the disappearance of such global oligarchy – for *there is no natural, spontaneous process to prevent destabilizing, inequalitarian forces from prevailing permanently* (Piketty, 2014, p. 21) – how to make the elite accountable to the requirements of sustainable development may now be a central question facing humanity.

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## Lost in Translation: Problems of Rendering the Term *Sustainable Development* into Non-Western Languages as Demonstrated in the Case of South Korea

### Zagubieni w tłumaczeniu: problem z prawidłowym wyrażeniem terminu *rozwój zrównoważony* w językach spoza świata Zachodu – przykład Korei Południowej

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#### Abstract

This study seeks to demonstrate the usefulness of a relatively underutilized approach to studying *sustainable development* as a term and concept. While studies on sustainable development have generally followed a normative approach seeking what the term should ideally mean, this study follows a historical approach such as recommended by the historian of philosopher Quentin Skinner to explore what changes of definition it has been capable of undergoing in the actual use. To illustrate why such changes may be a critical issue, we have deliberately focused on the case of a country – South Korea – where the very translation of the term into the native language, combined with other factors, has resulted in sustainable development being generally understood by the public as meaning something quite different from the more normative understanding of the term. Instead of a balanced development that protects the environment and promotes social welfare as well as promoting economic growth, sustainable development in the standard Korean translation has come to be understood as simply meaning *continued economic growth*, which is to be sought even at the expense of environmental degradation. For documentation and analysis, we have relied on various methods, while focusing on key sectors and select policy areas, including energy. We conclude with further reflections on why an approach such as ours might be a useful methodological addition in sustainable development research.

**Key words:** sustainable development, conceptual history, language, translation, South Korea, economic growth, energy policy

#### Streszczenie

W tej pracy podejmujemy użyteczne i relatywnie rzadko stosowane podejście do zrównoważonego rozwoju, rozumianego zarówno jako pojęcie, jak i koncepcja. Zwykle dominuje tu podejście normatywne, w ramach którego poszukuje się idealnej definicji, my proponujemy podejście historyczne, zgodne z zaleceniami historyka i filozofa Quentina Skinnera, odnoszące się do przeszłych zmian w definiowaniu i ich wpływu na obecne rozumowanie. Aby zilustrować, jak bardzo takie zmiany mogą być istotne, celowo wybraliśmy jeden kraj, Koreę Południową, w którym nawet przetłumaczenie terminu *rozwój zrównoważony*, w powiązaniu z innymi czynnikami, powoduje jego odmienne (niż to obowiązujące w podejściu normatywnym) rozumienie przez społeczeństwo. Miast rozwoju gwarantującego ochronę środowiska i społeczną pomyślność i wzrost gospodarczy, w standardowym koreańskim tłumaczeniu termin ten jest rozumiany jako *trwały wzrost gospodarczy*, do którego należy dążyć nawet za cenę degradacji środowiska. W badaniach opieraliśmy się na różnych metodach, uwagę zwracając na kluczowe sektory

i obszary polityki, włączając w to kwestie energetyczne. Wykażemy, dlaczego takie podejście może być metodologicznie użytecznym dodatkiem do badań nad zrównoważonym rozwojem.

**Słowa kluczowe:** rozwój zrównoważony, historia konceptualna, język, tłumaczenie, Korea Południowa, wzrost gospodarczy, polityka energetyczna

## Introduction

Since 1987, when the UN World Commission on Environment and Development (WCED) formulated a working definition of sustainable development in a report that has come to be known as *Our Common Future*, there have been innumerable attempts to refine the concept suggested by the term (WCED, 1987). The general consensus among its proponents today is that sustainable development refers to a balanced development that satisfies the ecological and social imperatives along with the economic. Yet even with the general agreement that the ecological, social, and economic dimensions thus constitute the *three pillars* – three main rubrics – of sustainable development, views on what constitutes an ideal balance among them, let alone how to go about achieving it, have been notoriously varied.

Our intention in this article is not to attempt to formulate yet another definition of sustainable development. Our aim is rather to argue the necessity of a more rigorous attempt than hitherto at analyzing varying definitions of sustainable development that have been in use since 1987, and to illustrate the types of gains that could be expected from such a line of inquiry with a focused look at what we believe is a highly telling case study.

The general research problem that frames this article is in what ways the term and concept of sustainable development and their uses can vary fundamentally from country to country and, more specifically, from one language to another. The methodological grounding of our study has been inspired by *conceptual history* as practiced by the historian of philosophy Quentin Skinner. As he explains, there are two distinct approaches to refining our understanding of key concepts. One is the normative approach, where the participants engage in debates which are largely theoretical in nature, with a view to arriving at one true, normative meaning of a term like, say, liberty, justice, or sustainable development; another is the historical approach, which investigates the specific and varying ways in which the term has been used historically, with a view to documenting and analyzing the changes of meaning it has proven capable of in real-life circumstances and to ponder the contextual factors – political, social, economic, and so on – responsible for such permutations (Skinner, 2002). The premise of this article is that our understanding of the concept of sustainable development now has much to benefit from a historical and contextual analysis of this type. We have no intention of disputing the usefulness of the normative approach, which has been thus far the most prominent mode

of inquiry for exploring the concept. What we would like to suggest, is that the historical approach also has its uses, especially in encouraging us to address the types of questions we are not likely to through the normative approach. How has the term *sustainable development* been actually understood and used by governments and the general public in varying countries? How far have the government and public use and understanding of the term deviated from the normative definitions formulated by the experts? What accounts for the deviations and what have been some of the main obstacles to the normative understanding of *sustainable development* reaching the public? Have there been examples of such a misunderstanding and misappropriation of the term having practical policy consequences?

Answers to such questions will likely vary from country to country, and in this article we deliberately chose to focus on what is likely one of the extreme cases illustrating just how far the meaning of sustainable development can mutate in the actual use. Once a country with almost the lowest per-capita income in the world, South Korea has emerged as one of the most talked-about success stories among developmental economists, by becoming a developed industrial economy in an unprecedented amount of time. Since the 1990s, it has officially adopted sustainable development as its new development paradigm and, in recognition, was chosen in 2012 over Germany to host the headquarters of the UN Green Climate Fund.

What we seek to demonstrate in this article is that the most popular and influential definition of sustainable development in South Korea has been one that focuses more or less exclusively on the economic imperative, to the utter neglect of the ecological and social. As our analysis shows, this change in meaning has been due in no small part to a factor that has been seldom recognized by scholars and experts as a possible obstacle to propagating a proper understanding of sustainable development: linguistic. Even in English the word *sustainable* can have several meanings; as it is translated into non-Western languages, it can undergo even further changes of meaning, to the point where, as in the Korean case, the original intent behind the term *sustainable development* can all but disappear.

## How Sustainable Development Came To Be Understood as Meaning Continued Economic Growth in Korea

When the term *sustainable development* was first adopted by *Our Common Future*, it was largely as a

term signifying a compromise between the opposed viewpoints of the North (industrialized countries) and the South (developing countries). As became evident at UN Conference on the Human Environment in 1972, while environmental activists of the North had begun to argue the necessity of reining in economic growth in order to protect the environment, countries of the South generally regarded the focus on environmental protection as being misplaced, given that the elimination of poverty was a more urgent issue from their perspective (De Kruijf and Van Vuuren, 1998). The mission of WCED, World Commission on Environment and Development, created in 1983, was to find a solution that was acceptable to both. Its 1987 report *Our Common Future* thus described *sustainable development* as being based on two key concepts: first, the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; second, the idea of 'limitations' imposed by the state of technology and social organization on the environment's ability to meet present and future needs (WCED, 1987, p. 125). Put succinctly, it meant development – which the countries of the South needed – that was also ecologically sustainable.

When *sustainable development* first came to be discussed in South Korea, there was some dispute over how the term should be translated. According to the Oxford English Dictionary, the verb root *sustain* has 4 main definitions: (1) support, (2) uphold, (3) keep from failing, and (4) keep in being or continue. The Korean word that best captures the spirit of the first three definitions is *ji-taeng*, which implies supporting something with a considerable amount of effort. The word that has come to be used in the standard translation, however, is *ji-sok*, which simply means to continue. While this word roughly corresponds to the 4<sup>th</sup> definition of *sustain*, it has no connotation of supporting something with difficulty as *ji-taeng* does. In fact, when *sustainable development* is translated using *ji-sok*, there is absolutely nothing to suggest development that can be supported by the environment: it simply means development that is continuable. While since the early 1990s there have been some in Korea who have insisted on the use of *ji-taeng* precisely because of its ability to evoke issues pertaining to the environment (Moon, 1995, p. 3; Moon, 1997; Park, 2004), the Korean government has continued the use of *ji-sok*. When the Presidential Commission on Sustainable Development (PCSD) was established in 2000, for example, its Korean title contained *ji-sok*, rather than *ji-taeng*.

#### A. Uses of the Term in the Media

To further document the process whereby sustainable development came to be generally understood as meaning *continued economic growth* in South Korea, we first sampled the use of the term in the news media from the period from 1990 to 2011. Two major daily papers were selected for this purpose, based on three criteria. First, they had to rank among the

top seven papers in the country, according to the number of copies sold. Second, one should be known to represent a conservative viewpoint and the other liberal. Third, they had to be among those that have been indexed to allow analysis using the same search tool. The papers satisfying these requirements were the *Dong-A Daily News* (conservative) and *Kyung-Hyang Daily News* (liberal). The search engine used was KINDS (Korea Integrated News Database System), and four keywords were used, two containing *ji-taeng* and two containing *ji-sok*, to account for all possible variations in the translations of sustainable development into Korean.

(1) *Quantitative Analysis*. In the period 1990 to 2011, we found a total of 550 articles containing one of the four possible translations of the term sustainable development, with 266 in *Dong-A Daily* and 284 in *Kyung-Hyang Daily* (Fig.1). Translations containing *ji-sok* were overwhelmingly more numerous than those with *ji-taeng*. In fact, *ji-taeng* was used only once in *Dong-A Daily* and three times in *Kyung-Hyang* throughout the entire 20 year period, and all of them in the early 1990s. Though *Dong-A* is a well-known conservative newspaper and *Kyung-Hyang* is its liberal counterpart, there was thus no noticeable difference between the two.

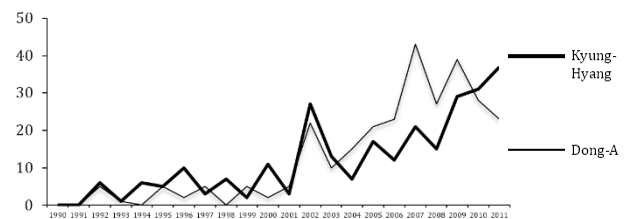


Figure 1. Counts of translations containing *ji-sok* in Dong-A Daily and Kyung-Hyang Daily from 1990 to 2011

2) *Content Analysis*. To examine what sustainable development in Korean translation has come to mean, we looked closely at the specific ways in which the term was used in the above newspaper articles from 1990 to 2011. In their June 3, 1992 coverage of the Rio Earth Summit of 1992 (United Nations Conference on Environment and Development or UNCED), both newspapers discussed environmental issues in connection with sustainable development, though the translation they used contained *ji-sok*. But after the early 1990s, as time went on, the discussion of environmental issues generally disappeared, and sustainable development came to be used largely in the sense of *continued economic growth*. In fact, we found it highly indicative, that some articles referred to sustainable development and environmental protection as representing two *opposite* agenda. Translated into English, some of the following passages can even seem absurd.

- ✓ Though dam construction might not be good for the environment, it is necessary for sustainable development (March 16, 1998, Dong-A Daily).

- ✓ *More than 70% of Korea consists of mountainous regions and it is a peninsula surrounded by sea. It is impossible to preserve all of the country's mountains and coastal swamps as 'Green Belt'. The environmental groups need a realistic sense of what should be set aside for environmental conservation, and what needs to be used for the country's sustainable development (September 24, 2003, Dong-A Daily).*
  - ✓ *Singapore, which is in many ways similarly situated as Korea, saw its per capital income double from \$10,000 in 1989 to \$20,000 five years later. (...) Even so, there is no guarantee that such developed countries will maintain their economic growth to ensure that they remain countries of sustainable development (April 29, 2005, Kyung-Hyang Daily).*
- From 2008 and on, when the government implemented a massive construction project named the *Four Great Rivers Project* to redevelop the country's largest rivers, sustainable development even came to be used as a term to justify the government's decision against the criticism of environmental groups that the project would be an ecological disaster.
- ✓ *The government began construction without an environmental impact report most likely because of the desperate need to stimulate the economy. (...) We need to transform our major rivers so that they become more useful to our citizens; they need to be made to feed Korea's sustainable development. (...) All politicians and citizens should refrain from making useless protests that could interfere with the project's timely progress (December 30, 2008, Dong-A Daily).*
  - ✓ *The country and its citizens cannot have sustainable development without certain values and virtues. Especially important to the general welfare of the nation are the efforts to protect the conservative values of democracy, the market economy, and constitutionalism (April 29, 2011, Dong-A Daily).*

#### B. Public Understanding of Sustainable Development Reflected in Government Surveys

For further evidence that sustainable development in the standard Korean translation has generally come to be understood to mean something quite different from *ecologically sustainable development*, we searched various government reports. Among them was a rare survey conducted in 2007 on the public understanding of the term sustainable development translated with *ji-sok*. The first question asked on the survey was whether they were aware of the significance of the term at all. Of 1000 subjects surveyed, only 253 answered in the positive (Fig. 2). To those who said they were aware of its significance, a second question was asked: what associations come to their mind when they hear the term (Tab. 1). The top five answers in the order of their popularity were: (1)

*steady and continuous development for the future* (16.6 percent); (2) *economic growth* (16.4 percent); (3) *improving the quality of life* (12.8 percent); (4) *preparation for the future* (7.1 percent); (5) *balanced development* (5.5 percent). The most popular answers were thus one version or another of *continued economic growth*, and apart from possible exception of the 5.5 percent who answered *balanced development*, *sustainable development* evoked no associations with environmental issues for those who participated in the survey.



Figure 2. Public Awareness of the Term Sustainable Development in 2007.

Note: Question: Are you aware of the significance of the term *sustainable development*?

Table 1. What the Public Associates Sustainable Development With

What Sustainable Development Means to the Public	Case	%
Steady and continuous development for future	42	16.6
Economic growth	39	16.4
Improving the quality of life	32	12.8
Future-oriented preparation	18	7.1
Balanced development	14	5.5

Note: N=253, who answered positive to the question in Figure 2 (5 % or more only)

#### The Rationale behind Government's Use of the Term: The Case of Energy Policy

Having established through various methods that sustainable development in the standard Korean translation is generally understood to mean *continued economic growth*, we have attempted an in-depth analysis of the rationale behind the government's decision to use the term in a sense that may be at variance with its true meaning and intent. To make an intensive analysis possible, we focused on one area of government policy which has been central to sustainable development debates, in South Korea as elsewhere: energy. What we have discovered is that the ambiguity of the term in Korean translation has been quite useful from the government perspective, allowing it to play up its commitment to *sustainable energy policy* as meaning *ecologically sustainable* when the context is appropriate, while its main objective has remained *sustainable energy policy* as meaning a policy to ensure a *continued and adequate supply of energy*, even if it means increased use of carbon-intensive energy sources like coal.

Since the late 1990s, sustainable development has been adopted as the central agenda of energy policy in South Korea. In 1997, the country started to use sustainable development as a key term in the first master plan for national energy (MTIE, 1997). Various master plans adopted thereafter made mention of the need for more use of renewable energy, reducing fossil fuel consumption and carbon emissions, distributing more renewable energy and nuclear power, and developing energy efficient technology (MCIE, 2002; PMO, 2008).

However, the trend in energy consumption in Korea has been moving in the opposite direction from what one would expect from the professed government energy policy. From 2001 to 2010, for example, the use of renewable energy increased, but only from 1.2% to 2.3% of the total primary energy supply, while the use of coal increased from 23% of the total to 28.9% (Fig. 3, 4). Energy used for the generation of electricity presents an even clearer picture (Fig. 5, 6). The first record of statistical data for renewable energy power generation, excluding hydroelectric power, was 0.1% in 2004. Renewable energy still counted for only 0.9% in 2010 (2.3% with hydroelectric power). Meanwhile, the percentage of coal powered generation increased from 38.7% in 2001 to 41.6% in 2010. Natural gas, which is considered a cleaner fossil fuel, increased from 10.7% to 20.4% in the same period. While the percentage of power generated by oil and nuclear energy has recently decreased, they have been replaced not by renewable energy sources, but with coal and natural gas. In fact, coal has contributed more than any other energy source to meet the national demand for electricity. Regarding this situation, many social and environmental scientists in Korea have been critical, claiming that the current energy policy more or less ignores environmental and social aspects of sustainability and that government's commitment to sustainable energy policy is in this sense simply rhetorical, and in the last analysis, just a tool for supporting economic growth (Kim, 1998; Yun 2002, 2008, 2009a, 2009b). Yet for the Korean government, ensuring a continued supply of adequate energy has always been the central objective of its energy policy. While the term used by energy experts for such an objective is *energy security*, *sustainable* translated into Korean with the use of the word *ji-sok* can also conveniently capture the same objective. *Sustainable energy* thus translated simply means energy supply that can be continued.

The origins of the Korean government's concern with energy security in fact go all the way back to the 1960s, when energy supply could not keep up with demand, because most of the power plants in Korea at the time happened to be in the Communist North, which became inaccessible to South Korea after the country's division. While South Korea first relied heavily on imported oil (up to 90% of electricity generation in 1977 and 62.8% of the total primary

energy supply in 1979), after the second oil shock of 1977 (KEEI, 1991), the diversification of energy sources to reduce dependence on oil became the focal point of its energy policy, and this came to mean increased dependence on coal, natural gas, and nuclear power to replace oil, which was an expensive and unreliable source of energy (MER, 1988; Kim, 2009). The central objective of the Korean government's energy policy thereafter remained creating a stable energy supply with a proper mixture of oil, coal, natural gas, and nuclear power (Kang, 2000; EPB, 1986).

By the 1990s, the government found a convenient new expression to convey this object and more: sustainable translated with *ji-sok* to mean continuable (Tab. 2).

Figure 3. The total primary energy supply (2001-2010) [1,000 TOE], source: KEEI, 2002, 2011

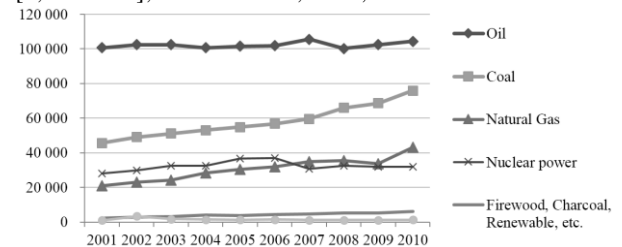


Figure 4. The total primary energy supply (2001-2010) [%], source: KEEI, 2002, 2011

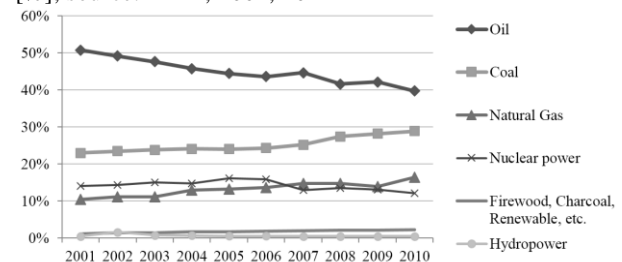


Figure 5. Energy Consumption for Electricity Generation (2001-2010) [GWh], source: KEEI, 2002, 2011

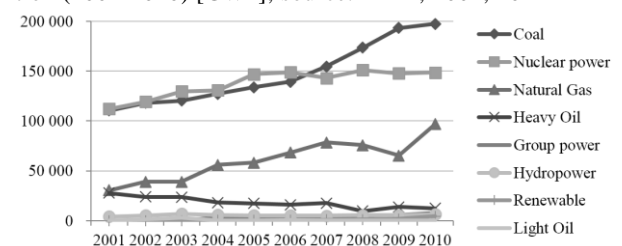


Figure 6. Energy Consumption for Electricity Generation (2001-2010) [%], Source: KEEI, 2002, 2011

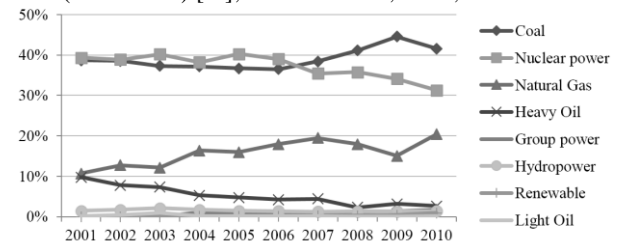


Table 2. Energy Plans before and after Sustainable Energy Policy, SOURCE: \* MER, 1988, p. 23-45, \*\* MCIE, 2002, \*\*\* PMO, 2008

Energy plan * after the 2nd oil shock in 1979	Master Energy Plan ** 2002	Master Energy Plan *** 2008
<p><i>Reduce Oil Dependence</i></p> <ul style="list-style-type: none"> <li>▪ The diversification of oil import routes</li> <li>▪ Increase oil reserve capacity</li> <li>▪ Oil exploration</li> <li>▪ Introduction to LNG and LPG</li> <li>▪ Non-oil power plant               <ul style="list-style-type: none"> <li>• More coal power plant</li> <li>• More nuclear power plant</li> <li>• Stop building oil power plant</li> <li>• Replace existing oil power plants with gas/coal power plants</li> </ul> </li> <li>▪ Development of renewable energy technology</li> <li>▪ Energy efficiency technology, and conservation</li> </ul>	<p><i>Sustainable Energy Policy</i></p> <ul style="list-style-type: none"> <li>▪ Stable energy supply</li> <li>• Diversification of oil import routes</li> <li>• Oil exploration</li> <li>• Plan for the oil reserve</li> <li>▪ Stable LNG import</li> <li>▪ Overseas resource development</li> <li>▪ Environment-friendly energy supply               <ul style="list-style-type: none"> <li>• More LPG and LNG</li> <li>• Low sulfur oil, clean coal tech.</li> <li>• Keep nuclear power plants</li> </ul> </li> <li>▪ Energy efficiency and conservation</li> <li>▪ Alternative energy distribution</li> <li>▪ Reduce oil dependence</li> </ul>	<p><i>Low Carbon and Green Growth</i></p> <ul style="list-style-type: none"> <li>▪ Stable energy supply</li> <li>▪ Overseas resources development</li> <li>▪ More nuclear power plant</li> <li>▪ Renewable energy distribution for energy security and environment</li> <li>▪ Energy efficiency and conservation</li> <li>▪ Ability to deal with climate change</li> <li>▪ New growth engine by energy technology innovation</li> <li>▪ Energy market improvement</li> </ul>

The Master Plan for National Energy adopted in 2002 even specified that *sustainability* was the new paradigm to replace *secure energy supply* (MCIE, 2002). In the discussion concerning energy policy in Korea, the term *sustainable* thus has had essentially two meanings. While the academics and other critics have insisted on it as meaning *ecologically sustainable*, the government has not considered it an inconsistency on its part in continuing to place emphasis on securing a *stable and continuous supply of energy*, and most importantly, there has been no indication of the public at large objecting to the government's energy policy, since it understands sustainable development as generally meaning *continued economic growth*.

## Conclusion

As stated, we have focused on South Korea as a case study because we suspect that it represents among the most extreme and hence among the most revealing cases demonstrating the relevance of the general research problem we proposed in the beginning: *in what ways the term and concept of sustainable development and their uses can vary fundamentally from country to country and, more specifically, from one language to another*. We feel that the approach such as ours can contribute to a better exploration and understanding of two of the top three issues that, according to Kevin Murphy, remain among the most urgent for the social pillar of sustainable development: *awareness for sustainability and participation* (Murphy, 2012). Moreover, having identified language and translation as possible contributing factors to the lack of awareness and participation, we have likely pinpointed a relatively little explored issue that may need to be tackled in carrying out the pop-

ular activist slogan *think globally, act locally*, especially in countries where the local language permits an ambiguous translation of the very term *sustainable development*.

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# A Curriculum on Sustainable Information Communication Technology

## Program zrównoważonej teleinformatyki (ICT)

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### Abstract

Economies are increasingly becoming dependent on Information Communication Technology (ICT) and concerns over sustainability have called for the investigation of the relation between sustainability and ICT. While the majority of the studies in this field have an environmentalist focus in this regard, technical, economical and societal concerns on sustainability have arisen in the last decade. Today, more and more studies are addressing the need for the inclusion of sustainability as a design goal for ICT development and for the systems that rely on ICT. Therefore, the integration of education on sustainability in the curriculum is imperative for current and future generations of professionals to accomplish this goal. In this paper, we propose a curriculum for sustainable ICT along with the expected learning outcomes and components. The course design is based on a multi-faceted approach that embraces different viewpoints on sustainability and aims to increase students' awareness of the complex nature of sustainability.

**Key words:** sustainability, Information Communication Technology, ICT, curriculum, professionals

### Streszczenie

Świat w coraz większym stopniu zależy od Teleinformatyki (Information Communication Technology, ICT). Warto zadać pytanie o relację pomiędzy zrównoważonym rozwojem a Teleinformatyką. Większość przeprowadzanych badań koncentruje się na aspektach środowiskowych, kwestie techniczne, ekonomiczne i społeczne pozostają w cieniu. Dziś jednak coraz częściej wyrażany jest postulat wskazujący na konieczność uwzględnienia aspektu zrównoważoności w tworzeniu systemów teleinformatycznych i w podsystemach, które są od nich zależne. Dlatego uwzględnienie w programie nauczania problematyki zrównoważoności stanowi imperatyw dla obecnych i przyszłych profesjonalistów.

W tym artykule proponujemy program dla zrównoważonej teleinformatyki, uwzględniający zarys treści programowych i efektów kształcenia. Program oparty jest na wieloaspektowym podejściu, obejmującym różne punkty widzenia, którego celem jest zrozumienie przez studentów złożoności problematyki zrównoważonego rozwoju.

**Słowa kluczowe:** zrównoważoność, teleinformatyka, ICT, program, profesjonaliści

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### 1. Introduction

The key challenges of the 21<sup>st</sup> century can mainly be characterized by their global impacts and Greenhouse Gases (GHG) effects. Climate change and sustainable development are only a few instances in this regard. *Sustainable IT* and, especially, *sustainable IT services* are terms that are becoming synonymous with an emerging second wave of green compu-

ting innovation (Harmon & Auseklis, 2009). They further argued that sustainable IT strategies are driving sustainability beyond just energy use and product considerations. Environmental issues impact IT business' competitive views in new ways and organizations, with the technology and vision to provide products and services that address environmental issues, will cherish such an edge along with financial and other benefits (Murugesan, 2008). He

also suggested that in future green use, disposal, design and manufacturing will be adopted. Harmon and Auseklis (2009) support the view that ecological issues, involving IT product and service design, supply chain optimization, and changes in processes to deal with e-waste, pollution, use of critical resources such as water, toxic materials, and air-shed – will need to be addressed in better detail. ICT infrastructure accounts for roughly 3 percent of global electricity consumption and the same percentage of greenhouse gases (Kumar & Mieritz, 2007). A Gartner study found that data centres, with their associated servers, air-conditioning, fans, pumps, uninterruptible power supply (UPS), and so on, use 100 times the energy per square foot of an office building (Capuccio & Craver, 2007).

Societal value calls upon organizations to build social responsibility and sustainability into their business practices (Savitz, 2012; Senge et al., 2008). According to Jenkin et al. (2011) Green IT and systems refer to initiatives and programs that directly or indirectly address environmental sustainability in organizations. Molla et al. (2009) also maintains that Green IT is emerging as an increasingly important issue, as organizations come under pressure to address environmental sustainability concerns. Green information technology (Green IT) is an emerging discipline and issues related with it are of growing concern for the business and have social and environmental impact (Mishra et al., 2011). Green IT can support, assist, and leverage other environmental initiatives by offering innovative modeling, simulation, and decision support tools such as software for analyzing, modeling, and simulating environmental impact, environmental risk management, platforms for eco-management, emission trading, ethical investing, auditing and reporting energy consumption, environmental knowledge management systems, including geographic information systems and environmental metadata standards, etc. (Murugesan, 2008). Akman & Mishra (2014) explored individuals' environmental behavioral intentions using the theory of planned behavior (TPB).

Business for Social Responsibility, a leading *corporate social responsibility* (CSR) association, defines societal value for businesses in terms of achieving commercial success in a manner that honors ethical values and respects people, communities, and the natural environment (M. E. Porter & Kramer, 2006). According to Donnellan et al. (2011) Sustainable ICT can develop solutions that offer benefits both internally and across the enterprise by:

- aligning all ICT processes and practices with the core principles of sustainability, which are to reduce, reuse, and recycle; and
- finding innovative ways to use ICT in business processes to deliver sustainability benefits across the enterprise and beyond.

There is an increasing interest in teaching sustainability in engineering and in ICT-related educational

programs. The growing concerns on the environment call for urgent action to renew programs and courses for sustainability (Desha, 2014; OECD, 2007). On the other hand, the search for sustainability also creates business and *green collar* job opportunities which require a skilled and knowledgeable work force (Deitche, 2010; Runciman, 2012; Worthington, 2012). In a study that investigates what final year engineering students know about sustainable development (Nicolaou & Conlon, 2012), it was shown that despite the inadequate personal commitment and knowledge with regard to sustainable development topics, engineering students recognize sustainable development as an important topic for their profession.

The term *sustainability* is highly dependent on one's adopted perspective, and there is a broad variety of such perspectives on Sustainability in ICT (Hilty & Aebischer, 2015; Penzenstadler & Femmer, 2012). Besides, the broad and complex nature of sustainability requires an understanding and analysis of the dynamic, non-linear, and long-term relations between the elements of a system extending beyond structural, linear and short-term relations (Easterbrook, 2014). Therefore, it is crucial to consider these factors in the approach to curriculum renewal for teaching sustainability (Warren et al., 2014).

Sustainability is becoming a significant emerging area in Information Technology (IT) as contribution of IT to safeguard our future, and as evolving market segment. IT's high productivity in combination with short life-cycles and, on the other hand, growing resource problems of our planet have the point that IT professionals should take their share of responsibility for sustainability. Therefore, there is a need to include the concept of sustainability in university curricula. Furthermore, the challenge is to motivate and interest students and faculty for sustainability, identify spheres of activity for IT professionals, build up competence fields for solutions, and incorporate the topic into the syllabi.

In this paper, a curriculum for sustainable ICT is proposed along with expected course outcomes. The course can be adopted by information technology, information system and inter disciplinary departments/centers. The rest of this paper is organized as follows: Section II provides an approach to course development and up-to-date information about the work carried out in this area. Section III illustrates the proposed curriculum and analysis of this work. Finally, Section IV concludes and highlights some of the future direction for the proposed course.

## 2. Approach to Sustainability in ICT Curriculum Development

Sustainability is a complex and multi-faceted term. The term has been used to refer to many different concepts and values in various contexts (Hilty & Aebischer, 2015; Pappas et al., 2013). Taking a sys-

tem thinking approach, which relies on three parameters of system (or resource): function and time horizon, once can define *sustainable use* in a ternary relation as the use of a system S with regard to a function F and a time horizon L, which means using S in a way that does not compromise its ability to fulfill F for a period L (Kaprawi et al., 2008). It is clear that the relativity of such a relation comes from the fact that it depends on how system S, function F, and time horizon L are defined in context (Hilty & Aebischer, 2015). On the other hand, values determine the expected qualities and emergent behavior of a system and its interaction with the surroundings (Dołęga, 2007; Penzenstadler & Femmer, 2012). For instance, the Brundtland Commission defines sustainable development as the *development that meets the needs of the present without compromising the ability of future generations to meet their own needs*, which emphasizes environmental conservation, poverty reduction, gender equity, and wealth redistribution as key values for sustainable development (Ahmed & Shuaib, 2012). Durdik et al. (2012) emphasize on an economic aspect and consider sustainability as the ability for cost-efficient maintenance and evolution of software systems. On the other hand, it can refer to a set of technical practices, principles and goals related to the design and manufacture of products (Software Sustainability Institute, 2015). Therefore, values, that stimulate the desire for sustainability, include various viewpoints of ecological, economic, societal, humanitarian or technical nature or their combinations (Penzenstadler & Femmer, 2012). These value domains are also in line with *five capitals* for sustainable development (Nicolaou & Conlon, 2012). Together, these value domains constitute an important dimension for understanding the relation between ICT and sustainability (Deitche, 2010; Hilty & Aebischer, 2015).

Many conceptual frameworks have been attempted to address ICT systematically in the context of sustainability (Hilty & Lohmann, 2013). Accordingly another core dimension of the relation between ICT and sustainability is the impact dimension of ICT which are given as first, second and third order effects (Cai, 2010; Hilty & Aebischer, 2015; Mann et al., 2010). The first order (or lifecycle) impact refers to the direct influences created by the physical existence and the processes involved including design, production, distribution, operation, maintenance and disposal of ICT systems and their components. The second order (or Enabling) impact refers to actions that are enabled by the application of ICT, such as stimulating consumption of other resources (induction effect), shortening the useful life of another resource (obsolescence effect), replacing the use of another resource (substitution effect), or reducing the use of another resource (optimization effect). The third order (or systemic) impact refers to persistent, long-term and macro-level ICT impacts in the reac-

tion of the dynamic socio-economic systems, such as changes in the culture, economy, corporate structures, or law.

Sustainability is an emergent property of a system; thus, one needs not only to understand the elements of a system, but also the relations and feedback mechanisms within that system. Systems thinking is one of the well-founded approaches to understanding sustainability and is a topic taught in the related courses (Badurdeen et al., 2013; Connell et al., 2012; Martin et al., 2005; T. B. Porter, 2008; Sterling, 2003). It is a framework for seeing interrelationships rather than its elements and seeing patterns of change rather than mere static snapshots (Senge, 1997). Systems thinking approach is particularly useful for ICT related discipline students. Easterbrook (2014) argues that systems thinking provides a domain ontology and a conceptual basis for reasoning about sustainability and transformational change. Additionally, it proposes a set of methods for critical thinking about the social and environmental impacts of technology. The author further argues that the reductionism of computational thinking offers an inadequate approach to dealing with systemic problems including sustainability, inducing blindness to issues such as the social and environmental impacts of ICT. Finally, it is suggested to include systems thinking concepts into the undergraduate curriculum for computer and information sciences.

It has been more than 20 years since the initial calls for integrating sustainability issues into educational curricula were made. The increasing growth of ICT dependent industries and economies drive researchers and practitioners to investigate ICT-Sustainability relationship and transfer the accumulated knowledge to next generation engineers, who play a significant role in the design and use of systems. However, an undergraduate curriculum renewal can be estimated to take 15-20 years to adopt and fully integrate a substantial new set of knowledge and skills (Desha, 2013). Bearing in mind the inclusion of on the job training, it will be some 2-3 decades before students graduating from fully integrated programs will be in decision-making positions using current methods (Desha, 2013). Therefore it is very crucial to develop educational materials and design effective courses in the subject matters.

