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Sustainability Perspectives from the European Semi-periphery

EDITED BY **Mladen Domazet / Dinka Marinović Jerolimov**

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Acknowledgments

For us, the editors, this was a volume long in the making. It took just over a year from the initial invitation to the contributors to address the exploration of relationships between environment, society and economy from the perspective of Europe's southeastern semi-periphery to the finishing touches to the layout of this book. For the contributors it was a period of bursts of rushed requirements and drawn-out periods of seeming abandonment. We would first and foremost like to express our deepest gratitude to them for the patience and perseverance they have demonstrated.

This volume is a product of a very fruitful, but mostly informal and sometimes frowned upon, cooperation and understanding between a prodigiously productive Heinrich Böll Stiftung's Croatian office and the jubilee *grande dame* of social research in Croatia, Institute for Social Research in Zagreb. The Institute has been conducting the ISSP survey in Croatia for almost 10 years now, but the official support to situate the data into the social policy context has often been found wanting. By the time the Environment module's data was uploaded to the international database, the post-Copenhagen COP conference disappointment faded and hope returned prior to the global Rio+20 summit in 2012. What were the attitudes of the Croatian population concerning environmental protection and trade-off between economic growth and mitigation of catastrophic climate change in the run-up to the Rio summit? The Environment ISSP module provided the wealth of answers, and *We Need to Change*, the book mapping 'objective' and 'subjective' potential of Croatia for sustainable development, was cooked up in HBS's production kitchen. But where did those findings situate Croatia, and similar small countries on the edge of Europe, in the broader European context? To provide a richer interpretation we gathered a broader team to look into the sustainability perspectives from the European semi-periphery. The results of our first attempt to bring together a wide set of authors to address issues of sustainability are collected in this volume.

We are grateful to the managements of Institute for Social Research in Zagreb and Heinrich Böll Stiftung – Hrvatska for recognising synergies and providing support in the realisation of this endeavour. It would also not have been possible without the initial efforts of the ISSP research team in the Institute for Social Research in Zagreb, Croatia: Boris Jokić, Ankica Marinović, Branko Ančić and Marija Brajdić Vuković. We are also grateful to the following institutions for their support in data-collection and analysis: Environmental protection and energy efficiency Fund of the Republic of Croatia, Ministry of Science, Education and Sport of the Republic of Croatia; and GfK-Croatia, market research institute. This volume would be just

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INTRODUCTION

Sustainability on the semi-periphery: an impossible topic in a non-existent place?

Mladen Domazet / Dinka Marinović Jerolimov

As the Intergovernmental Panel on Climate Change (IPCC) concluded in early 2014, global climate change has over the preceding decades impacted on natural and human systems all over the world. It is 'virtually certain'[1] that human influence, the consequence of practices that uphold contemporary complex civilisation, has been the dominant cause behind the perceived impacts. Climate change is probably the most complex and threatening environmental issue that human societies have ever faced. Whilst evidence is strongest for impacts on natural systems, scientists can also detect evidence of direct and indirect impacts on human societies. Water resources, essential for human survival and stability of ecosystems on which humans depend, have changed in quantity and quality. Plant and animal species have shifted geographical ranges, annual behaviour patterns and species interactions on which the very definition of familiar ecosystems depends have changed. Crop yields have largely decreased.

The vulnerability of people who are socially, economically and politically marginalized is further exacerbated by these changes in the environment. Climate-related extreme weather further compounds the existing social stressors diminishing livelihoods, especially of people already living in poverty. The resultant violent conflicts only further harm resources and infrastructure that could facilitate adaptation to change of climatic and bio-physical conditions. Whilst it spells immediate trouble for the most vulnerable, the 'fire' does not stop there and eventually affects everyone everywhere. A structural transformation to low carbon, and eventually post-carbon, society and economy is inevitable. A democratic structural transformation requires broad social mobilisation and institutional plan-

01 "Virtually certain" is the term IPCC uses in the summaries for policymakers to indicate the assessed likelihood of an outcome or a result, which carries 99–100% probability.

ning to contain vulnerabilities, in the 'core' and in the 'periphery' societies globally. A transformation to sustainability is a dynamic process of adaptation, learning and action, for which the relations between economy, society and the natural environment must be brought to light and examined. Awareness of the need for strategic transformation has been growing in scientific circles across disciplines since at least 1970s, but it has not engendered sufficiently pervasive broad public awareness required for communal action.

This volume presents a collection of theoretical and empirical contributions from 14 authors within a framework that explores the relationships between environmental, social and economic systems, and political and cultural institutions and norms. In elucidating these relationships they reflect the specific views of the 'European semi-periphery'[2], in theoretical explorations, positioning in reference to global development and impact indices, and analyses of public opinion survey data. The volume includes theoretical considerations of the understanding and significance of sustainability as the developmental outcome, from global and regional perspectives; as well as studies of attitudes among selected European populations and selected peripheral country case-study reports and recommendations for sustainability oriented policies. They all accept the theoretical inevitability of transformation, but address the specific obstacles to necessary social mobilization from a variety of perspectives.

The basic premise is that the European semi-periphery, especially its post-socialist countries, through experiences of specific modernising development harbour valuable lessons useful in the face of intense development crisis that combines environmental and social facets. These are the countries with high level of development, widespread educational and healthcare attainments, close to European cultural sphere and comparatively lower cumulative historical emissions of climate-change contributing industrial by-products. Interdisciplinary readings of global trends from semi-peripheral perspectives provide a renewed voice allowing those lessons to be heard in a global struggle to redefine different societies and

02 'Semi-periphery', to be introduced in greater detail below, marks the countries positioned between 'core' and 'peripheral' countries according to world-systems theory. Their societies are organized partly as those in core countries and partly as those in periphery countries. They are often geographically located between core and peripheral regions as well as between two or more competing core regions, and have transformative potential in terms of technology, reforms in social and organizational structure, and dominance over peripheral nations. Semi-periphery is more than a description; it is a position within the world hierarchy in which social and economic transformation can be interpreted.

economies under common bio-physical and ethical constraints. In the semi-peripheral European societies, such as the post-socialist countries of South-East Europe are, the overall average material development is among the highest in the world, although this fact is generally unrecognized among the national populations. The benefits of development and economic activity over the last 20 years have by and large not been equitably distributed in those countries, making inequality a serious concern for sustainable development path of peripheral European societies.

This introductory chapter provides a background for the subsequent chapters through its combination of historical and geophysical 'collapse' warnings, outlining ethical constraints in the present global state of injustice counterbalancing those warnings, and attempts at interdisciplinary scientific description. It reviews the development and environmental impact indices across Europe, to help position the specific findings of subsequent chapters.

Special times for a special perspective

We live in special times. Though we laud the complexity of contemporary advanced global civilization from a *longue durée* historical perspective, we are also increasingly aware of the multiple instances of historic civilizational collapse. There are examples in history where increasing complexity of civilisation based on mobilisation of ever-increasing quantities of resources, increasingly capable technologies and growth of population has been suddenly disrupted by a long-lasting collapse. A collapse is characterised by dwindling of population and deconstruction of complexity to the state of basic social and political organization and economic specialization (DIAMOND 2005A; TURCHIN and NEFEDOV 2009; MORRIS 2011; MONTGOMERY 2012). Western Roman and Mayan civilisations' examples are readily recognizable precursors, but these were local and regional phenomena. In today's interconnected and highly technological global society, the threat of collapse of civilisation is global in extent, both in terms of consequences and in terms of causes (EHRLICH and EHRLICH 2012).

The globalized nature of contemporary society is itself a historically special situation (BURKE III 2009), any shake-ups of which would have global consequences (GOLDIN 2013). But there is more to our predicament today than the mere domino effect of high economic and cultural interconnectedness. The globalized world is exposed to several structural weaknesses, the most significant among them being the global irreversible climate change and the inequalities of development. Both are a necessary consequence of the dominant development model based on output growth as the only remedy for relative poverty reduction, combined with fossil fuels

as the dominant energy source. The dominant development model is in turn rooted in the assumption that the primary source of our wellbeing as a species lies in the ability to increase the global output of goods and services by at least 5% per year, despite the clear sign of destructive outcome of continuing along such path.

Paul Crutzen coined the name "Anthropocene"[3] for the new geological era that humans have brought about in the life of the planet (cf. ZALASIEWICZ, CRUTZEN and STEFFEN 2012 for an overview). In geological terms it is a very recent transition from the much longer geological age that provided the climate hospitable to human civilisation as has been historically recorded. The name "Anthropocene" suggests that we are living in a special time in which our species, our societies and cultures, act with the power of a geophysical force, changing the material constitution of the atmosphere, cryosphere, marisphere and arid topsoils (ARCHER 2010; SAGER 2011); primarily thanks to the profligate use of fossil fuels as source of energy. Geophysical forces usually involve physical processes through which tectonic plates are shifted; major volcanic eruptions change the concentration of different compounds in air, sea and soil; or a large extra-terrestrial object (an asteroid) strikes the surface of the planet.

Yet, there is no doubt that the availability of abundant cheap energy in th eform of fossil fuels has freed modern humans from massive forced physical labour in the sustenance of civilisation. So, globally, humanity finds itself in a bind: what materially enabled a large part of our individual liberation and an engine for growth in population and material consumption, is also predicted with high likelihood to be bringing about the collapse of socio-political-economic complexity we call civilisation (EHRLICH and EHRLICH 2013). The lethal mix is provided by the coupling of fossil fuels with expansionist logic of capitalism, which once established necessitates an ever increasing consumption of fuels and resources to maintain its peculiar innovation and wellbeing expansion engine.

Climate change and its socio-economic consequences today engender narratives of lament, fear, hubris and justice combining empirical observation of the trends in bio-physical environment and historical strategies of modern societies (HULME 2010). Strong invocations of "time to 'believe and change the way you live', [... time] for human rebirth" (LEVENE 2010, 78) are typical of cultural transformation invoked as a mitigating response to threat of collapse. Meanwhile, meta-assessments (such as the IPCC working group reports) warn that over 4 degrees of warming, which is where

03 A number of other different names have been suggested for the new age that humans have ushered in: including the *Catastrophozoic era*, *Homogenocene*, *Myxocene* (from the Greek word for "slime").

the current development model is taking us, lie irreversible severe material changes for which we have no adaptation capacity. In other words, without mitigation of material causes and their social drivers, global civilisation will probably not be able to adapt to the biophysical changes (cf. the 'constraints' section below).

Given the scientific and cultural development over the last few millennia we are in a position to say that the way the world is today leads to there being no 'world' in some near future. This is not to say that there will be no humans, but the civilisation that humans have been constructing over the past few millennia is threatened with a long-lasting collapse. The global society is heavily dependent on fossil fuels for everything from food production, heating, construction, and material production to the production of energy for most of the contemporary global knowledge banks. These resources are not inexhaustible, and as yet are not fully replaceable with renewable sources of energy. Only their widespread replacement can guarantee the global civilisation's existing energy consumption without bringing on a widespread collapse under drastic, sudden and irreversible climate change.

This special time calls for a combined perspective of projecting physical trends with as high confidence as possible into the relevant near future, but also sensitivity to processes in political, social and cultural spheres through which the projected material changes are made meaningful (SKRIMSHIRE 2010). Not least because it is in those spheres also that we encounter signs of, at the very least, a "peculiar historical juncture" (GRAEBER 2011, 381). At this juncture, the dominant unsustainable paradigm for reducing ever evident inequalities between members of human societies is the national debt and credit money, a promise of continual future improvement made by 'government' to 'the people'. Widespread debt default and economic collapse without inequality reduction, again in a globalised world, is the other driver of the precipitous termination of civilisation.

It is not that difficult to grasp the impossibility of maintaining the current engine of perpetual growth forever on a finite planet, given the awareness that technological breakthroughs can provide very limited immediate improvements constrained by other limiting factors of their own. What is much more difficult is to untangle the intricate connections between environment, society and economy. By untangling them we would better elucidate what aspects of contemporary environment-resources-society-economy complex we wish to preserve as much as possible whilst abandoning others to necessary change under present-day constraints. This volume has an ambition to take a step towards untangling, to present and critique sustainability strategies through combined perspectives of economics, sociology (both theoretical and empirical) and development philosophy,

all rooted in the peculiar positions of its authors: researchers living and working in the region of the European semi-periphery.

The volume opens with examinations of philosophical, sociological and economic *a priori* considerations of sustainability (**Part I**) as conceived by experienced authors, and young researchers with novel interdisciplinary training and activists from post-socialist countries of Southeast Europe. They critique traditional growth theories and contemporary life-style practices, as well as controversial bio-pharmaceutical solutions or neoliberal market mechanisms as ways out of the collapse predicament. In that, they each step out of their professional disciplinary silos to initiate a broader conversation in this volume. Yet, they and the analysts in *empirical* comparative and country-case studies sections that follow, are professionally rooted primarily at one segment of Europe's semi-periphery, a region that plays a major role in mediating economic, political, and social activities that link 'old' Europe and aspirational peripheral areas.

Like many concepts employed in 'straddling' of established academic disciplines, semi-periphery is much maligned and ambiguous. However, on face value it serves well as description of the 'new' and aspiring European states, both by their geographical and historical position. In the 21st century Europe it covers industrialized and industrializing capitalist countries positioned between periphery and core countries. They mix both core and peripheral forms of organization despite recent accession to European Union, transmit flows between core and peripheral regions, and exhibit cultural and social institutional features intermediate in form between adjacent core and peripheral areas (WALLERSTEIN 1979; CHASE-DUNN and HALL 1997). It is most significant for our purposes, though, to delineate the semi-peripheral European region by its potential for transformation of world-systems.

Researchers in natural and social sciences are, generally, increasingly aware of the epistemological straddling of processes of otherwise vastly different scales: the dynamics of an inanimate Earth system, history of life and human evolution, the history of globalised industrial civilisation, and the collective intellectual creativity of individual humans freed from muscular toil (MCNEILL and MCNEILL 2003). In that they strive for a holistic understanding of the physical, biological, economic and cultural sustenance of contemporary civilisation by providing knowledge that itself straddles, or non-linearly combines, the finely profiled specialisations of the social sciences, humanities, and natural sciences. Researchers writing about the combined projections of the dynamics of an inanimate Earth system and the intellectual creativity required to transform the structures of social organisation and energy conversion have to themselves straddle discourses, disciplines and incomparable scales of processes they study within a single narrative.

This leads to texts, viewpoints, analyses and explanations with one foot in one set of ontological categories and the other in another, unwilling to cement a single unchangeable interpretation of how life and other people should be. Given the combined effect of processes of vastly different scales peaking in the threat of collapse, the viewpoints resulting from the straddling of disciplines are not less real for being subject to alternative reconstructions. However, the very awareness of the straddling of processes of vastly different scales within a single narrative of culture-civilisation-nature interaction, like the once revolutionary paradigm of Earth moving along a heliocentric orbit around the stationary Sun, does not in and of itself enable humanity to implement collective strategies that would alter the course of the four perilously combined processes. What the said awareness does enable, though, is an understanding of constraining principles under which future collective actions should unfold so as to avoid the dreaded collapse.

The loose overall framework within which to develop strategies to avoid the collapse trades under the name of "sustainability". Though an often misused concept (cf. MEBRATU 1998), sustainable development and sustainability have a ready-made interpretation in the so-called 'reduced Brundtland'[4] formulation as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED 1987). Such ambiguity-ridden definition of strategy goals is in accord with the constraining principles outlined below by focusing on 'needs', 'present', 'future', 'ability' and 'development'. Both old Europe and new, Far East and far flung islands have needs, historically conditioned abilities, variable presents, but the least common denominator of their futures is avoiding catastrophic termination of the beneficial aspects of global civilisation.

In providing the explanatory framework for sustainability, scientific explanation and prediction of both natural and social phenomena play a crucial role. The traditional mechanistically based rationalisation through separate disciplines resulting from the normal conduct of science (FUNTOWITCZ and STRAND 2007) – reducing complexity and eliminating uncertainty – fails to elucidate the so-called 'wicked' problems associated with sustainability (O'CONNOR 2006, 291). Based on the premise that the 'wicked' problems defy classical mechanistic problem-solving methods and explanatory conceptualisations, a choice of categories of representation of the present state and future development needs to be drawn from across a range of the problem domains (physical, geophysical, biological, social, economic, psychological, emotive). Reductive mechanistic paradigm of identifying a single obstacle

04 The authors are indebted to Tomislav Tomašević for introducing them to nuances of Brundtland definitions.

to the problem solution is not limited to natural sciences only (ELSTER 2007). However, at this historical juncture of straddling of processes of vastly different scales one process' obstacle (CO_2) is another process' solution (abundant 'cheap' energy). A straddling perspective requires a consideration of the 'wicked' concept within a unified operative explanatory framework.

When a problem seems 'wicked' or its constituent elements defy easy reductive categorisation sciences turn to obvious and unshakeable constraining principles to provide broadly generalizable explanations. As no intellectual discipline offers a direct mechanistic reduction of processes across scales of biological evolution and contemporary individuals' motivation and wellbeing, a standard mechanistic constructive explanation remains elusive. It would require an identification of basic natural and social categories that allowed us to meaningfully combine the vastly different geological and cultural process that a sustainability-oriented explanation has to straddle. A principle-based approach, on the other hand, identifies the most general statements about a whole range of phenomena without speculating about the universal characteristics of the fundamental elements of those phenomena. Whilst there are no conceptual categories unifying the analyses of European armed conflicts through history and an individual's motivating factors in choice of breakfast, both are constrained by the principle that 'humans have to eat'.

Principles are easily understandable constraints within which broadly explanatory and strategic conceptualisations can be developed. Pressed for time and conceptual apparatus, but enjoined to engender a wide-enough understanding of their narratives, principle-based explanations rest on general but easily understandable observations without newly invented conceptual apparatus. Given the self-evident or easily understandable nature of the constraining principles, they clarify what the world must be like so that those observations always hold as a general rule. The elements that form their basis and conceptual starting point are not the hypothetically constructed interacting elemental categories of disparate scale phenomena, but easily established general characteristics of processes under consideration (DOMAZET 2012A). This introductory chapter maps the possible constraining principles framing the more specific theoretical and empirical contributions below. It is the possible globally constraining principles spanning geophysical ecosystem conservation, cooperative behaviour motivation and ethics that we turn to next.

Common global constraints

The straddling of disciplines and processes outlined above calls for a methodological unification through constraining principles applicable across

a range of scales and structures very different in detail. When empirical sciences in material domains seek an integral constraining principle that is at work across a range of systems different in detail, they often turn to classical physical theory of thermodynamics as the paradigmatic principles theory (KLEIDON and LORENZ 2005; KLEIN 1967). Behind the formal structure of principles ('laws') in thermodynamics, there lies a guiding concept with the seed of much of the meaning and idiosyncrasies of the formal explanatory apparatus. Equilibrium, a balance, is a notion that can be applied to many aspects of human experience beyond thermodynamics, including the resource/nutrient cycling of the global population and the planet as a whole. In it lies concealed the behavioural principle, the 'minus first' law of thermodynamics that isolated systems in an arbitrary initial state within some fixed volume of space will spontaneously attain a unique state of equilibrium (BROWN and UFFINK 2001). It is the foundational postulate of this framing that left to themselves all things, the epistemological 'black boxes' as far as we are concerned, tend to equilibrium with their surroundings.

Thus, biological population with time equilibrates/balances its resource uptake and release with its environment (CATLING 2005), social groups over time equilibrate in material and cultural exchange with surrounding societies etc. Essential components of ecosystems: predator and prey species, parasites, diseases and periodic physical and geological events create an equilibrium that keeps the ecosystem vibrant, verdant and resilient – a green equilibrium (WILLS 2013). One lesson for us is that the 'green equilibria' result from a wide variety of environmental pressures, again from different fields of study and process scales. They too are characterised by wickedness as the strength and overall direction of external selective pressures varies with the structural changes within the ecosystems they act upon. The other lesson, from equilibria in general, is that there is a unique direction of time from when the equilibrium condition is suddenly removed/disturbed to when it is restored again. The overall macroscopic system will always tend to restore equilibrium regardless of the necessary rearrangement of relative frequencies of its component elements.

An important physical characteristic of the equilibrium state at a macroscopic scale is stability, an endurance of the overall state in time. Beyond biology, within history of civilisation stability is also a shared aspect with the 'human security' concept and its accompanying wider discourse (GASPER 2005). The thermodynamics root of equilibrium concept is an important analogy, as a macroscopic equilibrium can contain a myriad of microscopic inequalities. Of course, equilibrium in terms of what, and whose equilibrium are issues that deserve further exploration, but are an issue of an extension of choice of conceptual apparatus we introduce in

the contributions below. Suffice to say, from a continuation of wellbeing through civilisation perspective not all possible final equilibrium states are equally desirable.