There are a number of studies that propose methods and models for the renewal of higher education curricula and teaching sustainability in engineering programs (Cai, 2010; Desha, 2013; Heeney & Foster, 2010; Kaprawi et al., 2008; Mann et al., 2010) and report experiences and evaluated changes to curriculum (Ahmed & Shuaib, 2012; Ferrer-Balas et al., 2008; McGarr, 2010). Several others propose teaching sustainability ICT-related engineering programs. Cai (2010) suggested options and strategies for sustainability integration in computing. In the paper, Cai describes a course that includes mainly green

computing topics, those that concentrate on energy efficiency, waste disposal and recycling. Besides, two modules (Server virtualization and Green computing introductory modules) are introduced that can be integrated into other courses. In a recent study, Issa et.al. (2014) discuss the development and delivery of a new graduate seminar course in master's degree in the School of Information Systems dealing with the significance of sustainability and Green IT. The course aims to raise students' awareness of sustainability and Green IT along with sustainability strategies. The course structure comprises paper readings, reporting, presentations and collaborative writing; thus, it is not topic-oriented. Worthington (2012) presents an online green computing course for the Australian Computer Society Computer Professional Education Program. The course topics cover how to assess, and develop strategies to reduce the carbon footprint and materials' use of the ICT operations of an organization. British Computer Society also has a similar foundation course in Green IT as part of a certification program which covers topics that deal with cover carbon footprint and energy efficiency while extending it to include the role of IT in greening other processes and activities within an organization (BSC, 2011).

Our approach to teaching sustainability in ICT programs is based on important and inherent properties of sustainability summarized above. Firstly, it embraces not only the environmentalist perspective, but also technical, economic, humanitarian and societal concerns on sustainability. Second, we follow the systems thinking paradigm and infuse the idea across the proposed curriculum topics. More specifically, a bi-focal analysis of the effects of ICT on sustainability will provide a sound basis for improving sustainability seeing both the forest and the trees. Put in a different way, a good sustainability analysis should be based on the details of the individual and isolated ICT effects within the system and should see this problem system as part of another system that influences it.

Based on this approach, we propose the following learning outcomes for the curriculum:

- Develop an understanding of broad and complex nature of sustainability (LO1);
- Develop an ability to evaluate and assess the impact of ICT in multiple dimensions in a systemic way (LO2);
- Gain insight into frequently addressed ICT topics in the sustainability literacy (LO3);
- Increase the ability in modeling and analyzing systems for sustainability in complex settings (LO4); and
- Recognize the importance of sustainability in profession and generate commitment at a personal level (LO5).

### 3. The Proposed Curriculum

Our aim in this study is to provide educators with a sustainability course that investigates its relation to ICT, so that future generations of professionals in various ICT-fields will be able to design and operate systems with due regard for the topics. The following topics are proposed in order to achieve the learning outcomes of this course:

- **Key Concepts in Sustainability (T1)**

In this topic, students will learn key terms and core concepts in sustainability theory, discourse and practice such as sustainable development, dematerialization, resource-use hierarchy, recycling, etc.

- **Sustainability Value dimensions: societal, technical, economic and ecological values (T2)**

Here, students will learn about different viewpoints and concerns for sustainability and further seek answers to questions as to which systems (or resources) to sustain and why to do so.

- **Systems Thinking (T3)**

This topic aims the introduction of the System Thinking paradigm with the additional sub topics to include certain concepts (e.g., emergence, open systems, feedback, cohesion), principles (e.g., separation concerns, abstraction, holism) and patterns (e.g., specialization, generalization, composition, aggregation) to be presented and discussed with a reference to structured educational guides such as *The Guide to the Systems Engineering Body of Knowledge* (BKCASE Editorial Board, 2014)

- **Systems Dynamics Modeling (T4)**

System dynamics (SD) is a methodology and mathematical modeling technique for framing, understanding, and discussing complex issues and problems (Forrester, 1994). SD utilizes modeling and simulation software to study the behavior of systems over time and enables the application of systems thinking approach to sustainability problems. This topic will complement this approach and provide students with an ability to apply it for sustainability analysis using SD simulation and modeling tools.

- **Green IT (T5)**

Green IT is a set of principles and practices that aims at environmentally friendly ICT. Under this topic, students will gain insight into the relation between ICT product/service life-cycles and environmental concerns such as energy consumption, waste reduction, and recycling. Here, the role of process improvement will be emphasized since sustainability cannot be achieved by improving energy efficiency and recycling

but also reducing the use of resources. In addition, students will critically evaluate certain technologies such as virtualization in a *green* context.

- **ICT for Sustainability (T6)**

ICT is an enabler of the studies for sustainability providing tools and techniques for domains of sustainability studies such as Environmental Informatics, Computational Sustainability, and Sustainable Human Computer Interaction. In this lecture, students will learn about a set of selected tools and techniques that are used in sustainability studies such as Environmental Information Systems, Machine Learning and Modeling Tools (Hilty & Aebischer, 2015).

- **Ethics and Sustainability (T7)**

All sustainability studies are driven by principles which, in turn, require an understanding and questioning human values and practices. Therefore, ethical consideration of sustainability is fundamental, and there is increasing recognition for the importance of ethics component in educational materials (Dahl, 2015). In this respect, a set of principles have been gathered in forms of *Codes of practice* for engineers and published by different institutions (Desha, 2013). In this topic, students will learn about ethical considerations for sustainability such as environmental protection, biological and cultural diversity, distributive justice, peace, security, human rights, and equality.

Table 1 provides a mapping of the contribution of the sustainability topics to the learning outcomes in terms of primary (P) and secondary (S) degrees.

Table 1. Mapping of Topics and Learning Outcomes

	LO1	LO2	LO3	LO4	LO5
T1: Key Concepts in Sustainability	P	S	S	S	S
T2: Sustainability Value Dimensions	S	P			P
T3: Systems Thinking	P	P		P	
T4: Systems Dynamics Modeling		P		P	
T5: Green IT			P		S
T6: ICT for Sustainability		S	P	S	
T7: Ethics and Sustainability			S		P

#### 4. Teaching Techniques

The primary teaching technique used in this course will be collaborative problem-solving. The selection of the collaboration based problem solving pedagogical approach is motivated by the fact that Sustainability in ICT is a relatively new concept and students may not have a clear view about it. Therefore, this approach will increase their abilities in understanding and communicating within a group setting as well as defining the main issues related to sustainability, and proposing solutions. In the interactive lecture sessions students can be engaged in applying the concepts in class assignments, solutions and discussions and also providing feedback to the instructor. In turn, instructor provides an overview of sustainability and its relation to ICT and contemporary issues. Alternatively in such sessions, speakers from faculty and industry can present sustainability problems, solutions to problems and their experience. Field visits can be arranged to ICT organizations which have adopted useful practices to sustain their businesses which have developed an understanding of the elements of ICT and their inter-relations.

There are two main approaches taken to infuse sustainability issues into high-degree ICT programs: centralized and distributed (Cai, 2010; Mann et al., 2010). The proposed course has a centralized design, such that there is a strong cohesion and dependency between topics. It requires essential knowledge in ICT development and use; thus, it may not be applicable to non-ICT programs as a whole. However, several selected topics can be integrated into other courses in a distributed fashion. For instance, the Green IT topic (T5) can be integrated into IS/ Software Design and Process Improvement courses. Topics T1 and T2 are generic; as such, they can be integrated into engineering courses to achieve LO1. Systems Dynamics Modeling (T4), Systems Thinking (T3) topics are frequently included in engineering program curriculums such as Systems Engineering and Industrial Engineering. The selected topics from the proposed course can be integrated into these curricula so that Systems Thinking and System Dynamics can be applied within sustainability and ICT contexts, thereby creating awareness of the topics in similar programs. In the proposed course, evaluation will be performed based on assignments, case studies, mid-term and final exams in order to assess students' achievement in understanding course outcomes.

#### 5. Conclusions

Sustainability and green IT study in computing is not only critical and imminent for the long-term benefit of human beings, but also has the potential to attract more students to this area due to its indispensable significance for future. Over the past few years, green computing has received an increasing amount



of attention since it is considered as one of the critical factors for protecting the environment (Mishra & Akman, 2014). In this paper, a sustainability curriculum that can be integrated into ICT-related disciplines is proposed. The curriculum aims to support educators and educational institutes to transfer current theory and practice on sustainability to their programs. In the proposal, a balance between theoretical and practical topics is maintained so that students will be aware of current focus of ICT sustainability and can apply their knowledge and skills in various contexts. The systems' complexity is increasing and as more and more systems rely on ICT components, it requires multi-disciplinary knowledge in their design and analysis. Therefore, in the near future, it is expected that studies from any sustainability perspective will require ICT professionals to have skills and knowledge to handle such complexity. Mishra et al. (2014) supported that ICT professionals with positive intentions towards Green IT issues are actually practicing it in their work and Theory of Reasoned Action (TRA) is in favor of GIT adoption in organizations. The adoption of the proposed course will be a first step in this direction. It is also anticipated that the course will stimulate research projects, theses as well as undergraduate research opportunities. Students will take advantage of the course in achieving sustainability goals of industrial projects after graduation. Future offerings of this course will emphasize on problems and techniques regarding ICT sub-domains such as Software Engineering, Information Systems Engineering and Computer Engineering. The organization of the course will evolve into a framework maintaining the current topics as core and extending it with discipline specific topics.

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# The Holistic Concept of Sustainable Development in Strategies of Polish Voivodeships to the Year 2020

## Holistyczna koncepcja zrównoważonego rozwoju w strategiach polskich województw do roku 2020

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### Abstract

This paper presents the development strategies of the sixteen Polish voivodeships, taking into account the comprehensive concept of sustainable development, that integrates three dimensions: social, economic and ecological one. Depending on the results of this analysis, regional strategies have been divided into three categories: strategies beyond the paradigm of sustainable development, strategies beside the paradigm of sustainable development and strategies towards the sustainable development paradigm. The analysis of *Europe 2020* strategy has also been carried out in terms of its focus on sustainability and impact on the strategies of European Union Member States and their regions.

**Key words:** sustainable development, development strategy, European Union, Polish voivodeships

### Streszczenie

W niniejszym artykule zaprezentowano strategie rozwojowe szesnastu polskich województw, w kontekście całościowej koncepcji zrównoważonego rozwoju integrującej trzy wymiary: społeczny, gospodarczy i ekologiczny. W zależności od wyników tej analizy, strategie wojewódzkie podzielone zostały na trzy kategorie: strategie poza paradygmatem zrównoważonego rozwoju, strategie obok paradygmatu zrównoważonego rozwoju oraz strategie w kierunku paradygmatu zrównoważonego rozwoju. Przeprowadzono także analizę strategii *Europa 2020* w zakresie jej ukierunkowania na rozwój zrównoważony oraz wpływu na strategie państw członkowskich Unii Europejskiej i ich regionów.

**Słowa kluczowe:** zrównoważony rozwój, strategia rozwoju, Unia Europejska, województwa polskie

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### Introduction

In this paper, sixteen strategies of Polish voivodeships have been analysed, in the context of taking into account, in a holistic manner, the concept of sustainable development. In the holistic paradigm of sustainability only an integrated approach to three dimensions: social, economic and ecological, allows to achieve such development. The main research question of the paper is: whether in Poland we are dealing with a holistic approach to sustainable development or not?

Let's begin with the European context. The development of policies of the EU Member States means

interventionism, which is aimed at increasing the productive potential of economy in order to improve its competitiveness. Competitive economy is seen as a determinant of social welfare. The area of development policy is a region, while the direction of the policy is determined by a supranational organisation – the European Union. Therefore, Member States' strategies are modeled on *Lisbon Agenda* (European Council, 2000), and the strategy *Europe 2020* (European Commission, 2010). The national strategies imply the regional ones, in Poland it is the *National Development Strategy 2020* (2012).

The most important strategic document of the European Union is currently the *Europe 2020. Strategy*

for *Smart, Sustainable and Inclusive Growth* (EC, 2010). The strategy is a long-term socio-economic program. The assumptions are, in fact, not conducive to sustainable development. The fundamental problem, which influences all defined goals and means of achieving them, is the separation of economic, environmental and social issues, as well as passing to the category of sustainable development only the first two.

The division was further strengthened by dividing the overarching priorities of the new EU strategy:

- smart growth – developing an economy based on knowledge and innovation;
- sustainable growth – the promotion of sustainable management, resource efficient and competitive at the same time, capable of sustainable development;
- inclusive growth – strengthening the economy characterised by high employment, as well as, the economic, social and territorial cohesion.

Unacceptable is the fact, that in *Europe 2020* strategy the only measure of social development remains GDP, despite the fact, that GDP does not distinguish between the costs and benefits, sums up all the money spent on the final products and services included in economic activity. The measure does not also introduce a distinction between an increase in amount and improvement in quality, which is crucial for stable national economy.

*The National Development Strategy 2020. Active society, competitive economy, efficient state* approved by the Council of Ministers on 25 September 2012 is the basis of all medium term strategies until 2020. The Polish elements (determined by the EU guidelines) are institutional transformation fusing efficient state, exemplification of which will be a higher quality of public institutions and the active role of social capital. The strategy assumes an effective socio-economic development, economic, social cohesion and territorial cohesion, as well as creating the conditions for exploiting the potential of economy and society (Council of Ministers of the Republic of Poland, 2012).

The European Union is a supranational organisation uniting countries at different levels of socio-economic development. Standards, which has been established were tailored to the level of highly developed countries, so possible to implement in societies, that have already achieved prosperity and welfare and now strive for well-being. The analysis of the development strategy of Polish voivodeships in terms of interpretation and feasibility of the sustainable development concept, will also answer the question whether Poland is already a developed country or still a growing one, despite functioning under the aegis of the European Union.

The division of the article into subsection is not proportional, but adapted to the factual division established at work: strategies beyond the paradigm of

sustainable development, strategies beside the paradigm of sustainable development – taking into account one dimension of the phenomenon and strategies pursuing towards sustainable development. The analysis of each strategy was preceded by a brief characteristics of the region.

Social research methods applied in this paper include: descriptive method, analysis of official documents and comparative studies. The sources used for characterisation of the voivodeships were created at the same time as the analysed strategies: *Statistical Yearbook of Voivodeships 2010*, *Statistical Demographic Yearbook 2011*, *Yearbook of Labour Statistics 2010* (Central Statistical Office 2010, 2011). It is worth noting however, that over the last few years, there have not been significant changes in the statistics.

## 1. Strategies beyond the paradigm of sustainable development

### 1.1. Lower Silesia Voivodeship Development Strategy 2020

Lower Silesia Voivodeship: area of 19 947 km<sup>2</sup>, population of 2 877.8 MM; urbanised region, with a low share of employment in agriculture, high rate of economic growth and high incomes.

The strategy (Lower Silesia Marshal Office, 2013) is missing sustainable development among the principles and practices, the only *must have* principle is the preservation of cultural and natural heritage for future generations. But we should not forget, that social and economic policies, that have been conducted for years in the region, have led to environmental degradation. The irrefutable proof are the results of the analysis of particulate matter PM<sub>2.5</sub> and PM<sub>10</sub>, made under the State Environmental Monitoring in Lower Silesia in 2011-2012, which showed a significant excess of the average concentration, which increases the risk of respiratory diseases and cardiovascular (Regional Inspectorate for Environmental Protection, 2013). Regional authorities' policy has also led to the dependence of human and social capital of circulating speculative capital (wrongly identified with investment) and to legitimising economic activities based on dirty technologies, expelled from the highly developed countries.

It is worth mentioning, that progress of strategic objectives in the field of sustainable development in the present strategy of Lower Silesia is not noticeable in comparison to the previous strategy, where sustainable development was identified with the pursuit and comprehensive integration of various strategic actions.

### 1.2 Lublin Voivodeship Development Strategy for 2014-2020, with a View to 2030

Lublin Voivodeship: area of 25 122 km<sup>2</sup>, population of 2 151.9 MM; one of the three least urbanised re-

gions in Poland, with the highest ratio of employed in agriculture and one of the poorest in the country. The authors of Lublin voivodeship strategy (Lublin Marshal Office, 2013) posted an ideologically characterised, devoid of pro-social orientation, regional tactics of sustainable development, trying to define the phenomenon originally: *we often use very simplistic understanding of sustainable development as the one that eliminates the differences between the various socio-professional groups or areas. These differences cannot be eliminated though, they are natural feature of any social system of government, and identifying the existing differences as excessive is authorised only after identifying what kind of differences are acceptable, which is obviously difficult because of the lack of clear criteria in this regard. In addition, the state of sustainable development is basically unreachable, because of the tension and imbalances, that are inherent feature of development process, which involves making permanent changes in the structure of government social system. Therefore, this strategy is subordinated to the principle of development equilibration, that reflects the dynamic of development processes* (p. 7).

The attitude of the decision makers in Lublin voivodeship in terms of striving for sustainability through equilibration, can be characterised as follows: they declare their willingness to engage in a process of sustainable development, since these are the guidelines of the European Union, however they do not believe in effectiveness of the planned activities. The authors emphasise the adaptive activities rather, than the innovative ones. Among the thematic objectives CSF 2014-2020, there is *promotion of adaptation to climate change* (p. 8). This attitude was not reasoned enough in the strategy. Perhaps the authors pay homage to the theory, that a major factor in the climate change is nature itself, so we can only adjust to these changes, adapting the national economy, as well as, the social and political aspects of societies functioning (Lachenbruch & Marschall, 1986).

A significant drawback of the strategy, in the context of holistic sustainable development, is misunderstanding of contemporary social issues. The authors indicate that the Lublin Voivodeship has got the highest indicator of the risk of poverty in Poland (30%). Social exclusion is mentioned in the strategy as a separate problem as if it has been forgotten, that poverty was a key factor of exclusion. Then the authors pointed out the social and professional activity of marginalised people, improving access and quality of public services and development of social economy as a form of exclusion prevention. Thus, the social exclusion has been equated with marginalisation, and these are, after all, phenomena of different provenance. Moreover, in this concept of combating poverty, a growing phenomenon of employed people poverty due to low wages, has been overlooked. At the end, the authors mentioned the need

to increase social participation as a basic condition for development of civil society and reducing the size of negative social phenomena (p. 71).

The proposed direction of regional social policy does not fit in any development strategy, since it deals with the planned compensation activities and the compensation of negative social phenomena is transferred in this document mainly to civil society institutions.

The problem with understanding the complexity of the phenomenon of sustainable development has been already highlighted in the strategy of Lublin voivodeship 2000. In this strategy it has been noted that *one of the most important conditions for multi-laterally sustainable voivodeship development is to improve the social and economic situation in the country, mainly in agriculture*. Since 2000, there has not been any evolution of the perception of the regional sustainable development.

### 1.3. Pomeranian Voivodeship Development Strategy 2020

Pomeranian Voivodeship: area of 18 310 km<sup>2</sup>, population of 2 240.3 MM; region with one of the lowest percentages of people working in agriculture and one of the highest employment in the service sector; with an average growth rate, high wages and incomes.

In the Strategy of Pomeranian Voivodeship (Pomeranian Marshal Office, 2013) the support for the concept of sustainable development has been declared on the occasion of specifying the principles of strategy: *The achievement of living standards lasting improvement requires the sustainable development, implemented by providing social, environmental and spatial equilibrium* (p. 24).

Then, the authors emphasise, that the strategic interest of the voivodeship is to provide elementary conditions for a stable, long-term and sustainable development. However, the way in which the implementation of the sustainability idea is understood, leaves doubts. According to the authorities of the region, in order to achieve sustainable development, it is necessary to lay the foundation for a high mobility of the inhabitants, the smooth flow of goods and energy, based on effective functioning (smart) network and infrastructure systems (p. 52). These solutions will certainly contribute to economic growth, but do not determine its sustainability. Once again, overall, combining all the constitutive dimensions of sustainable development, was used in an opportunistic manner. The well-being-oriented idea, which consists of social justice, ecology and rational management, in this context, is legitimising any action (as evidenced by the above description) promoting the development of the region.

### 1.4. Silesian Voivodeship Development Strategy 'Silesian 2020+'

Silesian Voivodeship: area of 12 333 km<sup>2</sup>, the population of 4 635.9 MM; most urbanised region in Po-

land, with the lowest percentage of people employed in agriculture and the highest employment in industry, with an average growth rate, high wages and incomes, as well as low unemployment rate.

In the strategy of Silesian voivodeship (Silesia Marshal Office, 2013) sustainable development appears in the context of multifunctional forest management (course of action B.2.7) and spatial planning. Forests are presented in the strategy as a key element of ecological security of the country, hence a policy and forest management were raised to the rank of strategic. It was also found, that *forest management must be done in a sustainable way from the economic, environmental, social and cultural point of view* (p. 69).

In the context of spatial planning, the authors refer to the *Leipzig Charter* – a document of the European Union, which provides a framework for cooperation in the field of urban development policy, defining common principles and strategies in this area, taking into account the historical, economic, social and environmental aspects of European cities (p. 180). The authors predict that *'Regional Spatial Development Plan of Silesian Voivodeship' will be playing for the next several years a crucial role in controlling the future of the region, so as to make an optimum use of existing resources and opportunities, providing long-term sustainable development of the region* (p. 183).

In the strategy of Silesian Voivodeship, as well as in other regional strategies beyond the paradigm of sustainable development, the authors mention social cohesion, prevention of social exclusion, poverty reduction, however they do not connect these issues with sustainable development, do not indicate the entities that should be responsible for different aspects of socially sustainable development. With this kind of development problems, focusing on forestry and spatial management is definitely not enough for the region to be called sustainable. While in the *Silesian Strategy of 2000* the aspect of sustainable development has been completely omitted, in the most recent one the term appears, however the definitional scope proposed by the authors is too narrow.

#### 1.5. Kuyavian-Pomeranian Voivodeship Strategy 2020 – modernization plan 2020+

Kuyavian-Pomeranian Voivodeship: area of 17 972 km<sup>2</sup>, population of 2 069.5 MM; region with a high percentage of people living in rural areas and working in agriculture, as well as with high proportion of people living in urban area with population over 100,000; with the growth rate below the national average.

A broad analysis of the socio-economic situation of the region included in the strategy (Kuyavian-Pomeranian Marshall Office, 2013) was deprived of the context of sustainable development. It contains only a reference to the fact that *any action at the stage of planning, programming and implementation of pro-*

*jects (including the finances) must take into account, regardless of the fulfillment of the obligations required by the regulations, the impact and optimization of each task in terms of sustainability and space order. In planning activities in each program one should take into account the horizontal objectives and seek synergy of social, economic and environmental conditions* (p. 55). The statement precedes a list of activities, mainly investments, during which attention should be paid to the issues of maintaining the development equilibrium. The authors do not write about it directly, but the way in which the socio-economic problems of the region has been presented shows, that developmentally delayed Kuyavian-Pomeranian voivodeship, cannot afford to implement the idea of sustainable development.

## 2. Strategies beside the paradigm of sustainable development

### 2.1. Świętokrzyskie Voivodeship Development Strategy until 2020

Świętokrzyskie Voivodeship: area of 11 711 km<sup>2</sup>, population 1 266.0 MM; one of the least urbanised regions in Poland, with a very high percentage of people employed in agriculture, high dynamics of economic growth, as well as with low wages and incomes.

The authors of Świętokrzyskie voivodeship development strategy (Świętokrzyskie Marshal Office, 2006) rely on the *'Lisbon Strategy'*, *Świętokrzyskie, belonging to the five poorest regions in Poland and European Union, sees the actual chances of development in the implementation of the EU cohesion policy and the objectives of the revised 'Lisbon Strategy'* (p. 4) and to the concept of sustainable development: *The document 'Świętokrzyskie Regional Strategy 2020' has been developed taking into account the principle of sustainable development, understood as a balance between the economic, social and environmental issues* (p. 5). However, this strategy definitely does not contribute to the increase of awareness and action for a coherent perception of these three areas.

In the area of social and economic life, it is more about the proportional development of the region, than the balanced one.

At the stage of creating the strategy the basic principles have been adopted to be used also at the stage of implementation. Principle 2: *Socio-economic development carried out in order to ensure the possibility of satisfying the basic needs of the local community (both contemporary and future generations), takes into account the sustainability of nature, balancing the opportunities of access to the environment and the sustainability of basic natural processes; it implies the need for preference and strengthen the development of such processes, which will contribute to reduction of the use of resources in general, and in particular the non-renewable ones,*



as well as waste and pollution minimization. Principle 3 refers to the creation of conditions for sustainable development, in order to ensure the proper functioning of ecological systems (p. 94).

Świętokrzyskie voivodeship strategy refers only to the environmental dimension of sustainable development. The only social element, borrowed from the *Lisbon Strategy* – present and future generations – has not been sufficiently exposed.

## 2.2. Opole Voivodeship Development Strategy until 2020

Opole Voivodeship: area of 9 412 km<sup>2</sup>, population of 1 028.6 MM; region with a high percentage of people living in rural areas and with an average level of employment in agriculture, as well as with high economic growth, medium wages and incomes.

The strategy (Opole Marshal Office, 2012) includes numerous references to the priorities of *Europe 2020*, however, the term *sustainable* appears in the Opole voivodeship strategy mainly in the context of territorial sustainability and sustainable cities. The strategy shows, that the responsibility for the implementation of operational objective 7.3: *shaping the natural system, the protection of landscape and biodiversity* is transferred only to state institutions. Authors did not take into account the impact of economic operators and their responsibilities in terms of development and protection of the natural environment. It was limited to a general statement that *all activities connected with improving socio-economic conditions should take into account the environmental and spatial consequences, according to the concept of sustainable development* (p. 117). Moreover, this observation indicates a lack of understanding of the holistic concept of sustainability: can the actions aimed at improving socio-economic conditions be a subject of negative consequences for the environment?

The definition of sustainable development proposed by the Opole voivodeship, is presented in the section on the strategy principles and is narrowed to integrating the objectives and requirements of environmental protection into other policies, strategies and actions (p. 129). However it is not specified what kind of policies, strategies and action are concerned.

## 2.3 Development Strategy of Voivodeship – the Subcarpathian 2020

Subcarpathian Voivodeship: area of 17 845 km<sup>2</sup>, population of 2 103.5 MM; Polish least urbanised region with a high proportion of people employed in agriculture, low economic growth, as well as low wages and incomes.

The strategic objectives of the Subcarpathian voivodeship (Subcarpathian Marshal Office, 2013) aimed at sustainable development is focusing mainly on protection of the environment and preservation of biodiversity (p. 75). The limitation to only one dimension of sustainable development is particularly

surprising in the context of the adopted definition of sustainable development, as the socio-economic development that meets the basic needs of all people and preserves, protects and restores health and integrity of the Earth's ecosystem, without jeopardizing the ability to satisfy the needs of future generations and without exceeding the long-term capacity of the Earth's ecosystem boundaries (p. 114).

## 2.4 Podlachia Voivodeship Development Strategy by 2020

Podlachia Voivodeship: area of 20 187 km<sup>2</sup>, population of 1 188.3 MM; region with an average share of the population living in rural areas, one of the highest shares of employment in agriculture, average level of economic growth and low level of wages and incomes.

The authors of Podlachia voivodeship strategy (Podlachia Marshal Office, 2013) undertook a mission to raise environmental awareness. This process, according to the decision makers, *starts with the early education of children and young people, but should cover all stages of human life, if the environment is to become one of the most important strengths used for socio-economic development*. Relying on nationwide study, the authors indicate, that one of the basic training needs of public administration is the training in municipal management and environmental protection. Larger competencies of the officials enabling professional service are believed to be helpful in obtaining new investments in protected areas (p. 18-19).

The second area of involvement is the protection and rational use of natural resources, so as to ensure their availability for future generations. It has been underlined that *the current unsustainable patterns of production have a negative impact on the environment (especially on the quality of air, water, soil and biodiversity) and thus on health and quality of life. It is therefore necessary to shift to a resource efficient development, rationalizing the use of environmental resources and well thought compensatory measures. A healthy natural environment is as important for the quality of life, as for the state of the economy or social factors* (p. 48).

After this very important declaration the main lines of intervention have been pointed out:

- environmental education and an increase of social pro-environment activity;
- protection of the air, soil, water and other resources;
- an efficient waste management system;
- low-carbon economy (including energy efficiency);
- protection of natural resources and landscape values, as well as the rehabilitation of the degraded ecosystems.

The declared emphasis on compensation, that should be enforced from those causing the damage, did not find its exemplification in the directions of interven-

tion. It is hard not to agree with the authors that the natural environment is as important to quality of life, as the economic and social factors, but only in the combination of these three dimensions it will be possible to ensure welfare within the framework of sustainable development.

#### 2.5. Lodz Voivodeship Development Strategy for 2007-2020

Lodz Voivodeship: area of 18 219 km<sup>2</sup>, population of 2 534.4 MM; agglomeration of Lodz highly urbanised and industrialised; a region with a high level of employment in agriculture and low in the service sector, with medium level of wages and incomes.

In Lodz voivodeship sustainable development has been described in the context of rural areas (Lodz Marshal Office, 2006). The authors have drawn attention to the following aspects, including them in the strategic objectives:

- protection and improvement of the environment, as well as the prevention of natural and anthropogenic risks;
- sustainable development of natural resources;
- raising the environmental awareness.

Planned activities in this area include:

- implementation of water and sewage system;
- use of renewable energy sources;
- selective collection, recovery and disposal of waste (especially municipal and hazardous waste);
- protection against flooding;
- non-ionizing radiation protection;
- reduction of emissions to the atmosphere;
- improving of the surface and groundwater water quality;
- increase in forest cover;
- protection of soils;
- rehabilitation of mining abandoned and degraded areas;
- increase in water resources of the region;
- promotion of environmental education (p. 41).

The sequence of cause and effect presented in the strategy is however unclear. The authors insist on obtaining a strong position in the regional structure, which will raise the broadly understood quality of life and ensure attractive conditions for investment and business: *the overall level of civilization of the region will be raised and the standard of living is going to reach a level similar to the European standard. This in turn will ensure a balanced and sustainable development based on modern and competitive economy* (p. 4).

It seems, that once again the concepts have been mistaken and that *sustainable development based on modern and competitive economy* means *de facto*

continuous economic growth. Therefore, the need to enhance the attractiveness of the business environment in order to attract investment has been pointed out.

#### 2.6. Lesser Poland Voivodeship Development Strategy for 2011-2020

Lesser Poland Voivodeship: area of 15 183 km<sup>2</sup>, population of 3 310.1 MM; region with a high percentage of people living in rural areas, coupled with the average level of employment in agriculture, and the average level of growth, as well as medium wages and incomes.

In the development strategy of Lesser Poland voivodeship (Lesser Poland Marshal Office, 2011) the most exposed was the environmental dimension. The improvement of the quality of the environment has been indicated as a co-factor of sustainable development of the region in the social and economic stratum and a contribution to the achievement of the objectives set out in the Treaty of the European Union:

- preserving, protecting and improving the environment;
- protection of human health;
- rational use of natural resources;
- promoting the measures at international level to deal with regional or worldwide environmental problems, especially to combat the effects of climate change (p. 137).

The European Union's rules for the implementation of these objectives have been repeated:

1. The principle of a high level of protection: the obligation to have regard to a high level of environmental standards in all activities;
2. The precautionary principle: the probability of a risk to the environment is sufficient reason to take action to protect the environment;
3. The principle of prevention: the need to consider the potential consequences of a particular action and to take, on the basis of this analysis, preventive measures, the promotion of *cleaner* technologies, and establishing standards for emissions;
4. The *polluter pays* principle: the cost of compensation for environmental damage, restore the pre-contamination of the environment, as well as, in the case of causing the risk of contamination, the costs of preventing its occurrence rest on the perpetrator of danger.

The creative contribution to this strategy is the statement, that *the enforcement of these rules will be a formal requirement, mandatory in the selection process and the implementation of projects, with a particular focus on infrastructure projects*. These rules are designed to maintain ecological security of the citizens, social infrastructure and natural resources (p. 138).

### 2.7. Masovian Voivodeship Development Strategy until 2020

Masovian Voivodeship: area of 35 538 km<sup>2</sup>, population of 5 242.9 MM; region with one of the highest shares of people living in urban area with population over 100,000 and the highest employment rate in the service sector. The capital city provides the region the highest level of wages and incomes, as well as low unemployment rate.

Among the strategic objectives (Masovian Marshal Office, 2006) building the information society, improving the quality of life, increasing the competitiveness of the region, *improving the social, economic and spatial cohesion of the region in terms of sustainable development* has been included (p. 10). Another reference to the principle of sustainable development has been made in the postulate of increasing the level of competitiveness of the region, which is to contribute to the development of many areas of social and economic life, and consequently to improve the residents living standard. The authors stressed, that this development-oriented competitiveness must be sustainable, recognising the complementarity of economic, social and environmental aspects (p. 23).

The authors repeatedly focused on protecting the environment, designed to preserve the favorable conditions for environmental, economic and social development for the future generations, in accordance with the principle of sustainable development (p. 42). After such declaration, followed a series of the state's obligations to care for the environment, its preservation, revitalization of degraded areas, as well as a questionable assertion concerning *the protection of biodiversity and preserving the unchanged habitats environment, through making the area of the Masovian voivodeship GMO-free zone* (p. 43).

The issue is questionable, because, so far, a coherent definition of GMO-free zone has not been developed. The implementation of such projects mostly comes down to administrative bans for the production of genetically modified organisms. However such aspects, like agricultural and industrial processing (including both food and feed), the import of seeds or semi-finished products, and finally consumption remain unexplained. The strategy of Masovian voivodeship does not bring these problems, hence, it can be presumed, that the Masovian *GMO freedom* de facto will be reduced to a ban of GMO production in a separate area.

*Masovian voivodeship development strategy until 2030*, did not bring substantive value nor new content. Only the term sustainable development appears more frequently, than in previous strategies of the region.

### 2.8. Strategy for Socio-Economic Development of the Warmian-Masurian Voivodeship 2025

Warmian-Masurian Voivodeship: area of 24 174 km<sup>2</sup>, population of 1 427.2 MM; region close to the

national average of individual sectors in the employment structure, characterised by high unemployment, low wages and incomes.

The strategy (Warmian-Masurian Marshal Office, 2013) identified primarily the relationship of sustainable development and energy policy in the region. In one series it summarises the investment in gas and energetic networks and the use of renewable energy sources. The benefits of this investment are also supposed to be multi-faceted: they should contribute to the improvement of the natural environment conservation state, to increase the attractiveness of investing and standard of living, as well as to the region's energy self-sufficiency. Opportunity for the region is supposed to be a successful exploration of shale gas and oil (p. 57).

It seems that the inclusion of renewable energy sources among traditional, at least controversial ones, in this strategy is a strictly *must have* aspect. Renewable energy sources, in contrast to the traditional ones, are not a subject to further guidance in this document. The authors do not report also to the controversy of the results of the public consultation in the context of shale gas exploitation. The threats posed by technology in preparation for exploitation: fracturing technology (crushing shale), shale gas detection (vertical and horizontal test drilling), and the exploitation itself were not even mentioned.

So, planned development takes into account only the energy needs for economic growth. It will not protect natural resources and landscape, as the authors declare in the strategy (p. 58). More than this, sustainable development is meant to be present in the following operational purposes (though the impact of the idea has not been indicated): increase in competitiveness of the region through the development of smart specialization; increase in innovation of companies; increase in the number of jobs; improvement of the administration; intensification of inter-regional cooperation; increasing external transport accessibility and internal cohesion; adaption to the needs of the network of energy; improvement of the quality and protection of natural environment (p. 74).

Presented goals come from so many different areas, although undoubtedly strategic, that we are rather dealing with the regional authorities wishful thinking, than with real possibilities. What's more, with the majority of these postulates the idea of sustainable development is not directly related, and with a part of them, the idea is in contradiction. Sustainable development is not as universal concept, as it seems to the authors of the strategy.

### 2.9. West Pomeranian Voivodeship Development Strategy until 2020

West Pomeranian Voivodeship: area of 22 892 km<sup>2</sup>, population of 1 693.1 MM; region with a high level of urbanisation, very low level of employment in agriculture and very high in the service sector; with

high unemployment rate, medium wages and incomes.

Sustainable development in the West Pomeranian voivodeship strategy (West Pomeranian Marshal Office, 2010) is considered only in relation to the *Nature 2000* areas (perceived mainly as tourist areas). The authors note, that the development of these areas should be done in a sustainable way and based on such activities, which do not affect environmental sustainability. It is difficult to classify this strategy, not only because it deals with sustainable development in relation to just one aspect, but also due to the fact, that it allows the execution of investments significantly negatively affecting the areas of *Nature 2000* – *when the investment is of paramount importance for the public interest and there is no alternatives for it*. In such cases, it is necessary to apply measures to offset the losses caused by the implementation of an investment in the natural habitats of plants and animals (p. 80). Compensatory measures fit in with the idea of restoring the balance of development, however, the consent to prejudicial, questions the intentions of policymakers.

The current strategy is regressive in relation to the one of 2000, in which sustainable development was understood as: economic activity respecting the principles of sustainable economic growth, taking into account environmental factors in the region; development of science and building structural links between science and practice; supporting the development of small and medium enterprises and implementation of regional labour market equalization policy.

### 3. Strategies towards a paradigm of sustainable development

#### 3.1 Greater Poland 2020. The Updated Strategy for the Development of the Greater Poland Voivodeship by 2020

Greater Poland Voivodeship: area of 29 826 km<sup>2</sup>, population of 3 419.4 MM; the region is characterised by a medium level of urbanisation and employment in agriculture, with the industry employment above the national average, high level of wages and incomes, low unemployment rate and relatively low economic growth.

The strategy of Greater Poland voivodeship (Greater Poland Marshal Office, 2012) is the only one, in which the term sustainable economic growth was used. However, the definition of it is totally different from the sustainable development perspective. The authors refer in fact to stimulating economic growth, rather than to limiting or controlling the growth process. Reference to the limited growth appears only in so-called *difficult development scenario*, which assumes a slow, but steady and sustainable development. This scenario can be described as *poor but happy* and means small, but thanks to responsible

leadership, more sustainable growth, based on a different than the current one hierarchy of values (p. 158).

Gaining control over yet unbridled economic growth, and when there is a need to limit this process, is dictated by the over-exploitation of natural resources and the diversification of income. Those aspects are definitely missing in the strategy of Greater Poland and it is a shame, since this strategy is best embedded voivodeship strategy into the sustainable development paradigm.

The widely understood sustainable development, is seen by the authors as giving the Greater Poland the ability to obtain the status of a *green leader* emerging research and environmental technologies, research and technology for renewable energy, developing energy production from unconventional sources. The strategy also highlights the principles which should be strictly respected in the development process:

- solidarity – whether at local, regional, national or global level, as well as between the present and future generations;
- responsibility – so that the choices made today would not restrict the freedom of all participants in social and economic life in the future;
- participation – involvement of all participants in social and economic life of the region (p. 65).

The authors declare, that sustainable development of Great Poland 2020 should be based on economic efficiency. However, after analysing the definition of what the authors called economic efficiency – taking into account the profit for community including social and environmental costs, it should be noted, that the strategy developers meant rather social than economic efficiency.

Another pillar of sustainable development according to the authors, is a social equilibrium, understood as the creation of conditions for the population development, leading to the creation of new job places and active measures to improve the quality of life (p. 65). Such multifaceted understanding of social balance is unique in the strategies of Polish voivodeships.

The other rules that integrate social, economic and environmental dimension, are as follows:

- an effective use of non-renewable resources and the desire for their replacement substitutes;
- gradual elimination of business processes and other applications of hazardous and toxic substances;
- permanent protection and restoration of biodiversity at four levels: landscape, ecosystem, species and gene;
- creating the conditions for economic operators of fair competition in access to scarce resources and capabilities of discharges;

- socialisation of the decision making process, particularly on local environment, seeking to ensure a sense of the ecological safety of individuals, understood as the creation of an environment conducive to physical and mental health, as well as, to social development (creating and nurturing local ties);
- promoting investments, which are characterised by high energy efficiency in both technology and buildings, eliminating sources of pollution (p. 155-156).

The Greater Poland strategy strongly evolved towards sustainable development since 2000, when the only reference that came down to the idea was, that *sustainable development is concretised by providing the residents lasting ecological security and contributing to the sustainable quality of life of present and future generations*. A policy for sustainable growth will, however, require from the regional authorities the change of perception (or even a paradigm) of the impact of economic growth on social development.

### 3.2 Lubusz Voivodeship Strategy of Development 2020. Attachments

Lubusz Voivodeship: area of 13 988 km<sup>2</sup>, population of 1 011.0 MM; medium industrialised region, with a low rate of economic growth and medium incomes. The strategy of Lubusz voivodeship (Lubusz Marshal Office, 2012) is based on the criterion of sustainable development, which is provided by a harmonious formation of four capitals: physical, natural, human and social. Physical capital consists of: economic potential, assets – production, transport, communications, tourism, cultural infrastructure, etc. Natural capital consists of the environmental resources and efforts taken to improve the environment. Human capital is formed by the employees, their education and skills, as well as, their quality of life and state of health. The last of the capitals, social capital, is measured by the level of trust between people, their willing to cooperate and non-work activities (p. 3). The authors of the strategy did not specify how sustainable development forms the listed capitals. For the authors of this study, the most interesting would be the extent of the impact of sustainable development on the separated physical capital.

Then, sustainable development is analysed in the context of social participation: *Keeping active and democratic civil society and sustainable development of the country depend on the construction of the third sector, which in relation to social capital requires at least the existence of the citizens' trust and their social involvement* (p. 47).

The authors indicate third sector organisations as an important stakeholders of sustainable development. However, it seems that ceding the whole responsibility for sustainable development to the third sector is

too much, especially in countries, that are just starting to build a multi-sectoral social policy. Even in societies with the civic society mentality, civic institutions are purely consultative bodies. Sustainable development is a comprehensive decision-making system, hence also in this area the state authorities are the main entity. Nevertheless, the presented attachment provides a theoretical basis for the region's policy focused on sustainable development. Moreover, the evolution of the decision makers attitudes is evident – the strategy of 2000 did not contain any references to the idea or practice of sustainable development.

### Conclusions

The analysis of the strategies of the sixteen Polish voivodeships showed, that only two of them can be described as leading towards the implementation of the concept of sustainable development, and even these contain serious deficiencies. The problem of decision makers of Lubusz voivodeship lies in wrong division of responsibility for development, and the policy of Greater Poland authorities is in line with the neo-liberal trend of permanent economic growth stimulation.

With reference to the general characteristics of the regions it can be seen, that the regions that follow towards sustainable development were characterised by relatively low (compared to most voivodeships) economic growth. This fact was certainly noted by the Greater Poland authorities, hence the demand for the growth acceleration in the strategy. Six of the thirteen voivodeships in the other two categories were characterised by high economic growth. The highest growth was reported in Świętokrzyskie and Lower Silesia. In Świętokrzyskie high growth was accompanied by low wages and incomes, which proves once again, that economic growth and its most important indicator – GDP, have little in common with the egalitarian, sustainable welfare. Another example of the socio-economic disequilibrium is Lodz Voivodeship – high growth resulted here in high incomes in conditions of low wages. Such growth, therefore, did not contribute to the community development of the region.

Most strategies (nine of them) focuses on one, environmental dimension of sustainable development – environmental protection issues, maintenance of biodiversity and monitoring the activities that can contribute to environmental degradation. Policies of five voivodeships still cannot be called sustainable, despite the fact that the term sustainability is present in those strategies. As it is one of the priority areas in *Europe 2020*, the concept of sustainable development should be included in the strategies of the Member States, and so it happens, although the authors write *de facto* about spatial development and accelerated economic growth, and not about sustainability.

The division into three distinct dimensions of sustainable development and their separate analysis have been transferred from a supranational organisation documents to national and regional strategies. Existential social needs have been mindlessly separated from each other, planning to satisfy them at different time, with different intensity. Holistic approach to social development, which not only takes into account, but also consolidates all dimensions of welfare and well-being, is definitely missing. In the presented strategies the creative ways to implement the idea of sustainable development are rare. Such state of affairs may indicate, that Poland is not ready to implement the concept of sustainable development, that the only phenomenon we know is a continuous stimulation of economic growth, even at the expense of development equilibrium.

T. Jackson, writing about the situation of highly developed countries giving as an example the European Union countries noted, that continued economic growth and policies to promote this process actually weaken welfare, defined by the researcher as freedom from adversity and misfortune, strong communities, hopes for the future, sense of meaning and purpose. The author admits, however, that economic growth is still essential for well-being of the poorest nations (Jackson, 2009). As shown in foregoing analysis, the fact of belonging to a supranational organisation uniting highly developed countries, does not make each member state a highly developed one. Nothing stands in the way of creating one's own vision of welfare and well-being, as well as, the process of balancing market and social forces, if we cannot afford for the strategy proposed by the wealthy fraction. However, Polish central and regional authorities have not provided such an original, indigenous vision yet.

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## Furthering sustainable development: The implementation of Green Procurement in Central and Eastern Europe Methods and Experiences from Hungarian Public and Private Organizations

### Wspieranie rozwoju zrównoważonego: realizacja zielonych zamówień w Centralnej i Wschodniej Europie Metody i przykłady z publicznych i prywatnych firm na Węgrzech

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#### Abstract

The aim of the article is to show how one of the most active and demonstrative management tool for furthering sustainable development can be successfully implemented through a Central and Eastern European example. The Green Procurement Hungary Project (GPH project) was conducted in order to develop a toolkit most suitable for implementing green (public) procurement, in order to use the enormous purchasing power of public and private organizations for furthering sustainable consumption, eco-production and all together sustainable development. The article shows the relationship between sustainable-, green- and social procurement, introduces the state-of-the-art of green public procurement in the EU with specific attention to the CEE countries and shows the methodology developed in the GPH project. This methodology has great significance for practitioners and policy makers as well for the implementation of sustainable procurement. Even on the European level, for example by the development of funding opportunities and by the evaluation of project proposals these experiences are valuable.

**Key words:** sustainable procurement, green public procurement, green procurement, sustainable consumption, ecolabels, sustainable development

#### Streszczenie

Celem artykułu jest ukazanie, jak jedno z najczęściej stosowanych narzędzi z zakresu zarządzania można wykorzystać do wspierania rozwoju zrównoważonego, na przykładzie Europy Centralnej i Wschodniej. Projekt węgierskich zielonych zamówień (The Green Procurement Hungary Project, GPH project) wprowadzono, aby poszukiwać najlepszych rozwiązań w tym zakresie. Celem jest wykorzystanie ogromnej mocy nabywczej firm publicznych i prywatnych dla wspierania zrównoważonej konsumpcji i eko-produkcji, a poprzez to zrównoważonego rozwoju.

Artykuł ukazuje powiązania pomiędzy zrównoważonymi, zielonymi i społecznymi zamówieniami, wskazuje na najnowsze rozwiązania przyjęte w UE, szczególny nacisk kładąc na kraje Europy Wschodniej, omawia także ich stronę metodologiczną. Ten ostatni aspekt jest niezwykle istotny dla praktyków i polityków, jak również w kon-

tekście bezpośredniego wdrażania zielonych zamówień. Nawet na ogólnoeuropejskim poziomie, przykładowo poprzez rozwój instrumentów finansowych, czy sposobów oceny zgłaszanych wniosków, te doświadczenia są bez wątpienia wartościowe.

**Słowa kluczowe:** zrównoważone zamówienia, zielone zamówienia publiczne, zielone zamówienia, zrównoważona konsumpcja, eko-etykiety, zrównoważony rozwój

## Introduction

The first part of the article focuses on the relationship between sustainable development and procurement by defining the two terms and giving a brief specification of the topics appearing in the paper. The second part will focus on the barriers of green procurement and introduces a possible solution with methodology.

Starting with the widely known and accepted definition of sustainable development: *Development that meets the needs of the present without compromising the ability of future generations to meet their own needs* (WCED, 1987). This definition is completed by commonly accepted principals of sustainable development in terms of economic development, social development and environmental protection. Sustainable consumption and production is a key area in achieving sustainable development in today's societies. In order to succeed these principals should be parts of our everyday lives on all levels of the economy (households, public level, and business level). According to Walker and Brammer, 2009 Sustainable procurement *is consistent with the principles of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits, and promoting good governance*. Sustainable procurement can be defined as the pursuit of sustainable development objectives through the purchasing and supply process (Johnsen et al., 2012).

The first advantages of sustainable procurement is that enormous purchasing power can be used effectively to switch towards green economy and achieve the goals of sustainability by orienting production and consumption trends and encouraging the demand for environmentally friendly products and services. (Testa et al., 2014; Li and Geiser, 2005; Edler and Georgiou, 2007; Ambec and Lanoie, 2008). For example, in case of public procurement, spending represents 15 to 30 percent of the GDP of a given country on average, which used in a sustainable manner can drive markets towards innovation, sustainability and helps the transition to green economy. Sustainable Public Procurement (SPP) was identified in *Agenda 21* and in Chapter III of the *Johannesburg Plan of Implementation* as one of the key means to achieve sustainability (UNEP, 2012). It is now clear in policy making, that SPP can play a strategic role and specifically contribute to achieving sustainable development goals. *With SPP, governments can lead by example and deliver key policy objectives in the environmental, social and economic fields. With respect to environment, sustainable pro-*

*curement can allow governments to reduce greenhouse gas emissions, improve energy and water efficiency and support recycling. Positive social results include poverty reduction, improved equity and respect for core labor standards. And from an economic perspective, SPP can generate income, reduce costs and support the transfer of skills and technology* (UNEP, 2012).

Nowadays it is becoming more and more important for companies in the competing sector to stand out from the crowd of others. So in connection with CSR or simply environmental awareness it is worth taking actions for environmental protection. The products and services that meet the *green* criteria are usually top quality and represent the latest technical trends. This means that there is a major saving potential in their use. Together the positive public judgment and the financial savings can result better position in the market, a competitive edge. Green procurement is an obvious tool, because it is one the most active and most demonstrative ways of environmental protection. (Diófási and Valkó, 2012a)

Sustainable procurement is a burgeoning and current topic even though it is a relatively new research field. This is suggested by the fact that since 2000 the number of research articles has increased about tenfold (Johnsen et al., 2012).

## Definitions and research limitations

In this part the relationship between green-, social- and sustainable procurement will be introduced shortly. As mentioned in the Introduction part there is quite a lot of literature on sustainable procurement, but each article has a slightly different conceptual approach and each lives with narrowing the subject's focal point probably due to the topic and the complexity of possible purchasing criteria.

According to Johnsen et al., (2012) in this field of research we have to face cultural relativism. Views of sustainability are relative, and differ from individual to individual, organization to organization, sector to sector, and country to country (Nygren, 1998).

The other fact is, that procurement in the public and private sector also differs a bit. The following figure (Figure 1) seeks to show the differences in procurement types. The categorization can be based on the organization type: private procurement, or more frequently used supply chain management and public procurement, which is the purchasing practice of public organizations guided by legal framework. At the same time categorization can be based on the type of joint effects that procurement is meant to

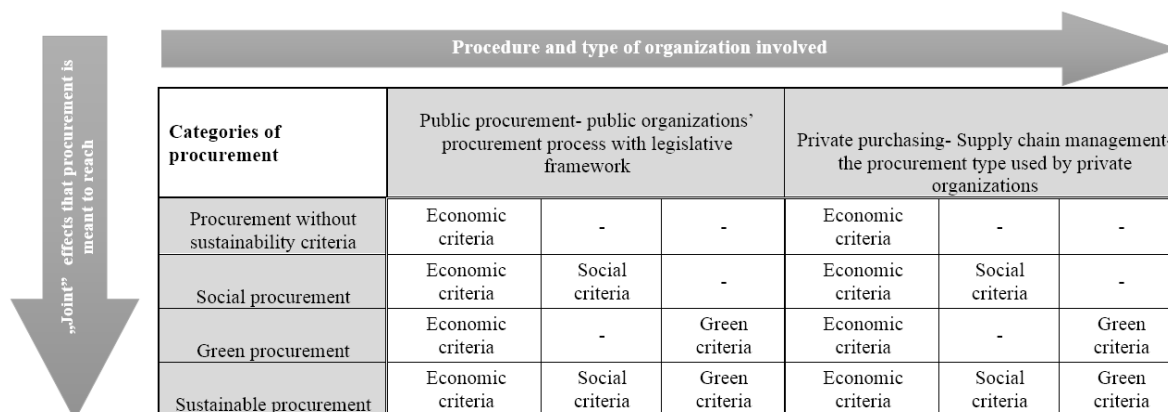


Figure 1. Categories of procurement, source: own compilation

reach besides the fact that the organization needs to buy a product or service. This joint effect can be described very simplistic with the followings:

- Social procurement: good, product, good price with social benefits;
- Green procurement: good product, good price and environmental benefits.

The tradeoff between the three aspects of sustainability in procurement creates differentiations. It is obvious that procurement is strongly linked to the economic aspect, but it is relatively rare that social and environmental criteria both accompany it and results in truly sustainable procurement.

### Sustainability in supply chains

Walker and Brammer (2009) found that there is a quite high research interest in sustainable supply chain management, with the overwhelming majority of studies focusing on environmental issues in private sector manufacturing supply chain contexts (Frota Neto et al., 2008; Piplani et al., 2008; Srivastava, 2007; Vachon and Klassen, 2008; Zhu et al., 2008).

This can be due to the complexity and interdisciplinary nature of green criteria, because nonetheless practice suggest that social aspect of sustainable procurement is focusing on labor rights, improving work conditions, avoiding child work especially in case of international companies who work with suppliers from less developed countries. From the contents of CSR reports it can be assumed that the social aspect of sustainability is more likely to appear in the private sector in form of, for example, employing disabled workers, gender equity programs and in funding different charity organizations.

### Sustainability in public procurement

Walker and Brammer (2009) also found that relatively few articles have investigated sustainable procurement issues in a public sector context (Mitra and

Webster, 2008; McCrudden, 2004), but there are a number of national and international studies and guidelines on both social and green procurement.

This suggests that in practice, when governments seek to participate in the market as purchasers and at the same time seek to regulate it through the use of their enormous purchasing power (McCrudden, 2004), it is quite difficult to integrate both social and green criteria. While the impact of green criteria can be measured relatively easy, social criteria often ends up in the *socioeconomic* effect category such as the promotion of local industries, the creation of jobs, and the support to micro, small and medium-sized businesses etc.

Even though researches and scientific articles focus on these topics separately on the international level UNEP has made significant efforts to promote SPP and also give examples (UNEP, 2012).

On the European Union level, the two aspects (social and environmental) are separated in terms of guidelines and in terms of promotion too. The **Procurement Reform** might bring some changes in terms of providing legal framework for further integrating sustainability criteria in public procurement. In the beginning of 2014 Directive 2014/24/EU replacing directive 2004/18/EC and Directive 2014/25/EU replacing directive 2004/17/EC were adopted. *The aims of the new public procurement rules include contributing to the implementation of environmental, social inclusion and innovation policies* (PPR, Fact sheet No. 8, 2014). In the followings the possible inclusion of social criteria will be introduced and the actions done by the EU so far.

According to the above mentioned new directives the possibility to include social criteria in the public procurement procedures will be furthered. A selection will only be mentioned of the most important changes:

*Social inclusion: It will now be possible to reserve procurement procedures. This means that for all types of work, services and supplies for specific structures ('sheltered workshops') or social enterprises working for the inclusion of disadvantaged*

people. To participate in such reserved procurement procedures, 30 % of the employees at the company must be disadvantaged (PPR, Fact sheet No. 8, 2014).

*Subcontracting: competent national authorities must also ensure compliance with environmental, social or labor law obligations under EU or national rules, collective agreements or international law* (PPR, Fact sheet No. 8, 2014).

There are two very important changes which will not only effect the social criteria, but the environmental as well. The first one refers to legal obligations and the second one to production processes.

*Legal obligations: Based on respecting applicable environmental, social or labor law obligations under EU and national rules, collective agreements or international law. Member States and public authorities must ensure compliance with the obligations in force at the place where the work is carried out or the service is provided and any company failing to comply with the relevant obligations may be excluded from public procurement procedures* (PPR, Fact sheet No. 8, 2014).

*Production process: public purchasers may now consider the process by which the goods, services and specific work they intend to purchase are **produced**. Therefore, they may decide to award the contract concerned to the company that intends to employ the greatest number of disadvantaged people, such as the long-term unemployed, to produce the goods or services concerned. They may also consider the specific working conditions of the employees concerned, which may extend beyond legal requirements. However, these criteria may apply only to staff involved in the construction, production or supply of goods or services covered specifically by the public procurement contract in question. The company cannot, therefore, be required to apply a general social or environmental responsibility policy, as such a requirement is not specific to the goods or services purchased* (PPR, Fact sheet No. 8, 2014). We should note that these new rules should be implemented by Member States by 2016. The effect of regulation will depend on the national implementation levels. The promoting tools for social procurement in the EU, for example: **Buying Social**, A Guide to Taking Account of Social Considerations in Public Procurement (Buying Social, 2010) will be updated and probably further support given to projects helping procurers with the implementation of social criteria (e.g. Landmark project).

According to our research, the European Union had so far made more significant efforts to promote **green public procurement**, rather than the social criteria. In form of a website, toolkit and plenty of supporting material (GPP Europe) green procurement is given slightly more visibility (further description about European GPP will be in the next chapter). According to Testa et al. (2014), legislative interventions and the implementation of operational

tools have been developed to promote the adoption of green public procurement in United States (Swanson et al., 2005), Canada (Brammer and Walker, 2011), South Africa (Bolton, 2006), Asia (Ho et al., 2010), Australia (Chang and Kristiansen, 2006) and Japan (Brammer and Walker, 2011) too. So we can say that the separation of the two aspects in procurement is very common.

The right balance between social and environmental sustainability aspects in procurement seems to be a *next* development level and a further strategic goal.

This article in the followings will focus on the European state-of-the art of green public procurement, so the environmental aspect will be addressed, due to the above mentioned slightly asymmetrical situation in the selected European region.

### Green Public Procurement in the EU

Researchers and experts agree, that public procurement can shape production and consumption trends and significant demand from public authorities for *greener* goods and is able to create or enlarge markets for environmentally friendly products and services (Testa et al., 2012; Li and Geiser, 2005) For this reason green public procurement (GPP) is becoming a cornerstone of environmental policies at the European Union level and at some Member State levels as well (Tukker et al., 2008). According to Testa et al., (2012) in the European Union there was a strong and convinced promotion of these instruments, so that green procurement is gradually turning into a legally binding instrument (COM (2008) 400).

The European Commission also had a number of studies (GPP Europe, Studies) focusing on the uptake of GPP in the EU. The most recent data is from 2012, which shows how the Member States implemented the concept. Figure 2. shows the implementation of National Action Plans based on the findings of the study titled *Strategic Use of Public Procurement in Europe* (Adelphi, 2011). In 2003 there was a communication on Integrated Product Policy which encouraged the Member States to develop their national GPP action plans by the end of 2006 (Diófási, 2012). As it can be seen from Figure 2. some of them are still missing. Germany has action plans on the federal level, implemented at different times, that is why no exact date is stated on the map. In November 2014. 22 of the 28 Member States had adopted a National Action Plan or an equivalent document (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, UK) (GPP Europe, NACs). 6 Member States still do not have accepted National Action Plans (Croatia, Estonia, Greece, Hungary, Luxembourg, and Romania) (GPP Europe, NACs). The reasons can be different, but another study titled: *The uptake of green public pro-*



fect, 2014) there are still barriers and obstacles that some of the Member States could not jump over. This part will summarize the drawbacks that negatively affect the uptake of GPP.

There are mainly three fields identified by Testa et al., (2012) that pull back GPP implementation:

1. economic,
2. political,
3. cognitive.

This type of categorization of barriers are based on the research done by Bouwer et al., (2006), which will be described in detail in the followings.

In 2005 the European Commission, the Directorate-General for the Environment (DGENV), commissioned a service contract to a consortium of five European organizations to *develop a measurement tool and measure the current level of green public procurement across the European Union (EU) and make available examples of environmental technical specifications for a series of product and service groups identified as most suitable for 'greening'.* The status of GPP in Europe was measured by analyzing the answers on 860 questionnaires from public bodies from all 25 member states (Bouwer et al., 2006). The consortium developed a web based questionnaire, which was translated to 19 languages of the EU and distributed to over 8000 public purchasing bodies in the Member States. These were local authorities (e.g. municipality), regional governments (e.g. county, region, province), central government bodies, other (semi-) public bodies governed by public law and water, energy, transport and telecommunications sector. The response rates are shown in Figure 5, but the average was 11 percent (the exact numbers per country can be found in Bouwer et al., 2005, page 85).

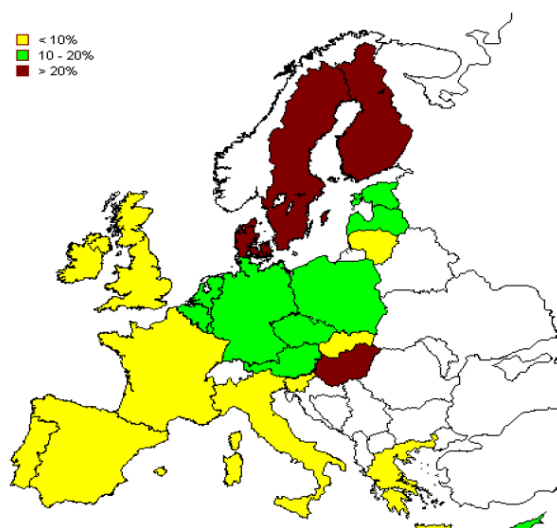


Figure 5. Response rates for GPP Questionnaire, Source: Bouwer et al., 2006

The questionnaire on green public procurement included product group related issues and management, procurement practice related issues as well.

For identifying the barriers *purchasers were requested to give their view on 10 possible obstacles preventing GPP. These possible obstacles were:*

1. *Lack of management support (including money and time), strategic focus and organizational policy strongly promoting GPP.*
2. *Lack of general political support in the country, province or municipality.*
3. *Lack of interest from procurement department/teams.*
4. *Lack of knowledge about the environment and how to develop environmental criteria.*
5. *Lack of training for public procurement officers.*
6. *Lack of practical tools and information (e.g. handbooks, internet-tools).*
7. *Perception that environmentally friendlier products would be more expensive.*
8. *Perception that environmentally friendlier products would not be readily available.*
9. *Perception that European directives are not clear about taking into account environmental criteria.*
10. *Concerns about legality of green public procurement.*

*Respondents could select the three obstacles they experienced the most* (Bouwer et al, 2006).

Table 2. shows the 5 mostly identified *leading-obstacles* of green public procurement.

Table 2. The 5 leading-obstacles of GPP according to, Source: own compilation based on Bouwer et al., 2006

Obstacle		Responses from all member states
a	Perception that environmentally friendlier products would be more expensive	44%
b	Lack of knowledge about the environment and how to develop environmental criteria	35%
c	Lack of management support (including money and time), strategic focus and organizational policy strongly promoting GPP	33%
d	Lack of practical tools and information (e.g. handbooks, internet tools)	25%
e	Lack of training for procurement officers	25%

These can be categorized, as mentioned above, as economic (a), political (c) and cognitive (b, d, e) barriers as done by Testa et al., (2012).

1. Economic: 44 percent of the surveyed public authorities stated, that their main barrier is the perception of financial burden, the assumed higher cost of green products and services.
2. Political: 33 percent of the public authorities indicated that there is a lack of management and political support of GPP and that significantly draws back any implementation efforts. The au-



thors had examined this barrier in one of their previous article (Diófási, 2012) which found that senior public sector officials often demonstrate low awareness of the importance of GPP. Without a dedicated strategic focus and an organizational policy strongly promoting GPP – in terms of time and money – the integration of environmental aspects will remain inadequate. Although a high level of commitment to national targets is not always a guarantee of successful implementation. Often there is a low level of understanding of the exact requirements, therefore creating an *implementation gap* – the conflict between policy and practice.

3. Cognitive: 25 percent of the surveyed public authorities identified the lack of training and available supporting tools and 35 percent mentioned technical expertise and know-how as a main barrier of GPP.

According to Testa et al., (2014) usually, the absence of complete information and knowledge is a typical hurdle in any decision making process and also applies to the GPP process (Günther and Scheibe, 2006): information on the real environmental impact of the products, the difficulties in finding suppliers or in preparing calls for tenders and purchasing, the lack of guidelines from higher order authorities and of co-operation between authorities (Bouwer et al., 2006; Thomson and Jackson, 2007; Walker and Brammer, 2009) causes this cognitive burden.

We should highlight the interdisciplinary nature of green criteria setting: the lack of knowledge to formulate specific, measurable and verifiable environmental preferences (Varnas et al., 2009) can be a personal barrier too. According to the aforementioned study of the authors (Diófási, 2012) the lack of employees' awareness of environmental problems, the lack of trainings calls for self-assessment within the organization and for attitudinal changes. Public administrations in general and the relevant purchasing officers in particular often lack the technical and legal expertise to apply sustainable procurement standards. Cooperation across departments and the consultation of external experts from research institutions and NGOs is therefore a crucial success factor. These barriers should be avoided so that the implementation and the theoretical advantages of green procurement can be fulfilled.

### Case study from Hungary

Even though Hungary does not have a leading role in implementing green procurement, according to the before mentioned studies, efforts had been done to promote the concept. The Green Procurement Hungary Project (GPH Project) had been launched in 2010 by the authors and engaged eight public organizations, and 27 private companies. 120 people were trained and 19 pilot projects completed within the GPH project so far until the end of 2014. The

project has a bottom up approach, which means that no governmental or EU level support was given for its development. The aim of the project is twofold:

1. To develop a useful and suitable aid, a toolkit for Hungarian organizations willing to implement green procurement.
2. Another goal was to raise awareness about green procurement and collect best practices from Hungary, to prove that the concept of green purchasing is feasible in this country too.

Throughout the project the goal was to get a varied sample to be representative for Hungary in terms of possible procurement procedures, but volunteers were always welcomed, since it is a great achievement, that more and more organizations became interested in implementing green procurement within this project. This is the reason for the higher number of private organizations taking part.

In the next part we make a few assumptions about why the interest in the project rose year by year. These assumptions are not only valid for Hungary. These phenomena are quite common all through Europe and can be used effectively in other countries where green procurement needs further support.

### Assumptions for growing interest in green procurement

There could be different reasons for positive interest in green procurement from 2010 and later.

1. Sensitization by EU funded projects, raising awareness about sustainability issues;
2. Personal commitment of the management and employees;
3. Existing certified environmental management systems.

On the European level there was a strong support for promoting sustainability and energy efficiency, so a number of information campaigns, conferences and sensitization projects reached Hungary and CEE as well. These campaigns mainly raised awareness and brought together people personally interested in giving a sustainable aspect into their work. This is important, because we can assume that organizations with high awareness on the benefits of green procurement are more likely to include environmental criteria in their call for tenders (Testa et al., 2014). This statement is proven to be valid for our case studies too since part of the consultations completed were concluded with connection to the BuySmart+ project in Hungary (BuySmart+, 2014).

This leads us to the question of personal commitment. According to the Italian research done by Testa et al. (2014), GPP practices are not dependent on the administrative solutions and the organization, *but they are primarily determined by the actions and beliefs of individuals within the organizational structure* (Testa et al., 2014). This is a remarkable result and the same experience is valid for Hungary, complemented by the fact that supporting organiza-



tional structure, procurement culture is a key to successful implementation of green procurement and in general any change in management activity. The statement is confirmed by Douglas, saying that *behavior in organizations is induced by norms, routine and in particular culture* (Douglas, 1987). In Hungary research is done yearly to discover the current trends in public procurement. *The Public Procurement and Development 2013* study also shows, that respondents considered procurement culture and organizational culture to be the key to overall quality development of public procurement (Tátrai, 2013). Existing certified environmental management systems (ISO14001, EMAS) also helped our work in implementing green procurement, since organizations already knowing EMSs were more open for new and additional solutions to improve their environmental performance. Testa et al.'s (2014) research suggests that there is no clear correlation between EMSs and GPP performance on the long run, which was our experience too, but the existence of the EMS within the organization definitely means at least some kind of commitment to environmental issues.

### Categorization of participants

The most important and slightly unexpected result of the GPP project so far is, that a new method was found for the categorization of procurement tools. Usually the toolkits and literature (articles, guidelines) are based on organization types (public or private), but in our opinion it is more effective to separate the tools according to the type of procurement process. Different types of processes usually have different resources, personnel and need a completely different approach in order to have successful implementation of environmental aspects or any other aspect (e.g. social), that brings changes to the daily routine of procurement. This was one of our most evident, but not yet discovered conclusions. *It is more effective to differentiate between the processes than between organization types*. For example it makes no difference in terms of training and supporting toolkit if public or private organization is going to conduct below threshold/normal tendering.

### Toolkit introduction

From the initial version over the years' of the GPP project finally three types of toolkits emerged. Modifications, developments were made on the toolkit (altogether 3 times) upon demand of the project participants. This way the final versions reflect the needs of practitioners and contain truly useful information for the implementation of green procurement in practice.

The introduction of the toolkit will only focus on the aspects that:

1. differ from other toolkits designed for green procurement,
2. are new findings,
3. can be used in other countries and environments too (e.g. could be used for implementing social criteria).

According to the experiences of the authors separating procurement types and modifying the support strategy accordingly is the most successful method for implementing green procurement. This is why the final a, b, c versions of the toolkit are for the following three types of procurement processes: (a) public procurement, (b) under the threshold procurement or private tendering, (c) ad-hoc purchases.

In this context public procurement process (a) means the purchasing process of a public organization under the scope of public procurement act (a process guided by legal framework). The (b) type of process can be defined as a procurement process with standard tendering (call for tenders: subject, technical specifications, award criteria, selection criteria and performance clauses), but not falling under the scope of any legal framework. This can be due to under the threshold procurement done by a public organization or simply by the procurement process of a private organization. Usually private organizations (SMEs and large enterprises) use this process by bigger value purchases and in case of developed management practices. Ad-hoc purchases (c) in this context mean small scale purchases, usually done by micro enterprises, SMEs and small public authorities. The term here is used for not planned, made-on-demand purchasing of daily, small value products which have significant environmental impact.