Human population growth, material wealth increase through pre-set utilisations of technology, and urbanization drive the use of natural resources and environmental services dramatically upward worldwide (SPETH 2008). Most humans want a piece of that goodness at a great cost to other humans and future generations. Such practices are deeply rooted in the economic structures and cultural patterns that motivate individual and group behaviour. Unlike 500 years ago that is no longer insignificant to the planetary biosphere as a whole. They lead to a sudden environmental change in geological and evolutionary terms. This is resisted by incremental readjustment of the environmental conditions in turn leading to societal conflicts and challenges at local, national and international levels. Accompanying unfair distribution of the costs and benefits of environmental change prompts serious concern for equity and fairness at all levels of governance. The following are then the constraining principles that summarise the limiting factors of the possible sustainability orientation strategies that our societies will have to develop in the near future if they are to avoid a collapse. Delineating micro-strategies within these constraints is illustrated in some contributions to this volume.

> Principle 1: The current sustenance processes (energy, food, and commodities production) constructive of the dominant development model practiced by the global human population drive a geo-physically sudden imbalance of the material conditions on the planet. This leads to change in parameters (e.g. average global surface temperature, acidity of the oceans, sea level etc.) over a 40 year period unrecorded in hundreds of thousands (in case of some parameters several million) years. From the perspective of history of human societies and geological processes a relatively sudden significant disturbance of equilibrium (or structurally insignificant oscillations about it) conditions is introduced.

In absence of images and graphs it suffices to say that current levels of CO_2 in the atmosphere are exceeding 400ppm whilst only 150 years ago and for a very long time preceding that they were only about 280ppm. The associated changes show records and predictions of change over a 40-100 year period not registered for millions (or in some cases tens of millions) of years. If the change over those millions is seen as the steady flux towards or minute oscillation around the equilibrium state, then the rapid change recorded and predicted now is nothing but a sudden equilibrium removal.

Meanwhile, so far all efforts to curb CO_2 emissions through regulation and international agreements have not worked. In other words, the equilibrium on the planet is disturbed by the current practices of use of resources and environmental services by the global human population.

Given the concept of equilibrium, and its 'minus first law', sciences warn of the predicted tendency of the global humans + non-human environment system to return to a state of balance of physical parameters and their biotic components. Looking at the global situation (which often may be hard to do from local semi-peripheral perspectives) and talking coarsely: a state of sudden imbalance has occurred and the overall global system will tend to find a new state of balance. The principle itself does not proscribe what ought to be done in terms of governance, it does not even state what shape the return to balance will or ought to generally take. That is a matter for more specific climatological, environmentalist, geographic, social, economic and most-importantly interdisciplinary discourses, a matter for debates between the strict scientific monitoring of the environmental conditions and the social and economic activities of human societies exemplified in contributions below (**Part III**). But the thermodynamic analogy teaches us that the role of civilisation in the new geological equilibrium may be altered beyond recognition.

Acceptance of the general overall state of imbalance and the understanding of the natural tendency towards equilibrium is the sufficient first step in motivating the popular sense of global common interest to support a transformation of the current modes of production. This will eventually probably have to include different governance structures, different energy production, different economic models, different cultural practices, different self-perception by individuals and societies etc. However, in terms of framing a lot is achieved when this initial point is universally accepted and translated into various subject-specific discourses. This is part of what contributors to this volume include in sustainability-orientation attitudes of European populations (**Part II**).

The remaining two principles (fairness and guaranteed minimum) focus on the constraints to possible modifications of the societal status quo. Moreover they are more plainly expressed following closely the foundational ethical principles of global fairness, a concept preceding mutual respect and dignity. They too, however, have a close connection with the equilibrium tendency and can as such prove to be a good guidance to the popular concerns. Shue (1997) claims that his principles, two of which will be adapted for our purposes here, do not depend on controversial philosophical theories of justice and are thus widely applicable and easy to understand. Behind them lies an awareness of the danger of further destabilizing the environmental conditions that all societies share should the

current path to development and economic prosperity be pursued; similar to the sharp equilibrium removal suggested above.

Shue also points out that despite unequal inter-relations in the past, all societies are now aware, especially those on the profiting end of inequality, that 'business-as-usual' when applied to all leads to "everyone [continuing to suffer] the effects of environmental destruction" (SHUE 1997, 531). He thus envisages that under such circumstances all societies might be willing to act cooperatively on equitable terms and in a manner that gives weight to the universal notions of fairness of burden distribution. Assuming that the current dominant development model has contributed to or solely created the sudden imbalance, a sharp deviation from equilibrium, the following constraining principles aim to prevent additional unfair disadvantages to collaborators from whom cooperation is expected. If the global humans + non-human environment system is to press for return to equilibrium of its own accord, its human subsystem should try to align with that tendency, rather than work against it and consequently invoke an even sharper response from the remaining segment.

> Principle 2: It is unfair (and works against restoration of balance within the societies) when some groups have less than enough for a decent human life whilst others have far more than enough, and the total resources available are so great that everyone could have at least enough. (Following SHUE 1997, 541)

In simplistic terms, the hungry participants have to be fed before the joint work on a common task can commence. But away from such extremes, this principle constrains the definition of a guaranteed minimum of decent life. Quantitatively setting up such a minimum will determine to a great extent the potential for acceptable equilibrium restoration. This principle also recognises the crucial explanatory role of recognition of 'radical inequality' prevalent among and within societies today: where the aggregate total of resources available today is sufficient for all parties to have more than enough, whilst some have much more than enough and other less than enough. Of course, one might ask what of the different cultural heritages' influence on the definition of the minimum. What if the definitions are so widely different that the two parties will never be able to agree? From the position of commons governance this issue is easily informed by the above principle: whatever one party sets as enough must not exert a pressure on the common resource that limits the access to minimum for others and leads to unsustainable management (denying this minimum in the future). No agreement would be fair, and would thus only bring about further imbalance, if it forced someone to make sacrifices that would leave them without necessities.

History of civilisation shows the willingness of societies and transnational governance institutions to engage in notional attempts to restore different power and freedom balance within non-cooperative sovereign states, so opening up a debate about others' self-defined minimum should not be a moral or a political first. Simply, those that say they need much more, knowing that by doing so they bring damage to everyone, whilst others have much less, must think hard about how to convince others of the fairness of their position. Without fairness there will hardly be lasting cooperation, or in Shue's terms: "if the wealthy have no general obligation to help the poor, the poor certainly have no general obligation to help the wealthy" (SHUE 1997, 543).

> Principle 3: It is fair (and is in line with overall equilibrium within societies) that among the number of groups contributing to a common endeavour those who have the most resources relevant to the endeavour should normally contribute most to the endeavour. (Following SHUE 1997, 537)

Or, in terms of individuals, when a number of parties contribute to a common endeavour then those individuals with the most resources should contribute the most. Of course, attribution of different resources may vary between those individuals, some may have most time, others most money, and others still most physical power, but according to the principle of simple fairness those with most of anything should give most of the amount of it required for the endeavour to succeed. The strongest should pull hardest, those with most time should keep watch most and those with most money pay the highest bills. No resource commitment should impoverish anyone, or bring them below the minimum unless it does so for all.

In terms of unified constraints framework offered here it seems hardest to reconcile fair and unequal distribution of burdens with the equilibrium tendency of blind physical systems. Except that again in tendency towards a future equilibrium state, those substructures with most energy will give up most to the establishment of the overall equilibrium. Most of the equilibrium heat capacity of the combined bathtub and cup of water will come from the bathtub, whilst relatively most 'heat' will be given up by the hotter of the two, whichever it is. In physics, though this should not be a blind guide to social governance but merely a possible conceptual inspiration, quantification of heat is only meaningful in relative terms, as heat available in difference from equilibrium (when no heat can be exchanged any more). In terms of societies, those with more invest more till balance is re-established. The one with more of a resource for the endeavour at the start will invest more for its successful outcome.

Cynical attitudes to human self-interest aside, it is clear that the threat of collapse opens up a necessity of discussion about the extent and conceptualisation of sacrifice, whether populations find it appealing at face value or not. Also, looking for marketable alternatives will not help, as Meyer and Maniates (2010) have elaborated. Finally, we do have both empathic and sacrificial practices and values already included in our biology and culture, and comparative surveys of societal attitudes can bring them to light as contributions to the ongoing discussion. A democratic shift to acceptance of invocation of constraints within which to navigate collapse-avoidance is based on recognition of crisis conditions. These include a sustained global economic recession in part brought about by the fossil fuel limitations, obvious evidence of changing climate in the core countries, a popular sense that there is a global common interest in preventing a catastrophe, discursive weakening of the power of 'carbon interests', widespread commitment of vast sums of money, organizational, technological and political innovations (URRY 2011, 158-9). In at least some of those the semi-peripheral societies may lead the way in exemplifying the required transformations.

Given that we are living a "disastrous mismatch between today's human societies and the world of living natures on which human life depends" (GREER 2009, 3) we need to radically reinterpret our ideas of development. The dominant global capitalist economic growth depends on expanding to ever new markets. Current strong growth of countries such as China or India relies on incorporating new land and labour into the production process, while concurrently the West is experiencing a deep crisis of its growth model since no significant resources remain that can be introduced into market exchange. Europe is obsessively focusing on the threat of losing the status of the most competitive region in the world, but displays an inability to redefine the ideas of development towards a more humane and sustainable model. Combining perspectives from 'old' Europe and the newly expanded peripheral regions paves the way for renegotiating what the European way of life stands for and what steps are required to orient us to that goal. Considering that the role-model of development for most world countries is a vague European ideal, by redefining the idea of the good society Europe stands a fair chance of influencing a global developmental trajectory towards a sustainable global community. Theoretical expositions in **Part I** illustrate how academics from European semi-periphery present these limitations.

Some of the options for sustainability oriented economies and policies explored in the contributions below include measurement of development and productivity beyond the categories included in GDP (COOTE, FRANKLIN and SIMMS 2010), the introduction of universal basic income and a reduction of working time (ORSI 2009). Besides planetary geoengineering, sweeping biotech engineering of popular consent would infringe on ethical norms

now taken as a civilizational bedrock (PERSSON and SAVULESCU 2012). To gain through technological improvement rather than mere historical regression to less energy-intensive modes of production we have to change intellectual property rights to achieve better balance between individual and societal welfare (cf. PAGANO and ROSSI 2009). But, as other contributions show, these can only be initial steps in a wholesale transformation of the economy as required by respect for natural constraints, rather than a smokescreen to buy more time for those least affected by the impeding collapse.

Though itself a dead academic letter on paper, this volume aspires to instil in its readers a sense of empirically founded hope that there are historically rooted alternatives to fear in the face of present state of things actually ending (GRAEBER 2011, 383; ŽIŽEK 2008). Whilst the recent decades of attempted change and upheavals concurrent with the *Limits to Growth* (MEADOWS, MEADOWS and RANDERS 1972) announcement were characterised by suppression, the experiences of peripheral existence can shed new light on our cultural priorities and orientation of collective aspirations. And when we are all at the beginning of the turn of a major historical cycle, all our voices count in determining how it's going to turn out. Analyses and conceptual connections exhibited in this volume are one such voice in a global conversation of how we could live more by, to paraphrase Graeber ever so slightly, *destroying* less (GRAEBER 2011, 390). In transition oriented towards sustainability that is understood as a dynamic process of adaptation, learning and action, theoretical contributions to this volume aim to clarify the relations between economy, society and the natural environment. Empirical contributions look for evidence of potential for those clarifications among general populations; and within economic and educational policies.

Development and its impacts across Europe

Viewed from the global perspective, sustainable or unsustainable practices are a matter of humanity's choice. For too many people on Earth, though, the problem is not unsustainable choices but a lack of choice in the first place. Real choice is only possible when basic human rights and needs, human security and communities' resilience in the face of adversity have been assured. Whilst contributions in this volume illustrate how inequalities reduce the spread of choices throughout societies and between states, all European societies surveyed in our comparative texts are highly developed and competent to take responsibility for the sustainability-orientation of their policies and practices. This is easily affirmed in the case of the so-called 'core' European wealthy nations, but from a globally comparative perspective it is also applicable to the states on semi-periphery included in this volume. And whilst the global semi-periphery covers most of the world's

states, or sometimes excludes the post-communist countries through narrow definition based on trade (CHASE-DUNN, KAWANO and BREWER 2000), it is clear that the new EU-member states from the European east and south play a cultural, political, economic and environmental role positioned between Europe's less developed eastern and southern periphery and the highly developed European core.

There are differences in governance architecture, global outreach, populations' experiences and aspirations and historical development practices between core, semi- and peripheral European societies which this volume accentuates as a contribution to the global coordinated action. This is reflected in the population's attitudes reported in the surveys as well as the theoretical strategy formulations by authors embedded in the academia and strategy groups in the semi-peripheral societies. The comparative chapters (**Part II**) in this volume construct measures to examine differences in prevalence of sustainability-oriented attitudes between core and semi-peripheral states beyond the initial expectation that greater individual wealth opens up the conceptual space to ponder sustainability of civilisation. The contributions in this part show that inequalities and risk of deprivation are barriers to sustainability-acclamations expressed at the level of wealthier and more egalitarian European societies, but do not prevent concern for the environment and strife for structural social interventions that raise the populations' wellbeing without the environmentally detrimental impact of the economic growth imperative.

Of course, this does not mean that the European semi-periphery, however extensively delineated, can make substantial contributions to planet-wide material sustainability alone, without a profound global reorientation. The UN Secretary General's Panel clearly stated in the run up to the Rio+20 conference that achieving sustainability requires the transformation of the global economy (UN SG HP GS 2012), which is a task too momentous for the European semi-periphery to achieve. Moreover, economic structures in the semi-peripheral region we focus on are characterised as liberal dependent capitalism (KING 2007), which is by definition incapable of *initiating* the required transformation of the overall global economy. However, under the aforementioned constraining principles, present day societies have to find the way of abating the basic population-consumption drivers of environmental deterioration. In the most developed countries this involves abating the cultural addiction to continued economic growth, and evolving the satisfaction of needs of many through a steady state or decreasing economic activity (JACKSON 2009B). In the time-span set by pace of climate change and our historic miniscule and localised decoupling of economic growth from material, resource and energy consumption this is imperative in high-development states of the world.

What the semi-periphery can contribute is experience, resources and practices to a coordinated global effort, and testimonies of the populations enjoying high level of material development with a lower environmental impact. As the case study of Croatia has shown before (DOMAZET, DOLENEC and ANČIĆ 2012) and case-study analyses in this volume (**Part III**) extend to Bulgaria and Slovenia, there are specific and inherent obstacles to sustainability-orientation in this region too. These are structural faults built into the societies reconfiguring their aims and ontology, combining intense historical socialist industrialization and more recent changes in the role of citizens and the environment in the generation of economic activity. The case-study chapters use a variety of methods (quantitative survey data-sets, interviews, policy and educational content analyses) to present hands-on empirical insights into the sustainability-issues as lived on the European semi-periphery.

In the last few decades an awareness of the need for a strategic shift is growing in the scientific circles, but the intensity of the crisis, and the strong association between its environmental and social facets, raises questions about the type and level of broad public awareness needed for consensual action. In the semi-peripheral European societies the material development is among the highest in the world, but this fact is almost invisible to the national populations. The benefits of development and economic activity over the last few decades have been inequitably distributed, making inequality the primary popular concern standing in the way of sustainable development path of semi-peripheral European societies.

Current disparities in development are not only detrimental to the biophysical manifold of civilisation, but are important because societies need to develop relations of cooperation to lessen the sacrifices that individuals and populations as a whole will have to make to meet the material constraints, most notably avoiding irreversible catastrophic climate change. Coordinated global action, and coordinated national or European action as well, cannot emerge in sufficiently developed societies enjoying civilizational freedoms of modernity when material conditions of life and resulting life chances are so disparate as to separate citizens into different socio-material realities. As Wright argues, without a basic sense of shared humanity we cannot engage in a democratic debate on the features of a just and sustainable society (2011).

Most comparative texts in this volume use the data for 18 countries (Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Latvia, Lithuania, Norway, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom) participating in the ISSP module Environment, and fielded during 2009, 2010 and 2011. These countries represent both the old or 'core' nations of the European Union (including also Norway

and Switzerland that are not members of the EU but have close ties to the EU economically, culturally and materially), as well as the new member states from the European semi-periphery, which includes Central Eastern and Southeast European post-socialist countries (HOBSBAWM 1995). More nuanced historical analyses point out the varieties of socialist economies, as well as their social and environmental consequences, experienced by the populations of states such as contemporary Croatia and Slovenia, Czech and Slovak Republics, or Latvia and Lithuania. Some of these are illustrated in the empirical comparisons below and in the contributions in **Part II**.

Whilst the GDP[5] of the range of European countries surveyed in this volume has suffered setbacks through the global economic crisis, severe and prolonged in many of the countries on the semi-periphery, a longer-term perspective provided by the UN's Human Development Index (HDI) paints a somewhat different picture. The HDI is a composite measure of life expectancy, literacy, education and standards of living in countries worldwide. It is part of the spectrum of indices that provide a background of distinctions between development trends and benefits in the core and semi-peripheral European societies. Although the exact methodology of the index calculation has changed somewhat over the years, the dominant trend places European countries in the top group of very high development (HDI 2012 value of 0.75-1).

Figure 1 shows that countries with HDI value above 0.7 fall into the segment where increases in GNI bring comparatively smaller societal development benefits. From a global perspective, whilst the relationship between HDI and GNI *per capita* is positive and strong, growth of HDI weakens above the 0.7 HDI score, which the score that all European countries attain. The lesson to be drawn from this comparison is the fact that even our semi-peripheral European societies should not be postponing sustainable development policies for some more prosperous future, but should own up to their global development position in line with Shue's egalitarian constraints presented above.

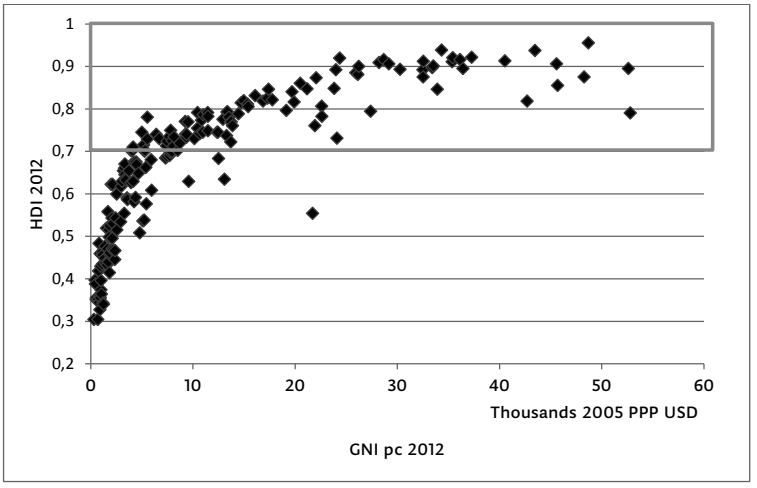
However, when we zoom in on the GNI-HDI relationship within core and semi-peripheral European societies, a finer differentiation between their wealth and development attainment appears (Figure 2). Now some of the decidedly semi-peripheral societies sit on the sloping part of the curve. Sustainability-orientation in that case must first address the question whether all European societies require equal attention. Some of the

05 Whilst GDP per capita is most readily used measure of state's economic performance, GNI is used in the figures below as the data readily available from UNDP and used in their calculation of individual state's HDI. GNI is by definition GDP adjusted for incomes contributed to domestic economy by foreign residents and earned in the domestic economy by non-residents.

contributions in **Part II** and **Part III** will address this question and compare it to the attitudes expressed by the respective populations, as well as structural obstacles to sustainability-oriented governance.

FIGURE 1

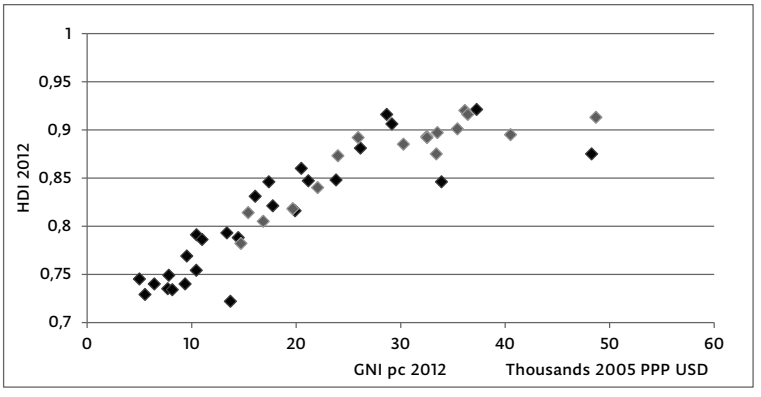
GNI per capita – HDI (2012 data); Lichtenstein and Qatar values off chart; closer presentation of European countries in the box in this figure is given in Figure 2



SOURCE: *https://data.undp.org/ (Accessed March 2014)*

FIGURE 2

GNI per capita – HDI (2012 data) spread for European countries; Lichtenstein values off chart; 18 countries participating in ISSP marked in grey colour



SOURCE: *https://data.undp.org/ (Accessed March 2014)*

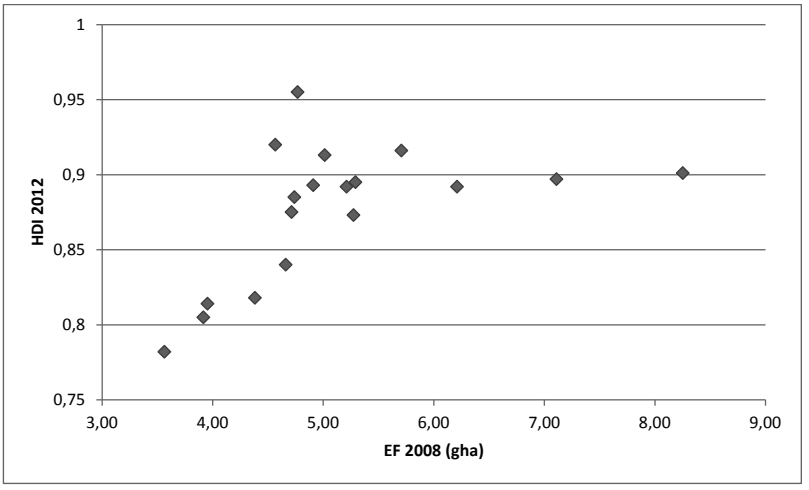
From the perspective of environmental constraints of the economic growth promise, we can compare the 'objective' environmental cost of the development attainment of European societies included in the ISSP survey. Ecological footprint (EF) is conceptualised as a measure of the land and water required to sustain the material standard of living of a given population, given the reliance on contemporaneously dominant technology (CHAMBERS, SIMMONS and WACKERNAGEL 2000). It is a measure of the human demand for extraction from Earth's ecosystems, that is of the human utilisation of the natural capital contrasted with the planet's ecological capacity to regenerate.

EF is expressed in figurative amount of biologically productive land and sea area (global average hectares, or gha) necessary to renewably supply the resources that the human population consumes, and to assimilate the resultant waste. Globally, the situation is not bright as the average global citizen (again hiding great disparities) has an eco-footprint of about 2.7gha, whilst the top sustainable limit is 1.8gha. In other words, the global population has (without including the threat of irreversible catastrophic climate change) overshot the global biocapacity by 50% and now lives unsustainably be depleting the previously accumulated stocks of natural capital (REES 2010). The EF of the EU (including 'old' and 'new' members in 2005) has risen by almost 70% since 1961, from a situation where it was matched by the available biocapacity of the European ecosphere to requiring more than twice as much as that biocapacity can provide today (WWF 2005). The greatest increase has been recorded in the decade around the turn of the century.

With only 7% of the world population, Europe now requires 20% of the planet biosphere's regenerative capacity. Whilst not all of the surveyed countries in the contributions below have a footprint that exceeds the biocapacity of their own territory (which is dependent on natural endowments), all of them have overshot the global average biocapacity and are extracting benefits for their populations to the detriment of the less developed countries and future generations (DOMAZET, DOLENEC and ANČIĆ 2012).

As Šimleša (2010) summarises, the key suggestion provided by EF is that lifestyle improvements (including wellbeing), human population size and/or technology, must end up in greater burden for the environment, or natural resources more specifically. We would thus expect an overall trend of greater EF to correspond to a greater HDI score for all European societies, as per capita values do not make a great difference between European countries based on population size other than those resulting from population density's impact on the environment. In other words, increases in individual wellbeing and technological underpinning across countries should show a linear increase in the selected European countries' HDI scores.

FIGURE 3
EF (2008 data) – HDI (2012 data) spread for 18 European countries



SOURCE: EF: *Global Footprint Network, 2012. National Footprint Accounts, 2011 Edition. Available online at http://www.footprintnetwork.org;* HDI: *https://data.undp.org/ (Accessed March 2014)*

As Figure 3 shows there is a clear trend amongst the selected European countries to increase the EF by 50% (whilst even the smallest is already 100% above the globally sustainable average level of 1.8 gha) with a 20% increase in the level of development (data source: GLOBAL FOOTPRINT NETWORK 2012). But more importantly, it shows two possible, but divergent trends facing the societies of the semi-periphery, if we assume that development attainment's correlation with environmental impact is path-dependent. This is not an unrealistic assumption given the current trends in the spread of the dominant social paradigm on the one hand, and almost negligent resource-development decoupling on the other (HOFFMAN 2011). One group of the selected European countries shows that there is a potential doubling or trebling of ecological footprint with a stagnation of the development benefits (HDI). Another group paves the way for a comparatively lower increase of footprint with more significant gains in development benefits.

But in avoiding overall collapse of civilisation under common global constraints through a strategic reduction of EF, of all the European countries the semi-peripheral states' populations stand in an exemplary trade-off of ecological cost and development attainment. Their footprints are on average 20% lower, with a 10% lower development score and a 50% lower GNI

per capita. From a longer historical perspective of CO_2 contributions, the semi-periphery drops down even further whilst some of the 'core' nations centred around the European average today rise to the top of global ranking (MATTHEWS et al. 2014).

When this material transformation is reflected in social and cultural processes the present day attitudes among populations and academic explanations of social, political and economic specificities present a starting point. Although most individuals in European populations are probably unaware of their national footprints, and more readily perceive the benefits of development and wealth, it is worth bearing this connection between development and footprints in mind when assessing attitudes with sustainability transformation potential of selected European populations. Whilst awareness of the national EF value does not have a direct effect on the populations' environmental attitudes, attitudes in countries with high and those with low EF do not carry the same gravity from a global transformation perspective (PRESCOTT-ALLEN 2001).

In this setting societies of the European semi-periphery are poorer and less developed with lower environmental impact (Figures 1, 2, 3). We might expect that this makes these societies less likely to act upon their potentials for a sustainability switch, regardless of objective potentials to benefit from good balance of globally comparatively high development and low environmental cost (DOMAZET, DOLENEC and ANČIĆ 2012). However, despite lower commitment to individual material sacrifice, many of our semi-peripheral societies populations' concerns on behalf of the environment and global empathy is higher than might be expected from simple relationship between wealth and liberty to care; as the contributions in **Part II** illustrate.

This is the importance of the semi-periphery's sustainability potential for the global dramatic cultural change required to avert collapse of civilisation (EHRLICH and EHRLICH 2013). Societies from European semi-periphery have a specific combination of material development, environmental impact and cultural heritage throughout modernisation. As the sociological analyses show (GIDDENS 1984; BAUDRILLARD 1998; CARRUTHERS and BABB 2000) our development patterns and environmentally destructive practices are not a case of individuals' malevolence, but a feedback loop between existing cultural trends and norms and individual adaptive reactions (ZABEL 2005). On the one hand these interact with what can be termed universal human biological predispositions for sociability and survival through competition for resources, and on the other with historical entrenchment of societal and technological structures, cultural norms and values (TRIVERS 1971; AXELROD 1984; WILSON 2012).

Whilst the human biological predispositions can be deemed universal across the European space, the societal and technological structures have

undergone a wave of recent rapid transitions in the semi-peripheral societies (EHRLICH and EHRLICH 2005; HOBSBAWM 1995). This volume presents theoretical and empirical rethinking of cultural and historical development patterns in semi-peripheral European societies. These are important because in a culture with a prevailing self-interest orientation, individual's concerns and attitudes reflect this orientation although they preserve patterns of philanthropy and altruism towards what they will deem their closer fellows (ZABEL 2005). The latter patterns are a foundation to build on within collective creativity processes under the common global constraints.

The exposition above justifies the choice of topics and research perspectives adopted across the range of contributions below. It situates the contributions below geographically, within the world-system framing suggested by the title, as well as within dimensions of human experience, scales of historical processes and across academic problem-solving domains. In the remainder of this chapter we provide an overview of the ISSP Environment module's fielding in 2010 and its survey instruments, and the particular content of individual chapters below.

International Social Survey Programme (ISSP) – a global survey of environmental attitudes

The ISSP is an on-going programme of cross-national research that covers a range of topics important within the social sciences. Its members are survey organizations from around the world, many of whom are affiliated with academic institutions, each representing one nation. The ISSP implements rigorous standards of survey research in order to address the difficulties inherent in multinational survey research. Since its modest beginning in 1984 ISSP has grown to include 48 members, each of whom are responsible for the ISSP surveys being implemented in their country each year.

The annual topics for ISSP surveys are developed over several years, led by an elected sub-committee and pre-tested in various member countries. The annual plenary meeting then discusses and finalize the questionnaire which is fielded in all countries. The ISSP research concentrates especially on developing questions that are: 1) meaningful and relevant to all countries, and 2) can be expressed in an equivalent manner in all relevant languages. The ISSP data archive prepares a combined dataset that is freely available. Many topics are repeated at regular intervals, allowing researchers to examine cross-national variations and changes over time.

ISSP marks several new departures in the area of cross-national research. First, the collaboration between organizations is not topic-specific nor intermittent, but routine and continual. Second, the on-going collaboration

of the same institutions makes cross-national research a basic part of the national research agenda of each participating country. Third, ISSP principles require that all member institutions be involved in various phases of planning and designing survey modules, and each member has a say in decision making. Fourth, by combining a cross-time methodology with a cross-national perspective, two powerful research designs are being used to study societal processes.

The data presented in six chapters of this volume (partially or exclusively) deal with the 2010 third fielding of the ISSP module *Environment*. The first module was run in 1993, when 22 countries took part, the second in 2000, when it was fielded by 25 countries, while in the 2010 module 36 countries took part.

This research module focuses on environmental attitudes, beliefs and behaviour. Previous studies from 1993 and 2000 have been widely used by researches in many countries.[6] They commonly use the data to examine how levels of environmental concern and behaviour vary between different groups and different countries, and to help understand different patterns of attitudes and how these relate to behaviour. Researchers very often relate country-level variables such as GDP and GDP growth to survey data, showing a great deal of diversity.

Attitudes and beliefs covers: environmental concern, the salience of the environmental issues, environmental knowledge, attitudes towards science, nature and environment, environmental efficacy, scepticism about the environmental threat, dangers of specific environmental problems, role of different nations in tackling environmental problems and environmental policy.

The question about environmental concern aims to explore the salience of environmental issues in more detail, allowing us to identify those who are the most and least environmentally concerned. Correlation of results with the behaviour items expectedly shows that the most environmentally concerned respondents are the most likely to behave in an environmentally friendly way. Attitudes about the salience of environmental issues explore which particular environmental problems respondents see to be of most concern both to the country as a whole, and to the respondent and his or her family. This refers to the well-known thesis of environmentalism which explains the global environmental concern, divided between rich (Northern) and poor (Southern) societies either as a manifestation of typical post-

06 The description of the module relies on Environment Drafting group report discussed at the ISSP annual meeting in Vienna in 2009. Drafting group consisted of five member countries: Canada, Chile, Germany, United Kingdom, South Korea and Spain.

material modern values in wealthy countries (INGLEHART 1995; DUNLAP and MERTIG 1997) or suggests that citizens' real experiences of environmental hazards in poor countries motivate them to protect the environment (INGLEHART 1995; BRECHIN 1999, 2003). Another way to explore the salience of environmental issues is assessing the importance of the environment to the respondent compared to other societal issues.

The environmental self-assessed knowledge question refers to causes of environmental problems and the solutions to these problems. Pilot results showed that those concerned about the environment report higher knowledge and that self-assessed knowledge increases with education. The part of the research aimed to explore attitudes to science and nature particularly how these relate to environmental concern (for instance whether we can expect science to solve environmental problems).

Attitudes about environmental efficacy (the extent to which people think their attitudes and behaviour are important and actually make a difference) are crucial to our understanding of how people live in practice. It is worth noting that although individual's impact is usually small, overall impact of people's behaviour is considerable. Evidence from the pilot showed a positive association between efficacy and environmental behaviour; people who said that they "do what is right for the environment even if it costs more or takes more time" were also more likely to report always/often engaging in green behaviour.

Another important possible predictor of people's behaviour is the scepticism about the environmental threat i.e. assessment of the extent to which they feel environmental threats have been exaggerated. Attitudes about dangers of specific environmental problems (air and water pollution, usage of GMO crops, usage of pesticides and chemicals in agriculture, global warming) showed the variation in recognising different areas as more or less dangerous for the environment. These questions have been used in analysis to explain environmental consciousness, and according Haanpää (2007) form a clear dimension that is distinct from environmental knowledge and behaviour.

The role of different nations in tackling environmental problems assesses the respondent's own perception of how well his or her country is doing. On the other hand the questions concerning the role of government in environmental policy refer to respondents' attitudes about the extent to which government should intervene to protect the environment, in respect to both individuals and businesses. Also respondents need to choose between the positive government policy approaches (such as tax incentives or education) and negative ones (such as fines or higher taxation). Pilot results showed a clear tendency for people to adopt more punitive policies when it comes to business than they do in relation to people and their

families (for example, policies such as more education or changes to the tax system are more popular than fines or stronger laws). In the context of climate change attitudes about energy sources as part of the environmental policy was found of particular importance.

Items concerning *behaviour* include: hypothetical behaviour, actual behaviour, membership of environmental groups and involvement in other environmental actions.

The hypothetical questions refer to willingness of respondents to make sacrifices for the sake of the environment. They explicitly highlighted the link between support for environmental protection and the associated costs involved in order to elicit more honest views. The actual behaviour covers important aspects of current policy debates: recycling, car use, use of pesticides and chemicals, fuel use and water consumption. It was important that the question wording makes clear that environmentally friendly behaviour is environmentally motivated (not for example religiously or by simply obeying the law).

Membership of environmental groups and involvement in other environmental actions are another environmentally relevant behaviour. Few people are members of an environmental group (under 10%), but a significant minority of people in many countries had been involved in one or more environmental activity. Increasingly common way of expressing environmental concern is boycotting or 'buycotting' (the term used to describe choosing to buy products from a particular source for environmental reasons).

There are several explanatory items used in the module: left-right orientation, materialism / postmaterialism, social trust and political trust. The left/right dimension remains important in helping explain different attitudes and beliefs about the environment (NEUMAYER2004; CURRY et al. 2007) as well as materialism/postmaterialist dimension despite a considerable debate about the extent to which post-materialism is linked to environmental attitudes (for example IGNATOW 2006; FRANZEN 2003). The key measure behind the social capital construct (PUTNAM 1995) social trust is expected to have considerable relevance to environmental attitudes and behaviour – if people are going to make sacrifices of various sorts for the environment, they are more likely to do so if they believe they can trust other people to act the same way. Social trust is also likely to relate to the perceived efficacy of environmental action and to participation in environmental action. In addition some authors suggest that political trust is an important factor in shaping people's views about the environment as well (KONISKY, MILYO and RICHARDSON 2007).

Almost all of the issues covered by the 2010 Environmental module can be found in the chapters presented in this volume, either theoretical or

empirical. Six chapters deal with ISSP national or comparative quantitative empirical data, and one presents the national qualitative study tackling the Croatian climate policy issues. All chapters are original contributions of scholars from different research institutions in Croatia, Switzerland and Bulgaria who are engaged in environmental research, some of them for decades.

Overview of the chapters

The volume *Sustainability Perspectives from the European Semi-Periphery* is divided in three parts.

Part I examines philosophical, sociological, and economic theoretical considerations of sustainability, giving a critique of traditional *growth* theories and contemporary environmental practices, of controversial bio-pharmaceutical moral enhancement solution and of the existing global (neoliberal) understanding of the market mechanisms which produce the crisis whilst offering those same markets as the way out of it at the same time. Different alternative approaches that re-examine the foundations of global economy are discussed, including the concept of *de-growth*.

In the opening article *"Limits to growth and the growth of limits. Are we ready for a sustainable society?"* **Ivan Cifrić** paints a broad canvass of the historical position of sustainability throughout the modern period, and identifies the contemporary practices seen as obstacles to a wholesale social switch to more sustainable socio-metabolic practices. In most general and global terms he also identifies the values and social norms assumed as the sociological and philosophical preconditions for such a switch. Presented in a creative way this chapter offers a needed critique of the traditional growth theories.

Tvrtko Jolić, in the chapter *"Climate change and human moral enhancement"*, provides a detailed and cogent philosophical argument against the shocking suggestion of 'geo'-engineering for technologically challenged societies of the semi-periphery, a bio-pharmaceutical enhancement of human moral faculties so as to socially engineer adherence to the politics of sacrifice for the sake of the avoidance of catastrophic global climate change. In absence of such drastic solutions what remains is the faith in a historic pattern of overcoming collective challenges and in potential for coordinated action and sacrifice engendered by education and understanding of the common constrictions.

In the chapter *"Global Environmental Crisis and Limits to Growth: A Marxian Perspective"*, **Mislav Žitko** provides a theoretical justification for the relevance of Marxian analysis of the contemporary globally dominant economic institutions for the considerations of environmental limits of eco-

nomic growth, and vice versa. Using the contemporary data from worldwide sources the article argues that moving beyond capitalist relations of production, whatever form they are cloaked in for the new century is a matter not of utopian theoretical projection, but of political urgency.

Dražen Šimleša, in the chapter entitled *"What kind of economy does a sustainable development need?"*, captures many aspects of sustainability and questions *the global state of the art* in progressive economic thought. He reviews the critiques of the existing global economic situation, the modes of management of economic crisis, and alternative approaches to the issues that each in its own right re-examine the very foundations of the global economy. Those alternatives aim to suggest how we might restructure the values and modes of organization of contemporary societies so as to mitigate the devastating consequences for environment and human wellbeing. He elucidates with concrete policies and examples from Croatia what would be required in order to build economies which are slower and lighter by design, rather than by disaster.

The chapters in **Part II** are based on ISSP 2010 quantitative survey data. They bring comparative empirical insights into European differences in the sustainability potential concerning environmental policies and practices, levels of social inequality, income of populations, personal willingness to activate and sacrifice for environment preservation as well as differences in sustainability potential of knowledge based societies / economies.

Mladen Domazet, Branko Ančić and **Marija Brajdić Vuković,** in the chapter *"Prosperity and environmental sacrifice in Europe: importance of income for sustainability-orientation"* analyse the comparative findings in 18 European countries. They construct indices to reveal the prevalence of the potential within different national societies to support policies and practices conducive to a sustainability switch. Going beyond general claims about prosperity and post-materialism, the authors offer a more nuanced view identifying the aspects of popular attitudes strongly correlated with the incomes of the said countries' populations. These are mainly related to individual personal concern, activation and willingness to commit to materially sacrificial practices. However, when asked about the broader developmental practices those populations' attitudes no longer depend on current income trends. With this, the authors pave the way for the remaining comparative chapters to investigate what other than current incomes might be driving the sustainability-potential differences across Europe.

In the chapter *"Why power is not a peripheral concern: Exploring the relationship between inequality and sustainability"* **Danijela Dolenec, Mladen Domazet** and **Branko Ančić** investigate the correlations between levels of inequality within the said European countries and personal concern, activation and sacrifice commitments within their populations. They expand the

models and instruments from the previous article with measures of social inequality and international indicators of material deprivation. Whilst acknowledging the strong influence of income in support for environmental conservation among general population, this chapter exposes the fallacy behind the expectation that only affluent European societies hold value orientations important for the switch to sustainability.

In the final comparative quantitative study, *"The sustainability potential of the knowledge society: Empirical study"*, **Marija Brajdić Vuković** explores further the factors behind differences in concern, awareness and economy-environment trade-off in a range of European countries. She focuses on two concepts that are widely used in political debates, 'knowledge society' and 'sustainable development'. The study is especially concerned with the belief implied by politicians that the development of the knowledge economy and, more broadly, of knowledge societies will result in sustainable development. It shows that that the sustainability potential of a given knowledge society varies with its contextualisation within the normative framework of neoliberal capitalism in different European countries.