Each type of process needs different supporting toolkit. All versions of the toolkit have four parts: training, performance sheets, calculation tool and a collection of evaluation methods. These elements are present in most of the green procurement toolkits (GPP Europe, Toolkit; BuySmart), the differences are minor, but very important. Each addresses one of the barriers listed in the Problems, barriers part. The **training** is very important, since this is the way to give explanations, knowledge and attitude to the participants with methods used in adult education. The trainings always have to be carried out by experts of the topic and is always a person-to-person experience. Every other kind of support and consultations can be managed online, but for trainings this was found to be the most effective way. The authors had previously worked on the training methodology, further information can be found in a previous article (Diófási and Valkó, 2012a). With the training the economic natured barriers can be resolved, by teaching the participants life cycle costing and giving example calculations for each product group. The **calculation tool** is very useful for demonstration. The **performance sheets and evaluation methods** are supposed to make green procurement easy by offering ready to use basic (core) and comprehensive

Table 3. Green Procurement Toolkit of the GPH project, Source: own compilation

Ver- sion	Target group	Product Groups	Description	Parts of the toolkit			
				Training	Perfor- mance sheets	Calculation tool	Evaluation methods
a	Public organi- zations	Smart phones, taxi/cou- rier services, long term car rental services, pa- per and printing service, notebooks, PCs, street lighting, facility man- agement, cleaning services	Procure- ment pro- cess based separation, not the type of organiza- tion matters: public pro- curement	GPP man- agement, le- gal frame- work, com- prehensive explanation of environ- mental criteria	Text, rec- ommenda- tions for all 5 stages of call for ten- ders / core and compre- hensive cri- teria/ <i>e.g.</i> : <i>recycled paper</i>	For demon- stration of LCC	Ecolabel or if ecolabel criteria used external help / <i>e.g.</i> : <i>EU Ecolabel or equivalent proof</i>
b	Public and pri- vate or- ganiza- tions	Smart phones, taxi/cou- rier services, long term car rental services, pa- per and printing service, notebooks, PCs, street lighting, facility man- agement, cleaning prod- ucts/services, sanitary paper products, in-door lighting	Procure- ment pro- cess based separation, not the type of organiza- tion matters: below threshold or private ten- dering	Green pro- curement manage- ment, ecolabels	Text, rec- ommenda- tions for all 5 stages of call for ten- ders/ core and compre- hensive cri- teria+ avail- able eco- labels/ <i>e.g.</i> : <i>EU Eco- label certi- fied paper</i>	For demon- stration of LCC	Ecolabels or exact evaluation method if the product group does not have ecolabel criteria

green criteria and exact ways of evaluation. This is where version (a) and (b) differs. In case of public procurement the use of ecolabels is limited in terms of allowing different, but equal kind of proof for compliance. So in public procurement cases the criteria from Type I and Type I-like ecolabels (UNEP web) can be used. This raises the question of involving experts who can confirm the compliance based on the data provided by the bidder. In case (b) by under the threshold or private tendering ecolabels can be used without restrictions, which makes criteria setting and evaluation much easier. The third version (c) is due to the nature of ad-hoc purchasing is totally based on ecolabels. In this case too, only Type I and Type I like labels can be used, since these provide third party certified proof for environmental compliance and direct information to the shoppers. These ecolabelled products are available in most countries thanks to the European market- though the level of availability is different for example in Scandinavia and CEE. The availability of ecolabels is a further research topic, more information can be found on them in Diófási and Valkó, 2012b, Baranyi, 2\*011 and in many other international articles. The following product groups had been offered and requested over the GPH project: taxi/courier services, long term car rental services, paper and printing services, notebooks, PCs, street lighting, cleaning products/services, sanitary paper products, indoor lighting. These are the most commonly used product groups in green procurement, and are the

most suitable for greening, although the list can be broadened and hopefully will be.

With the use of the three toolkit versions 19 successful pilot projects were concluded so far. Altogether the fact that over the years more and more interested parties joined green procurement implementation within the GPH project means two things:

1. That the work done with the development of the toolkit and support was successful and
2. that if bottom-up approaches tend to work effectively, the organizations in Hungary are ready for more comprehensive governmental support, policy, and goal setting.

With the already mentioned European Public Procurement Reform further support is expected for sustainability criteria. Not only on the environmental side, but among social aspects too. As we had seen from the above mentioned examples, the inclusion of green criteria might be difficult, but not impossible. The same statement can be made for social criteria inclusion as well. Even though in Hungary only a few steps had so far happened in terms of social procurement: the Hungarian version of the *EU Social Procurement Guide* (Buying Social, 2010) is available and a database (Sheltered workshops database, 2015) had been created for *sheltered workshops* which means that 50% of the employees should be disabled people. The new directives stepping into force might give more field for sustainability criteria in the national legislation as well. The latest available official data shows this slowly moving positive

trend in the increase of green and social criteria in the public procurement procedures – see table 4.

Table 4. Type of sustainability criteria in Hungarian public procurement procedures 2012-2013, Source: own compilation based on the data from Hungarian Public Procurement Authority (HPPA 2012-2013)

Type of sustainability criteria in public procurement	2012	2013	2012	2013
	number (pcs)		value (million Euro)	
Green public procurement	465	971	141	320,6
Social public procurement	115	144	45,6	105

We must add that, in spite of the positive trend, there is no available data about the inclusion of green and social criteria together, resulting in truly sustainable procurement so far.

## Conclusions

We can say that, the integration of green and social criteria into the procurement cases in the CEE countries need further support and development. With this new, and carefully tested methodology there is a great chance to implement green procurement more successfully than before and we believe that with intensified attention the toolkit of the GPH project can be used in any of the CEE countries that have similar level of GPP and need further assistance for development. Further task and research area is to integrate social aspects into the toolkit and create a complete methodology for sustainable procurement. Even until then, the results of the GPH project can be used by governments and policy makers, by choosing projects for funding and creating national strategies and targets. Practitioners and experts can also benefit from the findings and we hope that with these actions the transition towards sustainable consumption can be accelerated and the goals of sustainable development can be reached.

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## Distance Difficult to Overcome? Analysis of Norwegian and Polish Position on the Path to Sustainable Development

### Dystans trudny do pokonania? Analiza pozycji Norwegii i Polski na drodze do zrównoważonego rozwoju

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#### **Abstract**

Sustainable development is undoubtedly the key challenge of the contemporary world. On the way to this development Poland is far behind the other countries, especially Norway, which seems to be an unquestionable leader in this respect in Europe. There is a distance between Norway and Poland in all ten dimensions (themes) described in the EU Sustainable Development Strategy (socio-economic development, sustainable consumption and production, social inclusion, demographic changes, public health, climate change and energy, sustainable transport, natural resources, global partnership and good governance). Unfortunately it is not likely that the distance could be significantly reduced in the coming years. Poland must accept that fact and simultaneously learn from the leader and take advantage of its experience, but can also benefit from financial support, which is possible to obtain from the EEA and Norway Grants – the funds provided to particular programs aimed at reducing economic and social disparities and strengthening bilateral relations between Norway and Poland.

**Key words:** sustainable development, development gap, Poland, Norway

#### **Streszczenie**

Zrównoważony rozwój jest niewątpliwie kluczowym wyzwaniem współczesnego świata. Na drodze do tego rozwoju Polska pozostaje w tyle za wieloma krajami, a w szczególności za Norwegią, która wydaje się być niekwestionowanym liderem w Europie. Dystans dzielący Norwegię i Polskę występuje we wszystkich dziesięciu wymiarach (obszarach tematycznych) ujętych w Strategii Zrównoważonego Rozwoju UE (rozwój społeczno-gospodarczy, zrównoważona konsumpcja i produkcja, włączenie społeczne, zmiany demograficzne, zdrowie publiczne, zmiana klimatu i energia, zrównoważony transport, zasoby naturalne, globalne partnerstwo, dobre rządzenie). Niestety jest bardzo mało prawdopodobne, aby dystans ten uległ w najbliższych latach znaczącemu zmniejszeniu. Polsce nie pozostaje nic innego jak tylko pogodzić się z tym faktem i jednocześnie uczyć się od lidera i czerpać z jego doświadczeń, a także korzystać ze wsparcia udzielanego z funduszy norweskich i funduszy EOG – w celu zmniejszania dystansu w zakresie zrównoważonego rozwoju oraz wzmacniania dwustronnych stosunków pomiędzy Norwegią a Polską.

**Słowa kluczowe:** zrównoważony rozwój, dystans rozwojowy, Polska, Norwegia

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## Introduction

The key challenge of the contemporary world is undoubtedly sustainable development. Among many definitions of this development, one seems to be the most transparent and frequently used. This is the definition elaborated in 1987 by the World Commission on Environment and Development, which says that making development sustainable means ensuring that it meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987)<sup>1</sup>. In the Polish legal system sustainable development was recognized as a constitutional principle (*Konstytucja...*, 1997) and defined as socio-economic development within which the process of integrating political, economic and social policies takes place and alongside the protection of natural environment is ensured in order to guarantee the opportunity to meet basic needs of particular communities and citizens of the contemporary generation, but also the future ones (*Ustawa...*, 2001).

The aim of this elaboration is to determine the position of two countries i.e. Norway (NO) and Poland (PL) on the path to sustainable development. Due to the fact that Norway is considered to be the leader of sustainable development in Europe, the country was chosen as a benchmark. Moreover, at the moment the authors are involved in the project concerning sustainable development, which is co-financed from Norwegian funds (Norway Grants) and in which a range of joint activities in cooperation with Norwegian socio-economic institutions was planned<sup>2</sup>. The aforementioned positions of Norway and Poland were described taking into consideration ten dimensions (themes) included in the EU Sustainable Development Strategy<sup>3</sup> such as: socio-economic development, sustainable consumption and production, social inclusion, demographic changes, public health, climate change and energy, sustainable transport, natural resources, global partnership and good governance. Achieving this goal allowed to point out the distance between

Norway and Poland with regard to sustainable development. Moreover, in this elaboration the attempt was made to assess the opportunities of reducing that distance by Poland.

It should be emphasized here that although the concept of sustainable development disseminated nowadays is a consequence of historical experiences of mankind and the best way to ensure optimal conditions for development of both – human species and the natural environment, nevertheless the concept is differently perceived by people living in Western Europe and Eastern Europe. The citizens of Western Europe to a higher extent agree with the assumption that there should be a balance between three pillars of sustainable development (social, economic and ecological). On the other hand, the residents of Eastern Europe underestimate the environmental pillar and they pay less attention to the social one (Rydzewski, 2015).

## EU Sustainable Development Strategy – objectives, challenges, indicators

*Sustainable development is one of the priorities of the European Union. In the light of the 'Treaty on European Union' its institutions are to promote and work for permanent, durable and sustainable development of Europe. The basis of this development is balanced economic growth and price stability, a highly competitive social market economy aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment (EU Treaty, 2008). The fundamental document stating objectives and actions of EU aiming at achieving sustainable development, but also helping to come up with appropriate policies, establishing standards and offering solutions, is the 'EU Sustainable Development Strategy (A Sustainable Europe for a Better World)', which was approved in May 2001 by the European Council (European Council, 2001), and then renewed in June 2006 (European Council, 2006)<sup>4</sup>.*

*The paramount aim of the Strategy is to determine and develop such activities, thanks to which the EU would be able to ensure and guarantee the present and future generations the constant growth of the quality of life through establishing communities based on principles of sustainable development, i.e. communities managing and using their resources efficiently and effectively, gaining from economic potential in the area of ecological and social innovations and therefore bringing prosperity, assuring environmental protection and social cohesion. The priority goals included in the 'EU Sustainable Development Strategy' were: environmental protection, justice and social cohesion, economic prosper-*

<sup>1</sup> It should be emphasized here that sustainable development is not a stable state of balance, but a process of changes, within which exploiting resources, the direction of investments, technological development and institutional changes are in line with both the future and present needs.

<sup>2</sup> Project *SUSTMAN* – Entrepreneurship, sustainable development and manufacturing for students of PWSZ in Konin<sup>3</sup> covers a range of subjects (*Eco-Entrepreneurship, Soft Skills and Communication, Sustainable Development, Sustainable Production and Service*), but also study visits and workshops in Poland and Norway. Further information concerning the Project is available on the website: <http://www.sustman.konin.edu.pl>

<sup>3</sup> Norway does not belong to the EU, but most of indices highlighted in the aforementioned Strategy are made available by the Eurostat for both the EU Member States and a few other European countries, including Norway.

<sup>4</sup> It should be signalized here that the concept of sustainable development was included in many other European strategic documents, namely the *Lisbon Strategy*, *Europe 2020 Strategy*, *White and Green Papers*, etc.

ity and fulfilling commitments of the EU on the international scale. Moreover, the major challenges covered in the Strategy concerned the following areas: climate change and clean energy; sustainable transport; sustainable consumption and production; conservation and management of natural resources; public health; social inclusion, demography and migration; global poverty and sustainable development challenges. For each challenge (threat) the objectives and targets were set and actions were determined, which are to help accomplish the aforementioned purposes.

Achieving the targets of the 'EU Sustainable Development Strategy' is monitored by making use of a range of indicators that concern ten dimensions (themes): socio-economic development; sustainable consumption and production; social inclusion; demographic changes; public health; climate change and energy; sustainable transport; natural resources; global partnership; good governance (GUS, 2011). The indicators of sustainable development can be presented in a pyramid divided into three levels reflecting their hierarchy (figure 1). At the top of the pyramid there are eleven headline indicators which monitor the overall objectives connected with key challenges of the Strategy. In the middle of the pyramid there are 31 indicators concerning operational objectives and targets, then at the bottom there are 84 indicators depicting the actions therefore making the headline indicators more specific. The set of indicators is supplemented by so called contextual indicators, which are not used for monitoring the Strategy directly, but they provide additional and valuable information in particular topics and phenomena connected with sustainable development and can be useful for analytical purposes.

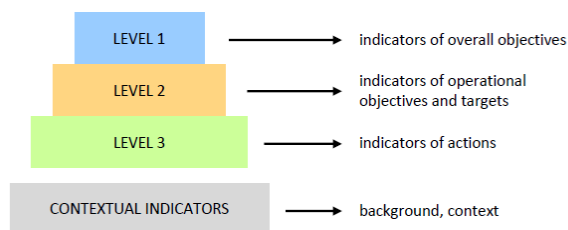


Figure 1. The indicators of sustainable development, source: Central Statistical Office of Poland, <http://stat.gov.pl> (06.02.2015).

The EU set of sustainable development indicators is regularly developed and updated by Eurostat, which prepares the monitoring reports (Eurostat, 2013)<sup>5</sup>, on the basis of which the European Commission elaborates reports monitoring the implementation of the *EU Sustainable Development Strategy* (European Commission, 2005, 2007, 2009).

## Methodological notes and source of information

Achieving the aim of this elaboration thus determining the position of Norway and Poland on the path to sustainable development and consequently determining the distance between these two countries in this respect, is possible by making use of numerous statistical measures – less or more advanced. However, taking into consideration the fact that the analysis concerns only two states, there is no point in using complex measures, for example, multidimensional comparative analysis. That is why the simplest measures such as: intensity ratios and dynamics ratios were used in this elaboration.

The starting point for conducting a comparative analysis was to find the values of indicators describing the situation of Norway and Poland with regard to sustainable development. Undoubtedly the best solution would be to use the aforementioned 11 headline indicators, which monitor overall objectives connected with key challenges of *EU Sustainable Development Strategy*. Unfortunately at that stage some constraints appeared. The values of two indicators, namely primary energy consumption and occurrence of common bird species (common bird index) so the indicators concerning the themes, respectively, climate change and energy and natural resources, are not available for Norway. Moreover, for the area good governance Eurostat did not propose a headline indicator. Bearing in mind these constraints with regard to the data availability and simultaneously taking into account the need to determine a position of Norway and Poland within all ten themes covered in the described Strategy, one headline indicator was used for the area of climate change and energy (chosen from three available) and operational indicators for themes: natural resources and good governance. Ultimately the values of the following sustainable development indicators were used<sup>6</sup>:

- $X_1$  – real GDP *per capita* (in EUR),
- $X_2$  – resource productivity (EUR per kilogram),
- $X_3$  – risk of poverty or social exclusion (in %),
- $X_4$  – employment rate of older workers (in %),
- $X_5$  – life expectancy of women at birth (in years),
- $X_6$  – renewable energy consumption (in %),
- $X_7$  – energy consumption of transport relative to GDP (compared to 2000, in %),

<sup>6</sup> Among the indicators there are both stimulants (S), which means that their higher values translate into a better situation with regard to sustainable development ( $X_1$ ,  $X_2$ ,  $X_4$ ,  $X_5$ ,  $X_6$ ,  $X_9$ ,  $X_{10}$ ), and the indicators being destimulants (D) whose lower values mean better situation in this respect ( $X_3$ ,  $X_7$ ,  $X_8$ ).

<sup>5</sup> The latest monitoring report was published in 2013.



- $X_8$  – water abstraction as a share of available renewable resources (in %),
- $X_9$  – official development assistance as a share of gross national income (in %),
- $X_{10}$  – voter turnout in national parliamentary elections (in %).

The values of most indicators were obtained from the Eurostat website and only a few of them – not available in the database of Eurostat – from the OECD database. It should be emphasized here that the values of particular indicators were presented for years 2004 (in some cases 2005) and 2013 (in some cases 2012), which therefore allowed to show the position changes of Norway and Poland on their path to sustainable development in the last decade.

### The position of Norway and Poland on the path to sustainable development

In this part of the elaboration the situation of Norway and Poland was characterized with regard to ten themes of sustainable development, which are as follows: socio-economic development, sustainable consumption and production, social inclusion, demographic changes, public health, climate change and energy, sustainable transport, natural resources, global partnership and good governance. Each of the mentioned above themes was described by a headline indicator ( $X_1$ ,  $X_2$ ,  $X_3$ ,  $X_4$ ,  $X_5$ ,  $X_6$ ,  $X_7$ ,  $X_9$ ) or operational one ( $X_8$ ,  $X_{10}$ ). Determining the position of both countries was preceded by the presentation of objectives associated to particular themes in the *EU Sustainable Development Strategy*.

Socio-economic development is a fundamental theme of the Strategy. The headline indicator within this area is real GDP *per capita*. In 2004 this value accounted for EUR 46.4 thousand in Norway and EUR 5.4 thousand in Poland. By contrast, in 2013 this value amounted to EUR 77.4 thousand and EUR 10.3 thousand respectively. It means that in the years 2004-2013 the absolute distance between Norway and Poland increased by EUR 26.1 thousand *per capita*. In relative terms the distance narrowed as in 2004 the value of Polish GDP *per capita* accounted for 11.6% of the Norwegian GDP value *per capita*, and in 2013 – 13.3%. Nevertheless, GDP *per capita* in Norway is still nearly eight times higher than in Poland<sup>7</sup>.

The objective formulated with regard to the theme sustainable consumption and production is to promote the patterns of sustainable consumption and production, which do not harm the natural environment and human well-being. The headline indicator within this area is resource productivity. In 2004 this productivity was at the level of 1.40 EUR per kilogram in Norway and 0.43 EUR per kg in

Poland, which means that using one unit of material (one kilogram) generates economic value amounting to respectively 1.40 EUR and 0.43 EUR. In 2013 resource productivity rose by EUR 0.46 and accounted for 1.86 EUR per kilogram in Norway. In case of Poland in the analyzed year the value reached the level of 0.49 EUR per kilogram. It means that in years 2004-2013 the distance between Norway and Poland in absolute terms increased by 0.40 EUR per kilogram. Assessing the distance from the relative perspective, it can be stated that the gap rose as in 2004 Polish resource productivity was 30.7% of the Norwegian one, but in 2013 – 26.3% (4.4% decline)<sup>8</sup>.

The objective formulated with regard to the next theme, which concerns social inclusion, is to reduce the number of people at risk of poverty and social exclusion, taking particularly into account poverty among children. The headline indicator within this area is risk of poverty or social exclusion. 15.8% of Norwegian citizens and 45.3% of Polish citizens were threatened with these phenomena in 2004. In 2013 the percentage of people facing the risk of poverty or social exclusion was respectively 14.% and 25.8%. It means that in years 2004-2013 the absolute distance between Norway and Poland declined by 17.8 percent points. Looking at the issue from the relative perspective – the gap also decreased as in 2004 the described percentage in Poland was almost three times higher than in Norway, but in 2013 – nearly two times<sup>9</sup>.

The objective formulated with regard to the theme demographic changes is to increase the number of women and older employees on the labor market. The headline indicator within this area is employment of older workers from the age group 55-64, the group mostly endangered by unemployment. The employment rate for this group in 2004 fluctuated around 65.8% in Norway and 26.2% in Poland. In 2013 the share changed and accounted for 71.1% and 40.6% respectively. It means that in years 2004-2013 the distance between Norway and Poland in absolute terms decreased by 9.1 percent points. We can observe the same tendency when we look at the issue in relative terms – the gap declined as in 2004 the rate was in Poland 2.5 times lower than in Norway and in 2013 1.75 times<sup>10</sup>.

The objective formulated with regard to the theme public health is to promote public health on equal terms and to improve protection against health threats. The headline indicator within this area is life expectancy at birth. In 2004 life expectancy for

<sup>8</sup> Resource productivity in Norway is similar to the EU average.

<sup>9</sup> The percentage of people at risk of poverty and social exclusion in Norway is lower by 10 percent points than the European average.

<sup>10</sup> The percentage of people (age group 55-64 years) employed in Norway is higher by over 20 percentage points than the EU average.

<sup>7</sup> The value of GDP *per capita* in Norway is nearly three times higher than the EU average.

women amounted to 82.5 years and 79.2 in Poland. The values of the indicator in 2012 reached the level of 83.5 years and 81.1 years respectively. It means that in years 2004-2012 the absolute gap between Norway and Poland declined by almost one year. Moreover, in relative terms the distance decreased, as in 2004 life expectancy for women in Poland in 2004 made up 96% of life expectancy for women in Norway, and in 2012 – 97,1%<sup>11</sup>.

The objective formulated with regard to the theme climate change and energy is to reduce climate changes, but also to lower their costs and negative effects, which become a burden for a society and natural environment. One of the headline indicator within this area is the use of renewable energy. In 2004 this use accounted for 58.1% in Norway and 7% in Poland. Taking into consideration the year 2013 the values amounted to 64.5% and 11% respectively. It means that in years 2004-2013 the gap between Norway and Poland in absolute terms increased by 2.4 percent points. However, from the relative perspective the distance declined, as in 2004 the use of renewable energy in Poland was over eight times lower than in Norway, but in 2013 nearly six times<sup>12</sup>.

The objective formulated with regard to the theme sustainable transport is to ensure that transport systems meet society's economic, social and environmental needs alongside minimizing their undesirable impacts on the economy, society and the environment. The headline indicator within this theme is energy consumption of transport relative to GDP. The energy consumption in 2004 accounted for 96.8% of consumption in 2000 in case of Norway and 104.7% in case of Poland. In 2013 the level amounted to 98.7% and 103.4% respectively. It means that in years 2004-2013 the gap between Norway and Poland in absolute terms declined by 3.2 percentage points. In relative terms the gap also narrowed as in 2004 energy consumption of transport relative to GDP in Poland was 108.2% of Norwegian one and in 2013 – 104.8%<sup>13</sup>.

The objective formulated with regard to the theme natural resources is to improve management and avoidance of overexploitation of renewable natural resources, due to the value of ecosystem services recognition. The headline indicator within this theme is a common bird index. In this elaboration the operational indicator was used i.e. water abstraction as a share of available renewable resources. This abstraction in 2004 fluctuated around 0.73% in Norway and 18.2% in Poland. In 2013 the share accounted for 0.77% and 18.9% respectively.

It means that in years 2004-2013 the gap between Norway and Poland in this area – both in absolute and relative terms – was at similar level.

The objective formulated with regard to the theme global partnership is to actively promote sustainable development worldwide and to ensure that the European Union's internal and external policies are consistent with global sustainable development and its international commitments. The headline indicator within this theme is official development assistance as a share of gross national income. In 2004 this help accounted for 0.87% in Norway and 0.05% in Poland. In 2013 this assistance amounted to 1.07% and 0.1% respectively. It means that in years 2004-2013, in absolute terms, the gap between Norway and Poland increased by 0.15 percentage point. In relative terms the gap narrowed as in 2004 the analyzed percentage in Poland was over 17 times lower than in Norway and in 2013 – nearly 11 times<sup>14</sup>.

The objective formulated with regard to the theme good governance is to promote coherence between national, regional and local actions in order to enhance their contribution to sustainable development. The headline indicator within this theme was not established. In this elaboration the operational indicator was used, i.e. voter turnout in parliamentary elections. In 2005 it accounted for 77.4% in Norway and 40.6% in Poland. The voter turnout reached the level of 78.2% in 2013 in Norway and 48.9% in 2011 in Poland. It means that the absolute gap between Norway and Poland declined by 7.5 percentage points. In relative terms the gap also narrowed as in 2005 voter turnout in parliamentary elections in Poland was almost two times lower than in Norway and a few years later a bit over 1.5 times lower<sup>15</sup>.

In the table below the values of used sustainable development indicators for Norway, Poland and the EU average were presented for the years covered in the analysis.

On the path to sustainable development Poland lags behind Norway in all aforementioned themes. Currently, i.e. taking account the situation in 2013 it can be stated that the biggest gap between these two countries is observed with regard to five following themes: socio-economic development, sustainable consumption and production, climate change and energy, natural resources and good governance. The distance is relatively the smallest within two themes: public health and sustainable transport.

In order to determine the overall gap between Norway and Poland in the area of sustainable devel-

<sup>11</sup> Life expectancy of women at birth in Norway is similar to the EU average.

<sup>12</sup> The use of renewable energy in Norway is nearly five times higher than the EU average.

<sup>13</sup> Energy consumption of transport relative to GDP for Norway is over 10 percentage points higher than the EU average.

<sup>14</sup> This percentage in Norway is over 2.5 times higher than the EU average.

<sup>15</sup> Voter turnout in national parliamentary elections in Norway is over 10 percent points higher than the EU average.

**Table 1.** The values of sustainable development indicators for Norway, Poland and the EU average in 2004 and 2013, source: Own independent elaboration on the basis of the data provided by Eurostat and OECD

Indicator	Year 2004			Year 2013		
	NO	PL	UE	NO	PL	UE
X <sub>1</sub>	46 400	5 400	22 300	77 400	10 300	26 600
X <sub>2</sub>	1,40	0,43	1,40	1,86	0,43	1,76
X <sub>3</sub>	15,80	45,30	25,70	14,10	25,80	24,40
X <sub>4</sub>	65,80	26,20	40,60	71,10	40,60	50,20
X <sub>5</sub>	82,50	79,20	81,50	83,50	81,10	83,10
X <sub>6</sub>	58,10	7,00	8,30	64,50	11,00	14,10
X <sub>7</sub>	96,80	104,70	98,70	98,70	103,40	86,90
X <sub>8</sub>	0,73	18,20	–	0,77	18,90	–
X <sub>9</sub>	0,87	0,05	0,34	1,07	0,10	0,34
X <sub>10</sub>	77,40	40,60	71,30	78,20	48,90	67,90

opment, so the distance taking into account all ten themes described with the use of indicators expressed in different units of measurements (EUR, percentage points, years). First of all, the relations between the values of particular sustainable development indicators for both countries for the period covered in the analysis were calculated<sup>16</sup>. Bearing in mind the fact that within each theme the situation of Poland was worse than in Norway, all the obtained results had the value lower than 1.0. Therefore the values of these relations were subtracted from the maximum value of 1.0 – the obtained difference showed the gap between two analyzed countries with regard to a particular theme of sustainable development. The last stage required adding up all obtained before differences (10 results altogether) – the value (sum) obtained showed the general distance between Norway and Poland on the path to sustainable development (on a scale to 10). The results of the calculations mentioned above were presented in figure 2 and figure 3.

### The assessment of opportunities to reduce the gap between Norway and Poland

In the context of the calculated results a fundamental question arises: is it possible for Poland in the coming years to diminish the distance towards Norway and therefore to reduce the gap between these two countries in the area of sustainable development? In the further part of this elaboration the attempt was made to answer this question – in particular with regard to five themes with the biggest distance and three themes with a relatively big gap. Two aforementioned themes i.e. public health and

sustainable transport, within which the analyzed disparities are relatively the smallest, were left out.

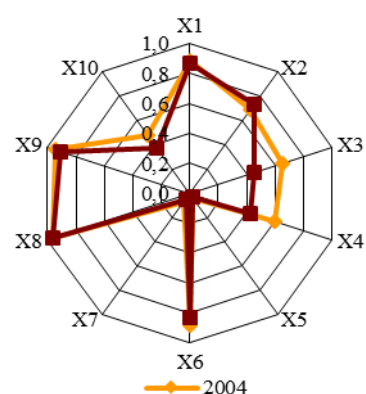


Figure 2. The gap between Norway and Poland with regard to particular themes of sustainable development in 2004 and 2013, source: Own independent elaboration on the basis of the data provided by Eurostat and OECD

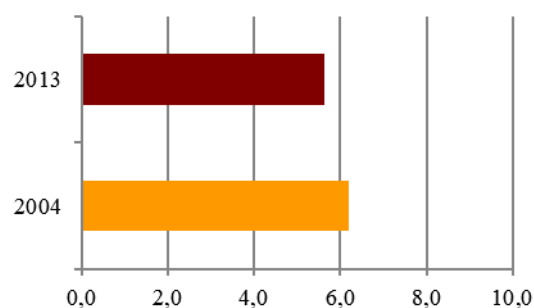


Figure 3. The general gap between Norway and Poland on the path to sustainable development in 2004 and 2013, source: Own independent elaboration on the basis of the data provided by Eurostat and OECD

<sup>16</sup> In different words, the quotients of indicators' values for Poland and Norway were computed – in case of indicators being stimulants (PL/NO), and in case of destimulants the multiplication was applied so the products of indicators' values for Norway and Poland were found (NO/PL).

According to the data provided by the World Bank – for many years Norway has been among the countries in the world whose socio-economic development is at the highest level, measured by

the value of GDP *per capita*<sup>17</sup>. Bearing in mind the fact, that in Poland this value is nearly eight times lower than in Norway, it can be clearly stated that the gap between these two states in this respect is not possible to overcome. Moreover, taking into consideration some key statistical measures, namely the average annual GDP growth *per capita* in Norway, which accounts for nearly 6% and in Poland a little bit over 7% (the geometric mean from last ten years), the relation of expenditure on research to GDP is respectively around 1.7% and 0.8%, and the unemployment rate fluctuates around the level of 3.5% and 10% respectively, it is difficult to expect – assuming similar socio-economic circumstances – that the analyzed distance could be reduced significantly. Frankly speaking, the value of Norwegian GDP *per capita* will be unreachable by Poland and most of the EU Member States in the coming years. The level of sustainability of consumption and production in Poland expressed by the resource productivity indicator – in comparison with Norway – leaves much to be desired. Unfortunately in the last years the gap between the two countries in this respect increased. Taking into account the values of two indicators out of three operational indicators proposed within the analyzed theme i.e. the amount of waste generated (in kg *per capita*) and the number of organizations with Eco-Management and Audit Scheme (EMAS) it can be assumed that the distance between Norway and Poland with regard to sustainable consumption and production will be slowly, but constantly diminishing in the coming years. The amount of waste generated *per capita* in both countries is at the similar level and on the other hand, the number of organizations registered in a scheme EMAS is in Poland bigger than in Norway.

Social inclusion, perceived through the lens of the percentage of people at risk of poverty and social exclusion, is a theme of sustainable development within which Poland made the biggest progress during last 10 years. However, this percentage is still higher by over 10 percentage points than in Norway (but much lower than in 2004). Undoubtedly the education (and its development) is the area that fosters social inclusion. Although the expenditures on education in Poland in relation to GDP (around 5%) are slightly lower than in Norway (around 6-7%), nevertheless, the values of two educational indicators, namely a percentage of early leavers of education and training and a tertiary educational attainment as a percentage of population aged 30-34 allow to arrive at the conclusion that there is a huge potential to reduce the distance between the analyzed countries. The first of the indicators mentioned is in Poland at a low level (5-

6%), whereas in Norway is much higher – it accounts for a dozen or so percents. The other indicator is systematically growing in Poland and in Norway it fluctuates at the more less same level.

A significant progress was also observed in Poland with regard to demographic changes, which is expressed by the growing percentage of people employed from the age group 55-64 years. In years 2004-2013 in Poland this percentage increased by 1.6 percentage points annually whereas in Norway only 0.6 percentage point a year. Nevertheless, it is unlikely that in Poland the value of this indicator could reach the level noted in Norway. In the authors' opinion it is possible for Poland to reach the European average in this respect, which would allow to reduce the gap in this area of sustainable development by about 20 percentage points. The further progress seems to be impossible, especially in the situation when the period of being active on the labor market amounting in Poland to over 32 years, is shorter by 7 years comparing to Norway<sup>18</sup>. The use of renewable energy specified as one out of three headline indicators within the theme climate change and energy in Poland is close to the European average and it is possible that in the near future it will be close to the level of 20% determined in Europe 2020 Strategy (European Commission, 2010), although it is highly unlikely it will reach that level. As long as reducing the distance of Poland toward the EU average seems to be feasible, diminishing the gap between Norway and Poland – similarly with regard to the value of GDP *per capita* – is beyond the reach of Poland and many European countries as well (except for Scandinavian states, especially Sweden). Norway belongs to the group of states – world leaders in the area of renewable energy use – which set standards and determine trends, which are held up as good examples to follow and therefore becoming an unsurpassed ideal for other countries.

The gap between Norway and Poland with regard to natural resources, expressed by an indicator concerning water abstraction as a percentage of the long-term renewable available water resources, is as big as the distance concerning climate change and energy. Poland belongs to the group of the largest European countries, such as France, Spain, Germany and Italy, where this indicator is at the significantly higher level than the OECD average. On the other hand, Norway, Ireland, Iceland, Slovakia and Sweden are the countries in which the indicator concerning water abstraction as a percentage of the long-term renewable available water resources is at a very lower level comparing with

<sup>17</sup> The value of GDP *per capita* places it among such countries as Switzerland, Luxembourg, Monaco, Qatar (World Bank).

<sup>18</sup> It should be emphasized here that in the context of demographic changes there are some worrying issues in Poland. First of all, the fertility rate is one of the lowest in the EU, and on the other hand the predicted dependency ratio is one of the highest in the EU.

other OECD countries<sup>19</sup>. Taking into consideration socio-economic settings in Norway and Poland, in particular the number of citizens and enterprises, and consequently the global water use and spatial conditions of both countries, namely access to water supplies, it can be stated that the distance in this area is not possible to overcome by Poland.

Global partnership, analyzed through the lens of allocating a part of gross national income to official development assistance, is the next gulf between the countries covered by this analysis. The distance does not take anyone by surprise, especially in the context of huge differences between Norway and Poland with regard to the values of GDP *per capita*. Moreover, the attention should be paid to the fact that Poland is the biggest recipient (beneficiary) of the funds from the EU budget, receiving more financial means than the contribution to this budget (European Commission), and on the other hand Norway – not being the EU Member State – gives help in the form of non-repayable grants, therefore provides funding to the least wealthy EU countries within the Norwegian Financial Mechanism, and is one of the countries-donors alongside Iceland and Liechtenstein within the European Economic Area Financial Mechanism (Norway Grants). Therefore, it can be assumed that the distance in this respect will not be eliminated, it can only be slightly reduced.

Voter turnout in national parliamentary elections, being one of the operational indicators reflecting sustainable development theme called good governance, is at a really low level in Poland – not only compared to Norway, but also to the EU average. It happens mainly due to bad opinions expressed with regard to the activities of the Polish parliament, especially the lower house of the Parliament (Sejm) and the feeling of lack of influence on public matters. Work of the Sejm was criticized by around 2/3 of Poles (CBOS, 2014), and nearly 80% of Polish respondents claimed that there was no possibility to have an impact on public issues (CBOS, 2013). In the light of aforementioned circumstances, a significant difference between Norway and Poland with regard to voter turnout in national parliamentary elections is not possible to overcome in the coming years. Admittedly, the distance between these two countries can be reduced in the theme of good governance, but it still will be at the level of 20 percentage points.

Summing up, in the authors' opinion it is highly unlikely to reduce the general gap on the path to sustainable development between Norway and Poland, which at the moment accounts for 5.63% on a scale to 10 (figure 3). Nevertheless, some of the disparities within three themes (sustainable consumption and production, social exclusion,

demographic changes) might be reduced, but in other five analyzed themes (socio-economic development, climate change and energy, natural resources, global partnership, good governance) disproportions will not change to a high and crucial extent.