In **Part III** five country case studies are presented highlighting some specific aspects of sustainbiliy obstacles and potentials in Bulgaria, Croatia and Slovenia. While in the Bulgarian study authors pay particular attention to relevance of social trust and other social factors for environmental attitudes and behaviour, several authors analyse the situation in Croatia concerning the structure, background and potential of environmentalist attitudes and values, industrial policy and climate change policies. The final chapter compares the sustainability education content and framing in Croatia and Slovenia.

Franziska Bieri and **Rumiana Stoilova** in the chapter *"Environmental Concern in Bulgaria: The Role of Social Trust"*, explore different social factors (particularly social trust) that shape European and Bulgarian individuals' environmental concern as the key components of sustainability-oriented attitudes. Based on the ISSP dataset the analysis sheds light on the determinants of environmental concern in semi-peripheral contexts, an area which has received only marginal attention. They find that in Bulgaria, income or post materialistic values do not significantly affect environmental concern, whilst educational attainment, gender and people's social trust appear as consistent and strong predictors for people's environmental concerns. These are particularly interesting findings in the light of the special position of Bulgaria within the comparative datasets presented in Part II.

In the chapter *"Structure and action potential of environmental attitudes and knowledge of environmental problems in Croatia"* **Krešimir Kufrin** analyses the history and findings of pro-environmentalist attitudes as preconditions for sustainability switch support throughout more than 20 years in

Croatia and compares them to the most recent data from the ISSP Environment survey of 2010. He finds that environmental protection falls behind pressing economic issues among majority of Croatian population leaving a lot of room for improvement of pro-environmental behaviour, despite high and widespread concern for global environmental limits. Yet there is also room for improvement, the author finds, in the level of awareness of environmental issues and their effects on individuals' everyday lives.

Igor Matutinović, in the chapter *"Industrial policy for sustainability"* takes the case-study of Croatia to illustrate in real-policy examples what interventions are required in the economic sphere today so as to better position a small semi-peripheral European country for long-term material sustainability without radically disturbing the current social order. From the perspective of ecological economics, clearly aware of the dangers posed for small peripheral societies by global climate change, he also argues for urgent and pointed interventions in sectors critical for sustainability such as food and energy production.

Contributing to empirical research on a relatively new topic **Jelena Pudak,** in the case-study *"Are we ready for a climate policy? – Status of climate change politics in Croatia"*, presents a qualitative analysis of climate change policies in Croatia from the perspectives of different actors: state, academic, CSO and business sectors, and finds them wanting from many standpoints. It concludes that Croatia does not have a comprehensive or efficient policy for the reduction of greenhouse gas emissions. Yet the problem identified seems to rest on a deeper structural fault, that of good governance and policy coordination and implementation in the countries like Croatia, and is not solely hampered by lack of individuals' will, vision or awareness of the importance of the issue.

In the closing chapter, *"Environmental sustainability and education: the case of Croatia and Slovenia"*, **Mladen Domazet** and **Branko Ančić** take a qualitative look at calls for change in educational content in line with the calls for social change in sustainability-oriented practices. The authors present an overview of studies of educational content related to environmental component of sustainability education in Croatia and Slovenia's compulsory education. They consider this component as a reflection on the development, prosperity and educational attainment of the two neighbouring countries' populations. The relevance of educational content in the context of this volume rests on the premise that education is an expression of a society's dominant choices; that a politics of nature and development is inscribed in the educational projects notionally geared towards sustainability.

Studying sustainability is a hopeful narrative for the future state of the human species in the face of the upcoming serious perturbation in

the Earth system. Whilst the connections between the subtleties of hope for elimination of subsistence inequalities between societies, progress in equality within the same societies, mitigation of ecosystem destruction and climate change are often hard to reductively model in language, the effects are often all too obvious. The global academic community does not have all the answers, but an informed public with basic knowledge of governing principles and political will to make a difference can start reducing the risks and contributing solutions to difficult questions that confront us all. The contributors to this volume dedicate their efforts to beginning to deal with these difficult questions.

The role of powerful actors in the global governance as the central instance that coordinates policies for 7 billion people is not in question, but this volume suggests that there is a need to strengthen democratic impulses for voice, collective action and self-governance in often overlooked populations on the semi-periphery. The states of the European semi-periphery are currently in a comparatively good position to change from the developmentalist project bent on excessive burden to environmental sustenance capacity and deepening of social inequalities to a sustainable development model that respects citizens' aspirations, ecosystems limits', common resources and future generations before it is too late for all. ●

I

THEORETICAL CONSIDERATIONS

1 Limits to growth and the growth of limits: Are we ready for a sustainable society?

Ivan Cifrić

> "The earth is full. In fact our human society and economy is now *so* large we have passed the limits of our planet's capacity [...] Our current model of economic growth is driving this system, the one we rely upon for our present and future prosperity, over the cliff. [...] We will change [...] completely transforming our economy, including our energy and transport industries, in just a few short decades." (GILDING 2011, 1-2).

Introduction

The motto above is the hope of critics of the contemporary industrial society. What remains to be seen how the transformation that they predict will unfold and what its result will be. The history of social thought has dealt with this issue from a range of perspectives, from the reformist to the radical. Considering that the reformist practice of industrial capitalism has been dominant so far, but did not help resolve the contemporary crisis, it could be an indication that a more radical approach is needed.

Starting from these considerations, the paper discusses *growth* as a contemporary socio-ecological problem and *development* as a "civilizational issue". The analysis starts with the thesis that socio-ecological crisis, defined as the crisis of the relationship between nature and society, exposes the existing *limits of growth* of the capitalist economy and western understanding of progress. However, despite the critiques of growth, the "limits of growth" are systematically widening (*growth of limits*), due to modern developments in science and technology, which remain firmly set on the path of liberal capitalism. As a result, the distance between the developed "center" and the poor "periphery" is also widening. The solution to this crisis is possible only if transformation occurs within the "centre", which parasatizes the resources of the "periphery". In other words, only with the

transformation of the "centre" can we expect more significant changes worldwide.

As an argument in favor of this thesis, the author examines the relationship between man and nature, the need for change of the relationship between economic and environmental systems, the crisis of modern society and its developmental dilemmas, as well as the possibility of a social *turning point*. There is an obvious paradox here: the "limits of growth" are being overcome by the new "growth of limits", in connection with the domination of developed countries, as capitalism is globally spread and sustained. Theoretically, the author expresses the need for a more permanent solution to socio-ecological crisis, by examining the social metabolism of liberal capitalist society, as well as the ideas of the *Green New Deal* and green economy, new international cooperation, and the role of the environmental movement. The crisis should serve as an incentive for a critical examination of the existing condition and direction of modern industrial society, as well as developmental perspectives of humankind. Environmental criticism can, therefore, be seen as the basis for social criticism, which can lead to the questioning of industrial capitalist model.

Humanity needs a new developmental paradigm, which will be based on a sustainable relationship between economy and nature (environment), as well as on a decrease in the alienation of the system on both global and national levels. Solutions based on the same way of thinking that led modern society and the entire world into this crisis are no longer suitable. We need almost a utopian paradigm which will limit the quantitative growth and the domination of economic and technical subsystems, establishing a new "unity of nature and society". It should be guided by a threefold principle: a liberated human in a librated society and a liberated nature.

Society and the environment – Need for ecological change

Ecological crisis warnings list key issues like population growth, food production, industrial production, exploitation of natural resources, and pollution, all of which contribute to the overall problem of increasing pollution and degradation of nature and the environment. All these processes have social causes. Nonetheless, fifty years ago some experts understood them not as being part of a longer process and complex problem, but chose to speak of them separately as "ecological crisis," "energy crisis," "natural resources crisis," "nuclear plant crisis" (ECKERT 1978, 8).

In the meantime, different ecological and social issues were shown to make up a complex of mutually related issues as an overall social-ecological problem. Ecological issues have become *global*, including climate change, biodiversity loss, etc. Social issues include international cooperation, global

security and personal safety, mass unemployment, uneven distribution of produced goods, debt bondage of individuals and countries, over-exploitation of natural resources etc.The most significant among these is the *population growth* and its demands for increasing welfare.

The environment does not become an issue of its own accord. The issue is created in the mind, in the social reception of reality as a theoretical (economic, political, ethical, esthetic, legal, etc.) *construct* on the basis of observed problems (BEMMANN 2012). It does not objectively exist in nature without human influence, nor subjectively without being socially constructed as a social problem.

Cultural evolution shows that the main goal of humans in the history of societies was survival, which required food and shelter, as it does today. The human being as a dual creature – *creative* and *destructive* (KATTMANN 1997) – has altered (destroyed and created) its environment to match its individual and collective *needs*. The *anthropological* determinant of humans is not only creating new cultural environments (which would fit their needs), but *destroying pre-existing* ones. In the process of creation and destruction, they accumulated historical *experience* by creating cultures and civilisations.[1] If this dual activity were to end, their development as humans would cease. Human beings cannot be separated from nature, regardless of the level of creation and the modes of mediation established: that is another anthropological determinant of humans. Humans have thus systematically *colonised* nature by colonising what had already been colonised (FISCHER-KOWALSKI et al. 1997). The question is: where are the limits of such linear colonisation, driven by the Western idea of progress? "External," i.e. spatial, colonisation of nature is almost completed; what follows is the "internal" colonisation of nature and its elements (humans and other creatures). Given the tendencies of contemporary science (e.g. genetic engineering), technical and biological colonisation of the human body will replace the colonisation of nature (the environment). This is an issue that brings up anthropological questions and causes ethical controversy.

The economy of premodern societies was formed within natural conditions, natural resources. The ecosystem came first, and the economic system came second. Industrial society is characterised by a "Copernican revolution" between the ecosystem and the economic system. The economic system has become the foundation of political, cultural, and moral systems.

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01 "Culture consists of the set of relations that the human beings of a given civilization maintain with the world; society consists more particularly of the relations that these same human beings maintain with one another." (LÉVI-STRAUSS 2013, 74)

Nature was placed within economy, and not the other way round, which resulted in turning nature into an economic construct. Three paradigms of conceptualising nature emerged: nature as "continuous" (organic), as "resource" (capitalised), and as "constructed" (the product of science and technology) (HECHT 1998, 248). The faulty logic of economic dominance over the environment was pointed out by the Chicago School in the "human ecological pyramid" (PARK 1952; HAMM 1982, 173), which conceptualised the economic system as limited by the ecological system. The caveat was embraced by contemporary *ecological economics* (HAMPICKE 1992; DALY 1994; COMMON and STAGL 2006).

One should distinguish between "ecological economics" and "environmental economics." Environmental economics is related to issues of economising environmental resources in the context of the existing liberal capitalist economy. It does not vary with different political systems, because its goal remains the exploitation of resources. "Industrialist economics" is another possible name for it, while some even call it "cowboy economics." Ecological economics foregrounds the ecological aspects of economy, i.e. a mode of economising that incorporates reducing exploitation of natural resources and use of agrochemicals, the reduction and further use of waste and energy in production, the application of new energy sources (solar, wind power) and technologies – in general, the economical use of materials in production and consumption of commodities.

In terms of the "ecumene," one can speak of the *biotic* and *cultural* ecumene. Acting in and upon nature, changes the human environment. Human encroachment upon nature and the environment has increased in the course of history. The space where culture (the cultural ecumene) and nature (the biotic ecumene) interact is called the *anthropobiotic ecumene* (CIFRIĆ 2007), and has expanded to cover a large portion of the Earth. Preservation of nature (the wilderness issue; species becoming extinct...) is but one aspect of protecting nature and the environment: it is the protection of humans themselves. It becomes necessary to protect the anthropobiotic ecumene in in its entirety, i.e. the cultivated space that continues to be polluted as well as endangered, and which is subject to increasing *entropy* (ALTVATER 1992, 42-43). Preserving nature and the environment has become an issue of development, and not of protection.

Crisis of modern society (economy) – Need for social change

In order for the state of things to change, an event must occur in its reality, which therby undergoes ta certain cathartic transformation where existing structures and relations are altered or eliminated, and new ones are formed – as expected or unexpected they may be. That process can be

described as a minor or major *crisis*. Every step of development in human history is the consequence of a crisis of the then existing order, a resolution between old and new relations (states). This means that crisis is not just a negative state (process) ending in a minor or major disaster, but also a *positive* state which produces a new potential choice, something new and progressive. It will be deemed progressive if existing social expectations see novelty as desirable.

There are different kinds of social crises, such as financial crises, market crises, crises of values and morals, political crises... but also ecological – social-ecological crises, which result from ill-suited human activity in nature (the environment). The crisis is not one of nature, but of culture, and its consequences are observable in nature as well as in society. New epochs are brought about by transformations of social order relations, such as "the great transformation" used by Karl Polanyi to explain the emergence of the first industrial revolution or of industrial society (POLANYI 1999), or by some authors to explain the emergence of "the era of ecology" (RADKAU 2011).

Different authors speak of different roots (causes) of crises in modern society. There is mention of Biblical causes of the ecological crisis (WHITE 1967), or of a threefold crisis of *values*, of world *cooperation*, and of *responsibility* (TAYLOR 1970, 352-354). Another prominent thesis is that of human self-understanding (as "exceptional" in their qualities but "excluded" from nature and the rest of the world) and the understanding of nature (as the object of human needs and greed), both of which are seen as separating human beings from nature (FABER and MANSTETTEN 1992).

Gilding (2011) optimistically describes three stages of crisis response. The first is a *call* for action; the second is the *clash* between the ecosystem and the economic system; and the third is the *great expectation*. Gilding warns that the Earth is "full" and that the world population and world economy have exceeded limits of provision, meaning that the current model of economic growth is pushing the ecosystem towards a disaster (GILDING 2011, 2). Today's world finds itself between the second and third stage, although opinions remain different and the "great expectation" undefined. Some expect to see a general improvement which is supposed to occur on its own; others expect to see the concept of sustainable development put into action; finally, there are expectations of a radical transformation of the capitalist system, which we agree with. In the long run, we do not share Gilding's (as well as some others') optimism that the way out is for humankind to take a new leap, prompted by the social-ecological crisis (entropy). That would lead to the next level, i.e. a deeper crisis. On the contrary, what is needed is a *radical transformation* of the contemporary industrial capitalist society, which would entail a transformation of

economy's relation to nature.[2] If the historically obsolete paradigm of contemporary capitalism was not evidently dangerous before, the danger is clear and present now.

It would appear that the key to the current crisis of modern society – a sliding crisis – lies in its *state of transition* into a different kind of society – a postmodern society[3], and in the fear of curbing growth and of possible economic entropy or social disaster. The goal of today's industrial society is not to "fill" it up with more economy to reach a "full world state" (DALY 1994). The issue is how to keep it *in balance*.

The system and global regimes. In terms of temporality, the basis of modern society is linear development, whereas premodern (agrarian) societies organise their time in line with nature (cyclically) and are not familiar with the category of development in the sense that we know it. Nevertheless, they also experience cyclical (social) crises. So far, liberal capitalism has manifested an extraordinary power of progress and is the main force behind today's level of civilisation. Its progress depends on its systematic expansion into, and colonisation of, the premodern world (cultures). The economy and logic of liberal capitalism has probably already "filled" (expanded into) this "empty world" to a great extent, which means that the conditions of its progress have expanded to include the whole world and to spread the logic of capitalist ideology of unlimited growth and profit increase. One historical cycle of its progress is therefore in crisis and probably facing its end, which poses the question of what the next cycle is going to be (under the assumed condition that global nuclear or environmental disaster is avoided). However, the system is strongly resisting more radical changes and supporting only those that meet the needs of the global system established by the highest developed countries.

On the global and national level, it is possible to track and analyse the influence on the crisis of modern (industrial) society which reflects on premodern (preindustrial) societies, i.e. societies in transformation. Namely, the modern system is characterised by the following:

(a) formation of different regimes and institutions (e.g. economic, financial) – economic protectionism and financial imperialism have become effective regimes of domination by developed countries. Financial im-

02 According to Supek, "there can be no possible solution for the contemporary 'ecological crisis' unless there is radical reform of human society, because the 'ecological crisis' itself is merely a reflection of the deeper social crisis of humankind, its mode of production, its relation toward its own life conditions" (SUPEK 1989, 36).

03 Relevant literature uses different terms to describe what we most commonly refer to as "modern society" (PONGS 1999).

perialism is the reflection of the crisis of contemporary capitalism and main threat to the prospects of undeveloped countries;

(b) networking regimes into an integrated global system that resembles an octopus; and

(c) estranging the system from society to an extent where it becomes an *alienated system*.[4] The paradox of humankind is that this creates the feeling of increased liberty, and not of slavery. Although the USA is a key to its emergence and existence, the global alienated system did not originate from a single national centre, but from several developed countries simultaneously. It was constituted as a global octopus.

The main purpose of this alienated system is its internal rationality, used to maintain itself and the modern industrial capitalism, instead of a functional rationality oriented towards society and humankind. It promises citizens prosperity and security, and in return, citizens are *willing to give up* part of their freedom. Thus the "security" catchphrase becomes a formula towards total control of citizens and increasing alienation of human beings from their community. It acquires magical powers.[5] Another modern *paradox of humankind* is the feeling of increased liberty, instead of slavery. J. W. Goethe was right in saying that no one is more of a slave than he who thinks himself free without being so. The system ought to be serving society and increasing human welfare (including being humane and ethical)

04 There is a distinction between the terms "system" and "alienated system." Every alienated system is a system *per se*, but not every system is alienated. An alienated system is a system estranged, characterised by separation and alienation from individuals and an imposed way of living. It is its own purpose and rationale. It is a *network of regimes*, characterised by *institutional* relations – regime interaction, formalised and *legislated* organisations, based on *interest* and *power*. Society comprises a network of interactions of individuals for the purpose of regulating life. It is founded on a consensus of *values* and *norms*, on *tradition* and personal communication.

05 A (new) paradox is noticeable in developed democracies in this respect. On the one hand, humans are becoming more and more tame, adaptable to the conditions of the alienated system (is this the historical route of ultimate domestication of humans into a state of "obedience" in a "stable" society?). On the other hand, humans as citizens protest through non-governmental organisations to seek their rights as humans and citizens. The question is: why do humans easily give up their autonomy and freedom? A likely answer is the fear of losing what they have achieved (assets), or the loss of faith in the possibility of playing an active role in the creation of a fundamentally different community, i.e. society. In addition to the social and ecological crisis, this is probably also a time of *existential crisis* as a crisis of human spirituality and identity.

instead of serving itself. This kind of rationality, upheld by today's level of liberal capitalism, has a negative impact on the environment and society on a global scale. The influence it exerts – imposing its rules on less developed countries – expands this impact to national levels and the colonised world, exhausting useful natural and social capital. Some authors believe that this course of events paves the way towards a potential new *totalitarianism* (HARDT and NEGRI 2000; HAMM and SMANDYCH 2005) and global management – "managerism" – in the area of economy and the environment.

The alienated system has created a setting that is ripe for a *crisis of democracy*, since democracy has obviously proven insufficient in resolving economic and environmental, but also social problems, and is at the same time susceptible to being dominated by the alienated system. Global and national centres of power make decisions in the name of an already small "30-percent democracy" that legitimises elected governments.

A long-term consequence of the financial and economic crisis is *debt bondage* (vulture funds)[6] and *debt bondage of society in nature* (ecological footprint). The solution to the latter lies in limiting the exploitation of nature; the solution to the first issue is not to refinance debt, but write it off. Refinancing leads to further debt and higher debt bondage levels for entire groups of countries which in turn leads to global conflict or extending existing local war conflict.

Growth – limits to growth and the growth of limits

The "limits to growth" thesis originated in the late 1960s (on the development level at the time), when the potential for new growth limits emerged with the application of better technology – Factor 4 (WEIZSÄCKER and LOVINS 1997) or even Factor 10 (WEIZSÄCKER 1999, 41). Factor 4, for instance, means that it is possible to simultaneously double welfare and use half the amount of natural resources, because technology can increase its efficiency. Limits to growth were therefore shifted, which can be described as "the growth of limits," including some contemporary optimistic claims as well. Since natural resources are limited, it remains to be seen how far limits can shift. Humanity needs optimism as an outlook, but it also needs facts as arguments. Unfortunately, facts seem to corroborate criticism of the current situation and direction of development more than they can optimistically support them. Despite the growth of limits (scientific-technical possibilities), a new model of the economy-nature relation will require growth to be limited. So far, *sustainable growth* has mostly been adopted

06 *Vulture funds*; *hedge funds* buy off debt in order to create more debt. Paul Singer founded the first such fund.

in principle (UNCED 1992),[7] the concept of which proclaims three mutually harmonised goals: protection of the ecosphere; stable economic growth; and equitable distribution of life chances. It presupposes different practical technology measures in environmental protection, including reduced use of natural resources and limited consumption in general. Overall, a change is needed in the modern way of life, but also of society itself and the basis of its economy.

One cannot consider "limits to growth" and "the growth of limits" without considering *development*, which is, in a broader sense, connected with nature and the *cultural evolution* as a historical process, as well as with *linear* time, as paradigms of the historical construction of development. The issue we are addressing is essentially how society relates to the environment, and since development has depended on growth, how culture relates to nature.

These phrases – "limits to growth" and "the growth of limits" – are a theoretical as much as a practical problem. They refer to the totality of society's flow and changes, with two major indicators: the *consumption of natural resources* (ecological footprint) and excessive *pollution of the environment* (ecological rucksack). They indicate the need for *limits to growth* and *overshoot*. The practical aspect refers to limiting the depletion of finite natural resources, while the theoretical aspect refers to the social paradigm as the constructed frame within which to think of development.

The advance of science and technology has boosted the growth of industrial society economy, while at the same time stimulating quantitative economic growth, including a definite growth in social welfare. This is how the liberal capitalist economic order and modern society have to this day developed as a form of "paneconomic idealism" (PANIKKAR 1995, 133).

(a) The phrase *limits to growth* refers to the projections of (resource and commodities) consumption limits onto some key resource sectors in the short or long term. The idea of limiting growth (MEADOWS et al. 1973) was influenced by new findings on factors that had supported growth and led to crises, such as: science and technology; rise of consumption aspirations in the population (society); lifestyle; the military sector; egotism of national economies; general belief in continuous quantitative growth and progress, all of which have contributed to the emergence of social crises, including the one we are facing today. Crisis, primarily that of the environment, has indicated the need for limiting growth. The problem with cogency of limits to growth is that they can-

07 UNCED – The United Nations Conference on Environment and Development, also known as the Rio Summit, Rio Conference, and Earth Summit held in Rio de Janeiro from 3 to 14 June 1992.

> not be precisely predicted. Supek insisted that limits to growth must be acknowledged willy-nilly. "The only thing left to see is whether the current exploitation of unrenewable resources (...) will be exhausted in fifty, a hundred, or two hundred years. A mere speck in all of Earth's history. In terms of contemporary economy, however, economising these resources would primarily mean discontinuing 'mass consumption of mass production,' i.e. any luxury, and serving humans according to their actual needs" (SUPEK 1989, 8).

Limits to growth are an indicator of how society (the alienated system) relates to nature (the environment). In the course of history, every society "defined" its limits according to the relation that was perceived between the needs of society (the collective) and the opportunities that nature offered on an inhabited territory. Some did not adhere to this principle, and failed (DIAMOND 2005B). Today, limits to growth point out the devastating long-term impact of exploiting natural resources at the current level as a "*natural necessity.*" Limits to growth of contemporary industrial society do not refer to small-scale, isolated communities (societies) but to "world society" i.e. all of humanity. Curbing growth limits does not mean ending evolution (of technological progress and the internal differentiation of societies), but bringing the current volume of current humanity to a halt at a certain cut-off point, which cannot be achieved overnight" (SUPEK 1989, 280). This is why the top question today is which areas must be further developed, and which curbed (SEIDL and ZAHRNT 2010).

(b) In parallel with the discourse on limits to growth, the *growth of limits* continued, i.e. the increase of scientific findings and technological applications, meaning the capacity increase of the economic system potential. The phrase "growth of limits" signifies the internal relation of a society (system) to itself, i.e. to what extent it might be able to transform internally – increase the possibilities of intervening in the ecosystem by developing human potential, as well as use the current (limited) natural resources more effectively and efficiently.

Being a product of human creativity, scientific findings and the application of new technologies are virtually unstoppable. They open up new opportunities of social welfare in every way. Limits of growth (of science and technology, and consequently economy) are constantly expanding in the practice of industrial capitalist societies, which prolongs the lifecycle of liberal capitalism. The alienated system and growth have thus been operating in a symbiotic relation.

However, the complex of science and technology as a whole, the consequence of which is a way of thinking where *technical rationality* and

its dominance in society hold central place, forms a *technosystem* (apart from the ecosystem and sociosystem). This technosystem, not just in the sense of application of technique – from production to everyday life, has its problematic aspects. It is the capacity of corporations to *control* biodiversity (e.g. monoculture) as an aspect of cultural diversity, i.e. the capacity to control human life (movement in space; personal data banks, etc.). Technique thus increasingly acts as a means of human alienation, i.e. as a separate alienated self-standing holistic system. The influence of the technosystem in society is not a practical issue (for instance, ethical) within the role of technology, but a theoretical issue (MITTELSTRASS 1991, 106). It requires a systematic consideration of the influence of new technologies on human life.

Growth, especially economic growth, affects the state of the contemporary world. Poverty, hunger, and illness are on the rise in the undeveloped world, whereas on the other hand the developed world is increasing its wealth. Two worlds are clearly discernible here: the minority developed world and the majority undeveloped world, with an 80:20 ratio in favour of the rich (developed countries). The solution clearly lies in reversing this 2:1 ratio which favours the developed (RADERMACHER 2002). At the same time, (developed and undeveloped) societies are experiencing an increasing gap between the stratum of the rich few and the poor many.

If we look at today's world in terms of "centre" and "periphery," the noticeable pattern is that of continuous growth of the "centre," and the "peripheries' " efforts to follow suit. Prosperity of the "centre" ought to be followed by prosperity of the "periphery," however that is not happening. Peripheries are lagging behind. History is strewn with "centres" (of economy, power, culture) and their peripheries. The basic question is: will the world remain divided in this way? Although this is an altogether separate issue, we can say that one should not have illusions about the existence of an equal world where these differences would be completely eliminated, but that one should believe in the possibility of a world that is more equitable, and a different world order with more solidarity towards poor societies and nature. [8]This cannot happen without transforming – in fact, abolishing – today's global world order, which is responsible for producing and distributing social and natural entropy. We are therefore facing a "natural limit" to growth (limited resources), but also the growth of limits as a *global social issue*, i.e. the social limits of growth. This force society to face its own value system as well.

08 A study carried out in 2010 has shown world peace, religious peace, and consensus on values to be significant preconditions of a new world order (CIFRIĆ 2011, 186).

The social-ecological system

Throughout history, every form of society had its own social-ecological metabolism (German: *Stoffwechsel*), depending on how it understood and enacted its relation towards nature (FISCHER-KOWALSKI 2000). The qualities of these societies provide a historical overview of the level of "unity between nature and society." Agrarian societies had a social-ecological metabolism similar to that of nature (ecological metabolism), where both the inputs and the outputs were organic. There was no production of waste that nature could not recognise and decompose. Industrial society created its own social-ecological metabolism: it uses organic and inorganic materials as input and disposes of the unused (unprocessed) inorganic materials in nature, polluting ecosystems and damaging the overal natural ecosystem in the long run. Industrial capitalist society has created a "metabolic rift" between nature and society (FOSTER 2000B).

We believe that this model of increasingly polluting economy is unsustainable, and that the key issue is that of the relation between economy and nature, between environment and society (inspite of the level of development of science and technology). That is, the lack of a developed and applicable model of a social-ecological metabolism that would in effect be similar to that of agrarian societies, i.e. the *social-ecological system* as a complex consisting of a biophysical unit and its associated social agents and institutions (GLASER et al. 2012; BECKER 2012).

As Jared Diamond has said (2011), societies have collapsed in the past (Easter Island) for refusing to recognise a problem and take it seriously, thus failing to anticipate it and take adequate action. This could be a lesson that today's societies could learn from premodern (undeveloped) ones, especially if they have vast communication options at their disposal. Far from regressing to a lower level of social metabolism, this would entail the creation of a new kind of relation between economy and the environment (nature).

Modern developed societies of today, as well as civilisation on the whole, cannot go back to a previous state, but their future is uncertain at this rate of change (development). Apart from the pace of social changes (REHEIS 2006), the condition of modern society and civilisation in general are also influenced by climate changes (e.g. FLANNERY 2007; URRY 2011). Lévi-Strauss describes a "third way."[9] Contemporary society ought

09 "The ideal would likely be a third path, one that would lead to making ever more order in culture without having to pay for it through an increase in entropy in society." He finds instructive Saint-Simon's thesis that a move is in order "from the governance of men to the administration of things" (LÉVI-STRAUSS 2013, 75). That requires will power, because the system is set up to govern things, and through them, govern people as well.

to learn from earlier civilisations in order to find its own solutions. "If Western civilisation does not seem to find in its foundations that with which it might renew itself and rise again, perhaps it might learn something about humans in general, and about itself in particular, from these demeaned and long despised societies, which up until recently avoided its influence?" (LÉVI-STRAUSS 2013, 13) It will likely be forced to radically change its linear mode of progress, perhaps even replace it with the cyclical (in the sense of internal restructuring), and establish a new balance between society and nature for which the social-ecological metabolism is a key precondition. It regulates a dual social exchange: (a) the exchange of materials between society and nature, and (b) the exchange (distribution) of resources among people. The importance of distribution here surpasses production.

Social turning point

We speak of a *turning point* in terms of the theoretical and methodical construction of key points in environmental history (UEKOETTER 2010; RADKAU 2011), that is to say its historical *reconstruction*, and at the same time the *construction* of an incipient turning point. At this point in history, we might describe it as a simultaneous social and ecological turning point, a "social natural relation" as a new unity between nature and society. It is not a short-term change marked by a single key point, but several points that come together to create a complex "turning point," that is, a long-term activity process of the social-ecological metabolism. If global agents of modern society (that is, Western civilisation) decide to introduce the practice of sustainability and the concept of sustainable development (systematically correcting it on the basis of historical experience), that would be a good sign that a social-ecological turning point is taking place (even if it is merely a change in consciousness to begin with) and that a new era of human cultural evolution has begun – an "era of ecology" (RADKAU 2011), "century of the environment" (WEIZSÄCKER 1999, 21) or of "ecological enlightenment" (KÖSTERS 1993), etc.

The need for a turning point could be supported with the following arguments:

(a) The problematic expansion of the *ecological footprint* (WACKERNAGEL and REES 1996). By this we mean the increasing "flows of energy and matter to and from the economy, converted into the corresponding land required to support these flows" (SIMONIS 1998, 6). Society, especially the highest developed societies, consume more and more natural resources and produced goods, which humanity will increasingly find in short supply.

(b) The *boiling-frog-syndrome* tendency of the *social-ecological crisis*, in which the ecological crisis can lead to social disaster, i.e. radical social change (CLAUSEN 1991), unless society takes systematic action to reach timely long-term solutions. By now, the crisis has gained momentum, especially when it comes to global climate changes where acknowledgment of difference and of the level of social-ecological systems is called for. Adaptation has its archetypal barriers as well (EISENACK 2012). The "cries" voiced today by certain scientists and world politicians might be efficient "social quick fixes," but are unlikely long-term indicators of radical change in the direction and formation of a new society.

(c) *Debt bondage in nature* (CIFRIĆ 2012, 75), which refers to human borrowing and excessive consumption of natural resources, beyond natural limits. At this moment, a year of human consumption tends to expend a year and several months' worth of natural production, thus using both current and future natural resources. This means that we live on natural credit. Borrowing more and more from nature, humankind increases its debt bondage. The illusion of progress that humans will master nature turns into bondage in nature and the illusion of liberation from bondage. The former "glory" of human "exceptionality" and "exclusion" as masters in nature has faded in reality, although not in human consciousness.

(d) The generally *disrupted relation between nature and society*, caused by the emergence of industrial society. Industrial society is merely a stage in the history of humanity, not its eternity. This indicates that we are living in a new "social natural state" (GÖRG 1999), that is, in the "Anthropocene" era for the past 200 years (CRUTZEN 2002), which Bill Ruddiman considers to have begun 8000 years ago, i.e. with the Neolithic, not the industrial period. Ruddiman seems to relativise the influence of industrialism by extending the Anthropocene era to include the totality of human activity in the course of cultural history. Humans did alter their environment – more than they altered themselves, indeed – but never to the extent seen in the past two centuries. Industrialisation has caused a "metabolic rift" (PARSONS 1977; FOSTER 2000B) and made it transparent: it is now an observable contemporary indicator that a turning point is necessary.

If the need for an *ecological turn*[10] is an object of public discourse and international efforts today, the need for a *social turn* (such as social deceleration,

10 "Ecological turn" (German: *ökologische Wende*) comprises three key themes in public discourse: *stepping out* of nuclear energy; *transferring* to clean energies of carbon and gas; *entering* renewable energies (SIMONIS 2012).

slowing down the pace of contemporary civilisation; REHEIS 2006), which is seldom mentioned, should be addressed as well. Contemporary civilisation systematically produces more order, but also more *entropy* than "primitive," egalitarian, stationary societies. We can therefore describe liberal capitalism as an *entropy society*, in which the system leads society into a greater state of entropy.

Another current issue, apart from the *ecological turning point*, is the question of a *social turning point*. The fact that it is discussed in scientific and expert discourse is an argument towards voluntary radical transformations of the current state of the *anthropobiotic ecumene* (CIFRIĆ 2007) and the paradigms of capitalist progress. They have been the subject of books and discussions. Crises, homogenisation of cultures, international cooperation, debt bondage etc. – all of these are general social turning point issues.

Development dilemma of modern society: Is it possible to do away with growth?

There is much criticism of the current state and development tendencies of modern society, especially economic liberalism and its impact on society and the environment, within the broad framework of civilisation as critical of the belief in infinite *progress* (for instance, FROMM 1984), which unites two ideas: progress of society and "progress of science and technique" (EIGENFELD 2002). According to Adorno (1977, 635) progress both "is and is not" – it simultaneously exists and does not exist. Some contemporary authors describe different kinds of progress: Christian progress; the increase of rule over nature; economic progress; autonomy and liberty of the individual; a greater degree of democracy (FETSCHER 1989): it would therefore be more logical to speak of "different forms of progress" (WEHRSPAUN and WEHRSPAUN 2002).

Earlier caveats of limitations (quantitative limits and pace) that humanity is faced with, specifically today's state of crises in modern (industrial) societies and societies that dwell on their peripheries, indicate two things: (a) that warnings of certain growth limits on the global scale were not taken seriously, and (b) that the few highest developed countries have created a "civilisation development centre," which furthers the existing development tendency to polarise the world into developed and undeveloped countries. Instead of helping to alleviate the hardship of undeveloped peripheries, which would in turn benefit the centre as well, the gap is widened, and limitations and "walls" put up: instead of being torn down (like the Berlin Wall), they are fortified (CIFRIĆ 2009).

They continue to drift further apart instead, along with the rising debt of the undeveloped; it becomes difficult to find a development measure of

growth and equity between the developed and undeveloped world by the end of the century (RADERMACHER 2002, 37). Radermacher uses the term "eco-social market economy," which will avoid a "cannibalising growth."

Without a doubt, society cannot "come to a halt" (save for total catastrophe, such as environmental disaster or nuclear war, after which some form of growth and development would most likely ensue again) and will keep developing. The question is, how far and in what way will it grow? Contemporary economic (monopolies and pressures), financial (debt bondage), social (unemployment, poverty), political (lack of adequate international communication) and ever-increasing criticism (theoretical and conceptual – sustainable development) has opened up a contemporary development dilemma of modern society, as well as of perspectives of liberal capitalist ideology. Undeveloped (primitive, agrarian, premodern) societies did not encounter development dilemmas because they had no concept of "development" as such.[11]

For the first time in human history, there is awareness of a development dilemma concerning industrial society. It is a very simple one: can today's modern (industrial) society give up growth increase, i.e. limit growth, or must the growth continue? If growth is limited, society will in the long run have to face *economic collapse;* if, on the other hand, the current growth tendency is retained, society will face possible *ecological collapse* (JACKSON 2009A, 167). Although it might pull through an economic collapse, it would be extremely difficult to recover from an ecological collapse. Moreover, they are not separate issues, but long-term connected phenomena of society and the environment: the threat is that of a sliding social-ecological collapse.

The contemporary development dilemma does not resolve the *issue of stability*, i.e. the question of the basic cause and driver of instability (of profit) and social crises of contemporary society, that is, world society which is becoming increasingly less stable and requires more and more intervention. It is the development dilemma of industrial capitalist society indeed, but it is false in that it presupposes a basic confrontation between humans and nature, between the natural and the social system, retaining the positions of industrial capitalism which caused the "metabolic rift" (MARX 1949). The premise that society and nature are pitted against one another is justified with possible reforms of the relation, including sustainable development. On the one hand, critics who see this view as a political or

11 The term *development*, *developed areas* and the like emerge after U.S. President Harry Truman gave his speech on 20 January 1949. It has since spread into theoretical discourse and virtually every other area of life.

ideological concept are right. On the practical side, they are wrong because it does represent a step forward. The dilemma can be resolved by continuing to consume resources until they are completely depleted, or by changing the very model of society.

Finally, the question remains whether sustainable society is a stable society, and whether sustainable development is stable development? Today, a stable society can only be a *world* society, society on all levels of development, humanity in its totality. Despite claims of world stability, there can be no global stability without stability of humankind: instead of a small closed community, humanity as a large community comprised of smaller sustainable communities. Within such a community, science cannot remain "metabolic" either, in the sense of "hard" sciences (e.g. natural sciences) and those that are usually belittled in our region, and which explain the connection between humans (society) and nature – human and social sciences.

Searching – Social turning points

When denoting a change, i.e. a turning point, which consists of several minor changes but is essentially a more complex and different entity on the whole, some authors use the term *transformation*, thereby including social and economic changes that mark a major epoch as a new era. Polanyi (1999), for instance, describes "the great transformation" and the emergence of industrial society. Historians, on the other hand, categorise periods of global history or of national histories.

There are common categorisations of human history in terms of successive social epochs, whether the criterion is *social relations* (tribal societies; slaveholding; feudal; capitalist (MARX 1952), or the historical (temporal) level of *development* (savagery; barbarism; civilisation (MORGAN 1981).

There are similar categorisations of environmental history in the context of cultural evolution and its historical periods – from hunters and gatherers to the post-industrial era (WORSTER 1994; DELORT and WALTER 2002; SIMMONS 2010; HUGHES 2011), etc.

The dilemma between continuing and limiting growth has so far been dealt with directly through technology (with no practical dilemma to speak of, in fact). Since the development of technology served the economy (of growth), no long-term solution was found: instead, the problem is even more severe today. To carry on with this practice would mean (a) facing disaster in the long run, or (b) enabling the technosystem more independence in setting foundations towards a totalitarian society (alienated system), alienated from humankind.

The advance of science, technique and technology makes it possible to put into practice virtually any human idea (MACK 1991).[12] Successes of technology can be argumented with the following: (a) the objective fact of fast development of scientific research and its application in economy and other sectors of life, and (b) the mode of human thinking. Practical domination of the technosystem indicates that science and technique *set their own limits*, through which progress is made, its own limits growing with the advance of science and technique. Human thinking today takes place within the technical paradigm, in the mode of *technical rationality*. Education serves as preparation for it. Human ideas move within those lines. Ethicists are therefore calling for an ethical assessment of the impact on human individuals, on society, and on the environment (nature). Technical measures are not necessarily ethical at the same time. Ethical measures stem from ethics, and ethics is always an ethics of the citizen (German: *Bürgerethik*), "the accomplishment and virtue of all citizens" (MITTELSTRASS 1991, 104).

This justifies the question: is humankind in a situation of an incipient turning point today? As opposed to a possible theoretical *reconstruction* of environmental history – ecological turning points[13] (UEKOETTER 2010; RADKAU 2011), we find ourselves in a situation of a potential theoretical *construction* of social turning points, and such a construction means consciously building the future.

A *Global Green New Deal* might be such a turning point. This kind of construction would have several requirements. *The first* requirement would

12 There are two kinds of human ideas – achievable utopias: (1) achievable utopias with expected consequences, based on the motto "Whatever humankind can conceive, technology can achieve;" and (2) "There is no need to worry about the consequences of today or tomorrow, because experience has shown that science and technique will find a solution" (a version of the first kind, examining in ethical discourse what science does and what it ought to do) (MACK 1992, 34).