## Conclusion

The analysis of the position of Norway and Poland on the path to sustainable development gives rise to the overall reflections, which can be expressed using the language from fairy tales: *in a faraway land there was a wonderful kingdom*. As it was mentioned before Poland lags behind Norway and stays on the sidelines of sustainable development in all ten themes. A huge gap between both countries, in particular with regard to five themes, four of which – according to authors – with a little chance for improvement of the situation in the coming years (socio-economic development, climate change and energy, natural resources, global partnership) makes it difficult to compare the situation of Norway and Poland as it seems to be *comparing incomparable things*. There is no doubt that in the future Norway will be an unquestionable and unsurpassed leader for Poland and many EU Member States at implementing the concept of sustainable development, setting standards and world trends. Poland must accept that fact and simultaneously learn from the leader and take advantage of its experience, in particular with regard to integrity and involvement of government authorities at different levels, which is essential to make citizens get engaged in cooperation and work for the common good – sustainable development. Another thing of significant value is the possibility to obtain financial support from the EEA and Norway Grants – the funds provided to particular programs aimed at reducing economic and social disparities and strengthening bilateral relations between Norway and Poland.

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## Sustainable Development of One of the Poorest Province of the European Union: Lublin Voivodeship, Poland – Attempt of Assessment

### Rozwój zrównoważony jednego z najbiedniejszych regionów Unii Europejskiej, Województwa Lubelskiego – próba oceny

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#### Abstract

This paper presents the attempt of sustainable development assessment for one of the poorest regions of the European Union (EU), Lublin Voivodeship in Poland, during its first decade in the EU, i.e. 2004-2013. Our analyses, performed for all pillars of sustainability: social, economic and environmental-technical, were based on sustainable development indicators (SDIs). The set of 21 sustainable development indicators, based on freely available statistical data, was proposed in this paper. The SDIs for Lublin Voivodeship were compared to values for Poland and the European Union. The special attention was put to assessment of sustainable development diversification between urbanized and rural areas of Poland and Lublin province. Our analyses showed that both, Poland and Lublin Voivodeship, clearly developed during the last decade but their sustainable development is still endangered and slowed down by several causes. Moreover, the value of most tested sustainability indicators was significantly below the European mean.

**Key words:** sustainable development, sustainable development assessment, sustainable development indicators, regional diversification

#### Streszczenie

W artykule przedstawiono próbę oceny zrównoważonego rozwoju jednego z najbiedniejszych regionów Unii Europejskiej (UE), położonego w Polsce w województwie lubelskim, podczas jego pierwszej dekady w UE (lata 2004-2013). Przeprowadzone analizy, odnoszące się do wszystkich głównych filarów zrównoważonego rozwoju: społecznego, gospodarczego i środowiskowo-technicznego, oparto o wskaźniki zrównoważonego rozwoju (WZR). W pracy zaproponowano zestaw 21 wskaźników, opartych o ogólnodostępne dane statystyczne. WZR dla województwa lubelskiego zostały porównane z wartościami dla Polski i Unii Europejskiej. Szczególną uwagę położono na ocenę zróżnicowania stopnia rozwoju między obszarami zurbanizowanymi i wiejskimi w Polsce i na



Lubelszczyźnie. Nasze analizy wykazały, iż oba obszary, Polska i województwo lubelskie, wyraźnie rozwinęły się w ciągu ostatniej dekady, ale ich zrównoważony rozwój jest wciąż zagrożony, bądź jest spowalniany, przez szereg przyczyn. Ponadto wartości większości badanych wskaźników zrównoważonego rozwoju plasowały się wyraźnie poniżej średniej europejskiej.

**Słowa kluczowe:** zrównoważony rozwój, ocena zrównoważonego rozwoju, wskaźniki zrównoważonego rozwoju, zróżnicowanie regionalne

## Introduction

The principle of sustainable development defined by *Our Common Future* report (WCED, 1987) and introduced in 1997 to Article No. 5 of the Constitution of Republic of Poland (Dziennik Ustaw No. 78, item 483, 1997) assumes the development meeting the needs of present and future generations. This idea means development of a current generation in which appropriate required living conditions and usage of natural resources do not affect the sustainability of natural system, thus, allowing the future generations to have their needs met. The concept of sustainable development is usually considered on three independent but linked areas: environmental (ecological), social and economic (e.g. Harris et al., 2001; Harding, 2006). According to Pawłowski (2009) these three basic pillars of sustainable development may be additionally supported by the moral, technical, legal and political aspects. The developed complicated and complex strategies of sustainable development, realized with respect to nature and the rule of intergenerational justice, should integrate the all above mentioned circles of sustainability.

The increasing popularity of sustainable development, as well as formulation and enactment (more or less successful) of strategies of sustainable development, resulted in necessity of quantified assessment of the natural environment, economics, law, social issues etc. in relation to demands of concept of sustainable development. As the effect of interdisciplinary collaboration, which was triggered by UN Agenda 21 plan (United Nations, 1992), a number of Sustainable Development Indicators (SDIs) were formulated, allowing to quantify and assess the actual condition of the natural environment as well as social, legal, political and economic affairs in relation to sustainability (e.g. Gilbert, 1996; Palme et al., 2005; United Nations, 2007; Palme and Tillman, 2008; Munitlak, Ivanovic et al., 2009). The scientific attempts of interdisciplinary assessment of sustainable development (of selected settlement, basin, region or country/countries and subcontinents) are usually based on from approx. 10 to several dozens of applied SDIs. The exemplary selected indicators of sustainable development frequently reported in the international literature are presented in Table 1. The exemplary SDIs presented in Tab. 1 show that realization of sustainable development strategy may be monitored and/or controlled by analyses of changes in countable and measurable values of selected several indicators representing various chara-

Table 1. Selected exemplary SDIs (modified after Konratyev et al., 2002; Hezri and Hasan, 2004; Palme et al., 2005; Ioris et al., 2008; Munitlak, Ivanovic et al., 2009; Tsai, 2010)

Pillar of sustainable development	Selected SDIs
Environmental and technical	Emission of pollutants to water, air and soil, (e.g. methane, CO <sub>2</sub> , BOD, COD, phosphorus, greenhouse gases, production wastes, toxins, heavy metals, oil derivatives), available resources (e.g. water, coal, gas, oil), availability of resources (e.g. population supplied in water), use of resources (e.g. water, coal, oil and gas), use of energy (conventional, renewable), roads and railways infrastructure, melioration, use of fertilizers, use of pesticides, reliability, volume of collected sewage, amount of deposited wastes, biodiversity of ecosystems, system stability (e. g. ecosystem of watershed or river).
Economic	Gross domestic product, gross domestic product per capita, income, income per capita, public debt, outside debt, inflation, industrial growth, arable land area, fallow land area.
Social, political and legal	Population, rural and municipal population, natural growth, mortality, infant mortality, length of life, poverty, illiteracy, unemployment, corruption, education, health care, parity, gender equality, political freedom, human rights, institutional readiness, social involvement.

acteristics of at all three areas of sustainability. In 2011 the exemplary set of SDIs for Poland for the period 2004-2009/10 (according to available data) was presented by the Polish governmental agency Central Statistical Office (GUS, 2011). The assessment was based on 76 indicators for four main areas of sustainability: social, economic, environmental and legal/political. All discussed indicators were related to data available for countries of European Union. However, in some cases the proposed indicators, especially in the field of environmental and technical sustainable development, may seem to be quite general. Moreover, the performed analyses for the whole country do not consider the spatial diversification of Poland's social and economic potential as well as environmental and technical conditions among all provinces of the country. In addition, the discussed

sustainable development of Poland was not assessed according to its differentiation between municipal and rural regions.

The United Nations guidelines (UN, 2007) described set of 50 indicators, without division along the pillars of sustainable development. The indicators developed by Commission on Sustainable Development, which were mainly used in the GUS's report of 2011, should be first applied to the analyses of sustainability at the national level. However, it is possible to introduce, beside the officially suggested, other indicators for the regional scale analyses, but they need to meet the several requirements. The adopted SDI should be representative, conceptually sound, understandable, clear and unambiguous, based on easily available data of known and proven quality, relevant to assessing sustainable development progress and finally limited in numbers but adoptable for future needs (UN, 2007).

The recent history of Poland in the 20<sup>th</sup> and 21<sup>st</sup> century resulted in a huge differentiation of several country regions. Before gaining back its independence in 1918 Poland was for more than 100 years partitioned among three superpowers: Romanov's Russian Empire, German Reich (earlier Prussia) and Austro-Hungarian Empire. As the effect, the reborn Poland in 1918 was consisting of three parts of different legal and monetary systems, agriculture and industry development, roads and railroads infrastructure, metric systems, technical and environmental standards, numerous ethnical minorities etc. The year 1939 and the beginning of World War II brought end to the free Republic of Poland, which was partitioned between Nazi Germany and Soviet Union. As the outcome of the war of 1939-45 in the new *Yalta* order Poland was left in the Soviet sphere of influence. The country borders were moved West, to the river Oder, while the huge eastern part of country was introduced to the Soviet Union. Incorporation into the Soviet bloc resulted in radical changes in country policy, economy and legal system, industry development (dispensable development of heavy industry), ownership of means of production as well as lack of personal and political freedom. The collapse of the Eastern bloc in 1989, caused by, inter alia, the Solidarity revolution, opened for Poland the road to free and sustainable growth but its underdevelopment in many areas should be first overcome. The entry of Poland to European Union in May 2004 seems to be a pivotal date in Poland's development, first proving the progress made since 1989, second opening the new opportunities for sustainable development. The unanswered question concerns the actual state of sustainable development in Poland and, specially, in its less developed and most diversified region, the Lublin province.

This paper presents the attempt of sustainable development assessment for one of the less developed regions of European Union, the Lublin Voivodeship,

Poland. The performed analysis was related to development of the whole country and to the international level of the European Union. Additionally, the diversification of development between municipal/urbanized and rural regions of Lublin Voivodeship, as well as Poland, was discussed.

## Materials and methods

### *Object description*

Lublin Voivodeship, located in the southeastern Poland, in its current shape established on January 1, 1999, is third of biggest administrative regions in Poland, its area is equal to 25 122.49 km<sup>2</sup> while its population was, in the end of 2013, equal to 2 156 150 people, which was approx. 5.6% of Poland population ([www.stat.gov.pl](http://www.stat.gov.pl)). The population density in Lublin Voivodeship is equal to approx. 85.8 residents per km<sup>2</sup>. According to the administrative division the Lublin Voivodeship is divided into 24 counties (powiats) covering 4 city counties and 20 land counties, which are further divided into 213 rural communes (gminas). There are 42 cities and towns and 4 116 rural settlements in the province. The largest city in the voivodeship, its capital, Lublin with population of approx. 344 000 ([www.stat.gov.pl](http://www.stat.gov.pl)) is 9<sup>th</sup> city in the country, according to population size. The next three largest towns of Lublin Voivodeship are Chełm, Zamość and Biała Podlaska with population between approx. 70 000 and 50 000 residents. Lublin Voivodeship is definitely a rural region, with rural population exceeding 53.7% of total number of province residents. Recently its gross domestic product per capita was reported as equal to 30 477 PLN (approx. 7256 Euro) makes Lublin Voivodeship the poorest region in the country and one of the poorest in EU.

After political and economic transformation of Poland during the last decade of the 20<sup>th</sup> century and collapse of several heavy industry enterprises in Lublin, the industrial production located in the province is very limited, achieving approx. 2.5% of the production in the country while sale of construction and assembly production reaches approx. 3.0%. Economic transformation also resulted in increased level of unemployment, of which the registered unemployment reached the range 11.2%-17.8% in period of 2004-2013. As the result, the considerable part of province residents is endangered by poverty, legal or relative, up to over 20% of the total population.

### *Methodology*

Sustainable development assessment of Lublin Voivodeship was conducted for the time period of 2004-2013. The starting date was selected according to the pivotal date in last decade of Poland's history, i.e. joining the European Union during the largest single expansion of the EU on 1 May 2004. The analyses were based on sustainable development indicators method. The applied indicators were based on data

Table 2. SDIs applied to sustainable development assessment of EU, Poland and Lublin Voivodeship

Pillar of sustainable development	Sustainable development indicator	Unit	Definition
Economic	Gross Domestic Product per capita	Euro	Gross Domestic Product (market value of all goods and services produced in a year) divided by number of the population.
	Commune income per capita	Euro	Income of local administration per one resident.
	Mean gross salary	Euro	Mean salary before tax deduction.
	Monthly income per capita	Euro	Mean monthly income per one resident.
Social	Registered unemployment	%	Percentage of officially registered unemployment.
	Rural vs. total unemployment	%	Registered unemployment in rural regions related to total registered unemployment.
	Poverty threshold	%	Percentage of population living below the national legal and relative poverty threshold.
	Birth rate indicator	-	Difference between births and deaths related to 1000 inhabitants
	Infant mortality rate	‰	Relation of infant deaths to infants births per 1000 inhabitants
	Total fertility rate	-	Average number of children that would be born to a woman over her lifetime.
	Population per one hospital bed	-	Number of inhabitants related to number of available hospital beds.
	Patients per hospital bed	-	Number of treated patients related to number of available hospital beds.
	Net migration rate	-	Difference of officially registered immigrants and emigrants of an area divided per 1000 inhabitants.
Environmental and technical	Water use	m <sup>3</sup> /m	Yearly water consumption per one inhabitant.
	Water supply network users	%	Number of inhabitants connected to water supply systems related to total population.
	Sanitary sewer users	%	Number of inhabitants connected to sanitary sewer systems related to total population.
	Water supply network density	km/100 km <sup>2</sup>	Length of water supply network pipelines per 100 km <sup>2</sup> .
	Sanitary sewer network density	km/100 km <sup>2</sup>	Length of sanitary sewer network pipelines per 100 km <sup>2</sup> .
	Waste water treatment plant users	%	Number of inhabitants connected to waste water treatment plants related to total population.
	Total wastes	kg/person	Total wastes mass related to one inhabitant
	Sorted vs. unsorted wastes	%	Relation of sorted domestic wastes to unsorted wastes.

published by Polish government executive statistical agency Central Statistical Office and freely available in Local Data Bank at [www.stat.gov.pl](http://www.stat.gov.pl). Data considering indicators of sustainable development for United Europe and its member countries were obtained from the EU statistical office Eurostat web page and several reports concerning indicators of sustainable development of the EU (GUS, 2011; Eurostat, 2013a, 2013b).

The performed attempt of Lublin Voivodeship's sustainable development assessment related to development of the whole country and the international level of the EU was conducted for the following areas of sustainability: social, economic and environmental – technical. In many specific cases the development of Lublin province was analyzed separately basing on

the established indicators for both, urban and rural regions of the province. The special attention was paid to impact of the environmental engineering on sustainable development (Pawłowski, 2010).

Table 2 shows the indicators of sustainability applied to the presented study.

### Sustainable development analyses

#### *Economic development*

The most frequently used economic indicator describing standards of living of a country or a region is Gross Domestic Product (GDP) per capita. According to EU data the real GDP per capita for EU mainly increased, excluding slight decrease and limited growth after world crisis period in 2008 year,

from 19 600 Euro in 2000 to 26 600 Euro in 2013. The GDP per capita in Euro zone reached even higher level.

In 2013, according to actual Eurostat data, GDP per capita of Poland was equal to 10300 Euro, which makes it 38.7 % of EU and 33.9% of Euro zone GDP per capita. Only two countries in the EU present significantly lower indicators. Bulgaria with GDP per capita equal to 21.1% of EU and 19.0% of Euro zones GDP as well as Romania with 27.1% and 22.7% respectively. The similar level of the discussed SDI to values for Poland is presented by Hungary (37.9% and 34.2%), while Latvia (43.6% and 36.9%) and Lithuania (44.4% and 38.0%) present slightly higher indicators. The available Polish data, presented by GUS for the Lublin Voivodeship (of population comparable to Latvia and Lithuania) shows the real GDP per capita for year 2012 equal to 7019 Euro per person. This value is 70.3% of GDP per capita of Poland and 26.4% of indicator for the EU. The historical development of analyzed SDI for Lublin Voivodeship, Poland, EU and its Euro zone in the period of 2004-2012 may be observed in Fig. 1.

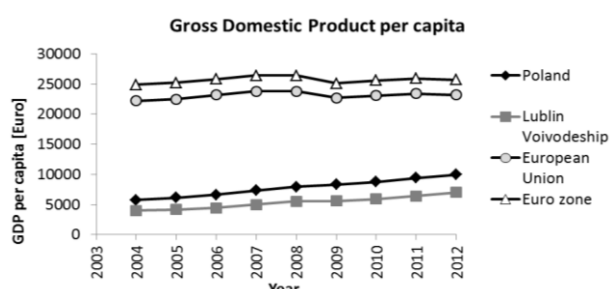


Figure 1. GDP per capita for Lublin province, Poland, European Union and Euro zone in period of 2004-2012 (developed after data by GUS and Eurostat)

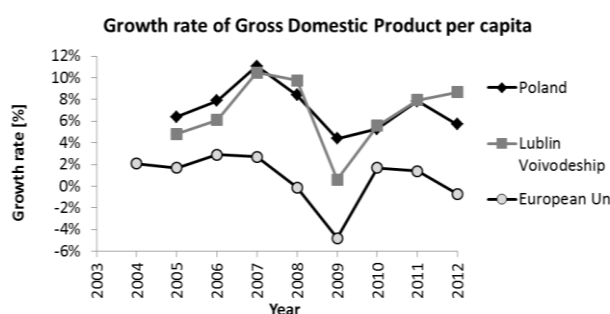


Figure 2. Growth rate of GDP per capita for Lublin Voivodeship, Poland and European Union in period of 2004-2013 (developed after data by GUS and Eurostat)

Fig. 1 and Fig. 2 show that economics of Poland and Lublin Voivodeship were not significantly affected by the world crisis in 2008, which clearly hit European economics in 2009. The growth rate of GDP per capita for Lublin province and Poland were slowed down by the crisis but the negative values were not reached. According to Polish data, the lowest value observed, growth rate of 0.6%, was noted in Lublin Voivodeship in 2009, at the same time the value for European Union reached the level -4.8%.

However, despite the fact, that analyses of growth rate of gross domestic product per capita suggests that economy of Lublin Voivodeship developed for the tested period slightly slower than in the rest of the country, but at the satisfactory level (even exceeding the GDP growth at the end of 2013), the real level of life may be assessed by application of another two indicators, i.e. mean gross salary and monthly income per capita. Mean gross salary for inhabitants of Lublin Voivodeship was permanently lower than the mean value for the country during the considered period of time and rested in rather steady level of the range from 87% to 90 % of mean salary for Poland. Its value varied for Lublin Voivodeship between 499 Euro in 2004 and 831 Euro in 2013, while for Poland these values were 574 in 2004 and 923 in 2013, respectively. Although, monthly income per capita for residents of Lublin province was constantly decreasing its value in relation to country's mean value – from 92% in 2004 (161 Euro vs. 175) to 85% in 2013 (252 Euro vs. 304 Euro).

Economic development of the region may be also assessed according to changes in local governments' incomes per capita. The clear increase of communes incomes per capita for the considered period is visible, starting from 449 Euro in 2004 to 892 Euro in 2013 for Poland, including cities and from 379 Euro in 2004 to 738 Euro in 2013 in rural areas. For the same period the same values for Lublin Voivodeship (including cities) increased from 389 Euro to 810 and from 350 to 702 Euro for rural areas. Thus, a huge difference between incomes of communes, including cities and rural ones, in the scale of the whole country is visible. The incomes per capita of rural local governments were equal to approx. 82-85% of communal incomes including cities. Despite the fact that incomes of communes including cities were lower in Lublin Voivodeship during the period of the analysis, reaching the value of 82-91% of Poland's incomes, reaching even in some period of time the level comparable to country's rural communes income, the difference between municipal and rural communes incomes located in Lublin province were in the range of 87-92%.

The brief analyses of sustainable development of Lublin Voivodeship and Poland, related to level represented by states of the European Union, showed that both, Poland and Lublin province developed significantly during the considered period of time. However, despite the fact that GDP per capita showed weaker reaction of Polish economy to the world crisis started in 2008, the quality of life in Poland may be affected by the low value of gross product. Additionally, all tested economical SDIs for Lublin Voivodeship showed considerable differences between the region, especially its rural part, and the whole country. The development of the Lublin province's economy similar in rate to the development of Poland's economy is not enough to fill the gap in all applied development indicators.

### Social development

Generally, social development may be assessed by means of several indicators, connected also to quality of live understood as well-being of societies or individuals. The selected SDIs describing quality of live were already used in description of the actual progress of economic development for EU, Poland and Lublin Voivodeship, so the total registered unemployment rate, directly connected to economy and creating social problems affecting quality of life, will be discussed as the first.

According to data reported by Eurostat the actual total registered unemployment rate for Poland equal 10.3% is close to the mean value for European Union (10.8%). However, official data presented by Polish GUS for year 2013 show the registered unemployment rate for Poland as 13.4%. Nonetheless, there are numerous countries in EU of registered unemployment higher than observed in Poland, e.g. starting from Spain, Greece with 26.1% and 27.5% in 2013, respectively, to Croatia, Cyprus, Portugal and Slovakia of unemployment in range of 14.2%-17.3%. On the other hand, there are the countries with the lowest rate of registered unemployment, such as Austria (4.9%) and Germany (5.2%). Fig. 3 presents the development of registered unemployment in EU, Poland and the Lublin Voivodeship for 2004-2013. It shows, that in 2004 the registered unemployment in Poland and Lublin Voivodeship was approx. two times higher than in the countries of European Union. Then, the observed indicators of unemployment for Poland decreased significantly until the year of 2008. Since 2008, the increased world and European crisis resulted in nearly parallel increase of registered unemployment in all the discussed regions: The EU, Poland and Lublin Voivodeship. However the value for discussed SDI is still significantly higher in Poland than the mean value for European Union by approx. 30%.

The full assessment of unemployment in Poland and Lublin Voivodeship should be supported by the analysis of unemployment diversification. According to official data for year 2011, over 60% of population in Poland was living in the urbanized areas. In the scale of the whole country for the period of consideration the registered unemployment in rural areas was in range of 42%-44% so its roughly corresponds to percentage of rural population in Poland, 38-39% of total population. The registered unemployed residing in rural settlements of Lublin Voivodeship during considered time period were in range 53-55%, higher than in case of the whole country, but again roughly corresponding to the share of rural population in Lublin province (approx. 53% of residents).

Another indicator of sustainable development connected to social matters and directly resulting from the economic conditions is number of people at risk of poverty and social exclusion (AROPE). According to EU regulations (1177/2003, 1553/2005,

1791/2006) AROPE is defined by share of people who are: i) at risk of poverty, meaning below the poverty threshold; ii) in a situation of severe material deprivation and iii) living in a household with very low work intensity. The EU poverty threshold for risk of poverty is understood as persons with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income.

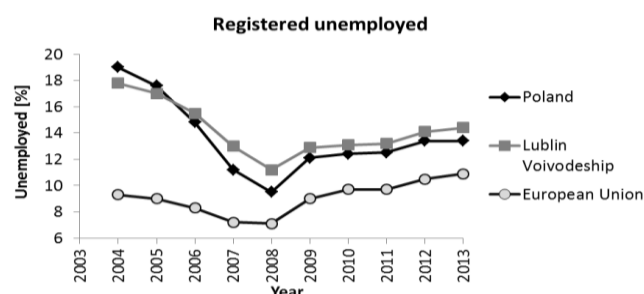


Figure 3. Registered unemployment for EU, Poland and the Lublin Voivodeship in 2004-2013 (developed after data by GUS and Eurostat)

According to Eurostat mean share of people at risk and social exclusion in 2013 was equal to 24.5%, while the highest values observed for Bulgaria and Romania reached the values of 48.0% and 40.4% respectively. The lowest values of AROPE was in 2013 observed in the Netherlands, Sweden and Czech Republic equal to 15.9%, 16.4% and 14.6%, respectively. During the same time European indicator of people at risk and social exclusion in Poland was equal to 25.8%, slightly above the average value. The level comparable to presented by Poland was in 2013 achieved by several countries such as United Kingdom, Spain and Portugal. However, it is worth to note, that, according to Eurostat data, number of people endangered by poverty and social exclusion in Poland decreased significantly in the period 2004-2013. In year 2005 noted value of AROPE indicator for Poland was equal 45.3%, then, in 2008 reached the level of 30.5%, just to decrease to 27.8% - 27.2% between 2009-2011.

The inner Polish statistics, presented by GUS, are based on several thresholds of poverty of which the legal, relative and minimum of existence thresholds are commonly used. According to Polish regulations, the legal poverty threshold determines the percentage of persons living in households of expenses lower than the one allowing to obtain the financial support from the social help (due to the binding Polish law). The relative poverty threshold determines the percentage of people living in households of expenses lower than 50% of mean expenses of the total number of households in the country. The last poverty threshold used in Poland determines the share of people whose incomes allow only to secure the basic needs necessary for biological survival of human being.

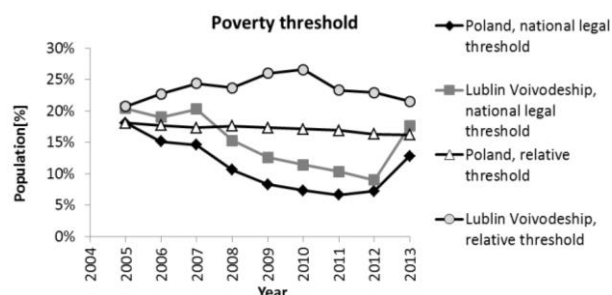


Figure 4. People endangered by various types of poverty in Poland and Lublin Voivodeship in the period 2005-2013 (developed after data presented by GUS)

Fig. 4 shows the time variable development of percentage of Poland and Lublin Voivodeship residents endangered by various types of poverty threshold. During the whole analyzed time period, the poverty indicators for Lublin province were higher than the mean values for Poland. Additionally, it's worth to mention that during the last three years for which the official data are available (2011, 2012 and 2013) the studied indicators for Lublin Voivodeship belonged to the group of the highest in the country reaching the following values: legal poverty threshold indicator 10.3%, 9.0% and 17.6%, relative poverty indicator 23.3%, 22.9% and 21.5% and minimal existence indicator 11.0%, 8.5% and 9.4%, respectively. Fig. 4 shows also that time varied curve, presenting percentage of people endangered by reaching the legal poverty threshold, has similar shape and decreasing tendency for both, Poland and Lublin Voivodeship. The only difference is the indicator value, higher for Lublin province by approx. from 13% to 56%. In case of the other studied indicator the higher differentiation between the values for Poland and Lublin province may be observed because not only the higher values but in the increasing trends for Lublin Voivodeship.

Social sustainable development may be assessed also by application of indicators related to generally understood health of the population. One of the most worldwide popular and commonly applied indicator is the birth rate. According to EU data, the mean birth indicator for EU in 2012 was equal to 0.3, while the value reported by Eurostat for Poland was equal to 0.0. Meanwhile, the lowest values of the birth rate in EU were noted in Cyprus and Malta, -3.4 and -2.4, respectively. The highest birth rate was observed in Lithuania reaching 2.9 (similar values of approx. 2.8 were noted in Latvia and Bulgaria). Thus, the birth rate indicator for Poland does not differ significantly from the European mean.

Fig. 5 presents comparison of the birth rate for the EU, Poland and Lublin Voivodeship based on data allowed by Eurostat and Polish GUS for the selected period of analysis. It's clearly visible that through the whole analyzed time the birth rate indicator for the Lublin province was significantly lower than for the whole country and the EU mean and had the neg-

ative value for the studied decade. Recently, according to GUS data, the discussed indicator for Poland is equal to -0.46 and for Lublin Voivodeship -1.44.

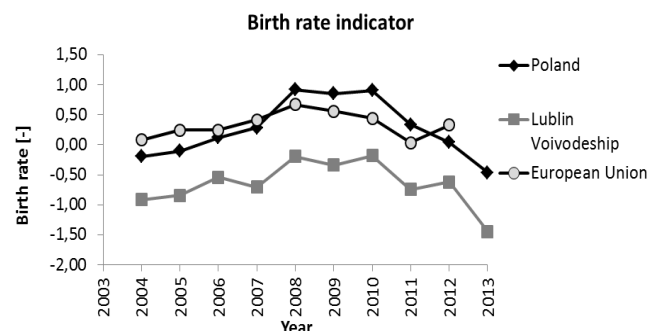


Figure 5. Birth rate indicator for EU, Poland and Lublin Voivodeship, based on GUS and Eurostat data

Another social SDI connected to population's health is the infant mortality rate, which was commonly used in the past to assess the capability of health care system and popularly understood quality of life. Actual, the mean infant mortality rate per 1000 births for all EU countries, presented by Eurostat, is at the level of 3.8, while for Poland 4.6. The lowest mortality rates in 2012 were observed in Slovenia (1.6), Finland (2.4), Luxembourg (2.5) and Sweden (2.6). On the other hand, the highest infant mortality values were noted in Romania (9.0), Bulgaria (7.8) and Latvia (6.3). The level similar to represented by Poland was reported for Hungary and the United Kingdom. There are no significant differences between infant mortality rates reported by Polish GUS for Poland and Lublin province. The reported values are similar and the decreasing tendency, providing for improvement in public health care, is visible. The infant mortality rate in Poland for the considered period decreased from 6.8 to 4.56, while in Lublin Voivodeship from 7.93 to 4.56.

The another SDI allowing to assess the social sustainable development and connected to public health and society wealth may be the total fertility rate. In EU in 2013 it was equal to 1.58, for Poland even less, 1.3. The lowest value in European Union, equal to 1.28 was reported for Portugal, while the highest values, 2.01, were noted for France and Ireland. If we add, that in the UK and Sweden, total fertility rate is at level of 1.92 and 1.91, respectively, it becomes visible that the top fertility rates were noted in countries of significant immigration, registered and unregistered.

Fig. 6 shows changes of total fertility rate for Poland and Lublin Voivodeship and for the European Union in the period of 2004-2013. It's visible, that after few opening years of the studied decade the level of discussed SDI became the same. Changes of fertility rate in Poland and Lublin province are corresponding to changes in some economic SDIs, such as gross rate of GDP per capita or registered unemployment.

Additionally, the total fertility rate in Poland and Lublin region was lower than the mean EU value for the whole considered period.

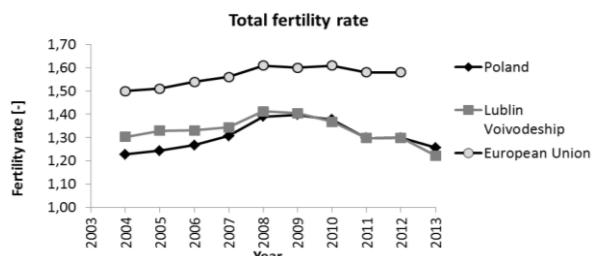


Figure 6. Total fertility rate for EU, Poland and Lublin Voivodeship, developed after GUS and Eurostat data

Public health care, affecting social sustainable development, may be assessed by its accessibility, quantified by the number of hospital beds available for the population of a country or region.

The mean value of population per one hospital bed, according to calculations based on Eurostat reports, was in 2011 equal to 225. For the same year this SDI for Poland, according to Eurostat, was equal to 153, while the lowest value of 122 was noted for Germany and the highest, 370, for Sweden. The similar population per one bed to the one reported for Poland were in 2011 observed in Bulgaria (155), France (157) and Belgium (158).

The Polish governmental statistical agency, GUS, presents slightly different data concerning the discussed SDI. According to this source, actually, the population per one hospital bed reached in 2013 level of 205, while this indicator for Lublin Voivodeship was equal to 187. The historical development of the concerned SDI is presented in Fig. 7. The difference between indicator for the whole country and for the Lublin province remains nearly constant through the analyzed period, but the accessibility of public health care in Lublin region was easier, because of lower population per one hospital bed. However the number of patients treated, related to one hospital bed, was in the last decade similar or slightly lower in Lublin Voivodeship than in the whole country. In 2004 – 35 people were treated one bed in Lublin region, 37 in the whole state of Poland. After nearly a decade, in 2011, 42 people were treated on one bed in Lublin Voivodeship and 44 was the mean value for Poland. Thus, the public health care in Lublin province may be assessed as slightly less effective than the mean values representing the whole country. Both SDIs, for Lublin region and for Poland showed mostly lower values during the considered period than the reported EU mean.

Finally, social sustainable development may be also assessed by analysis of net migration rate SDI. However it should be remembered, that usually presented data concern only the official registered migration, which in any cases may be significantly lower than the unofficial, unregistered migration. The mean migration rate for EU in 2013 reached the level of 3.3,

while for Poland -0.5 migrants per 1000 inhabitants. The above means, that people are still migrating to the countries of European Union, but inhabitants of Poland are leaving their country. The highest positive migration rate was in 2013 noted for Italy, 19.7, the lowest negative equal to -13.9 was reported for Cyprus. Net migration rate observed for Poland had the level comparable to Czech Republic, Bulgaria and Romania.

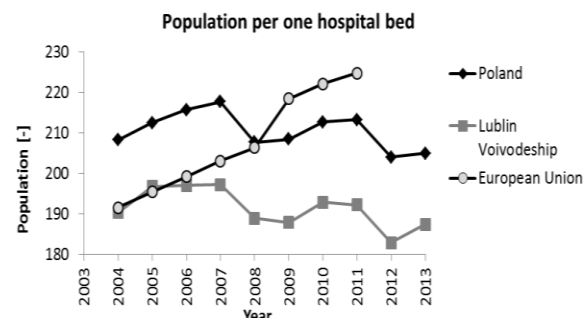


Figure 7. Population per one hospital bed in EU, Poland and Lublin Voivodeship, developed after GUS and Eurostat data

Fig. 8 presents the historical net migration rate SDI for the period of 2004-2013 for Poland and Lublin Voivodeship. Both presented curves are quite similar, in most cases net migration rate, for both, Poland and Lublin region are negative, however, the discussed SDI had greater values for Lublin Voivodeship. During the same decade, the net migration rate for the EU, reported by Eurostat, was clearly higher, reaching only positive values (see Fig. 8).

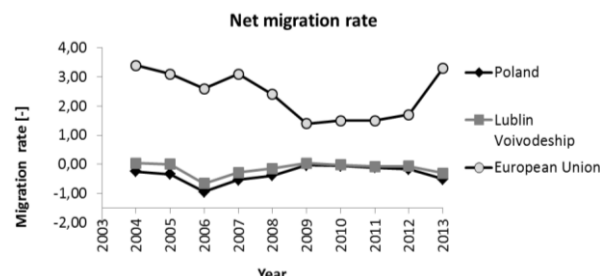


Figure 8. Net migration rate for EU, Poland and Lublin Voivodeship, developed after GUS and Eurostat data

The presented above attempt of assessment of social sustainable development of Poland and Lublin Voivodeship showed some progress since the date of entry to European Union, e.g. in public health care, despite the temporal changes related to economic and political situation in and outside of the country.

The presented data also shows, that Lublin region, in most cases, develops slower than the mean values for the rest of the country. However, there are visible areas where the social sustainable development of Poland and Lublin Voivodeship is endangered. Relatively high and constantly slightly increasing registered unemployment, high and constant rural unemployment, significant numbers of inhabitants endangered by poverty, decreasing birth rate, negative

value of net migration rate suggest, that Poland and its poorest region, Lublin Voivodeship are not so attractive for their residents as they should be.

#### *Environmental and technical development*

Usually the environmental and technical development is assessed by several SDIs connected to quality of environment, its pollution, available resources and their quality. However, in this paper we would like to propose the alternative set of easily available and understandable indicators, focused mainly on interactions between environment, technical infrastructure of environmental engineering and quality of life and health of population (see Tab. 2).