13 The term can be used (a) in the singular, meaning that irreversible change has occurred and that a transformation of the existing situation will follow, or has already happened, or (b) in the plural, when describing different stages of a turning point in a specific sector. There is, for instance, the global scale of humankind in the biosphere (MCNEILL 2000), different time periods in forestry (GREWE 2010) or in urban history (TARR 2001).
In the socio-cultural sense, turning points are important in the periodisation of human history as "cultural thresholds": moving from a gathering existence to a sedentary mode of living; the emergence of monotheistic religions and the idea of an invisible god; the emergence of industrial culture (GEHLEN 1994, 5).

be to determine the most important current social-ecological issues that present a burden for the development perspectives of modern society and humanity in general. They are reflected in practice on the following levels: the level of development of individual countries or groups of countries, the global level of humanity, as in theoretical reflection or environmentalist practice. *The second* requirement would be to determine the priorities of resolving issues (questions) which will (according to current knowledge) have a major influence on the "new social natural state." And *thirdly*, it would be necessary to indicate a possible direction for this new movement.

The construction of a social turning point should be preceded by theoretical discussions about the global direction of our civilisation, not just practical aspects within the existing neoliberal capitalist economy which offers no (radical) alternative of its own. Let us describe just a few areas and aspects: economy, ethics, international politics, and ecological movements.

(a) *Global Green New Deal*. The goal of the "Green New Deal" concept (German: *die Neuverteilung der grünen Karten*) is to achieve structural ecological changes which will influence the reduction of climate changes on the global scale. This concept is part of overall efforts to reduce global ecological (climate) effects, specifically activities related to "decarbonising" (reduction of harmful emissions) and "dematerialising" (absolute reduction of resource use) (SIMONIS 2011).

The concept echoes the "New Deal" measures introduced during the great economic and social crisis in the USA when unemployment soared between 1930 (3.2 million) and 1933 (13.2 million). "Therapy" was designed by the government (Franklin D. Roosevelt), and included controlling unsound banking and the stock market, as well as other measures: shorter working hours and higher wages; setting minimum wages in industry, minimum prices for agricultural products; accepting union tariff levels; lower taxes for the poor and higher taxes for the rich, etc. The phrase "New Deal" is used in the sense of card games as well as business: as a new round and distribution of cards, and "sealing a new deal."

The term "Green New Deal" was first introduced by the economist Thomas L. Friedman in a *New York Times* article on January 10, 2007. It was embraced by the UN Environment Programme (UNEP), whereas the economist Edward B. Barbier (2010) formulated the concept (policy, investment, and incentive mechanisms), which originates from previous discourse on the relation between economy and ecology, with three goals: (a) revival of world politics, job creation and protection of disadvantaged groups; (b) reduction of coal dependency, reduction of environmental degradation and

water shortage; (c) promotion of the UN Milennium Development Goals[14] and ending extreme poverty.

The Green New Deal is a current strategy of *transformation* as potential response to the three-fold crisis: ecological, financial and social, which is, as yet, missing its *revolutionary subject* (BÜTIKOFER 2011, 29). This concept presupposes a radical change of the *industrial metabolism*, which is why it could be described as a social "turning point," i.e. "green turning point" that would usher in an "era of ecology" (RADKAU 2011) in the periodisation of environmental history (UEKOETTER 2010).

Green economics, that is, ecological economics (DALY 1994), is the opposite of classical economics in theory and practice. It refers immediately to production, and indirectly to consumption as well. It takes into account the limits of the natural system, the principle of ecological irreversibility, and sustainability within the limits of the environment's absorption capacity. It incorporates ethical aspects of relation towards nature and produced goods. It emerged from the critique of exponential growth and the increase of entropy, and the profit of capitalist economy (DALY 1973; HAMPICKE 1992; COMMON and STAGL 2006), but was well known to agrarian society.

It is still not sufficiently represented in industrial or agricultural practice. Studies of economics and agriculture will therefore be required to incorporate more green economics-related content into their curricula. In the current context of Croatia, it is probably better known to farmers and environmental organisations than to many students and some professors.

(b) *World ethos and ecological orientations.* When discussing the issue of limits to growth and international cooperation in establishing world peace and a new world order, it is important to mention the concept of world ethos (German: *Weltethos*). It was introduced by the famous theologist Hans Küng (1992).[15] The aim of the concept is to encourage world religions and other beliefs to get involved in building a world ethos which would be an "ethos of humankind." It assumes that, despite differences between religions, there is a cluster of common values towards a "minimal ethical consensus" that could open up dialogue on social values. There has been virtually no empirical research on world

14 This refers to the 55/2 „United Nations Millennium Declaration", Resolution adopted by the UN General Assembly on September 8, 2000.

15 For more on the world ethos, please see Küng (1992, 1996, 1997). To mention only a few other writings: REŽAN 2008; RADIĆ 2009; CIFRIĆ 1997B; CIFRIĆ 2000; 2004A.

ethos.[16] Unfortunately, global economic and financial issues as well as war conflicts have overshadowed this type of ethical discourse; at the same time, theologians do not seem to be exhibiting much "theological will" for ethical discourse or for empirical research.

Several studies of *ecological orientations* have been carried out in Croatia: their authors (CIFRIĆ 2004B; ČULIG 2004; KUFRIN 2004) presented their results in the journal *Socijalna ekologija*. These studies have shown that there are three major social-ecological orientations: *anthropocentrism*; *ecocentrism*; and *technocentrism* (CIFRIĆ 2008A). Everyday situations do not require that people consciously subscribe to any of them: their actions depend on the situation. Although it is impossible for humans not to act anthropocentrically, they do not have to go against their own natural bases of life. However, our civilisational paradigmatic and practical inclination is essentially anthropocentric, and impervious to criticism of anthropocentrism.

(c) *International politics. Cooperative competition*, which has marked the last fifty years, does not seem to be crossing over into *competitive cooperation*. Up until now, (international) economy was based on competition that affirmed itself in the marketplace. However, since the marketplace was not a level playing field, competition occurred in inequitable conditions. Despite efforts to establish international cooperation within these conditions, inequity led to limited cooperation. In international politics, we are talking about cooperative competition. International economy (community) today ought to be based on cooperation, whereas (market) competition should be viewed in the sense of competing for more efficient and effective cooperation. The term is competitive cooperation, i.e. competing in the area of cooperation (who can achieve a greater level of cooperation). Units of cooperation are independent countries acting on the international scene. "Here, competition is not based on output, but on the process that establishes a cooperative order... the conditions of competitive cooperation require that competition be understood as a process of joint searching and learning" (MESSNER 2001, 31). In terms of international law, this type of cooperation presupposes relinquishing part of national sovereignty to the international community (BIERMANN 1996, 245).

16 One such study was carried out in Croatia (2010), so the results cannot be compared with other studies. The study found that between 35.7% and 56.9% of participants considered that the stated values were "not respected." "Partnership between man and woman" was an exception, estimated as respected in society by 38.5% of participants. Opinions on values were compared with three established factors of socio-cultural identity: territorial-regional; professional; and religious-national (CIFRIĆ, 2011).

(d) *The role of the global environmental movement (NGOs)*. Globalisation of environmental and social problems leads to a rise in cultural and biological entropy, which endangers *cultural* and *biological* diversity. At the same time, there are indications of two global movements forming: one to protect *cultural diversity*, and the other to protect *biodiversity*: "Preservation of biodiversity and cultural diversity are the two major social movements of the twenty-first century. These two forces are closely connected" (RIFKIN 2005, 322). In both of them, we encounter optimism and pessimism, vision and catastrophe as warning of the necessity of a *bioethical* approach.

A comparative view of environmental and social issues (separately or as a complex social-ecological problem) over the past few decades, including the present, and taking country development level(s) as criterion, clearly shows that these problems have influenced the structure and dynamic of environmental movements. Movements in developed and undeveloped countries differ in terms of priority content, as well as the level of *environmental awareness*, which affects their quality. There is therefore a difference between "first world" and "third world" *environmentalism* (LANGE 2011).

Environmental issues, just like developmental ones, are becoming more global, while movements are mostly defined in terms of territories – apart from the few that operate on a global scale. Since "fragmented" environmental movements cannot be as effective in responding to global environmental challenges, it makes sense to consider integrating them on an international level (organisation) (MESSNER and NUSCHELER 1996). If it is possible for certain organisations to exist within the UN, there is also the possibility and need for this type of organisation with cross-border activity (WEIZSÄCKER 1999, 101), just like cross-border organised international capital. This would secure them a decision-making position in global governance (BRÜHL and SIMONIS 2001).

Certainly, some ascribe a major role to NGOs and have high hopes for them, seeing them as a turning point; others, on the other hand, doubt their effectiveness as they adapt to the *prevailing reality principle*, which is reflected in their professionalisation and embrace of "managerism."[17] It should be mentioned that NGOs and environmentalists operate globally in

17 The concept of a "managerial revolution" (BURNHAM 1941) separated the greedy interests of owners from the interests of managers. However, it did not occur because managers became interested in increasing their personal share in the profit (ownership) and ended up pursuing their own interests.

two areas: raising global *awareness*, especially during the 1970s, and acting as a social mechanism for *ecological repair* since they are "professionalised." They have increasingly become part of major entrepreneurship and management in environmental protection, with individual careerists among their ranks (KÖSTER 2012). They ought to get back on course if they want to retain their credibility.

Even Greenpeace has become a large organisation that resembles entrepreneurship, with a hierarchical structure and careerists among its ranks. Members of environmental organisations thus become a sort of *repair mechanism*, whose reaction to pollution and destruction of nature limits the protest potential to overcome the social causes of the problem (KÖSTER 2012). They lose their authenticity by simply joining the logic of the social system, because, to paraphrase Albert Einstein, we cannot solve problems by using the same thinking we used when we created them.

However, we should bear in mind that environmental movements should not be the only agents to play a key practical role here. There are other agents (powers) in society, such as public media (television; radio; print media), the Internet; religious organisations/institutions; and of course, scientific and educational institutions. Yet we should not expect to find the utopian initiative within the alienated system, which brought about the current alienated relation between society and nature in the first place, but in the utopian potential of environmental movements on the one hand, and in the historical mutability of the system and its own logic on the other hand: their guiding principle will be a qualitatively different society – *sustainable society* where the principle of violation of nature aggravating the violation of man will not hold true (MARCUSE 1973, 72). The final goal is a three-fold liberty: *liberated man in liberated society and liberated nature* (MARCUSE 1968, 18; 1973, 60 and 89).

Conclusion

The question of development today faces a (global) *social dilemma* concerning growth, i.e. a dilemma on the possibility of impending social and environmental disaster.[18] Limiting growth will in the long run bring about *economic collapse*, whereas retaining the current growth tendency might lead industrial society into *ecological collapse*, the kind of which have already occurred in history (DIAMOND 2005). Systematic scientific research

18 (Social) disaster occurs if there is uncertain safety, uncertain danger that was not expected as a budget value (especially in the long term), and which occurs as a surprise. Following Clausen (1991), Simonis describes six degrees of diagnosis and prevention (SIMONIS 1996, 32).

is therefore necessary to establish the causes of potential social-ecological collapse.

Development is connected to the energy needs of a society, as well as with climate changes (JAHRBUCH ÖKOLOGIE 2011). These are also limiting circumstances in terms of growth. Discussions on "climate geoengineering" today include Solar Radiation Management (SRM) and Carbon Dioxide Removal (CDR).

Liberal capitalist economy must continue growing for its own sake; the opposite will lead industrial society, i.e. capitalist economy itself, into crisis, perhaps even collapse (catastrophe) in the long run. Capitalism cannot survive without growth. This brings to the foreground criticism of today's capitalism as an ideology of "cannibalising growth," whereas humans have at times been described as *parasites* in nature.

Today's environmental and social problems originated in the centres of globalisation – developed industrial countries, and are reflected onto their social (cultural) and environmental "peripheries." This is where the "centre" gets its development power today. The question is: how long will the "peripheries" be able to take the centre's current pace of development? This limit will probably be the growth limit of contemporary industrial capitalism, especially its aspect of financial imperialism. Indeed, the "peripheries" also use crises of the "centre" in order to increase the intake of capital and technology. Until the majority of natural and social resources of the peripheries has been depleted, liberal capitalism and the global alienated system will carry along its well-trodden path. This path will reach an end to itself, of its own accord, unless there is radical change.

This article aims to remind that there are significant indicators of a possible social turning point, and relevant literature singles out two: *resource consumption* (ecological footprint) and *environmental impact* (ecological rucksack). This is why resource decoupling and impact decoupling are required. We have exceeded limits in some aspects, but there is still hope (MEADOWS et al. 1992; 2004). The question of today's social turning point is connected with limits to growth.

Ideas towards creating a new social-ecological system, green (ecological) economics, that is, a *global new deal*, value system, international cooperation, and the role of environmental movements, are some of the points discussed in this article as possible social turning points in the Anthropocene era.

Exhausting natural resources and global pollution gradually leads to global crisis as a sliding *social-ecological crisis*, and even a possible disaster in the long term. We do not seem to be aware of this sufficiently to take radical action. Is it possible to avoid without radical change of society itself? No civilisation, no society is timeless: they have their temporality, and so

does liberal capitalism. Only if society changes in a way that engages human potential is there hope for a better life.

Although theoretical discourse questions the existing paradigm of liberal capitalism, beside the concept of sustainable development (which already is a lot) – which is otherwise met with strong resistance, a new paradigm is required of the relation between humans and nature – a social-ecological humanist paradigm, different from the Newtonian mechanistic view and the idea of Promethean progress. More than a global paradigm of modern society, this is about paradigms on different levels that refer to different social-ecological systems. This new paradigm will not stop the development of humankind, especially not scientific research; it will encourage new limits of development, but with ethical considerations of their application. Some contributions towards a turning point have already been identified: far from regression, it would entail the use of knowledge and historical experience of humankind to define criteria for sustainable survival of all of humanity and a humane relation between people, nations, and religions. Sustainability has not yet become a new reality of human development or a new symbol of progress – as humans do require symbols, but remains more of a threat and an alibi for developed countries, and is likely to become a mitigating circumstance for the undeveloped world. However, there are positive initiatives on the micro level. "One thing is certain: there can be no possible solution for the contemporary 'ecological crisis' unless there is radical reform of human society, because the 'ecological crisis' itself is merely a reflection of the deeper social crisis of humankind, its mode of production, its relation toward its own life conditions" (SUPEK 1989, 36).

It is not possible to build a new relation toward nature or a more equitable social order without criticism of the society of alienation, alienation in society and the social origins of alienation. For "....the goal is not control over nature but control over technique and over irrational social forces and institutions that threaten the survival of Western society, if not of the human race" (FROMM 1984, 185). Furthermore, Albert Einstein warned that problems cannot be solved using the same thinking that was used when they were created. If researching the condition and consequences of growth is enough for science, it is not enough for humanity without asking questions about the meaning of growth and limits to growth.

In conclusion, it can be said that both growth and the ideology of growth are closely connected to the model of liberal capitalism. Within that same model the critique of growth and demands for its limitation are also formed. Growth is increasing due to the application of new knowledge and technologies that enable a more efficient use of resources and living labour (and its GDP) – which leads to the widening, growth of limits.

The thesis about the limits of growth relies, on the one hand, on the idea of an increasing exploitation and depletion of resources and, on the other hand, on the fact that continual growth did not result in the increase of justice or living standards for the majority of the world population (in developing countries). Therefore, the temporality of the linear economic model of capitalism is prolonged, and it must be closely followed by anthropological and humanistic critique of modern industrial society and its developmental dilemmas. The existing model of economic growth and capitalist development has lost sight of the human dimension. ●

2 Climate change and human moral enhancement

Tvrtko Jolić

Introduction: Education for change

Contemporary science is providing more and more evidence that climate is indeed changing and that at least part of the cause lies in factors related to human activity. Strong emphasis is placed on raising public awareness about the need to conserve the environment in order to remove, or at least alleviate, the worst consequences of climate change. However, research has shown that only a small share of, for example Croatian, population considers environmental concerns to be the most important social issue (cf. DOMAZET, DOLENEC and ANČIĆ 2012, 31). Also, very few people are willing to change their behaviour in aid of environmental protection and sustainable development if it means sacrificing their own economic interests (DOMAZET, DOLENEC and ANČIĆ 2012, 43). There are many reasons why people are not willing to modify their behaviour. I will name just a few.

Firstly, not everyone is convinced that climate change is indeed happening under human influence. A possible reason for this is that, upon considering different scientific theories, they might think that the arguments in support of the thesis that climate change is the result of human activity are just not strong enough. A second possible reason is that the scientific theories which explain processes that lead to climate change are too complex to understand, even when presented in simplified form.[1] Failing to understand a certain theory is often accompanied with reluctance to accept the theory.

01 Environmental psychologists claim that for most people it is difficult to understand even some basic concepts associated with climate change, e.g. difference between a deterministic weather prediction and a statistical climate projection. "[T]he explanation is complex to the journalist, the policy maker, and the general public, despite every effort to use simple language" (NEWELL and PITMAN 2010, 1004).

In addition, even those who believe that climate change is the result of human activity, and who have the knowledge of how they should alter their behaviour, often lack the motivation to do so. Some of them know that a significant part of their actions will only have a long-term impact, affecting generations that will come after them. Others are not motivated to change because their actions affect population in remote parts of the world. In both cases, spatial or temporal distance leads to weaker interest and concern among individuals for those who are affected by the negative repercussions of their actions. In addition to the individual level, this problem is encountered on the group level as well, especially in the activity of businesses and countries that refuse to change and choose the politics of waiting instead.

How can individuals be moved to change their behaviour towards environmental protection and sustainable development? Having analysed relevant data, the authors of the study *We Need to Change* conclude that "citizens with higher level of educational attainment more often perceive environmental issues as important, they less frequently see economic growth as damaging for the environment and they are more willing to accept a reduction in living standards for the benefit of the environment" (DOMAZET, DOLENEC and ANČIĆ 2012, 47). Why is it that education, especially higher levels of education, lead to greater degrees of sensibility towards issues of environmental protection and sustainable development? Answers to this question seem to lie in the very structure of education processes and their intended goals. According to the understanding prevalent in contemporary Western liberal democracies, education comprises at least two significant components. The most prominent component, which is often considered to be the fundamental goal of education, is the transfer of knowledge and development of different skills and competences. This knowledge and these skills can have a wide variety of possible applications, such as reading and writing, or they could be limited to more narrow areas, like knitting lessons or constructing bridges (BAILEY 1984, 14). The second, equally important, component of the standard Western process of education is related to upbringing, socialisation and internalisation of civic virtues. In terms of environmental protection and sustainable development, education can offer individuals information about the challenges that we face due to climate change, to provide them with the knowledge and capabilities to cope with these challenges, and to acquaint them with the principles and values which they must uphold in their actions. Without these three constituents of education, humanity is highly unlikely to sustain itself and progress.[2]

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02 There is no room here to enter into elaboration of general strengths of education for sustainability, which can be found elsewhere in this volume (DOMAZET and ANČIĆ, THIS VOLUME).

To what extent is it possible to achieve these educational goals through traditional modes of education? As can be expected, education would be the best way to fulfil the goal of informing people about climate change, about harming the environment and harming-related hazards. We can approach this goal by placing emphasis on making tertiary education more accessible, as, according to statistics, people with tertiary education attainment express the greatest concern for environmental issues (DOMAZET, DOLENEC and ANČIĆ 2012, 32). The capabilities of the current education model to transfer the knowledge and abilities necessary to tackle climate change-induced issues depend on the capabilities of science to generate this knowledge. Given the complexity of processes that affect climate change, many doubt that science is capable of achieving this to the degree necessary to deter impending environmental disaster (cf. HUESEMANN 2000; 2006). However, even those who are more optimistic believe that science can only help resolve these issues if it is accompanied by a shift in awareness and values that guide our actions. At the same time, it is highly unlikely that the education system will be able to carry out a quick and radical enough change in our understanding of what we are morally obliged to do in order to prevent climate change that could have a disastrous impact on human survival. This primarily involves our tendency to put our short-term interests before long-term ones, and to ignore the negative repercussions that our actions have on other people who are most often removed from us in terms of space and/or time.

Although research has shown that people are willing to modify their behaviour in order to contribute to the protection of their living environment, their readiness for change drops if they are expected to sacrifice their lifestyle (KEMPTON, BOSTER and HARTLEY 1995; DOMAZET, DOLENEC and ANČIĆ 2012, 46). Educational and other institutional measures (taxation, incentives, and the like) can to a certain extent encourage people to alter their behaviour. However, as some authors state, traditional measures of moral education were able to achieve only "modest success" during the last few millennia (PERSSON and SAVULESCU 2012, 9). The limiting factor in the internalisation of principles and values crucial to the preservation of humankind in the light of global climate change (as well as tremendous distributive inequalities, threats of terrorism and possible nuclear war) is our moral psychology, which has not altered significantly since the emergence of humankind (PERSSON and SAVULESCU 2012, 1). Namely, our moral psychology is better suited for living in small communities that operate with simple technologies than for today's way of living in multi-million population countries that use advanced technologies. The shortcomings of our moral psychology are evident in the lack of altruism towards people with whom we do not interact closely, a consequence of which is our reluctance to alter

our actions that cause climate change. Actions that we take today will only reach their full effect in several decades, impacting generations that will come after us. Also, the present consequences of our actions are seriously affecting the population of remote countries and parts of the world. The limitations of our moral psychology, which motivates us to have concern for those who are near and dear to us, prevent us from changing harmful patterns in our behaviour.

In order to avoid the worst consequences of climate change caused by human activity, it will be necessary to reach a sustainable level of consumption of natural resources on the global scale. According to some estimates, however, a sustainable level of consumption presupposes that the material welfare level enjoyed by citizens of Western democracies would have to decrease significantly (PERSSON and SAVULESCU 2012, 76). Namely, even the current level of consumption necessary to sustain the lifestyle of one billion population of the rich West is considered to require an overall unsustainable level of consumption. Things get even more complicated when we take into account the aspirations of the rest of humanity to reach a higher level of welfare. In addition, moderate projections by United Nations experts estimate that the population growth might exceed ten billion people by the end of the twenty-first century (UN 2013, 2). These data support the thesis that human behaviour and approach to the environment must change as soon as possible.

Biomedical moral enhancement

Apart from the technologies we use to exploit natural resources, there are other contemporary technologies (specifically, nuclear and biological weapons) that enable humankind to inflict immense damage upon humanity itself as well as the world it lives in. Given this greatly increased possibility of humans causing damage or even complete destruction, Savulescu and Persson believe that humans should be morally enhanced so that they could apply these technologies responsibly. Starting with the assumption that our moral behaviour is based in biology and is a product of the process of evolution, Persson and Savulescu's solution proposes the research and, if possible, application of biomedical modes of moral enhancement (PERSSON and SAVULESCU 2012, 106; 2013, 124). These authors consider it to be one of the ways we *must* test in order to reduce the risks we face from reckless and malevolent use of power enabled by contemporary technology.

According to one of the originators of the idea of moral enhancement by biomedical means, "a person morally enhances herself if she alters herself in a way that may reasonably be expected to result in her having morally better future motives, taken in sum, than she would otherwise have had"

(DOUGLAS 2008, 229). What could therefore be done to improve people's motives for action, thereby changing their behaviour and starting to make sustainability-oriented decisions? Whereas traditional methods of education did this indirectly, informing people about available options and the effects of particular choices, the idea of biomedical enhancement considers the option of directly influencing the biological and psychological basis of human motivation. There are three basic ways to do this – with the help of drugs, genetic engineering, and using technical devices connected to the brain. All these methods are in very early stages of testing and are very far from being applied on human beings (DOUGLAS 2008, 233). Those who are optimistic about biomedical moral enhancement of humans rest their hopes on two research projects that are exhibiting somewhat promising signs of progress in this area.

The first project is tied to the research into the activity of the hormone and neurotransmitter oxytocin. It was found to enhance certain morally relevant characteristics and was popularly dubbed "the cuddle hormone." Apart from the oxytocin released by the posterior lobe of the pituitary gland, the hormone can also be introduced into the body via pills or nasal spray. Research has shown that persons who are administered with a dose of oxytocin exhibit a higher level of trust and readiness to cooperate than those left untreated (KOSFELD et al. 2005; ZAK, KURZBAN and MATZNER 2005). Also, oxytocin was found to be helpful in fostering fidelity in monogamous couples (SCHEELE et al. 2012). However, other studies have found that the application of oxytocin does not really corroborate the arguments of those in favour of biomedical moral enhancement. Namely, quite contrary to the idea that oxytocin might help extend altruism, trust and cooperation to include persons beyond our immediate social group, these studies have shown that oxytocin primarily enhances prosocial behaviour within the group, and can even encourage sacrificing outsiders if it could benefit members of the group (DE DREU 2010; 2011; 2012).

The other method that is often seen as a potential way of influencing our moral behaviour is the application of selective serotonin reuptake inhibitors (SSRIs), which are used to treat depression, anxiety and personality disorder. Similar to oxytocin, SSRIs stimulate cooperation, but they also seem to affect our sense of fairness. Experiments have shown that SSRI-treated individuals are more willing to offer fairer conditions of cooperation than the control group which was left untreated (TSE and BOND 2002; WOOD 2006). As with oxytocin, the current state of research has at best provided a mere hint that the application of SSRIs might have a positive effect on human behaviour. Further research in this area indicates that technological advancement might lead to these methods becoming more precise and having a stronger effect on human behaviour.

These and other lines of research into ways of biomedical enhancement of human morality are seen by some authors as a promising solution for shortcomings of the human nature that lead to the resources depletion, climate change, and global inequality. The main argument behind this view is the following: if drugs and medical treatments could be used to me make people care for the wellbeing of other human beings that are temporally and spatially distant, these bioenhanced people will be more willing to adopt sustainable ways of behaviour.

Persson and Savulescu believe that "[i]f safe moral enhancements are ever developed, there are strong reasons to believe that their use should be obligatory, like education or fluoride in the water, since those who should take them are least likely to be inclined to use them. That is, safe, effective moral enhancement would be compulsory" (PERSSON and SAVULESCU 2008, 174). However, even if biomedical methods are sufficiently improved to be used safely and effectively on humans, the question remains of how justified it would be to try and influence human moral behaviour in this way.

Arguments against the biomedical moral enhancement project

According to an influential school of ethical thought, the only way to morally improve humans is connected to the enhancement of our cognitive abilities. The more we know, the less we err. Those sceptical of biomedical intervention in the basis of human moral motivation refer to the philosophical understanding that goes back to Socrates, according to which the root of immorality is false belief, which is best eliminated by cognitive improvement and education. For instance, John Harris thus claims that "[t]he most obvious countermeasure to false beliefs and prejudices is a combination of rationality and education, possibly assisted by various other forms of cognitive enhancement, in addition to courses or sources of education and logic" (HARRIS 2011, 105).

The most prominent representative of this branch of ethics is most definitely Immanuel Kant, for whom morality is based in rationality. He, as well as his subsequent proponents, would find the very idea of affecting morality by altering our emotional psychological inclinations such as altruism completely misguided. Namely, moral actions are those that result from duty which is based in rational thinking, not in inclination (KANT 2011, 24). Acting upon our inclinations, whether natural or acquired, cannot be free according to Kant. When we act upon our inclinations, we are slaves to our own emotions or customs. The only free actions are those which result from our ability to think rationally. Therefore, in order to achieve moral improvement, we must improve our rationality, not the emotional aspect of our character. Attempts at improvement that are

carried out through direct enhancement of emotions, such as suggested by Douglas, Persson and Savulescu, cannot therefore be *moral* improvements (HARRIS 2013).

Also, opponents of biomedical moral enhancement might object that mandatory subjection to moral enhancement would narrow the subjects' freedom, namely in two respects. Firstly, no one asked them whether they wanted to undergo moral enhancement. From a liberal standpoint, this is a serious encroachment upon human freedom in a particularly sensitive area like private moral beliefs. One of the basic tenets of liberal political philosophy, built into the foundations of more or less all Western democracies, is the principle of state neutrality, according to which the state must not favour any one moral belief or understanding of human good (cf. DWORKIN 1978, 127; RAWLS 1993, 179). For instance, communitarians might therefore object that state-imposed "moral enhancement," which would motivate us towards greater concern for the needs of outsiders, is detrimental to the interests of our own community, which is, according to the communitarian moral outlook, a fundamental moral value. Without assessing the rectitude of this moral view, it is evident that the idea of mandatory subjection to biomedical procedures of moral enhancement is at least *prima facie*, for lack of better justification, contrary to the tenets of liberal political philosophy.

The second objection is not so much concerned with political restrictions of freedom as with our understanding of what it is that makes a certain action morally good. With posthumans, which is the common name for humans who have undergone some sort of biomedical enhancement, their improved nature causes them to have different motivation in certain situations than they would have had without the moral enhancement. Neither the motivation that they would have had without the moral enhancement, nor the motivation caused by moral enhancement is the result of these individuals' independent choice; in that respect, posthumans are no less free than common people.

However, sceptics might argue that moral enhancement deprives posthumans of the ability to demonstrate strength of character in certain situations, resisting the supposedly poorer motivation that they would have had without the moral enhancement. They are thwarted from demonstrating their moral excellence, which derives its specific moral value from overcoming their biological predispositions. Certainly, there will be differences in moral excellence among posthumans as well, since even morally enhanced individuals will exhibit different degrees of being able to turn the good motivation laid down by biomedical engineering into morally good action. However, the excellence of an individual who has had their psychological process biomedically altered is not ascribed solely to their moral character, but also, at least in part, to the biomedical treatment to which they were

subjected. The virtue of marital fidelity displayed so beautifully by Penelope as she waited for Odysseus to return from his voyages will no longer be ascribable solely to the character of the spouse, but a well-administered cocktail of medication and genetic intervention as well.[3]

This line of thinking led John Harris to state the following: "Without the freedom to fall, good cannot be a choice; and freedom disappears and along with it virtue. There is no virtue in doing what you must" (HARRIS 2011, 104). Changes that are brought about by enhancing psychological characteristics of humans are changes in behaviour alone, and not in the human understanding of *morality*. If biomedical enhancement can someday make people choose to act in such a way that is more responsible to the interests and needs of temporally and spatially remote strangers, to the natural environment and threats posed by weapons of mass destruction, this will on the one hand be morally good, useful, and commendable.

However, the problem from the standpoint of morality is that these actions will not have been deliberate choices of moral actors, thereby having no intrinsic moral value. Biomedical enhancement of our emotional psychological characteristics is thus revealed not only as being no moral enhancement at all, but sacrificing a major aspect of the moral character of humans as well.

Biomedical enhancement and liberal democracy

What are the potential counterarguments that advocates of biomedical enhancement could provide in response to the abovementioned objections? In response to the objection that mandatory moral enhancement curtails human freedom, it could be said that freedom is not the only value humans care about. Although exceptionally important, freedom can be restricted in certain circumstances, especially in situations of threats to human safety or the very survival of humankind.

There are many who believe that humanity will face such a challenge, if not today, then in the near future. Climate change, environmental devastation and threats of terrorism, combined with the possible use of weapons of mass destruction, will seriously endanger the chances of human survival. A possible way to deter this threat is the moral enhancement of humans.

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03 As regards proposals to stimulate marital fidelity through biomedical enhancement, please see WUDARCZYK et al. 2013. Earp, Sandberg, and Savulescu 2012 believe that this form of enhancement should be mandatory for couples who are parents.

However, it seems that this enhancement would have to be applied on a wider scale if it is to be effective.

This would require something that could be described as a "biological contract," which would oblige all people to undergo biomedical enhancement procedures in order to secure the survival of humankind and make Earth a safer place to live. In other words, people would relinquish part of their sovereignty over their biological characteristics to the state. In this respect the "biologically contract" is similar to the social contract in which people relinquish part of their sovereignty over their freedom to state, which then take it upon itself to secure peace and safety for its citizens.

Is this justification of mandatory moral enhancement plausible? It could be, if certain conditions are met. Just like in the natural state in social contract theory, what needs to be shown is that humans are in a situation, or that their way of life will necessarily lead to it, where normal functioning of society is threatened. That humanity is indeed in such a situation is what Persson and Savulescu are claiming. They believe "that the development of science and technology turned for the worse, all things considered, at the point at which it put in the hands of humankind the powers of doing ultimate harm" (PERSSON and SAVULESCU 2011, 441). According to them, "something could be ultimately harmful by forever extinguishing sentient life, or by damaging its conditions so drastically that, in general, life will not henceforth be worth living" (ibid.).

A major difference between the biological contract and the social contract is that the social contract stems from the fact that the war of all against all, which occurs in the natural state, is unbearable. According to Hobbes' famed description of the disadvantages of the natural state, human life in it is "solitary, poor, nasty, brutish, and short" (HOBBES 1998, 84). But is not human life, at least that of most citizens of Western democracies, everything but that?

Savulescu and Persson acknowledge that most people are not aware of the risk we are faced with, and they partially ascribe this to our innate cognitive bias to objects and events that we find familiar and available: "we are fixated on the possible occurrence of events of which we have readily available images, largely as a result of recently having experienced events of these kinds. Our emotions are geared to how vividly we imagine possible events rather than simply to how we abstractly estimate their value and probability" (PERSSON and SAVULESCU 2011, 442). But is humanity truly headed for destruction? And could biomedical enhancement save us from it? These questions are, as admitted by Savulescu and Persson as well, "so complex that it is difficult to be confident of not going astray somewhere" (PERSSON and SAVULESCU 2011, 444).They become especially difficult to an-

swer when it is not possible to attribute an exact, or at least approximate, degree of probability to different outcomes.[4]

Some reckon that even in these circumstances it is possible to apply the Catastrophic Harm Precautionary Principle, which requires regular citizens, as well as the government, to take extra precautions when assessing potentially catastrophic situations (SUNSTEIN 2007, 122). But even if we agree that climate change and other threats that accompany the development of contemporary technologies represent a potentially catastrophic danger, which requires precautionary measures that involve various forms of action to deter this danger, it obviously does not mean that any and all precautions are justified.

For instance, although I am in danger of contracting a virus in contact with other people, it does not mean I have to accept avoiding all direct social contact as precaution. I can just get inoculated against the most dangerous diseases for which there is reasonable probability of getting infected. It is therefore not only in our interests to identify challenges in connection to the threat we are facing, but also the challenges that accompany potential solutions. Apart from the potential dangers of climate change and weapons of mass destruction, we should assess the dangers that come with biomedical enhancement as one possible solution to these issues.

Earlier in this text, I claimed that biomedical intervention aimed towards improving human behaviour that is considered moral improvement by its advocates is, in fact, no moral improvement at all, and that it also restricts moral and political freedom. If this reasoning is correct, the project of biomedical improvement could be justified solely if it was the *only* way to save humanity from destruction.

However, not even advocates of biomedical enhancement believe that; they see this method as an accompanying measure that could contribute to resolving the problem (PERSSON and SAVULESCU 2012, 121). They consider it necessary because they are convinced that liberal democracy as the political order of the developed West is not capable of making changes that would deter the threat of catastrophic predicament and secure sustainable development. The democratic process makes change impossible as long as the majority of citizens put their short-term interests before long-term interests. Politicians likewise avoid proposing and carrying

04 Reports by the Intergovernmental Panel on Climate Change provide rough estimates of the probability of climate change impact on human life. The reports confirm, with a high degree of reliability, that economic losses due to weather- and climate-related setbacks are on the rise and that developing countries are particularly affected. However, the reports are highly reserved when it comes to estimates of the magnitude of losses and damages that climate change will cause in the future (IPCC 2012, 234 and IPCC 2013).

out unpopular measures whose impact would only be felt in the distant future, for fear of losing elections. Another solution would be to accept a form of benevolent authoritarian government which would be successful in putting unpopular decisions into action. But the authoritarian form of government cannot be a serious solution because it has so far invariably failed in the area of freedom and human rights.[5]

Were Persson and Savulescu perhaps too quick to write off liberal democracy? Although their analysis of liberal democracy reveals that it is faced with serious problems, the practice of liberal democracy per se has in the course of history displayed an amazing capability of self-correction. The development of Western democracy in the past two hundred years has shown that democracy was able to find it in itself to respond to some of its own shortcomings, such as the tyranny of the majority and the abuse of power. Since democracy is never a finished project, these responses must always be examined and improved anew. The development of democracy primarily depends on developing awareness among its citizens of the need for its continuous improvement. For instance, the development of civic awareness of gender equality led to enfranchisement of women. Raising awareness of the gross injustice of subjugating religious, racial and ethnic minorities led to effective legislation which guaranteed equal rights for all citizens. In these cases, the enfranchised ruling majority was able to put aside its own short-term interests and support a politics that would benefit the long-term interests of society on the whole.

05 Not all threats of potential catastrophic damage originate from the shortcomings of liberal democracy. Among the potential dangers that ought to incite our moral improvement is the misuse of nuclear weapons. However, history has come to show that, after the sobering effect of Hiroshima and Nagasaki, nuclear weapons were never used again. Perhaps we owe the fact that a nuclear event did not occur during the Cold War to the so-called "balance of power," but almost a quarter of a century after its end, no country seems to be ready to use nuclear weapons either. Persson and Savulescu are more concerned with the level of technological development, which they consider to have made available the knowledge and necessary materials to produce a nuclear bomb to smaller groups or even individuals; they are also apprehensive that terrorists might acquire nuclear weapons through stealing (PERSSON and SAVULESCU 2012, 47). Without a doubt, there are terrorist organisations that would gladly get their hands on nuclear weapons, either by producing or by stealing them. But neither option is that simple. Despite the fact that knowledge on producing nuclear weapons is fairly easily available, we bear witness to the fact that not even those countries that possess far greater resources than terrorist organisations are capable of it. Still, the threat of nuclear weapons theft is far smaller today than in the 1990s, when the nuclear weapons storage facilities of the former Soviet Union were virtually unguarded.

Although problems related to climate change, excessive use of natural resources, and the misuse of weapons of mass destruction open up a great number of queries, uncertainties and fears from today's perspective, the hope remains that humans are capable of seeing the steps that need to be taken in order to deter at least the worst repercussions of these threats. Past experience has shown that humans were able to overcome their misconceptions and limitations without biomedical enhancement to establish a more equitable and long-term sustainable society. To be able to do this in the future, additional efforts are required to develop awareness of the problems we are facing. The research data we provided at the beginning of this article indicate that a higher level of problem awareness and higher level of educational attainment lead to a greater willingness to sacrifice one's own interests and embrace necessary changes. Year after year, science gains more knowledge about human impact on climate change; this new knowledge strengthens public conviction that it is necessary to change how we relate to the world we live in. There is also growing awareness that economic growth and protection of the living environment are not mutually exclusive. Countries are becoming more serious about focusing on sustainable forms of development and ecological sources of energy. It might not be enough, but it still leaves hope that the road to change can be reached without biomedical enhancement that would require us to sacrifice part of our freedom.

Conclusion

In this chapter I have discussed a recent proposal according to which human beings are in need of moral enhancement by novel biomedical means in order to reduce the risk of catastrophes that could threaten the very possibility of continued human existence on this planet. According to the proponents of this position, our moral psychology – evolved for a life in small societies with primitive technology – is no longer able to cope with the challenges of modern technologically developed and globalized world. Since these authors believe that the traditional means of moral enhancement such as education had only a modest effect in the effort to adjust our moral behaviour to the challenges of modern world, they propose that it is necessary to examine and (if proven safe and effective) adopt alternative ways of moral enhancement by biomedical means. Their hope is that once human beings become morally enhanced by traditional and biomedical means, they will be able to overcome the affectionate limitations of our psychology. These limitations are most obvious in our inclination to take care primarily only of those that are near and dear to us, whereas this "near" should be understood in its spatial and temporal meaning. One of the main

tasks of moral enhancement is to strengthen our altruistic feelings toward strangers. Once we are morally and psychologically equipped to take care of the needs and interest of those with whom we do not share spatial and temporal proximity, we will be more willing to change our behaviour in accordance to the more sustainable modes of development.