In our opinion, there is no quality of life and development of population without access to fresh water resources. The mean yearly water use for several countries of EU, reported by Eurostat, was in 2011 at the level of 69 m<sup>3</sup> per inhabitant, while water use in Poland was equal to 40 m<sup>3</sup> per inhabitant. The highest water use per one resident in 2011 was reported in Cyprus reaching over 158 m<sup>3</sup> per resident and Latvia, 120 m<sup>3</sup> per resident, the lowest in Lithuania and Estonia, approx. 33 and 36 m<sup>3</sup> per resident, respectively. The level reported of tap water use for Poland was noted only for Romania. The neighborhood EU countries of Poland showed greater water use, i.e. Czech Republic 47 m<sup>3</sup> and Germany 50 m<sup>3</sup>. To better understand structure and amounts of consumed fresh water by households residents the another SDI should be introduced: population, in percentage, connected to water supply pipelines.

The mean value of inhabitants connected to organized water supply systems in the European Union was in 2011 equal to 92.3%. The highest possible values, i.e. 100%, were reported for the seven countries, including e.g. Belgium, Spain and the Netherlands. The population connected to water supply over 90% was reported in eight EU countries. On the other hand, 57% of population were connected to water supply pipelines in Romania. The mean population of member countries of EU during the decade between 2004 and 2013 was in the level of 91.0%-92.3%.

The precise info describing yearly water use in Poland and Lublin Voivodeship, with differentiation on municipal and rural areas, is presented in Fig. 9 and Fig. 10. Generally, we may state that yearly water use for whole country of Poland was at the nearly constant level, in the range of 31-32 m<sup>3</sup> per inhabitant, more than twice lower than the mean value for the EU. It is visible that in both, Poland and Lublin Voivodeship, water use in the cities was significantly higher during the whole period of analysis than tap water consumption in the rural areas. Fig. 10 shows also the constant decrease of water use in the cities and increase in the rural areas, both for Poland and Lublin region. However, the tap water consumption in cities of Lublin Voivodeship was at comparable

level to the mean consumption for the whole country. Additionally, tap water use in the rural areas of Lublin was the lowest of analyzed values, for the whole period concerned.

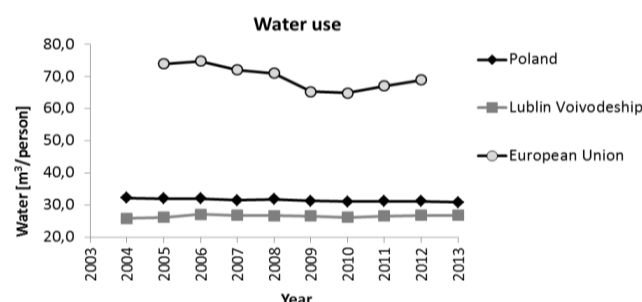


Figure 9. Water use per inhabitant in EU, Poland and Lublin Voivodeship, developed after GUS and Eurostat data

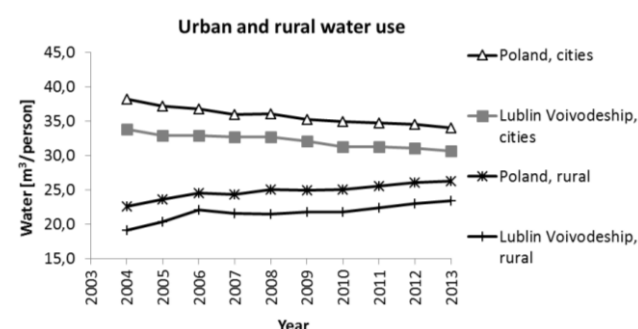


Figure 10. Water use per inhabitant in cities and rural Poland, 2004-2013, combined after GUS data

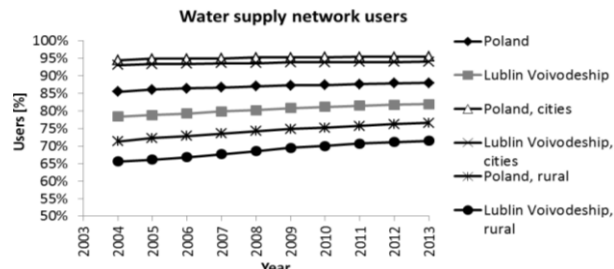


Figure 11. Water supply pipelines users in Poland and Lublin Voivodeship, based on GUS data

To better understand these information we need to introduce the data concerning various types of water supply users in Poland – see Fig. 11. The historical data presented in this Fig. show, that the mean population of Poland connected to water supply pipelines increased slightly since 2004, from 85.5% to 88%. The number of water supply network in the cities was nearly unchanged, both in Poland and Lublin Voivodeship, during the whole discussed decade, at the level of 94-95%. The greatest changes were reported for rural settlement in Poland and Lublin Voivodeship, the clear increase of connected population, from 71 to 77% and from 66 to 72%, respectively. However, the part of rural population connected to water supply systems in Lublin province is lower than in the rest of the country. The rest of the population use the local water sources, such as



dug or drilled wells, providing water of unknown and uncontrolled quality.

Water consumption always results in domestic and municipal sewage generation and discharge, so the environmental and technical sustainable development should be also assessed by share of population connected to sanitary sewers (as allowing to limit the danger of environmental pollution triggered by uncontrolled wastewater discharge). According to Eurostat data, the mean value of urban population connected to sanitary systems was in 2011 equal to approx. 82%, while in Poland this value reached the level 87%. The similar level was reported for Belgium (89%), Sweden (87%) and Czech Republic (83%). The highest values were noted in Spain and the Netherlands, 99%, the lowest in Croatia, 53%, Slovakia (62%) and Slovenia (63%). Unfortunately, no separate data for rural populations were available in Eurostat.

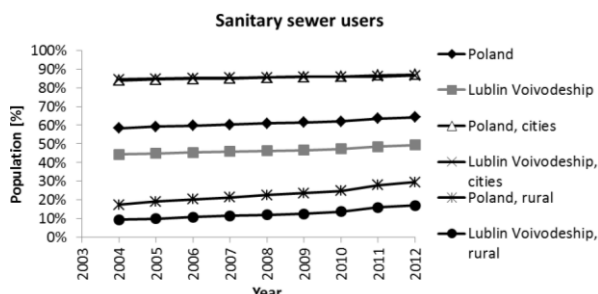


Figure 12. Sanitary sewers users in Poland and Lublin Voivodeship in the period of 2004-2013

The precise data concerning different types of sanitary sewer users in Poland and Lublin Voivodeship are presented in Fig. 12. The total population of Poland inhabitants connected to sanitary wastewaters systems increased in the period of our analysis, from 58% to 65%. In Lublin Voivodeship this value was in range 44%-50%. The urban population using sanitary sewer also slightly increased and was in range of 84%-87.4% and 84.4%-86.7% for Poland and Lublin region, respectively. The greatest increase in percentage of people connected to organized sanitation systems was observed in the rural areas, from 17.3% to 30.9% for Poland and from 9.3% to 17.7% for Lublin Voivodeship. The quoted numbers show that the majority of rural population of Poland has no connection to organized wastewater collection systems. The generated wastewaters are transported to wastewater treatment plants by septic cars or managed in various types of mostly uncontrolled septic tanks and domestic sewage treatment plants, usually limited to drainage systems. The available GUS data show, that in 2013 there were 2256572 septic tanks noted in Poland and 178114 tanks in Lublin Voivodeship. The 154944 and 18458 operating domestic sewage treatment plants of various efficiency were reported in Poland and Lublin region in 2013, respectively.

To better understand diversification of water use and water and wastewater systems in urbanized and rural areas of Poland and Lublin Voivodeship, the density of discussed system should be presented. Fig. 13, Fig. 14 and Fig. 15 present total, urbanized and rural density of discussed systems, respectively.

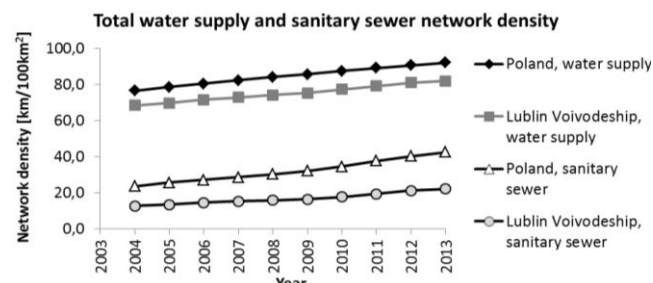


Figure 13. Total water supply and sanitary sewer network density in Poland and Lublin Voivodeship, based on GUS data

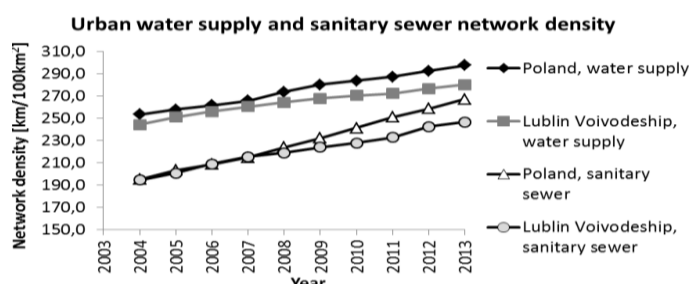


Figure 14. Urban water supply and sanitary sewer network density in Poland and Lublin Voivodeship, based on GUS data

Data presented in Fig. 14 show, that during the last decade, since entrance of Poland to the EU, the density of both studied environmental engineering system increased, especially the sanitary wastewater collection system. However, the density of sanitary sewer is clearly several times lower than density of water supply system. Additionally, density of both systems are significantly lower in Lublin Voivodeship than in the whole country.

Fig. 14 shows the clear increase of both systems density in urbanized areas during the last decade. It's visible that the greatest increase was reported for density of urban sanitary wastewater system in Poland, from the density of approx. 195 to 267 km per 100 km<sup>2</sup> of urbanized area. The same value for Lublin Voivodeship was presented as increasing from 195 to 247 km per 100 km<sup>2</sup>, so the observed development was slower.

Fig. 15 shows, that density of both studied systems, water supply and wastewater sewer, however increasing since 2004, is significantly lower in rural conditions than in urbanized areas. The density of water supply increased from approx. 64 and 61 km per 100 km<sup>2</sup> to 76 and 74 km per 100 km<sup>2</sup> for Poland and Lublin Voivodeship, respectively. Definitely the worse situation is visible in case of rural sanitary sewer systems. Their density in Poland increased

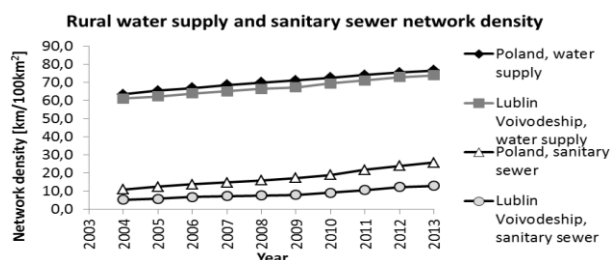


Figure 15. Rural water supply and sanitary sewer network density in Poland and Lublin Voivodeship, based on GUS data

since 2004 from approx. 11 to 26 km per 100 km<sup>2</sup>. During the same period in Lublin Voivodeship the increase of sanitary sewage density from 5.4 to 13 km per 100 km<sup>2</sup> was observed. Thus, the density of rural sewage system in Lublin province is twice lower than mean value for the rest of country.

The final elements of sewage removal systems are wastewater treatment plants (WWTPs). Unfortunately, data concerning population of EU countries available in Eurostat is limited to only 16 states. The mean share of population connected to WWTPs was in 2011 equal to 87%. The reported values varied between 100% (e.g. Denmark, Germany, the Netherlands and Finland) and 39% (Croatia) or 42% (Romania). According to GUS data, actually, 70.3% of residents of Poland are connected to WWTPs. The share of Poland's population connected to wastewater treatment plants increased from 59% to 79.4% during the period 2004-2013. At the same time number of Lublin Voivodeship residents using WWTPs increased from 50.6% to 55.5%. Fig. 16 presents data concerning diversification of population connected to WWTP in urbanized and rural areas of Poland and Lublin Voivodeship.

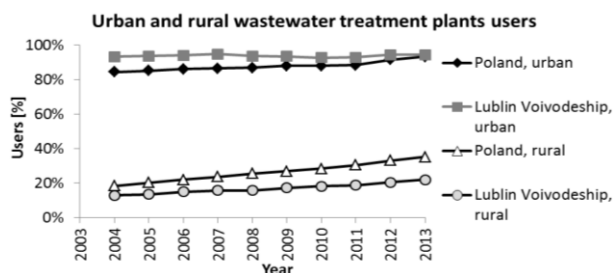


Figure 16. Residents of urbanized and rural areas of Poland and Lublin Voivodeship connected to WWTP

Fig. 17 shows that in both cases, Poland and Lublin region, the huge diversification of population connected to wastewater treatment plants. Despite the fact, that since 2004 number of rural inhabitants of Poland and Lublin Voivodeship connected to WWTPs increased to 35.3% and 22%, respectively, these numbers are several times lower in comparison to residents of urbanized areas.

Residence of population, in urbanized and rural areas, always results in generation of wastes, which are

required to be collected and treated to reduce the anthropogenic threat to the environment. The total municipal wastes per capita generated and collected in 2012, according to Eurostat data, varied between 688 kg/person in Denmark and 271 kg/person in Romania. The mean value of total wastes generated in the EU countries was equal to 487 kg/person. The amount reported in Eurostat for Poland reached the level of 314 kg/person. The interesting phenomenon may be noticed here, the lesser developed country (e.g. lower economical SDIs discussed earlier) the lower total waste per capita reported in the survey. The group of countries with the total wastes reported as comparable or lower than in Poland covered Czech Republic, Estonia, Latvia, Romania, and Slovakia, thus, all belonging to the late Eastern Soviet bloc. The above may be connected to the higher consumption triggered by higher standards of life or more efficient system of wastes collection and treatment in developed countries of Western Europe.

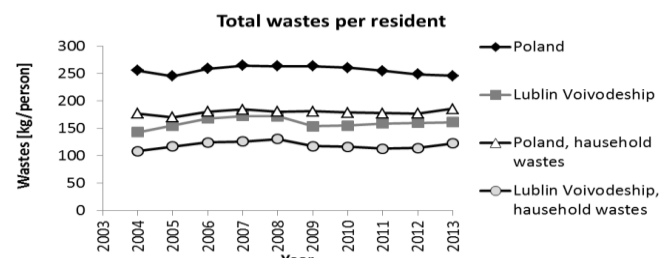


Figure 17. Total wastes per capita for Poland and Lublin Voivodeship in 2004-2013

Fig. 17 presents historical survey based on GUS data of total wastes per capita generated in Poland and Lublin Voivodeship, with additionally presented wastes generated in households. It shows, that during the last decade, despite the small deviations, level of total wastes generated in Poland and Lublin Voivodeship was constant and was at the level of approx. 250 kg/person and 160 kg per person respectively. The amount of wastes collected from households was clearly lower, the level of 180 kg/person and 120 kg/person for Poland and Lublin region, respectively. However, the relation of sorted versus unsorted wastes for Poland and Lublin Voivodeship shows the clear increase of sorted wastes share resulting from the recent changes in law, wastes management and increased environmental awareness of the Polish society. In 2004, the percentage of sorted wastes, including household wastes, in Poland and Lublin province was at the level of approx. 2-2.5%, nowadays, according to GUS data, this share reached the level of 13-13.5% in 2013.

However, problem of wastes collection and treatment is not fully solved in Poland and Lublin Voivodeship. According to data reported by GUS, in 2013, there were 431 and 56 operating municipal landfill cells in Poland and Lublin Voivodeship, respectively. On the other hand, the number of reported uncontrolled wild garbage dumps of various

scale was significant, reaching the level of 2791 dumps in Poland and 303 in Lublin Voivodeship. The share of landfilled wastes to the total mixed wastes collected in 2013 was equal to 67% for Poland and 75.8% for Lublin Voivodeship.

The brief analysis of presented selected SDIs for environmental and technical development for Poland and Lublin Voivodeship showed, that during the last decade, the country and the region developed. However, the ratio of this development may be unsatisfactory. A very huge diversification between urbanized and rural areas of Poland and Lublin Voivodeship is visible, especially in the field of water use and supply, wastewater removal and connections to wastewater treatment plants. Additionally, it's clearly visible, than in case of most of the discussed sustainable indicators development of Lublin region was slower than the development of the rest of the country.

## Conclusions

This paper presented the brief attempt of sustainable development assessment of one of less developed province of Poland, Lublin Voivodeship, since the entrance of Poland to the European Union in 2004. Our studies were based on a very popular methodology of sustainable development indicators. The special set of 21 SDIs was selected to present and quantify the sustainable development of the studied area and compare it to the actual state of development of the whole country to study the possible diversification in three main circles of the sustainable development: economic, social and environmental-technical. Additionally, the differences between development of urbanized and rural areas of Lublin region and Poland were considered. When it was possible, the discussed data were compared to the most actual data concerning SDIs for the United Europe and its member states. The selected indicators differed slightly from the ones commonly used, their choice was reliant on ease of data availability and was mentioned to underline the quality of life and interactions between the society and the environment.

The main outcome of our analyses is that both, Lublin Voivodeship and Poland showed development since entrance to the European Union in 2004 in all studied fields of sustainability. However, there is still a visible and significant gap between level of development presented by the leading member countries of European Union or the mean level of the EU countries and Poland or Lublin Voivodeship. Additionally, in most cases the applied quantifiable indicators showed slower development of Lublin region, than the rest of the country. Finally, the significant differences between most values of the tested SDIs for urbanized and rural areas of Lublin province and Poland confirm the diversification of sustainable development of studied areas.

The clear orientation of Lublin province towards the sustainable development is visible. The sustainability indicators show significant progress since 2004, even in several aspects, like growth rate of GDP per capita, public health care, reaching or exceeding the mean values for the rest of the country. But there were many threats for the sustainable development of the Lublin Voivodeship identified during our analyses, in all aspects of sustainability.

The main and, in our opinion, most important factors threatening the sustainable development of Lublin Voivodeship are:

- Low value of most applied economic indicators, including GDP per capita, mean gross salary, monthly income per capita representing low economical capabilities of the region and limiting several activities, including purchasing power reflecting the economical underdevelopment of the region, especially its rural areas;
- High registered unemployment, especially in rural areas, significant number of population endangered by poverty, for both national and relative thresholds, low, negative value of the birth rate, low fertility rate and negative rate of registered migration rate clearly show the limits for sustainable development, low quality of life and uncertainty of the society resulting from the limited perspectives for the future;
- Low tap water use, especially in rural areas, low numbers of population connected to water supply and wastewater removal networks, reduced density of water supply systems and totally undeveloped wastewater systems in rural areas, low number of rural inhabitants with access to wastewater treatment plants, sewage management based mainly on septic tanks, low amount of total mixed wastes collected show the huge threats to environmental and technical sustainable development in the aspect of the environmental engineering triggering significant danger to the natural environment, public health and quality of life.

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## Roshwald's Philosophy of Care – the Creative Nature of the Concern (Implications for Sustainable Development)

### Roshwaldowska filozofia troski – twórczy charakter troski (implikacje dla zrównoważonego rozwoju)

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#### Abstract

The article considers issues connected with Professor Mordecai Roshwald's philosophical and anthropological thought. It presents important elements of the philosophy of care, focusing on its fundamental concepts such as: appeal, dignity, being-with-you, and being-with-we. It is postulated that these elements may be employed to serve the idea of sustainable development. This has been done on the example of the so-called participation:

- a. social participation,
- b. mechanisms for citizen participation.

**Key words:** Mordecai Roshwald, philosophy of care, appeal, dignity, being-with-you, being-with-we, participation, social participation, mechanisms for citizen participation

#### Streszczenie

W proponowanym artykule podjęto zagadnienie związane z problematyką filozoficzno-antropologiczną profesora Mordeciaia Roshwalda. Przedstawiono nośne elementy filozofii troski wskazując na jej podstawowe zagadnienia jak: apel, godność, bycie-z-ty, czy bycie-z-my. Jednocześnie postuluje się, że omówione elementy mogą w swej strukturze posłużyć idei zrównoważonego rozwoju, dokonano tego na przykładzie tzw. partycypacji:

- a. partycypacji społecznej,
- b. mechanizmów partycypacji obywatelskiej.

**Słowa kluczowe:** Mordecai Roshwald, filozofia troski, apel, godność, bycie-z-ty, bycie-z-my, partycypacja, partycypacja społeczna, mechanizmy partycypacji obywatelskiej

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#### Introduction

Philosophical reflection on reality is based on experiencing it through the senses and intellect. The history of human thought is full of different conceptions that tried to answer the questions about our existence and the world of animate and inanimate nature. All these attempts gave rise to human science, which is so extensive that it is necessary to place a given scientific discipline in some particular branch.

Like other fields of knowledge, philosophy explores reality within some range. Although *love of wisdom* is interdisciplinary, philosophy is classified as part

of the humanities. By its very nature, however, it is a meta-discipline.

Philosophy can be divided into different branches, such as: philosophy of knowledge, philosophy of reality, philosophy of human being, philosophy of values, history of philosophy, philosophy of culture, philosophy of God, philosophy of religion, or philosophy of animate and inanimate nature. Of course, it is impossible to list them all here, and it is not our goal. We just want to indicate that the scope of each particular branch has been set out in detail.

The article aims to present the philosophy of care, addressing the issues related to the creative nature

and meaning of concern. This will allow us to show the implications of philosophy of care for sustainable development.

## 1. The creative nature of care

### 1. 1. Appeal

The term *appeal* is ambiguous. It comes from the French word *appel*, which means a call, a request to change a decision. Its meaning has evolved and the word is used to refer to a direct appeal, demand, or an address to the community made by the authorities. In existential phenomenology, following Luijpen, an appeal is to be understood as an active goodwill that leads to the affirmation of interpersonal relationships (Luijpen, 1972).

The appeal in Professor Roshwald's philosophy has an ethical and moral dimension, but it is not based solely on the stringent norm that the human being must comply with. The appeal, as described in his works, is associated with the fundamental references *I – other*. These references derive directly from the constitutive interpersonal relationship described as the affirmation of *other* by *I*.

The relationship *I – other*, *I – society* does not refer to treating reality like an object, distancing oneself from it, and what follows being isolated from it, which allows the *I* to minimize its involvement in social life. Withdrawal from social life entails adopting individualism as a negation of the *other* in society: *Individualism is not a virtue in society, and in the public life, as in a broader perspective it destroys all initiatives of <other> in the social development. Individualism is inherently quite egotistical* (Roshwald, 2006).

The egotistical attitude of the expansive self-centered and autocratic ego which is focused on its own needs along with the acceptance of the democratic system, results in totalitarian rule, in which the individual striving for power creates imaginary relationships in order to achieve his own benefit. Therefore, a selfish man treats appeal as a form of relationship that can help him come into power.

In this context, the work of Professor Roshwald seems to provide a thoughtful insight into the reality in which man realizes his goals and needs. An expansive appeal – order also assumes that the *other* is an inanimate object, it does not speak, does not feel, and it only has to carry out what it is told to do: *Humanity in every generation is always between the known and the unknown past, but with hope for the future. Wondering which way to go: to rely on the experience and wisdom, or take a chance (...). As we have seen, choosing one of these alternatives is not simple. The human condition and human effort known as civilization, requires careful symbiosis of past and future. Such a relationship to be crowned with success cannot be based on the order of one general performance model adopted for the benefit of only the individual and his ego (...), <I> must find*

*the right way in various spheres of life and civilization, according to the nature of each sphere. What may be the law in science may be wrong in ethics. What may be beneficial to the national policy may be wrong for the international community. We cannot forget this* (Roshwald, 2006).

The affirmation of *I – other* is the central place of the appeal. The *I* becomes *I* when it respects the *other* and when it does not cross the limits of the *other's* freedom. The *other* forces *I* to step out of its own selfishness and take into consideration the needs of *other*.

Mordecai Roshwald regarded the juxtaposition *I – he* in terms of moral evil, seeing in it depersonalization of the *other*. He anxiously observed a shift towards utilitarianism in contemporary life, shift which constitutes a threat to human life and results in loss of the spiritual life as we depart from the norms, or simply abandon ethical and moral values.

In this spirit of Socratic admonition, Roshwald warned against losing ourselves in a world of personal moral principles: *Amazingly, these basic, clear and appropriate rules of conduct can be found in the letters prior to our times, (...) namely in the Bible. It is the past, distant past, which should be taken over by the present and future generations (...). The future, therefore, could voluntarily adopt the guidelines of the past, because the basic principles of morality can be found scattered in several books of the Bible* (Roshwald, 2006).

It is sufficient to point out some of these universal principles. The Decalogue can be a very good case in point. While the first two commandments are mainly religious and theological in nature, the remaining ones can be seen as the fundamental moral document outlining how we should behave. The prohibition of killing, stealing and adultery expresses an ethical imperative. *There is also an order not to lie under oath and do not bear false witness against thy neighbor. (...) Do not covet the property of another person – which means do not try to steal things <of other>, the order which ensures harmonious cohabitation. In short, if the commandments are respected by all members of society, there will be no crime, nor hostility, nor discord nor predatory economic race. The recipe for proper human relations can be found in the Bible, commandments are proof of it (...). In a sense it can be said that the affirmation of man can pull into a simple imperative <love your neighbor as yourself> a well-known principle that Jesus quoted by accepting the past as a principle in the future* (Roshwald 2006).

### 1. 2. Dignity

As a rule, the issue of dignity is connected with that of freedom, justice, and man's responsibility. Today, dignity is viewed through the prism of equality and tolerance, and entails acceptance of the truth criteria (Howard, 1992).

In personalistic philosophy, *the dignity of man is the internal, inborn and natural human right, independent of the social context and history. Society and history do not give it to man, but they have the obligation to respect and protect it* (Gałkowski, 1994). Dignity applies in the same way to men, women, and children, the healthy and the disabled. All human beings having the same nature and the same origin, enjoy equal dignity (CCC, 1994).

Mordecai Roshwald does not speak directly of the dignity of man, but it can be argued that all his work is an attempt to show it. Furthermore, it should be noted that in Roshwald's philosophy, dignity becomes visible in the relationship *I - other*. The relation *I - he* is clearly a dangerous one as *other* can be subjected to law, religion, economy, and so deprived of liberty and justice, all this happening in the apparent social order, in the democratic system and with universal consent. In this way, the human being loses his dignity and humanity, while at the same time remaining seemingly responsible for the *other*.

The relationship between *I* and *other* implies not only responsibility, which is a measure and test of humanity, but it also manifests human dignity, as it is relations with the whole ethical and moral context that show and explain who man really is as a person. According to Professor Roshwald, dignity is undoubtedly related to ethical values expressed in the relationship *I - other*. Original as this approach is, it basically refers to Buber's view of man: *The monological existence is not that of the one you can call a lonely man, but of the one who is not able to realize the community where he lives in with the judgments of fate. (...) The dialogical existence, even in the extreme abandonment, is characterized by painful, but reinforcing feeling of reciprocity.*

The monological existence does not go beyond the boundaries of one's own self even in the most responsive community. Dialogic should not be confused with love. *But love without dialogic, without real outgoing to the other, reaching to the other and companying with the other, the love remaining with itself - this love is called Lucifer. Of course, to be able to reach to the other, you must have a starting point, you have to find yourself at yourself and be with yourself. The dialogue between mere individuals is a sketch, which can be filled in only by the dialogue between persons* (Buber, 1992).

Roshwald's approach differs from Buber's in his deistic view of God and acceptance of the biblical revelation along with the ethical and moral message that it carries. That is why Roshwald clearly emphasizes the fundamental importance and primordality of responsibility for the *other* as the key element of human morality.

He explains a close connection between dignity and responsibility taking into consideration human life and daily life of every individual. He stresses the inseparable link between *I* and *other*, link without which dignity becomes an abstract and useless qui-

etism, and responsibility is reduced to obeying the law.

In the model that we defined as the philosophy of care, dignity finds its full explanation only in the relation *I - other*. Changing the focus from the *other* to *he* can lead to disappointment, because without that fundamental orientation toward the *other*, the dignity of *other* is rejected in favor of the utilitarian positive law. Moreover, the *I* also does not see dignity in itself, and is not ready to serve people to choose the good and the truth in realizing the social ethos.

Taking into account unquestionable difficulties posed by the *I* perceiving the *other* as *he* and not limiting its own ego which lacking this important relationship with the *other* is not able to devote itself to the community, Professor Roshwald emphasizes that human life must be based on integrity and responsibility. Therefore, we suggest that dignity should be understood as concern for the other, the self and the world (Roshwald, 2006).

The analysis of Roshwald's philosophical thought which is characterized by strong defense of the fundamental importance of cognition and relations arising from metaphysical realism convinces us to advance the above thesis. Although dignity in Roshwald's view is not connected with man's nature, but instead with the relationship *I - other*, it still entails a moderate cognitive realism through the true responsibility, understood as the credibility of actions that should be based on morality, while adopting the metaphysical realism.

This situation implies that man building his relations cannot rely only on an imaginary reality, but must take into account the reality as it is, regardless of the cognitive problems. To discover the *other*, the *I* must become aware that it is looking for itself and realizing itself in specific situations and in society. As a result, the *I* can see its own dignity and the dignity of the *other*.

## 2. Meaning of concern

### 2.1. Being-with-you

Let us define the term *concern* in the philosophy of care as being-with-you and being-with-we. Ancient philosophy emphasized harmony of the world considering animate and inanimate beings, in the Middle Ages human reality was described in relation to the creative act of God *ex nihil*, and the finite world of human existence was juxtaposed to the existence of the infinite being. In the modern era, on the other hand, man has been subordinated to empiricism.

Mordecai Roshwald's philosophical reflection on the human world makes us define his approach as the philosophy of care which emphasizes the creative power of *being-with*. As a rule, the term *being-with* is used to describe an interpersonal relationship, though it is not clear because it consists of:



1. Being,
2. With.

The very notion of being is ambiguous. In terms of the *analytic of dasein*, being is a way of perceiving existence (Pomian, 1965; Michalski, 1978). In his description of (...) *man*, Heidegger adopts a specific perspective. He is no longer concerned with the description of existential experiences in their course and in their internal <quality> content. He assumes that every experience is primarily a way of human existence. It lives in man, and man lives in it. Man is not directed to the world through his acts but above all and in the first place, by ways of his own existence. It is important to perceive man from the perspective of <ways of existence> especially those that are necessary for him (Kruczak, 2011). On the other hand, *mit* indicates the ambiguity of coexistence, which always manifests itself in being *mitsein*. Although Roshwald was not concerned with the *analytic of Dasein*, the study of his writings raises a number of questions, such as: Is it valid to claim that the creative nature of the human being in Roshwald's philosophy reveals itself in *being-with*, as it was the case in Heidegger and Abbagnano? or How to understand the concept of *being-with*?

We believe that *being-with* takes on a new dimension in Roshwald's philosophy. It is not about exploring *being* only, but it involves looking at human existence in the context of responsibility arising out of concern for the *other*. According to Professor, concern is not conditioned by fear and anxiety about nothingness, as it was the case in Heidegger's philosophy, but it is the natural disposition of every man who coexisting with *others* and the world, recognizes the common desire to improve the life of every human being, which at the same time makes it possible to seek the truth.

Concern presupposes openness towards the *other* and towards the world. It does not consist in looking at the reality in the context of subjective recognition of it, but in the responsible pursuit of the common good through careful admonition, actions and decisions that will bring individuals and whole societies together (Roshwald, 1959).

Thus, the *being-with* in Roshwald's thought is not only connected with responsibility, appeal, or dignity, but also with the desire for truth. In this way, the *being-with* shows new forms of coexistence to a modern man. One of these forms is global communication. *What was far away in the ancient times, in the Middle Ages and in the early modern period is close today. Today no one can say that people living hundreds of miles away from each other cannot communicate. The global communication allows man to discover the cultural, social, national diversity; on the other hand, one can discern his existence thanks to these differences* (Bartoszewski, 2012).

Communication entails processing of information, but it is not the same as dialogue. In communication,

some message is transmitted, either in a straightforward way or it may be manipulated in order to achieve the desired effect, e.g. advertising – growth in sales, political parties – increasing support.

Dialogue, on the other hand, assumes opening ourselves onto the ethos of the human person and whole societies; moreover, dialogue makes it possible to seek the truth in an objective way. In dialogue we look for the *other* and build the relations *with-you* and *we*, at the same time.

Man discerns differences between himself and *you*. Before he freely and consciously chooses *you*, he realizes that the co-existence is connected with his *being-with*. *Being-with-you* becomes a driving force for changing the world, and consequently improving the reality. However, man may become subordinated to what seems to be better, for example: to a virtual world.

Nowadays, it is not a virtual reality which is at the service of man. On the contrary, it is man who is at the service of new technology, as exemplified by different addictions, which have become a disease of affluence. As a result, different centers that provide treatment to help people return to life in the macro- and micro-society are being opened. So what civilization brings and what is sometimes believed to be a qualitative leap, disrupts relationships and responsibility in favor of half-truths, which make us believe that everything is good: *we cannot accept everything as the truth, civilization without the truth is a civilization of half-truths, our duty is to exhort, to look for and take care of the good, but only in the truth* (Bartoszewski, 2012).

There is no doubt that this leads the human being to explore his own opportunities. But if man closes himself only in the world of half-truths, this may lead him to denying the *other*, its life, views, and beliefs. Man connects to *you* and *we* with multiple bonds, they enter into a relationship. He also opens up to the world and responds to it in a conscious way by his actions. That is why, development and opportunities for further human progress are constantly within certain limits (Bartoszewski, 2012).

## 2. 2. *Being-with-we*

Man sees his own *self* through his desires, wants, or actions. However, the *I* viewed in such a way does not define the whole man. Man is not *reflected* adequately in the consciousness or in experiencing. Firstly, this is because our body, which also defines us, is not seen. Secondly, our emotionality is ignored, too (Bartoszewski, 2012; Möller, 1969; Panennberg, 1978).

This approach also completely ignores experiencing the *other* as something that influences the *I*: *Mankind discovered or created, the realm of consciousness that existing outside dimension of time (...), where neither in the past nor in the future does not dominate realm of reality, which wants the truth at all*

*times and outside the tangible world* (Roshwald, 2006). As a result, the *I* treats *we* as a place where it can meet its needs, not referring to the truth.

We believe that this kind of thinking has influenced the social life. It overlooks the importance of community, through which the *I* can discover the creative character of itself. At this point it is worth noting that already German idealists emphasized the creative nature of *we* and considered the *I* in the context of God's existence. Undoubtedly, this approach helped to overcome the isolationism of philosophy of reason, but on the other hand, according to philosophers, it undermined the importance of human existence (Bartoszewski, 2012).

Philosophy of existence considered existence as something primary, something that preceded the essence of human being and consequently, it rejected the transcendental dimension.

In Professor Roshwald's philosophical reflection on the reality, we can see a *phenomenon* when man can suddenly or gradually separate from the *we* closing himself in his own *self*. The result is that the *I* tolerates *we* only as long as *we* is needed to carry out some undertaking. However, the *we* is more than just the *other*. Every man in his existence is directed at *we*. Thanks to this, the *I* can find itself in *we* as a being existing in a community. Hence, the *other* is what the *I* is missing. It is in the *other* that man can discover and evaluate his ethical and moral attitudes. It is noteworthy that when Heidegger and Sartre, for example, wrote about *other*, they meant *the other*. Martin Buber could not imagine a human being without *you*. Abbagnano indicated that the *I* realized itself only in the triple movement of transcendence, i.e. through the *I*, *other* and *world*. In Professor Roshwald's writings, we can see the relation of the *I* to *other* and *we*. It is manifested in the conscious pursuit of the truth, truth that can be reached through appeal, dialogue, and relationship, despite a broad consensus that is used in the system of liberal democracy.

Although the liberalism of modern democracy being based on pluralism emphasizes individualism, it ignores *sine qua non*, i.e. the real reality that is experienced through senses and the mind. Without these two elements and realness, we are dealing with the Cartesian world that is born in the human consciousness.

This allows man to accept or reject the *other* in favor of various ideologies, whether political, economic, or religious. Human history is full of disappointments with man's behavior, but all these disappointments cannot disrupt the search for answers to the question of what man is. They also cannot destroy the reference of *I* to *other* and *we*; nor can they make ethical and moral standards illusory. Man sees the

differences between the *other* and *you*. Before he freely and consciously chooses *you*, he realizes that coexistence is connected with *being-with*.

### 3. Participation

#### 3.1. Social Participation

Social problems come down to meeting not only the basic needs of homo sapiens, but also to protecting the resources which highly developed societies take by the handful. The concept of sustainable development strongly emphasizes the principle of participation, i.e. socialization (Krajewska, 2009). This principle assumes that citizens should be involved in planning and decision-making for sustainable development. The sense of responsibility for future generations encourages the public to take decisions which aim to improve the planning process for the benefit of next generations. From the perspective of sustainable development and on the basis of the concept of socialization, it is necessary to shape the society in such a way that it would take responsibility for itself, others and the world, respecting the interests, needs and values of various social stakeholders.

Following this idea, we can look at Roshwald's thought, which indicates that participation cannot be based only on the social contract, but it must be carried out in the context of concern, which in fact entails socialization: *The attitude to <other – who is different> depends greatly on how we treat <other – different> who lives and fulfills himself in a particular social, economic and religious group. Man developing in a sustainable way is present in all references, no matter how he realizes his individual and social tasks. If a person decides to choose egotistical references, he pursues an appeal to the <other> as a command or prohibition, highlighting the formalism of social life: It is clear that each person is not the best judge of his own interests, and should therefore rely on the judgment of others by developing in a sustainable way. (...) Respect for others is a consequence of the realization that he is not alone in the world, and as <I> my rights are the same for <other> who has the authority to make decisions and choose and find solutions that do not only lead to a better life, but the affirmation of man* (Roshwald, 2006).

Roshwald's philosophy of care<sup>1</sup> indicates that participation does not depend on the recognition that the values and interests of all community members have their legitimacy in exercising control over the public authorities' decisions and that they should be expressed in a consensus. The key element of planning is not a consensus seen as decision-making in a *social contract*, but in the truth which is understood as *veritas rei et intellectus adaequatio est*, and which is a *sine qua non* for the common good.

accepts concern as a starting point for participatory actions.

<sup>1</sup> Concern entails taking responsibility for oneself, the world and future generations. According to Roshwald, complete socialization takes place when the human being

Participation forms the basis of civil society. The real socialization is not possible if the relation *I – other* is rejected. If this happens, the *I* carries out its activities treating *other* as part of the world of existing things. Moreover, the *I* expands its ownership (in the realm of having, and not being with *other*), its dominance and power. Dehumanization leads to weakening of the relations in social life, with man becoming an instrument subordinated to the state structure, deprived of his rights, freedom and the truth.

Roshwald's insight into the reality of *being-with-you* and *being-with-we* brought to light not only existence, but also the relation and responsibility and pointed out to the fact that through care we discover the community of the good which is based on dialogue and the truth.

Without the creative nature of concern, expressed in the word and in the truth, it would not be possible to *create* a community which focuses on the concern for the human family, a community where opinions are shared to create the right standards in order to protect children, mothers, and fathers. The aim of this activity is, therefore, the good of the individual and the community.

It should be noted that this approach does not assume the egotistical participation of legalism, but it refers to the appeal for care. This care is manifested in the affirmation of man who becomes a place of social and ethical balance. At the same time, appeal and care constitute the basis of personal growth. Although the objective of sustainable development can be achieved through consistent joint action of all stakeholders, the principle of participation can be included in the concept of extended social responsibility in the context of Mordecai Roshwald's proposals and his philosophical thought, which is based on moderate metaphysical and epistemological realism.

### 3. 2. Mechanisms for citizen participation

Mechanisms for citizen participation to realize sustainable development are based on two premises. The first one concerns enriching and supplementing traditional democratic mechanisms, while the other one refers to participation of citizens, i.e. managing the public sphere in such a way that the differences in understanding of the common good are not resolved by administrative decisions or by the law of the market. This approach assumes:

- a communication,
- b consultation,
- c co-decision.

Mechanisms for citizen participation assume a consensual approach to issues and social problems.

According to Roshwald, democracy is based on the value of equality, and it allows for different behaviors and beliefs, including different ideas on how the state, human resources or natural resources are to be managed. It is also noteworthy that Roshwald criticizes the understanding of the truth in the context of

a common consent and he states, among other things, that a person is losing a sense of what is good, true and beautiful, he no longer knows what is right and what is not right, is losing his understanding and is indulging in power: *the agreement between people in a democratic system leads to one goal, to achieve power. They claim that they aspire to power to create laws that will be impartial and fair for all citizens to secure freedom and justice. All this is done through marketing activities aimed at the formulation of rights corresponding to the appropriate group of voters. So, in fact, truth is connected with the political activity of future government. Of course individual people are in government as ministers of truth, however apparently, masters are politicians and their staff, state government is doing what the majority introduced in everyday life* (Roshwald, 2006). Professor Roshwald describes a type of man for whom democracy opens up a wealth of different options, but who lacks ethical and moral signposts. So, he does not know exactly what to choose, what is true and what is false (Roshwald, 1963, 2003). All this makes it impossible to determine the truth taking into account the epistemological and metaphysical realism; for realism, according to the proponents of a common consent, constraints pluralism with its principles which must be referred to when defining, for example, what man is. Moreover, in pluralism decisions are made by the majority in the so-called free choice. What, then, is to be regarded as the moral norm? What, then, is to be regarded as the truth, the good or justice? Keeping in mind philosophy of care, it must be clearly emphasized that the mechanisms for social participation for sustainable development can be based on appeal, dignity, being-with-we and being-with-you, i.e.:

- A. The affirmation of the *I – other* is the central place of appeal, where immediacy and spontaneity, order and presence show the relationship of personal growth. Humanity and the dignity of man is only embodied in and realized through respect for the *other*; for truth and freedom being so different from falsity and arbitrariness make the individual care for himself, others and the world.
- B. Concern, in our view, is revealed in the affirmation of and trust in every existing being, which in turn tests man's trustworthiness to himself making him worthy of himself – or *vice versa* – not worthy of himself or in other words, someone who betrays and abandons the relationship with the other, himself, and the world, i.e. shirks the responsibility. Only the man who will meet with himself by building self-responsibility can enter into credible relationships with other people, and finally with the world.
- C. *Being-with-you* entails links similar to those that we see in *being-with-we*. They manifest themselves in the formation of human reality,

for example through discoveries in medicine, technology, physics, etc.

- D. *Being-with-we* is rooted in ethics. This does not mean that man is condemned to it. In order to be, the *I* has to orient its actions towards the *other* because man is a responsible being. Acceptance of conscious responsibility leads to a genuine concern for the community. The *other* is accepted by the attitude of being ready to suffer and act for the good of the other person, as well as by putting the other person above the *I*.

### Conclusion

To summarize, Mordecai Roshwald's philosophical thought can be used for the idea of sustainable development in some respects:

- 1) if we take into account not only the anthropological aspect, but mainly the social one and consider it in the context of moderate cognitive and metaphysical realism (the principle of social participation is manifested here).
- 2) Roshwald's concept entails full responsibility for the other, oneself and the world, but in the context of classical understanding of the truth (we are striving to return once again to the true reality with all its shortcomings and questions).
- 3) it becomes necessary to look at man through the prism of his relations towards himself, the other and the world (according to Roshwald, only in this way it is possible to care about the present and future reality in a sustainable way).

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## Integrating Role of Sustainable Development Paradigm in Shaping the Human-landscape Relation

### Integrująca rola paradygmatu zrównoważonego rozwoju w kształtowaniu relacji człowiek-krajobraz

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#### Abstract

In order to implement the sustainable development paradigm more broadly, it is postulated to deviate from the simple protectionism, which is based on sectoral approach, in favour of systemic landscape management, which encompasses the human-landscape relations. The article presents the issues concerning rural landscape protection in Poland in relation to the assumptions of the *European Landscape Convention*. The aim of the article is to analyze the causes of inefficiency of the Polish rural landscape protection system.

**Key words:** rural areas, landscape protection, sustainable development

#### Streszczenie

W celu szerszego uwzględnienia paradygmatów zrównoważonego rozwoju postulowane jest odejście od ochraniarstwa, opartego na ujęciu sektorowym, na rzecz systemowego zarządzania krajobrazem, obejmującego relacje człowiek-krajobraz. W artykule przedstawiono zagadnienia dotyczące ochrony krajobrazu na obszarach wiejskich w Polsce odnosząc je do zapisów *Europejskiej Konwencji Krajobrazowej*. Celem artykułu jest analiza przyczyn nieskuteczności polskiego systemu ochrony krajobrazu na obszarach wiejskich.

**Słowa kluczowe:** obszary wiejskie, ochrona krajobrazu, zrównoważony rozwój

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#### Introduction

The development strategies of modern civilization are formed on the basis of sustainable development principle. This concept was created when the modern man acquired technical measures enabling him to transform the world to an unlimited degree, and –

simultaneously – was at a loss when it came to their application (Pawłowski, 2010). The fundamental paradigm of sustainable development is caring for the intergenerational equity, which involves enabling fair access to necessary natural resources for

the future generations, in addition to leaving non-degraded natural environment for them (Pawłowski, 2013).

This paradigm is very general and requires specific actions to be taken in the human environment. The most multi-dimensional criteria have been presented by Pawłowski (2008, 2011), who proposed a hierarchical arrangement of the dimensions of sustainable development. The first level – which provides a basis for the others – is an ethical reflection. The second level covers ecological, social and economic issues, all treated as equally important. The third level augments the analysis with detailed technical, legal and political issues.

It can be clearly seen that the sustainable development paradigm is deeply ingrained in philosophy – in ethics, to be more precise, which is an integral part of modern philosophy. Clear determination of human duties in relation to other people and to the individual elements of social and natural environment is the foundation of all considerations relating to sustainable development.

One essential element of this environment is the rural landscape. Dynamic changes that impact both the lives of people, as well as the state of natural environment, occur there (Sobczyk et al., 2012).

Transformations of agricultural production space into multi-functional consumption space are observed, in which recreation, tourism and housing, as well as using natural resources outside production are of growing importance (Halamska, 2008; Raszeja, 2013). On the other hand, agriculture withdraws both from the functional and land-use aspects (Roszkowski, 2008; Bielińska et al., 2014). Such transformation of utility value is a feature of the modern consumer society model. The process of commodification, enhanced by the modernization and globalization, causes significant changes in the structure, form, and content of rural landscape both in Poland, as well as in the Western Europe (Raszeja, 2009). Rural areas, which were isolated and developed autonomically until recently, have been incorporated into the global system of changing world values (Williams, 2002). Numerous new phenomena occurring in the process of rural areas transformations (including, among others, replacing locality by globalization, evolution and succession by supersession, commitment by alienation, integration by segregation) seriously threaten their sustainable development, ecological stability and landscape diversity (Vos, 2000). The dwindling of agricultural lands is accompanied by a noticeable increase in building development, including the creation of traffic routes, which leads to the fragmentation of a landscape and violates the continuity of its ecological structure (Vos, 2000). The present spatial development of rural areas in Poland is the outcome of carrying out local spatial development plans devised for small areas, which are usually determined by property borders. It is connected with the common practice of

issuing single resolutions pertaining to the conditions of development, on the basis of the information found in studies on conditions and directions of spatial development of communes, which were created on account of overestimated needs of housing development areas (Kozłowski, 2005; Raszeja, 2013).

Along with the strengthening of the idea of sustainable development, the issues concerning landscapes assumed an important position in the set of common European policy principles. Landscape was recognized as an important element of European identification (Wascher, 2000). It is postulated to deviate from simple protectionism, based on sectoral approach, in favour of systemic landscape management, which encompasses not only the resource management but also the changes in the socio-economic sphere (Zydroń et al., 2013). Such assumptions are formed by the *European Landscape Convention* (EC, 2000) and the programs of common European spatial policy, found in the fundamental documents and strategies (ESDP, SPESP, ESPON). The new landscape policy pertains to both the European level, as well as the common European principles of landscape protection, planning, and management in individual countries, with respect for their legal system individuality (EC, 2000). The necessity of creating coherent visions and strategies which also include the socio-economic environment is strongly emphasized. The role of landscape has altered as well. Being previously the subject of protection, it has now become an idea integrating sustainable spatial development (Selman and Knight, 2005).

Poland ratified the *European Landscape Convention* in 2004, committing itself to implement its fundamental principles. The issues connected with the practical aspects of implementation (scope, rate, procedures and instruments) falls within the competence of the countries ratifying the document. In Poland, a low level of social landscape awareness is observed, in addition to meagre participation of inhabitants in its protection. The new nature of landscape protection, which involves substituting solely protectionist actions with an integrated landscape policy in rural areas, will help to establish the balance between three entities which co-exist: environment, society, and economy.

### New landscape policy

One of the more important challenges of the 21<sup>st</sup> century is preserving and bolstering the landscape as a means of expressing the national, regional, and local identity and stability through an integrated landscape policy (EC, 2000), which accounts for the present-day requirements of socio-economic development (PEBLDS, 1995; STRATEGY, 1998). The action theme 4 of Pan-European Biological and Landscape Diversity Strategy (PEBLDS, 1995) concerns the landscape conservation. It assumes the adoption of common guidelines for the creation of strategic and

legal basis of landscape conservation, determining the criteria of its identification, protection, and monitoring, as well as recording of the endangered valuable landscapes and examining the relation between the protection and socio-economic development on a regional scale (PEBLDS, 1995). In line with the PEBLDS guidelines (PEBLDS, 1995), the conservation of landscape diversity should be carried out through the following actions:

- preventing the further degradation of landscapes, as well as the cultural and natural heritage of Europe connected with it;
- preserving their beauty and individuality;
- considering the landscape comprehensively, as a one of a kind combination of cultural and natural features;
- giving the landscapes in the entire Europe a more adequate protection status;
- specifying and adopting the criteria, which are to be followed in the protection of the aforementioned landscape features;
- preparing a list of endangered landscapes in Europe and determining the methods of their conservation;
- determining the agricultural practice and landscape management methods in line with the concept of sustainable development;
- examining the influence of ceasing or intensifying farming on landscape;
- preparing coherent guidelines for landscape protection.

The fundamental document determining the assumptions of the modern European landscape policy is the *European Landscape Convention* (EC, 2000), which advocates a comprehensive, integrated approach to the issue of sustainable landscape protection and shaping. Apart from an active protection, reserved for the areas and objects recognized as especially valuable, it also proposes other types of actions in a landscape, driven by the socio-economic needs.

The *European Landscape Convention* emphasizes the integrated management of the landscape resources, including both the natural and socio-economic aspects. The method and mode of spatial decision-making, which is the answer to the changes in conditions, needs, and social aims, are especially important. The level and scope of intervening in landscape is characterized by a broad spectrum: ranging from the compensation and limitation of the effects, to a directed and more remote – in regard to time and often space as well – influence exerted on the causes of changes (Klijn, 2004). According to the guidelines of the *European Landscape Convention* (EC, 2000), the recipients of a landscape have to be included in the process of landscape management, as they are its essential element, especially in regard to the protection of common heritage, which requires the participation of both the experts and authorities, as well as all the users in order to protect and familiarize with it (Jones, 2007).

As the recommended actions concern the human behaviour, it is necessary to formulate adequate paradigm on the basis of philosophy, and more precisely – ethics, which would allow conscious decision-making.

### Landscape protection in European countries

A review of methods and protective instruments employed in various European countries was conducted as a part of devising the *European Landscape Convention* (Report, 1997). The status of landscape in the national institution system of the European Union is diverse. Only in four EU countries (Italy, Germany, Switzerland, the Netherlands) landscape was legally recognized at the highest level, i.e. constitutionally (Report, 1997). There are limited legal acts solely pertaining to landscape found in the European countries. Separate acts function in Germany (Federal act of 1976 on nature and landscape conservation), France (Act of 1993 on protection and shaping of landscape), Switzerland (Federal act of 1966 on the protection of nature and landscape, updated in 1995), Czech Republic (Act of 1996 on nature and landscape protection) and in Slovak Republic (Act of 1994 on the protection of nature and landscape). Most often, the issue of landscapes is found in the legal acts concerning the environmental protection. In the majority of European countries the issues connected with landscapes are included in the legal regulations pertaining to the spatial planning, historical and cultural heritage of monuments and nature monuments, nature protection, urbanism and urban development, as well as architecture (Report, 1998; Żarska, 1995).

Sometimes, one ministry assumes the leading role and organises taskforces or committees handling this subject (Report, 1997). British Countryside Commission, founded in 1968, which is a very active landscape protection institution, deserves attention. It is an independent governmental commission, whose responsibilities include: organization, promotion, information and public education. Its numerous functions also involve: advising the government and Parliament in the issues connected with landscape, conducting research on the changes occurring in rural areas, suggesting areas for protection, as well as ensuring that rural areas be taken into consideration during the planning (raising the awareness of the interested parties). It is also supposed to aid in protection and management of landscape, in co-operation with corresponding ministries (of agriculture and environmental protection), as well as in the implementation of the projects concerning agriculture and environmental protection (Marsden, 1998; Jensen, 2005).

The landscape records are made in numerous European countries. They can include all types of landscape or only those, which have already been protected or classified. These records are used in classi-



fication or protection of landscape. They identify extraordinary landscapes or the ones bearing a special meaning. The records are also made at an initial stage of landscape plans. They identify the landscape types in order to include proposals of certain protective or reclamation actions or guidelines for their shaping in a plan (Jongman, 2004). These descriptions give the local and national authorities broader information on the status of landscape in the given area and may serve as guidelines for land development. The authorities are obliged to take the data found in records into consideration (Agnoletti, 2010).

According to the comparative analyses concerning legal landscape protection in the Member States of the Council of Europe, three legislative forms exist, which reflect the specific approach to the issue of landscapes (Report, 1997):

- legal protection of monuments and historical places – dominant in France and Italy, where cultural and aesthetic values are especially emphasized;
- legal protection of the nature – reflects the tendencies of emphasizing the natural values of landscapes (dominant in Germany and Norway);
- inclusion of landscape protection to the legal regulations on spatial economy – found where landscape is considered as a combination of equally important natural and cultural elements, while its protection and shaping is an integral part of spatial planning on different levels, e.g. in Great Britain, the landscape protection is systematically incorporated to the zone system as part of the classification devised by British Countryside Commission.

Studies carried out by the University of Milan in selected European countries (France, Great Britain, Germany, Denmark, the Netherlands, Italy, Spain, Norway, Poland, and Slovenia) showed significant differences in the approach to the landscape, which stem from different tradition and cultural context (Scazzosi, 2002). Thus, different aspects are emphasized: natural, ecologic, aesthetic, and historical. There is a significant difference in perception of landscape between the northern European countries, where attention is drawn to the ecologic issues and nature protection (Norway, Germany), and southern Europe, where the cultural importance of places is emphasized (France, Italy). In some countries (Great Britain, the Netherlands, Spain), the visual-perceptive approach was dominant; however, at present, other landscape aspects were added (Scazzosi, 2004).

The diversification of approaches to landscape in individual countries impacts the choice of operational and institutional solutions, as well as of the instruments of implementing the new landscape policy as part of government and local administration. Inclusion of landscape issues to the planning studies and

procedures, concerns mainly the land development and development plans (ESDP, 1999). The range and level of arrangements depends mainly on the spatial planning systems in the individual European countries (Dembowska, 1999). At present, there are four main methods of landscape protection, employed separately or jointly (Raszeja, 2003):

- the issues of landscape are incorporated into the spatial planning procedures;
- the individual, valuable landscapes are classified as the protected areas, with corresponding legal regulations – ranging from the ban on taking individual actions to specific guidelines and recommendations;
- landscape is a factor for making decisions concerning land use, e.g. prohibition of resource exploitation, declining the building permit;
- detailed landscape plans are devised, integrated with the planning studies to a varying degree or used as guidelines for spatial policy.

European countries, in which the importance of landscape and the social awareness increase, introduce various stimuli and financial mechanisms for strengthening the existing legal means (Zaremba-Warnke, 2013). The most commonly employed solutions in the European Union Member States are based on the instruments enabled by the common agricultural policy, which advocates programmes involving sustainable management of agricultural landscape (Strategy, 1999). These include agricultural and environmental subsidies or, so-called, landscape contracts. In the Netherlands, contracts concerning landscape management are made between the authorities and farmers. Such contract contains detailed obligations, which ensure that the principles of ecological farming, as well as environmental and landscape protection are employed. In return, farmers receive financial grants. In France, since 2004, special landscape contracts concerning the realization of plans and landscape projects came into force. The government also funds research and studies conducted for the purpose of landscape plans. A special rural landscape conservation fund was created on the basis of landscape plans (Raszeja, 2013 a).

In the European countries, building permits and other administrative decisions pertaining to the spatial economy play a special role in management of landscape resources. These include: land-use method, land integration, location of industrial objects and/or elements of infrastructure, advertising placement, dismantling of buildings, etc. Such permits are issued on the basis of landscape guidelines. In Denmark, each of 275 communes prepares their own plan, containing detailed guidelines on shaping the landscape and building development. These plans are the basis for issuing decisions concerning building development. The British Act on spatial planning mentions – among others – that the local authorities are obliged to be in possession of the development plans while issuing building permits, in

addition to having a right to impose sanctions when the changes in land use are made without a permit. The Dutch spatial development plans constitute the most important instrument of spatial policy, as well as a legal basis of forced land buyouts, which is essential for carrying out the protection and landscape reclamation plans (Scazzosi, 2002). The organization of consultations prior to issuing various administrative decisions is another crucial element of landscape management (Raszeja, 2013 a).

The property law, and the way it functions in different European countries, is essential for landscape management (Bielińska et al., 2014 a). In some countries it has been limited long ago due to the broadly understood public good (ESDP, 1999; Dylewski, 2004). Landscape is recognized as public good more and more often. In France, the government and local government authorities can reject the building application if either the planned location of the object, its size or external appearance threaten the landscape harmony. In the Swiss and Spanish legal systems, the building permit can be declined in the case of possible landscape degradation as well (Raszeja, 2013 a).

### **Rural landscape protection in Poland – theory versus practice**

Due to the implementation of the *European Landscape Convention*, Poland is obliged to follow its fundamental assumptions (EC, 2000), including:

- protecting all types of landscapes, while adjusting the means to the value of resources;
- creating adequate methods and instruments on various levels of planning and spatial management;
- creating consulting procedures which increase the social participation in evaluation and spatial decision-making;
- making appropriate legislative changes;
- devising educational programmes in order to increase the social awareness on the protection and shaping of landscape;
- improving the theoretical and practical methods (development of research, educating professional staff);
- creating effective landscape resource management, among others, as part of spatial economy and fiscal policy;
- drawing more attention to the rural areas;
- gathering necessary funds.

In Poland, rural areas – though important for the quality of life of the entire society – for a long time had a marginal meaning in the spatial shaping actions (Ryszkowski, 2004; Wilczyński, 2012). These actions focused mainly on the urban space, densely populated areas, with complex array of functions and problems, subjected to multi-directional influences of high intensity (Zimny, 2005; Niedźwiecka-Filipiak, 2009). At present, the issue of rural landscape

protection is raised increasingly often. However, a discrepancy is observed between the political statements and the methods of landscape management employed in practice. One of the important causes of the hindrance for rural landscape protection is the inefficiency of the Polish spatial planning system and its legal instruments, including the Polish property law (Böhm, 2008). A clear lack of coherence between the identification methods and landscape evaluation and planning is visible, as the results of landscape studies are not transmitted into spatial management. The hurdles in protection and landscape management in rural areas stem not only from the legal, organizational, and financial problems, but also from the lack of common vision and strategy based on a good recognition of landscape features (Raszeja, 2008).

The Polish legal regulations form a system which allows the public authorities (government and local government) to interfere in certain people activities which result or may result with the changes in spatial development. They enable controlling the spatial development, especially eliminating or limiting undesirable methods of its implementation (Wysocka, 2000). Controlling occurs through normative acts (acts, regulations, local laws and law enforcement acts. As regards the spatial development, the most essential is the Act on Planning and Spatial Development (Ustawa, 2003). It determines the system of instruments and procedures of carrying out the spatial policy through the government administration and local government instruments, in line with the European Union standards and legislation, and referring to the general direction of the system changes and Polish law. This is expressed by introducing the economic criterion strengthening the local community governments as the main subjects responsible for the spatial shape (Raszeja, 2013 a). The act assumes sustainable development and spatial harmony as the priorities in development, pointing out the necessity of including the landscape values in planning and spatial development, in addition to the requirements of environmental protection, as well as cultural heritage and monuments.

Among the various landscape management devices (legal, administrative, financial) the ones that function locally are especially important. These include:

- local spatial development plans – which constitute local acts pertaining to spatial development;
- studies on the conditions and directions of spatial development of communes;
- strategies of commune development;
- local development plans;
- communal monument protection programmes;
- countryside renovation programmes
- nature and landscape studies;
- ecophysiographical elaborations.

According to the Act on spatial planning and development (Ustawa, 2003), the decisions regarding the

purpose and use of lands – and therefore, concerning the changes of landscape in rural areas – are mainly based on the local spatial development plans, which determine the functional, compositional, and technical rules as the basis for achieving spatial harmony in a landscape. The analyses carried out by the authors of this work (data not published) in the Lubelskie region communes, as well as in the municipalities in Poznań agglomeration (Raszeja et al., 2010) showed that in fact, this legal instrument is not used for creating harmony in rural areas, but rather for the purpose of satisfying the investment needs. The contents are usually imprecise and do not find application in practical management of landscape resources. Plans are fragmented, while the size and shape of the designed building development is calculated from the parameters pertaining to the areas excluded from agricultural use and divided into plots, often very schematically. They often include small areas on which several plots were separated linearly or in a closed system. Such solution causes increasing dispersion of building development, which was previously used in agriculture, and leads to disintegration and fragmentation of the landscape (Kowicki, 2010). In some planning-related content, there are inconsistencies, sometimes leading to the degradation of landscape values. A broad evaluation of Polish spatial management system weaknesses and shortcomings was included in the report of the National Secretariat *Habitat* (HABITAT, 2003). According to this report, the weakness of the system hampers, and often prevents the rational spatial economy, and rational development of areas, thus negatively impacting the quality of life of people, as well as the conditions and possibilities of sustainable development of rural areas. Studies and strategies usually lack the identification and interpretation of landscape in line with the recommendations of the *European Landscape Convention*. The communal documents pertaining to the renovation of towns and communal monument protection programmes usually contain information about the registered monuments. While preparing the communal studies, only the analyses of source materials are conducted and no landscape-related research is made. The value of rural landscape is evaluated in regard to tourism development (Raszeja et al., 2010). In the case of protection plans, the legislator's intention was to ensure that the regulations take effect in the study of conditions and directions of spatial development. Therefore, the protection plan should be prepared first. However, at present, communes are usually in possession of obsolete studies and local plans, which contradict the idea of landscape protection and are transferred into the protection plans. The record of protection plans arrangements in the local law remains problematic. This is relevant, as the local planning and local decisions shape the rural landscape. Transferring the re-

sponsibilities pertaining to spatial management and spatial decisions onto the basic level hinders the social control over the landscape, which is considered a common good by the *European Landscape Convention*. Locally, the local spatial development plans concern landscape development, performed through interventional decision making in the form of immediate reactions, aimed at achieving quick effects or through actions taken to avoid certain threats to landscape. On the other hand, regionally, it assumes the form of a long-run strategic planning and shaping the landscape policy, integrated with multi-faceted regional development policy. Striving for the deregulation of rules and system, as well as separation of the regional and local planning (allocating them into two separate ministries) may lead to the further spatial disintegration and deformation of rural areas (Raszeja, 2013 a). It needs to be emphasized that the *European Landscape Convention* indicates planning as an efficient and common form of active rural landscape protection. To sum up, the practice of planning and spatial management in rural areas should include the spatial policy and strategy of development, ranging from the regional scale and local scale planning, to concrete actions taken by the local communities. Participatory planning, which is connected with the social participation in the process of planning, is an opportunity to bolster the active rural landscape protection. Participatory planning is based on the following assumptions (Pawłowska, 2008):

- people are entitled to take part in decision-making which impact their life, express their needs, expectations and fears;
- alienating people from planning and decision-making induces their resistance against the implementation of various planning arrangements;
- it is essential also for the planners, who thus verify their ideas;
- local knowledge enriches the information necessary for planning;
- participation in planning creates the sense of identity with the place, owing to its better understanding;
- including the residents and users in planning increases their responsibility for the space, creates the basis for a certain social agreement in the form of local spatial development plan or other local development plans.

Organization of meetings, consultations, and discussions is a fundamental element of participatory planning (Buchecker et al. 2003). It is important who and in what way took part in this process (Fig. 1). Usually, its initiators consist of experts and professionals (planners, leaders of countryside renovation programmes); however, the commitment of landscape users is especially important, including in the information gathering, analysis and area

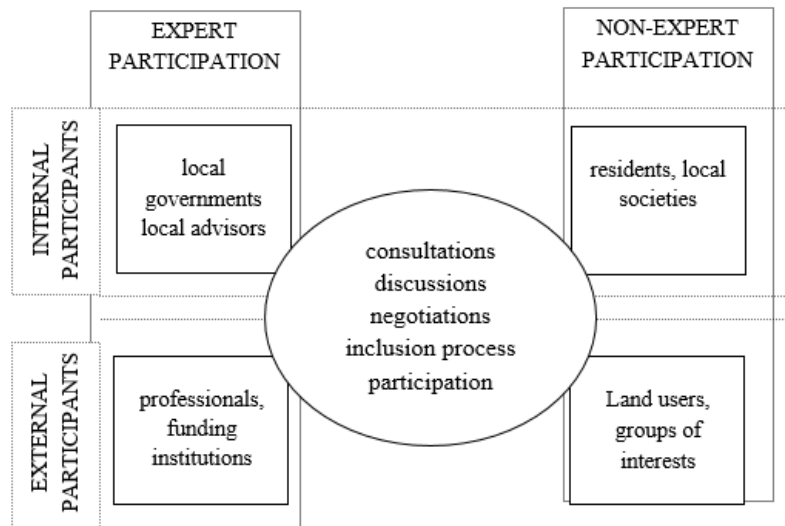


Figure 1. Forms of social participation (according to: Selman, 2006)

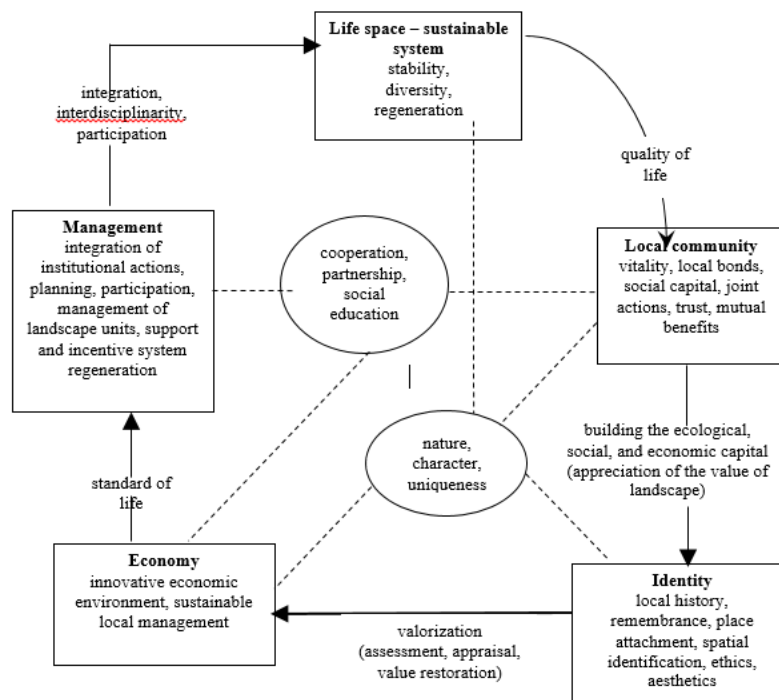


Figure 2. A scheme for the functioning of a stable local social-landscape system (according to: Selman, 2006)

characterization processes, as well as in the assessment of solutions.

Following methods of social participation exist (Swanwick, 2004; Selman, 2006; Pawłowska, 2008):

- passive participation – people take part solely by informing about the taken actions;
- participation through giving information – taking part in various polls and questionnaires, but no influence on the planning method;
- participation through consultations – influencing the modification of planning solutions;
- functional participation – creating groups dealing with particular projects, beginning of an active participation in the project;

- interactive participation – active and direct participation in the analyses, studies and planning;
- internal mobilization – taking own initiatives, independent from the external institutions and experts.

One of the fundamental problems connected with social participation is, usually, the short-term commitment. Sometimes, it stems only from the fear of the expected threats or losses related to, e.g. a change in local plan. There is also the danger of certain elitism, consisting in separation of the team committed in the planning process from the remaining local society. It may lead to pushing the interests of certain groups under the guise of social consultations (Selman, 2006; Pawłowska, 2008). The common participation

of local societies in the creation of local spatial development plans (polls, debates, negotiations) ensures the abundance of their assumptions, considered a common social agreement (Pawłowska, 2008). It also helps raising the social landscape awareness. In sustainable development of rural areas, the improvement of landscape status cannot be limited to the procedural issues, without any reference to the social, economic, or political context. Preparing and conducting social consultations is especially important in the wake of increasing conflicts and *spatial fights* (Raszeja, 2013a). Choosing a certain approach to the issue of landscape resources causes many conflicts. All subjects operating in the rural space (individuals, social groups) bear the undisputed right to freedom, which in practice is expressed in diversified usage of landscape resources. Conflicts arise when the freedom of management boils down to an unlimited and uncontrolled – sometimes even greedy – exploitation of its resources (Mokrzycki et al., 2009). In the process of integrated rural landscape protection, raising social awareness in regard to the issues connected with recognition and respecting the value of landscape, and not only solving single spatial problems, is especially important.

Stable local social and landscape systems (Fig. 2) operating in rural areas, are capable of being incorporated into the global systems, without facing its dangers. They can adapt to the changing external conditions (Selman, 2006). These systems are based on taking advantage of their own potential: social, cultural, and economic, as well as the local spatial and landscape-related nature.

It is vital for the system to operate in the principle of sustainable development and participation of all the residents, as well as to be well-established in the actual economy and well-managed. This creates its stability, resilience, and allows it to react to external interferences (Selman, 2006).

## Conclusion

Along with the strengthening of the sustainable development, the issue of landscapes assumed an important position in the collection of common European policy rules. Landscape was recognized as an important element of European identification.

The fundamental document which determines the assumptions of the common European landscape policy is the *European Landscape Convention*, which postulates a comprehensive and integrated approach to the issue of sustainable landscape protection and shaping, as well as drawing more attention to rural areas.

The threats to the rural landscape, stemming from the modern development processes necessitate the verification of the methods and protection instruments currently employed in Poland.

The majority of the European countries are equipped with – still improving – the means and instruments

necessary for the conservation of various landscape resources.

The analysis pertaining to the assessment of the implementation of the integrated rural landscape protection in Poland shows:

- inefficiency of the currently employed methods;
- a visible gap between the theoretical elaborations and the practice of managing the landscape resources;
- inadequacy of the existing procedures and instruments to the needs of integrated protection, as well as to the standards established by the European landscape policy.

The integrated rural landscape protection should ensure:

- creation of landscape resource management instruments efficient in changing conditions, in line with the principle of sustainable development;
- raising the social awareness regarding protection and shaping of the landscape;
- appropriate legislative changes;
- creation of consultation procedures, which increase the social participation in the assessment and spatial decision-making.

Recognition of landscape changes should be an indicator for future strategies, and influence the protection plans, shaping, as well as management.

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## The Measures of Sustainable Development – a Study Based on the European Monitoring of Energy-related Indicators

### Mierniki rozwoju zrównoważonego – studium oparte na europejskim systemie monitoringu wskaźników związanych z energetyką

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#### Abstract

Sustainable socio-economic development is the guiding principle in the European Union policy. The implementation of that principle is monitored by a set of indicators being developed since 1995, referred to as the indicators of sustainable development. The monitoring is conducted both at the level of Member State, as well as of the entire community. The main indicators describing the social, economic and environmental issues of the EU functioning show positive results in regard to the implementation of the sustainable development strategy; however, in the themes related to the issues of social inclusion, sustainable transport, and global partnership, the indicators show a negative trend. In this paper, the sustainable development indicators in the theme of Climate change and energy are described and analyzed in detail. Their changes over the last decades were strongly stimulated by the EU energy policy. In connection with the implementation of numerous programs for the promotion of renewable energy sources, their share in the energy market is growing, whereas the greenhouse gas emissions from the EU area and the primary energy consumption are falling. During the last 25 years, the total man-made GHG emission in the EU was reduced by 18%. It should be noted that these changes are influenced not only by the manner of energy management stimulation in the EU, but also by an equally significant problem of the economic crisis, geopolitical situation, and the resulting economic change. Moreover, some indicators relevant to the concerned theme, such as energy dependency, clearly show a negative trend.

**Keywords:** sustainable development indicators, European Union, energy, climate change

#### Streszczenie

Zrównoważony rozwój społeczno-ekonomiczny jest naczelną zasadą w polityce Unii Europejskiej. Wdrożenie tejże zasady monitorowane jest zestawem rozwijanych od 1995 roku wskaźników, określanych jako wskaźniki zrównoważonego rozwoju. Monitoring prowadzony jest zarówno na poziomie państw członkowskich, jak też całej wspólnoty. Główne wskaźniki opisujące aspekty społeczne, ekonomiczne i środowiskowe funkcjonowania UE wykazują pozytywne efekty w zakresie wdrażania strategii zrównoważonego rozwoju, niemniej w obszarach tematycznych związanych z kwestią integracji społecznej, zrównoważonego transportu i partnerstwa globalnego zmiany wskaźników wykazują niekorzystną tendencję. W niniejszym artykule w sposób szczegółowy opisano i poddano analizie wskaźniki zrównoważonego rozwoju w obszarze tematycznym Zmiany klimatu i energia, których zmienność na przestrzeni ostatnich dziesięcioleci jest silnie stymulowana polityką energetyczną Unii Europejskiej. W związku z realizacją licznych programów w zakresie promocji odnawialnych źródeł energii, ich udział w rynku energetycznym rośnie, a emisja gazów cieplarnianych z terenów UE oraz zużycie energii pierwotnej spadają. Emisja gazów cieplarnianych w UE w przeciągu ostatnich 25 lat została zredukowana o 18%. Należy jednak zauważyć, że na wspomniane zmiany wpływ mają nie tylko sposoby stymulacji gospodarowania energią w UE, ale m. in. równie znaczące kwestie kryzysu ekonomicznego, sytuacji geopolitycznej oraz związanych z tym zmian gospodarczych. Ponadto, część spośród związanych z omawianym obszarem wskaźników, jak zależność energetyczna, wykazuje wyraźnie negatywne tendencje zmian.



**Słowa kluczowe:** wskaźniki zrównoważonego rozwoju, Unia Europejska, energia, zmiany klimatu

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## Introduction

Sustainable socio-economic development is one of the most important challenges of the modern world. The concept was defined in 1987 by Brundtland World Commission on Environment and Development (WCED) in the report *Our Common Future*. It defines sustainable development as one in which the needs of the present generation can be met without compromising the ability of future generations to meet theirs. This development refers to the environmental, economic and social issues that can be compared to the three legs of a table, needed in order to stand steadily. Even in the case when the human is placed in the centre of the system, the objective is to preserve the natural resources and ensure continued development capable to support all kinds of life on the planet.

Environmental sustainability can be therefore defined as: *meeting the resource and services needs of current and future generations without compromising the health of the ecosystems that provide them* (WCED, 1987). Environmental sustainability could be defined more precisely as *a condition of balance, resilience, and interconnectedness that allows human society to satisfy its needs while neither exceeding the capacity of its supporting ecosystems to continue to regenerate the services necessary to meet those needs nor by our actions diminishing biological diversity* (Morelli, 2011).

In the face of the current financial crisis, the economic aspects of sustainable development are under more detailed investigation. Economic growth is one of the most important policy goals across the world, commonly accepted by society. In this perspective, it is the reason why the balance between economics and sustainability is not easy to be achieved. Regardless of the fact that there are voices in discussion talking about idea of *degrowth*, economic sustainability is still a mainstream concept, defined as increasing consumption and based on the economic progress (Moldan, 2012).

The social pillar of sustainability concept is strongly connected with its core objective – to provide the opportunity to lead a decent life in the society and clean environment to everybody, everywhere, and at any time. It is assumed that this demand for a high quality of life should include a developed standard of living, social cohesion, full participation and a healthy environment (WCED, 1987). Social sustainability is based on the personal properties such as education, skills, consumption, income and employment, as well as institutional issues like democracy, gender equity or independent and pluralistic sources of information (Omann, Spangenberg, 2002).

## Key indicators of sustainability in European Union's legislation

The idea of using sustainability indicators as a solid basis for decision-making at all levels was mentioned in Agenda 21, one of the documents introduced during the Earth Summit which took place in Rio in 1992. However, at that time there were no specific tools intended to monitor the effects of sustainable development deployments, so an effort had to be undertaken in order to develop such indicators.

In 1995, the Commission on Sustainable Development approved *Work Programme on Indicators of Sustainable Development* and the first set including 134 indicators was presented. In the period from 1996 to 1999, 22 countries across the world voluntarily pilot-tested the indicator set. Between 1999 and 2000, the results of the national testing were evaluated, whereas the indicator set was revised and reduced. In 2001, the second set of 58 indicators was presented and published. They have been extensively tested, applied and used in many countries. A large number of countries had developed their own national indicators. Additionally, indicators were used to measure progress on achieving the *Millennium Development Goals* (*United Nations Millennium Declaration* adopted in 2000). The third edition of indicators related to the development on the national level was published in 2007 (United Nations, 2007; Rametsteiner, 2011).

Sustainability indicators are essential tools for monitoring the essence of the concept of sustainable development in a measurable way. In relation to the nationwide or global monitoring systems, a variety of indicators is used, describing different aspects, including Gross Domestic Product per capita, etc. However, there are opinions that the current indicators are insufficient to measure the sustainable trends (they are rather created to evaluate the unsustainable trends) and are insufficient at the national level (Dahl, 2012).

An indicator of sustainable development can commonly be understood as a measureable tool that enables to analyse changes by quantifying the progress towards the sustainable use and management of social, economic, and environmental resources. In this meaning, an indicator is a measure that directs to a specific issue. Its function is to show whether the assessed system is running towards the defined goals. Indicators can evolve either into a quantifiable or qualitative pointer, depending on the purpose of evaluation (Gallopín, 1997).

The most important feature of the indicator is the comparability of its value (in contrast to the general characteristics expressed by absolute values), used

Table 1. The evaluation of progress in headline indicators for EU-28 (Eurostat, 2015)

Theme	Headline indicator	Progress towards SD	Time span of comparison
Socio-economic development	Growth rate of actual GDP per capita	+	2002
Sustainable consumption and production	Resource productivity	++	2011
Social inclusion	Persons at-risk-of-poverty or social exclusion	--	2008
Demographic changes	Employment rate of older workers	++	2005
Public health	Healthy life years and life expectancy at birth, by sex	+	2002
Climate change and energy	Greenhouse gas emissions	++	2005
	Share of renewable energy in gross final energy consumption	++	2005
	Primary energy consumption	-	2002
Sustainable transport	Energy consumption of transport relative to GDP	-	2003
Natural resources	Common bird index	+	2002
Global partnership	Official development assistance as share of gross national income	-	2010
Good governance	No headline indicator	...	...

for specifying the position of the system / country in relation to other systems / countries. In this sense, the indicator is a function of one or more features. For example, Gross Domestic Product per capita is a function of GDP (feature 1) and population (feature 2).

The distinction between *indicator* and *index* can be assumed as follows: the indicator applies to certain state phenomenon, while the index expresses its change in time. Among the many requirements of correctness, sustainable development indicator should also be characterized by (Czarski, 2011):

- the connection with the sustainable development, which can be evaluated through a clear answer to the question: does a specific indicator express the importance of sustainable development in the chosen pillar (e.g. environmental) and particular area (e.g. climate change),
- the clear principle of calculation and purpose of the described SDI.

The indicators are used in European Union monitoring system by Eurostat, as well as the European Environment Agency (EEA, 2015). The system used by Eurostat relies on over 100 positions of the European Union Sustainable Development Indicators (Eurostat, 2015). The current set of sustainable development indicators for the EU consists of ten *Themes* with 12 *Headline indicators*. Topics gradually progress from the economic, social, and environmental to institutional and political ones (Table 1). Themes (level 1) are then divided into sub-themes (level 2) called *Operational objectives* and *targets* and *Actions* (level 3). In a natural way, they also reflect the main objective – achieving prosperity based on the

principle of sustainable development, as well as the guiding principles related to good governance.

The evaluation based on the headline indicators (Table 1) shows clearly favourable changes in Sustainable consumption and production and Demographic changes. Moderately favourable changes can be observed in Climate change and energy, Natural resources, Public health and Socio-economic development. The remaining headline indicators indicate a rather unfavourable tendency of change. The rising number of persons living at risk of poverty, exceeding 122 million of people, constitutes an example. Due to the economic crisis, the percentage of persons affected by poverty and social exclusion has been rising for both *old* and *new* Member States (Eurostat, 2015). At the same time, the disproportion between the incomes of the richest and the poorest parts of society increased, which has to be classified as an unsustainable effect (Pawłowski, 2011).

### European targets in energy policy

One of the EU strategic goals is connected with the minimization of environmental burdens related to the energy sector, especially those responsible for the global warming effect. Considering the meaning of the sustainable development indicator in this area, it is necessary to note the following issues:

- price of electricity unit, since unfavourable economics are not sustainable,
- greenhouse gas emissions as the key parameter that defines sustainability of energy generation,
- availability and limitations of each technology of energy generation in the case of the strategic

- regulations in this particular area. For example, land use requirements are important in the case of renewable energy sources, since they may comply with arable land, whereas the water consumption is important in arid climates,
- efficiency of energy transformation,
- social impacts used for identification and quantification of the human risks and consequences (Evans et al., 2007).

The European system of monitoring the Climate change and energy theme includes three headline indicators: Greenhouse gas emissions, Share of renewables in gross final energy consumption, and Primary energy consumption. The remaining indicators in this theme are divided into *Operational objectives and targets*, and *Actions*.

Greenhouse gas emissions are presented as the annual total GHG emission in relation to Kyoto base year (which differs for individual countries) or to 1990, when the indicator was equal 100. This indicator presents the trends in the sum of man-made emissions of the greenhouse gases expressed in the equivalent of CO<sub>2</sub>, through the use of Global Warming Potential factors. The Kyoto list of greenhouse gases includes: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>). The indicator does not incorporate the sources related to land-use change and forestry, or the emissions from the international marine transport. International aviation is included in the data indexed to 1990, yet not in Kyoto base year (Schneider S. H., 2009; Eurostat, 2015).

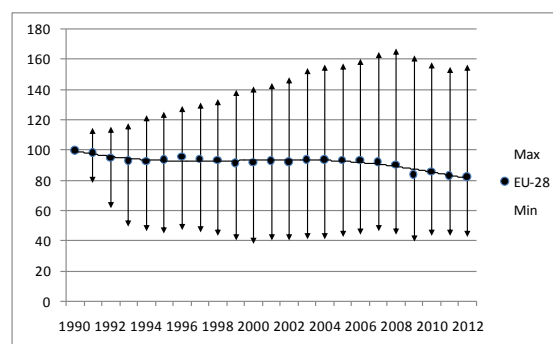
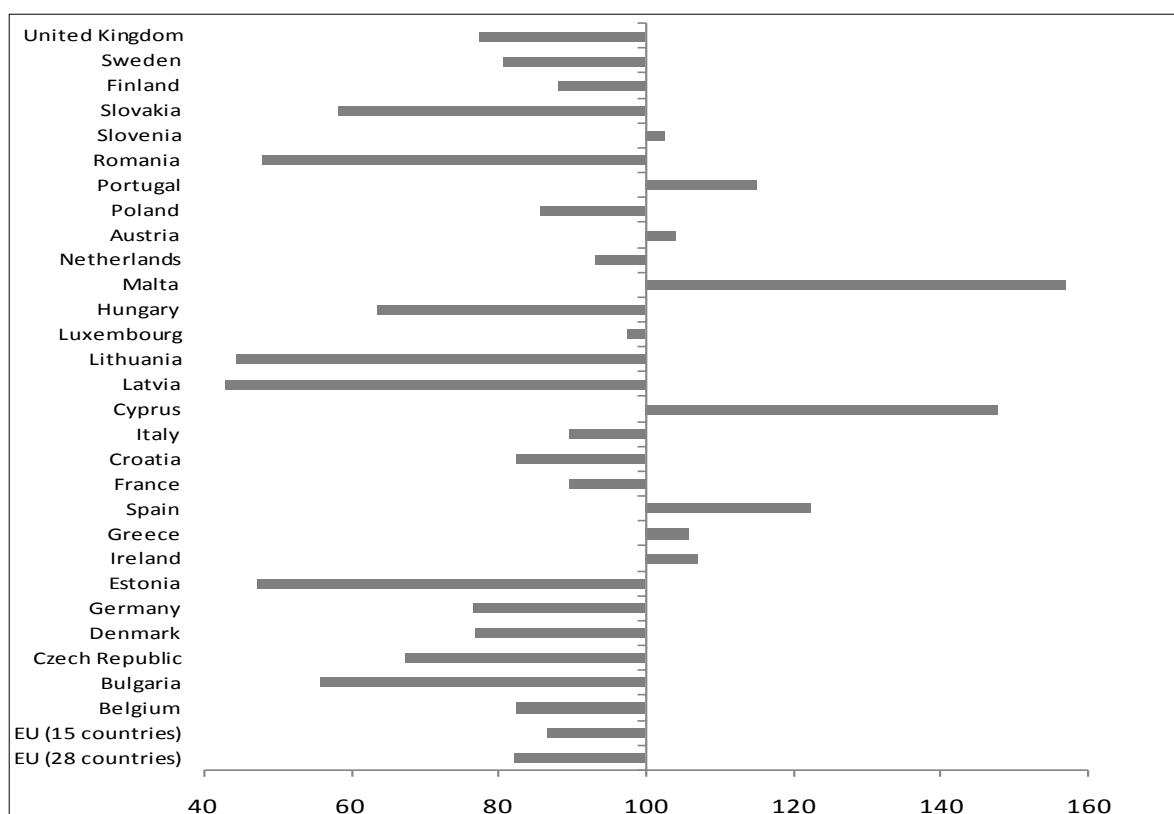


Figure 1. Emission of GHG indexed to 1990, average for EU with extreme values for individual Member States [1990=100] (Eurostat, 2015)

As presented in Figure 1, total man-made GHG emission was successfully reduced during the last 25 years by 18%, and the indicator reached the level of 82.14 in 2012. The latest data on emission of GHG refer to 4 678.8 million tons of CO<sub>2eq</sub> in 2012. The greenhouse gas that comprises nearly 97% of emissions is carbon dioxide (CO<sub>2</sub>). According to Eurostat data, in 2013 carbon dioxide emissions from fossil fuel combustion decreased by 2.5% in the EU-28 in comparison to the previous year, following the drop of 1.6% in 2012. This data includes international aviation, and, as reported in European Environmental Agency statistics, the decrease without aviation was even higher (EEA, 2015).

It should be noted that the minimal GHG emission in relation to the base year 1990 was reached by Latvia, Lithuania, Estonia and Romania (42 – 47), while Cyprus and Malta are represented by the highest indicators (147 and 156), as presented in Figure 2.

Figure 2. Emission of GHG indexed to 1990 for European Union and Member States in 2012 [1990=100] (Eurostat, 2015)



The high diversity of this indicator is related to individual characteristics of countries, their energy and transportation sectors, climate, policy goals, and finally public awareness of global warming. The examples are Malta and Cyprus, two countries which are not obliged to diminish GHG emission by the ratification of Kyoto protocol and are deprived of its own resources, importing coal mainly from Russia. On the other hand, in the countries with nuclear power plants, like Lithuania, governmental mechanisms influencing the energy market and increasing access to renewable sources presented a positive trend of GHG emission decrease.

Considering the amounts of GHG emission instead of indicator discussed above, it is crucial to note the role of leading European countries including Germany, United Kingdom, France and Italy (Figure 3), where the high level of industrial and social development influences the level of emission. Poland is the fifth biggest emitter due to the coal-based energy sector.

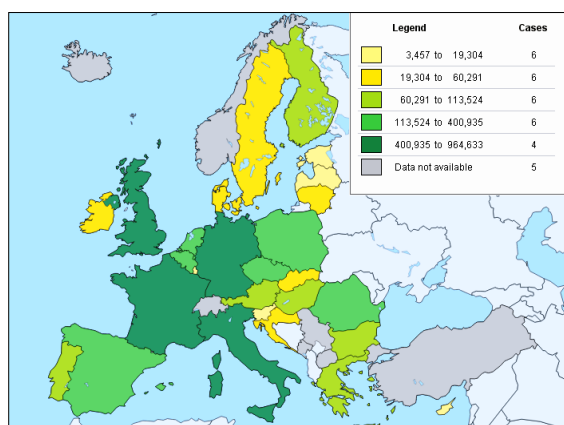


Figure 3. The map of Europe GHG emission [tons] in 2012 (Eurostat, 2015)

Greenhouse gas emission by sector is another quantitative indicator, assigning the emission data to individual branches of the economy. In this case, the most significant sectors are energy and transportation. The decrease of GHG emission from energy sector is not only the result of EU policy towards transformation of energy sources and efficiency. The lowered energy demand during the economic crisis caused a significant fall in energy consumption and consequently, in the GHG emissions between 2007 and 2012 (Figure 4). The mild winter in 2010/2011 could be another important factor. Therefore, the current reductions may not only be connected with the transformation of energy sector, but partially also with the low economic performance (Eurostat, 2011).

The greenhouse gas intensity of energy consumption is another important indicator. It is expressed as the ratio of energy-related greenhouse gas emissions (including carbon dioxide, methane and nitrous oxide) to gross inland energy consumption, indexed to the base year 1990. The changes in emissions from en-

ergy use (Figure 5) suggest that the energy production has switched towards less GHG-intensive sources such as the renewable ones.

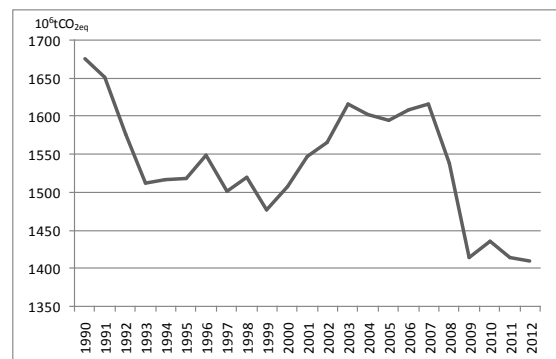


Figure 4. Emission of GHG from energy industry in EU-28 [ $10^6$  tons] (Eurostat, 2015)

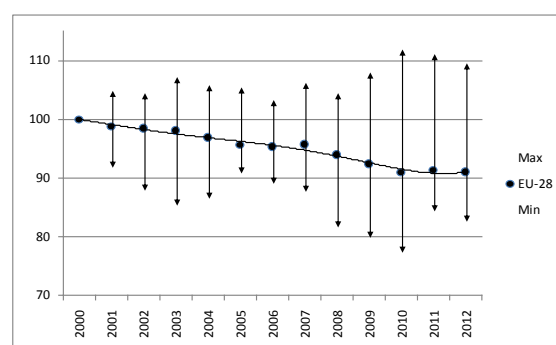


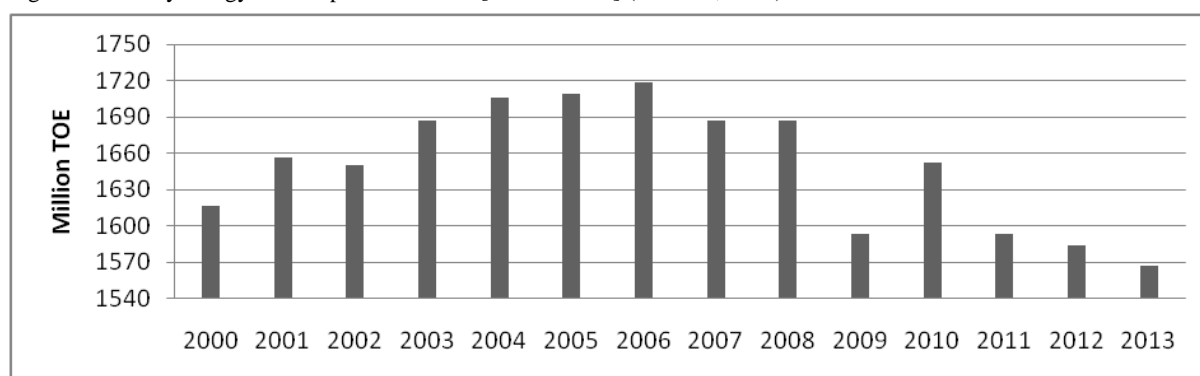
Figure 5. GHG intensity of energy production in EU-28 indexed to the base year 1990 [1990=100] (Eurostat, 2015)

Yet another group of indicators discussed in this article is related to the issue of energy. They are used to monitor the progress resulting from the adoption of the *Europe 2020* strategy. Primary energy consumption indicator (Figure 6) shows gross inland consumption of energy carriers used for energy purposes (consumption by the energy sector itself, distribution and transformation losses, final energy consumption by end users). In the calculation of gross inland consumption, the energy provided to international maritime bunkers (including all dutiable petroleum products loaded aboard a vessel for consumption by that vessel / the storage and supply of fuel oil to maritime vessels) is not included.

Since 2006, a downward trend of primary energy consumption in European Union is observed. In 2013, the primary energy consumption of all Member States amounted to 1566.5 million tons of oil equivalent. The exception was noted in 2010, after a significant decrease in 2009 resulting from the financial and economic crisis. In 2013, the primary energy consumption was 8.3% lower than in 2005.

The share of renewable energy in gross final energy consumption (expressed in %) is identified as a key indicator for measuring the progress under the *Europe 2020* strategy. The gross final consumption of energy from renewable sources is calculated as the sum of:

Figure 6. Primary energy consumption in EU-28 [Million TOE] (Eurostat, 2015)



- The final gross electricity consumption from renewable energy sources,
- gross final energy consumption from renewable sources in heating and cooling,
- final consumption of energy from renewable sources in transport.

The share of renewable energies in the fuel consumed by the transport sector is calculated on the basis of energy statistics, according to the methodology described in Directive 2009/28/EC. Biofuels are included in calculation up until 2010. From 2011 onward, the data for biofuels are restricted only to the biofuels compliant with Directive 2009/28/EC.

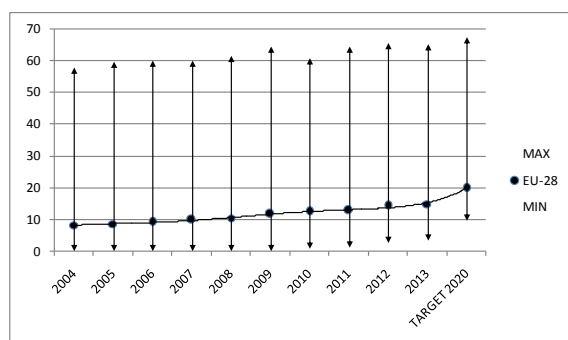


Figure 8. Renewable energy share in gross energy consumption for EU-28 with extreme values for individual Member States [%] (Eurostat, 2015)

In gross inland consumption, primary production, recovered products, total imports, and variations of stocks are taken into account. Total exports and bunkers are not included. Furthermore, this indicator corresponds to the addition of final consumption, distribution losses, transformation losses and statistical differences. In Figure 7 the share of renewable energy in the gross energy consumption throughout the last decade is presented.

Between 2004 and 2013, the share of renewable energy in gross inland energy consumption has increased from 8.3% to 15%. Sweden, Latvia, Finland and Austria are the countries in which this indicator assumes the highest value. In 2013, its value amounted to 52.1%, 37.1%, 36.8%, and 32.6%, respectively. Countries that have already reached the target are: Bulgaria, Estonia, Lithuania, and Sweden.

The smallest progress in that matter is noted in United Kingdom, Netherlands, France, and Ireland. Taking into account that the target for all Member States is to achieve the agreed 20%, 5% more is still needed.

Another indicator is the electricity generated from renewable sources. The share of renewable energy sources is defined as the ratio of the electricity produced from renewable energy sources to the gross national electricity consumption. Electricity produced from renewable energy sources comprises the electricity generation from hydropower plants (excluding pumping), biomass, waste / wind, solar and

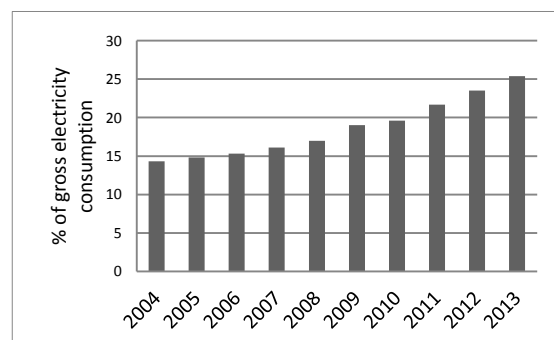
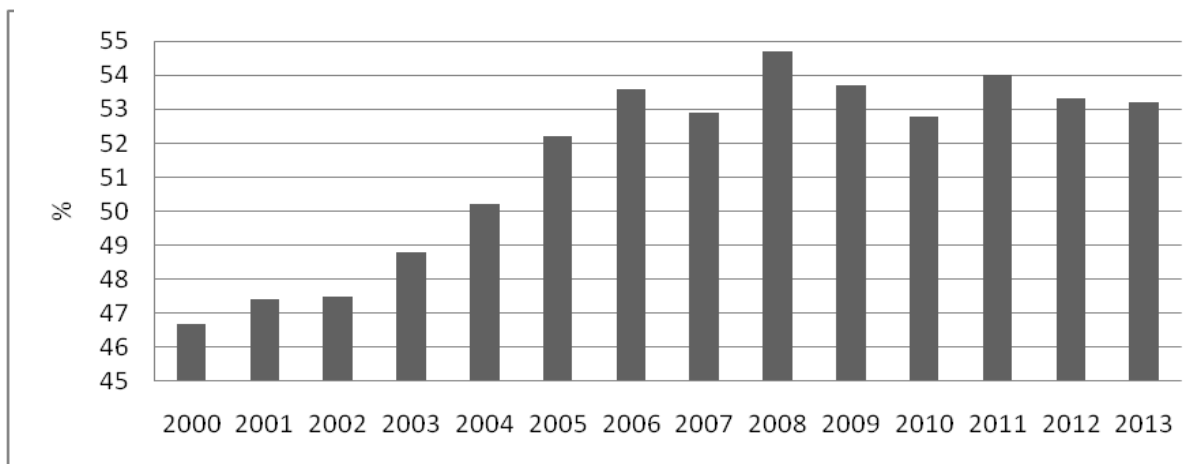


Figure 7. Electricity generated from renewable sources in EU-28 [%] (Eurostat, 2015)

geothermal installations. On the other hand, gross national electricity consumption comprises the total gross national electricity generation from all fuels (including autoproduction), including the electricity imports, but not the exports.

The share of electricity generated from renewable sources in gross electricity consumption in the EU increased from 14.3% in 2004 to 25.4% in 2013. Austria and Sweden are the countries in which the largest part of electricity demand is covered with renewable sources. For these countries, the share in 2013 amounted 69.1% and 61.8%, respectively. In Malta and Cyprus, the use of renewable energy sources for electricity production is negligible. For Cyprus it increased from 0 to 6.6% between 2004 and 2013, while for Malta it increased from 0 to a mere 1.6%.

Figure 9. Average energy dependency for EU-28 [%] (Eurostat, 2015)



This fast expansion of renewable energies, particularly in the electricity sector, is supported by many initiatives on the European and governmental level, including the direct economic support. In the 2007-2013 financial perspective, nearly 11 billion of Euro, representing approx. 3% of the EU general budget, was allocated to the energy purposes (development of renewable energy sources, increase of energy efficiency and construction of trans-European networks) (Pająk, Mazurkiewicz, 2014)

Energy dependency indicator (expressed in %) shows the extent to which a country relies upon imports in order to meet its energy needs. The indicator is calculated according to the following formula (European Commission, 2013):

$$EDI = \frac{M_j - X_j}{GIC_j + Bunk_j}$$

Where: X – export, M – Import, J – energy product, GIC – gross inland consumption, Bunk – consumption of international bunkers (for international maritime and aviation transport).

Import dependency has been calculated for the following energy products: natural gas, crude oil, solid fuels (hard coal and derivatives, and lignite and derivatives) plus the total that is all of the above-mentioned products combined. The average energy dependency for European Union is presented in Figure 9 (Eurostat, 2015).

In the years 2010-2013 import energy dependence in the European Union rose by 6.5%. This increase was associated with a substantial reduction of primary energy production in EU, especially of oil and hard coal, which was not matched by an increasing production of renewable energy.

Denmark was the only EU Member State with a negative dependency rate between 2000 and 2012. Other Member States with the dependency rates below 30.0 % include Estonia, Romania, the Czech Republic and Sweden. Conversely, Malta, Cyprus and Luxembourg are the countries that are dependent on imported energy to the greatest extent.

Energy dependence is a source of concerns related to the security of energy supplies. In 2013, more than half (53.2 %) of the EU's gross inland energy consumption came from the imported sources. A high proportion of energy imports is concentrated among relatively few partners, thus the security of the EU's primary energy supplies may be threatened. Currently, the main crude oil and natural gas supplier is Russia. In 2012, 33.7% of the EU-28's imports of crude oil and 32% of natural gas came from Russia. Other important supplier of crude oil is Norway (11.1% in 2012); in the case of natural gas, these include Norway and Algeria (31.3% and 13.5% in 2012, respectively). In recent years, Russia also emerged as the leading supplier of solid fuels reaching 25.9% in 2012. Other suppliers are Colombia and United States (23.7% and 23% in 2012, respectively). For individual countries, Russia is the largest providers of energy sources. Greece, Hungary and Austria are dependent on the gas supplies from Russia in more than 80%. Lithuania, Hungary, Slovakia and Poland are almost entirely dependent on the oil supplies from Russia. In turn, Estonia, Latvia, Lithuania and Cyprus are almost completely dependent on the coal supplies from Russia (Eurostat, 2015).

The strong dependence of the EU on the external energy supplies has a negative impact on the issue of energy security. In this situation, the EU economy is exposed to serious risks related to energy prices, including potential supply shocks (Gawłowski et al., 2010). Recent internal conflict in Ukraine and the collapse of the conciliatory policies of Western countries towards Russia showed that energy dependency and energy prices can become an instrument of manipulation in international politics.

The set of indicators discussed above is related to the issues of energy and climate change. It does not consist in the individual technologies, but rather the whole energy sector; therefore, the issues concerning the limitations of specific technologies and their individual carbon footprint are neglected on this level. However, the economic and social impact of energy sector seems to be underestimated in the European statistics, since there is no direct evaluation of the

connection between its transformation, price of energy unit and the number of workplaces in this branch. It is noticeable that this number increases for RES sector; however, the limitations of carbon emission in the case of coal-based industry may lead to decreased production efficiency and dismissals. The price of energy sector transformation is paid by the entire European society, firstly in the taxes spent on promotion of RES and the efficient technologies from the EU budget, and secondly in the lower economic performance and rising energy prices. Therefore, the social discussion on the EU energy policy can be, in some cases, the reflection of its negative assessment, especially in the case when this policy is compared to the global targets and considering the lack of limitations for the leading emitters, like India.

## Conclusions

The system of indicators used in the EU as the basis of growth evaluation in most of the cases shows positive changes, resulting from the implementation of strategic policies towards environmental, economic and social sustainability. In relation to climate change and energy, the trend is fairly good, with exceptions occurring for a small number of indicators. If the current rate of GHG emission reduction continues, the EU will exceed 20% goal in 2020. However, the emission reductions between 2000 and 2012 are not satisfactory, considering the long-term commitment to reduce GHG emissions by 80-95% till 2050 – in relation to the base year 1990 (COM 2011). Moreover, a part of reduction is connected with political and economic changes which occurred in Eastern Europe in 1990ties, when a part of heavy industry was transformed into more service-based economies.

Most of the Member States are on the way to achieve their individual 2020 goals by increasing the share of renewable sources in gross final energy consumption, which resulted in a noticeable increase of the indicator for the whole Union. However, some trends are not continuous and cannot be simply explained as resulting from the transformation into low carbon economy and the increase of energy efficiency. Energy consumption is a function of many factors, for instance economic crisis and weather conditions; therefore, this indicator is likely to show an unsteady tendency of changes.

Furthermore, increasing the energy imports may result in compromising the security of the EU's primary energy supplies. The EU's dependence on external energy suppliers is not only the result of the growing demand for energy, but also the depletion of the Member States' resources. The general negative trend in energy production may, at least in part, be influenced by the exhaustion of raw materials and the uneconomical exploitation of limited resources.

The growing importance of energy security in the hierarchy of the EU's objectives also results from the increased awareness of progressive dependence on energy imports. Long transportation distances and the necessity of transit may influence the prices, as well as the accessibility of fuels, resulting in deterioration of the EU's economic stability. Therefore, changes in this area cannot be presented as positive and certain actions, at least leading to diversification of suppliers, should be taken.

The EU's ambitious goals concerning energy sector were established to diminish the global warming effect. Since 1990s, the GHG emission of European countries maintains a declining trend; nevertheless, it only includes the direct emissions, without those connected with imported and consumed goods, which remain at the constant level. Moreover, according to US Environmental Protection Agency, global GHG emission during that time has been growing (EPA, 2015). The largest increase of emissions is noted especially in Asian developing countries, and the contribution of Europe in total anthropogenic emission shows the decreasing tendency. Currently, the EU's share in this emission amounts, approximately, to 10%. Taking into account all of these facts, together with the economic crisis and the social issues, such as the increasing number of people affected by poverty, it remains a question of the compatibility between the political vision of European leadership in environmental awareness, and the social expectations of its habitants.

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