In my discussion I raised two objections to this proposal. The first objection claims that the idea that human beings could be morally enhanced by altering our emotional psychological inclinations, such as altruism, is misguided. In the line with Kantian understanding of morality I argue that our morality is based on rationality and not on inclinations. If we take this view of morality it becomes clear that the proposed enhancement by biomedical means cannot be moral enhancement. What is enhanced is emotional aspect of our character, not our morality. People enhanced in this way would not act on the basis of their deliberate choices but on basis of preprogramed psychological inclination. This would in turn undermine our basic moral concept of freedom and, thereby, of moral responsibility. The second objection to the proposal show how the idea that moral enhancement by biomedical means should be mandatory violates political freedom of citizens. Faced with the objection that moral enhancement by biomedical means could be necessary in order to prevent catastrophic destruction of environment, in the final part of this chapter I try to point to education and liberal democracy as the alternative and morally acceptable ways of changing our behaviour. ●

3 Global environmental crisis and limits to growth: A Marxian perspective

Mislav Žitko

"Accumulate, accumulate! This is Moses and the Prophets!" wrote Marx in the first volume of *Capital* recognizing the internal drive of the capitalist mode of production towards perpetual accumulation and growth. The point of often present religious overtone in Marx's analysis of the relationship between relations of production and accumulation is to capture the enduring irrationality of capitalist growth imperative. Capitalism must develop, and it must grow because it is structured in such manner that without constant displacement of natural and social boundaries it cannot survive as a mode of production. Again, this point was forcefully made in class terms by Marx and Engels in the *Communist Manifesto*:

> "The bourgeoisie cannot exist without constantly revolutionising the instruments of production, and thereby the relations of production, and with them the whole relations of society. Conservation of the old modes of production in unaltered form, was, on the contrary, the first condition of existence for all earlier industrial classes. Constant revolutionising of production, uninterrupted disturbance of all social conditions, everlasting uncertainty and agitation distinguish the bourgeois epoch from all earlier ones. All fixed, fast-frozen relations, with their train of ancient and venerable prejudices and opinions, are swept away, all new-formed ones become antiquated before they can ossify. All that is solid melts into air, all that is holy is profaned, and man is at last compelled to face with sober senses his real conditions of life, and his relations with his kind." (MARX and ENGELS 2004, 19)

It is, therefore, rather curious that the intellectual tradition within which capitalism's distinctive growth imperative received so much theoretical attention has had only a minor role in recent mainstream debates about

environment, growth and sustainability. At first glance, it is as if the dreadeness of the Soviet model convinced radical ecologists and the commons movement that, to use Lenin's phrase, "the Soviet government plus electrification[1]" is the only legacy of Marx and Marxian theory. However, such a claim, which undoubtedly still plays a prominent role in public discourse is fallacious and inappropriate as it fails to distinguish between two separate enterprises: the Marxian analysis of capitalist mode of production underpinned by labour theory of value and a historical investigation of the varieties of socialism (ranging from Yugoslav self-management and Hungarian market socialism to the Soviet model). It then becomes possible to show that the first enterprise has a real significance for the debate about environmental crisis. Indeed, Marxian political economists have provided, building on the works of Marx and Engels, tangible insights into the causes of the environmental crisis by linking diverse forms of nature's degradation with the dynamics of capitalist accumulation, and stressing the pivotal role of social class for the understanding of the social order saturated with inequality in wealth and income. By taking into account these insights one can move forward and explore how contemporary dominance of finance capital and the process of financialization creates new enclosures and generates barriers for transition to a sustainable economy.

Needless to say, the critique of capitalism cannot by itself provide a blueprint for an egalitarian, democratic and ecologically sustainable (i.e. socialist) society. Nevertheless, an informed alternative depends not only on our ability to expand the reach of democratic decision-making process, but also on our aptitude to confront the contradictions of the capitalist system at their core. The latter point is of particular importance inasmuch as the influence of neoclassical economics is increasingly present in the domain of ecological economics, rendering it more and more useless as a discourse that can clarify the scope and depth of the environmental crisis. Notwithstanding the avowed critical stance towards neoclassical theory and its narrow-minded disregard for natural limits to growth, it appears that the neoclassical apparatus is still very much present in the minds of many ecological economists. The consequences of this learned ignorance are quite devastating, since thinking in neoclassical terms of marginal utility and market valuation leaves the entire economic domain free of any real scrutiny and, hence, undercuts a possibility for the assessment of interconnections between economy, society and the natural environment which are rightly considered to be decisive (DOMAZET et al. 2012, 10). Instead of confronting the difficult task of, for example, relating the greenhouse gas (GHG) emissions to the regime of accumulation and patterns of consump-

01 "Коммунизм есть советская власть плюс электрификация всей страны"

tion in the advanced capitalist economies and peripheral countries alike, the orthodox economic discourse leaves us with an elusive puzzle of finding the right price for carbon and spurious cap-and-trade arrangements. From the dominant point of view, the problem revolves around the search for missing markets and mitigation of externalities, while the solutions can allegedly be found in further privatisation and extension of market influence. The paradoxical nature of neoclassical solutions is well noted by Mirowski et al. (2013): "If environmental degradation is encountered in orthodox economics as a 'market failure' and attributed to 'externalities', then this amounts to arguing that climate change has not yet been priced into investment decisions because private property rights to the atmosphere cannot yet be assigned in financial contracts. In conventional economics, pollution isn't wrong because it disrupts and debilitates the natural manifold, but rather because it somehow derails the market. The general prescription is to concede a role for government to restore the market to its pristine natural state, rather than to actually do something to repair nature or to stop doing the things that mess it up". (MIROWSKI et al. 2013)

Neoclassical economics: Growth without prosperity

If business as usual is not an option, than thinking as usual cannot be one either. This lesson has been understood quite well by authors focused on the complex issue of relation between prosperity and growth. Tim Jackson, in his attempt to reconstruct economics for a finite planet, argues that neoclassical economics is able to avoid dealing with the ambiguous association of prosperity, utility and growth by assuming that the value of various commodities is equivalent to their price, while at the same time price is just a monetary expression of utility in the context of market exchange (JACKSON 2009A). Thus, people participate in the market in order to satisfy their utility preferences and market exchange brings together producers and consumers allowing them to increase their utility and, in that respect, their welfare. In a few short steps the square is circled and the individual utility maximization is equated with the overall increase in social welfare, whereas the increase in social welfare depends on the market exchange. Moreover, gross domestic product (GDP) is designed in order to capture all market exchanges in a single number within a single economy. On the background of the fictitious causality between utility, market exchange, social welfare and prosperity it should not come as a surprise that since the end of the World War II and the establishment of national accounting system, governments have set their strategies in accordance with the imperative of attaining positive rates of growth (VICTOR 2008). The point here is not to add to the growing literature on the inappropriateness of GDP as a measure

of human development, but to highlight the fact that the primary problem is market valuation of nature and economic growth itself. Deficiency in the measurement of growth is but a symptom of the unsustainable capitalist dynamics. Changes in measurement procedures are, of course, important and represent a sign of rising social concerns about climate change and deterioration of the biosphere, but they do not begin to address the core issues. In fact, many mainstream analysts and commentators have pointed to the need to re-think the value of GDP as an aggregate economic indicator, just as one can observe a formation of a new discourse with the aim of developing a framework for a hybrid economic order in which sustainable (green) development can co-exist with capitalist markets without contradictions or conflicts. The notion of "climate capitalism" put forward by Newell and Paterson (2010) can be seen as a refined effort to bring about decarbonisation of the global economy with the growth imperative still locked in place.

From a Marxian standpoint, changing of the orthodox mind-set has produced ambiguous results which can hardly be named politically progressive. Nowhere is the opaqueness and ambivalent nature of "sustainable" or "climate capitalism" discourse more present than in the reports, protocols and other documents which emerged out of the many summits and conferences dedicated to set the groundwork for new policies in the face of on-going climate crisis and devastation of nature. From the *Earth summit* held in 1992, through the lapses and blunders of Kyoto and Copenhagen, to the disappointing outcomes of Rio+20, instead of taking into account a fundamental fact that we are approaching a tipping point "beyond which global warming begins to feed on itself and becomes essentially irreversible and uncontrollable, with large-scale adverse consequences" (STORM 2009, 1012), we have seen the institutionalization of the neoclassical apparatus and „neoliberal approaches to sustainable development" (BÖHM et al. 2012, 2). "The liberal norm-complex" as Böhm et al. have argued "has been based upon two fundamental assumptions, 1) that free trade regimes and high economic growth rates are not only compatible with, but are important preconditions for, environmental sustainability, and, 2) that market-based tools are the most appropriate instruments to apply in effort to achieve that goal." (ibid., 2). To be sure, one can find numerous reasons for what can now be described only as a complete failure of global climate policy, from the influence of lobbies that profit from fossil-fuel use, through weak international legal regimes to inertia and corruption of political parties in core capitalist countries, but Marxian analysis reminds us that the explanation of this failure must be found in the ability of the neoliberal political forces to present market solutions for market problems model as if there is no alternative (LOHMANN 2010, 133). In that regard Lohmann has rightly argued that the future international agreements on climate are "unlikely

to bring about better results unless it is recognized that instead of aiding a transition away from fossil fuel mining and use, which must be the overriding goal of any coherent climate policy, the market instruments at the centre of today's international climate regime are designed in way that actually entrench fossil fuel use and delay the changes that need to be initiated immediately." (ibid., 134). In a similar vein, others on the Left have stressed how "primarily economic and flexible instruments, such as emission trading (ET), the clean development mechanism (CDM), and joint implementation (JI)" are set to "counteract the trend towards an increasing greenhouse effect" as if that is the only way of dealing with the ecological crisis and the only possible way of regulating the relation between natural resources and social needs. (BRUNNENGRÄBER 2009, 213-14). From the Left perspective carbon markets in particular can be seen as "a part of a broader set of green economy discourses and practices which are currently facilitating the expansion of capitalist accumulation through the capture, pricing and monetization of ecosystem services and other environmental goods". (BÖHM et al. 2012, 3).

It is understandable that the international financial institutions such as the World Bank or the IMF have made every effort to incorporate market-based solutions to their policy response. The Stern Review and the IEA reports, having exhibited quite a lenient stance towards the possible GHG stabilization target (at 550 and 500 ppm , respectively), also gave explicit support for the carbon trading schemes which in the world designed to fit the assumptions of orthodox economics "can deliver least cost emissions reduction by allowing reductions to occur wherever they are cheapest" (STERN 2007, 326, as quoted in STORM 2009). On the other hand, it is particularly unsettling to observe, coming back to the issue of the neoclassical apparatus at work within the domain of ecological economics, the support that the emission trading schemes received from the prominent ecological economists like Herman Daly. The role of a Marxist approach to ecological conflicts and crisis can be seen, first of all, in bringing a much needed epistemological vigilance to a discipline that has often fallen prey to "solutions" that do not work, give business sector incentive to delay structural changes, and entrust the financial markets to act as the avant-garde that will override the status quo and design a radical climate policy on a new ground. Furthermore, theory of capitalist accumulation first developed by Marx and later on improved by numerous contributors to Marxian political economy can be of use for understanding the rise of finance as the hallmark of recent economic history. Commodification of natural resources is, in the present regime of accumulation, closely linked to the process of financialization. To understand the current state of play, i.e., to see what is the role of natural resources in contemporary capitalism we will give a brief

account of the financialization of commodities market and then examine the link between the concentration of power in the sphere of finance and the formation of carbon markets. Against the background of the analysis of financialization of commodity markets and the construction of carbon markets it is possible to get a better insight about the Marxian contribution to the environmental crisis literature.

The Entropy law and Marxian Theory

One can readily agree with Paul Burkett's (2006, 292) appraisal according to which "the ecological potential of the Marxian perspective stems from the fact that it does not artificially separate a material realm of production from a social realm of exchange and distribution. Rather, it sees class relations as material social relations, and therefore as specific forms of economy-environment interaction" (BURKETT 2006, 292). As is well known, the duality of labour, or the fact that the capitalist class is able to exploit the difference between the labour time necessary for the reproduction of the labour force and the surplus labour time (which can, it turn, be realized as profit) is the kernel of Marxian theory of exploitation.

For the discussion about the ecological potential of Marxian theory it is important to notice that the process of accumulation of capital, built upon the alienation of workers from the product of their labour and from the conditions of production, generates the *metabolic rift* between society and natural conditions (FOSTER 2000A). In a production system primarily driven by profit maximization the tension between use-value or wealth, which includes "natural wealth and the individual or collective capabilities of workers and communities", and monetary exchange value inevitably leads (all other being equal) to degradation of labour and nature (BURKETT 2006, 139). The process of degradation of labour and nature cannot be reversed because of the in-built growth imperative, i.e., an insatiable need to surpass the previous limits of accumulation which depends upon an unimpeded access to labour-power and material use-values.

These tendencies Marx discussed in chapters on large scale machinery and land rent in the first and third volume of Capital, respectively. Burkett has conveniently translated the main argument of Marx and Engels into today's language of ecological economics: "Capitalism's uncoupling of production from the solar budget constraint, and it's tremendous acceleration of matter-energy throughput, had led to entropic degradation of natural conditions – a metabolic rift between human reproduction and the conditions needed for this reproduction to be healthy and sustainable." (ibid., 204). Once appropriated by capitalist class, human and natural resources or use values must be given a commodity form and sold on the market. Hence,

capitalist valuation depends equally on the process of exploitation at the level of production, and on the market mechanism at the level of exchange.

The relevant connection with the on-going debate about the status of market mechanism in ecological economics should be obvious. As pointed out by Burkett (2006), Noonan (2010) and Smith (2010A, 2010B) ecological economics critically evaluates some of the basic features of orthodox economics discourse (such as the Pareto principle or the neoclassical growth theory), but at the same time remains chained to the simple allocation/scale and private/social dichotomies. For example, Daly explains that the market "solves the allocation problem by providing the necessary information (prices) and incentives (money). It does this one thing very well" (DALY 1996, 50). So, the market can coordinate and balance individual maximizing efforts and by doing so it can determine the set of relative prices that measure opportunity cost in the sphere of private decision making, notwithstanding the scale (macro-allocation) problem for which market offers no solution and should be therefore viewed in terms of social or collective decision making (CONSTANZA and DALY 1992, 41). Thus, we find ourselves faced again with "externalities-missing markets view of environmental problems", only this time at the macro-level as the capitalist economic order tends to „overuse low-entropy matter-energy and overproduce high-entropy matter-energy." (BURKETT 2006, 50).

A Marxian analysis of ecological crisis recognizes that the production of surplus value depends on the separation of producers form their conditions of production which includes land and other natural resources. In their seminal work *Capitalism with Derivatives*, Bryan and Rafferty identify three degrees of separation of capital ownership. The first degree involves the process in which the worker is separated from the means of production, while the second degree refers to the formation of the joint stock company, i.e., the separation of company ownership from the process of production (BRYAN and RAFFERTY 2006, 71-74). The third degree is related to the current historical period in which the proliferation of new financial products is accompanied by politics of financial liberalization. The third degree of separation implies a change in the nature of class relations. Disconnection of laborer and land is a key aspect of the first degree of separation which Marx used as a basis for his inquiry into the secret of primitive accumulation, as he traces the process through which peasants were removed by force off their land and the commons were enclosed. Furthermore, the discussion so far pointed to the link between the first and the third degree of separation, as the labor force encounters its natural environment, albeit in commodity form in the sphere of consumption.

On the production side, nature also appears in commodity form, but this time as a stock of productive assets. This is an important point because

once nature appears as a stock of productive assets, neoclassical economic theory was able to use the metaphor of capital and to treat nature as natural capital (BURKETT 2006). Hence, a chain of equivalences can be created, and the theory suggests that it is possible to use different forms of capital (manufactured productive capital i.e. means of production, natural capital, human capital) without paying much attention to the specificities of each form. One can therefore imagine that all one needs is to find an appropriate combination of non-renewable forms of natural capital and renewable forms of manufactured capital. The problem of confronting the limits to growth can be postponed indefinitely, as long as technological progress and rise in productivity enables the substitution of different forms of capital.

Now, before the *Club of Rome* introduced the limits-to-growth notion into economic analysis in 1972, neoclassical theory did not devote much attention to natural resources. The natural capital metaphor came about as the answer to the limits-to-growth challenge. Burkett (2006) writes that neoclassical resource optimism was based on the belief that the market would automatically bring resource substitution and technological advance. The background assumption was that natural capital is more than just a convenient metaphor and, furthermore, that there is a possibility of perfect substitution between natural and manufactured capital, so that at any point in time it is possible to replace renewable for non-renewable resources. The natural capital metaphor is consistent with the overall neoclassical framework in which market valuation and pricing of production factors determine allocation and scale of production. Ecological economists were quick to indicate great difficulties in the attempt to put a market price on nature and warn about potential harm that can befall as a result of the myopic market valuation of the ecosystem. Writing from an eco-socialist perspective O'Connor and Martinez-Alier remind us that "the prominence in academic writing of the term natural capital coincides with the real social and political process of capitalization of nature. This refers to a pattern of response of business, within the logic of capitalist economic relations, to the supply problem of depletion of natural resources and degradation of environmental services required for support of commodity production" (O'CONNOR and MARTINEZ-ALIER 1998, 37).

A Marxian approach to the problems of valuation of nature and environmental crisis relies on the insight advanced by Nicholas Georgescu-Roegen that highlights the importance of the entropy law for economic dynamics. For Burkett (2006, 143), entropy is an anthropomorphic category and "it needs to be developed in terms of the class relations that shape the productive use of nature". Georgescu-Roegen's influential study *The Entropy Law and the Economic Process* (1971) was out just one year before the Club of Rome published *Limits to Growth* (1972). Georgescu-Roegen started his

career as a mathematical economist and has used his natural science background to introduce physical concepts of energy and entropy into economic analysis. The motivation for this can be found in his open dissatisfaction with neoclassical economics which he thought to be a direct contradiction of the second law of thermodynamics, a more fundamental universal world-view. The main idea which he elaborates is the concept of entropic degradation as a pervasive constraint placed upon the process of production, in contrast to the neoclassical theory of unadulterated growth. For Georgescu-Roegen, the entropy law can be readily applied in economic analysis since there is a biological aspect of human economy as it requires available energy in usable form. The implications for ecological economics should be clear and are spelled out by Gowdy and Mesner : "Entropy measures a system's unavailable energy, and humankind has the distinction of currently being the most significant contributor to entropic degradation by increasing rates of extraction of natural resources and discharge of wastes into environment" (1998, 147). In correspondence with the laws of thermodynamics, Georgescu-Roegen observes that "the economic process neither produces nor consumes matter-energy, it only absorbs it and throws it out continuously" and therefore "matter-energy enters the economic process in a state of low entropy and comes out in a state of high entropy" (as quoted in BURKETT 2006, 144). The problem is that in an isolated system, by definition, there are neither matter nor energy transfers between the system and its environment, whereas in the closed system energy can be exchanged, but the work cannot be performed indefinitely at a constant rate. From that Georgescu-Roegen concludes that the limited supply of low-entropy matter-energy places the absolute constraint on production, or in Herman Daly's formulation, the entropy law is "the ultimate supply limit, the source of absolute scarcity" (DALY 1992, 25). For our present analysis Ayers (1999) offers a brief recapitulation of the Georgescu-Roegen six main propositions: (1) human welfare is a function of economic output (2) production is inherently material-intensive (3) material processing requires available energy as it converts low-entropy material such as fossil fuels or metal ores into high entropy materials (4) the quantity of low-entropy materials is finite on our planet (5) recycling materials or fuels requires an exogenous inflow of low entropy energy (6) complete recycling is impossible due to entropic losses.

From a Marxian standpoint the entropy law has a definite function in the critique of capitalist mode of production. By introducing the entropy law into analysis of capitalist accumulation it is possible to see the interconnection between the alienation of labor and the devastation of nature, inasmuch as they appear, from the capitalist view, as factors of production. Marx understood that only a monetary theory of production can properly grasp capitalist dynamics, so the role of money was highlighted in his

account of how capitalism works. In contrast to neoclassical economics where money is reduced to a function of a veil around the so-called real transactions, in Marx's account money is the universal equivalent that grounds the commensuration of different commodities in exchange. It is no wonder then that for Marx capitalist accumulation can be understood only in monetary terms. In regard to entropic contradictions of capitalist valuation, Burkett (2006) argues that it would be indeed very difficult to capture the qualitative variety, irreversibility and quantitative limits of low-entropy matter-energy with a homogeneous, divisible and mobile device like money or monetary claims on wealth. In Marxian theory then the surplus product cannot but have a monetary expression and the money value at the end of each investment cycle must be augmented as a condition of a 'normal' capitalist reproduction. Marx's formula M – C – M' (money – commodity – money) captures the capitalist cycle in which commodity production is embedded in monetary accumulation. Nature and natural resources either have no place in this valuation chain or can enter in a form of commodity which, in turn, strips them of all the properties except for those that can influence the process of capitalist accumulation. In other words, "while recognizing the reality of the entropy law" Marxian theory also "reveals the crucial divergence between capitalism's entropic requirements and the entropic requirements of sustainable human production and development" (BURKETT 2006, 173). The social implications of different degrees of separation between producers and conditions of production, and the incapacity of capitalist market to incorporate the requirements of sustainable development in light of the limits to growth, suggest that one needs to differentiate between two types of environmental crisis.

In the first type "capital accumulation is threatened by environmental constraints on supplies of its requisite material use-values", while the second type "involves capitalism's degradation of the conditions of human development" (ibid., 294). In the period of financialized capitalism the first type of crisis can be induced artificially, through the mechanisms of contemporary finance that regulate the behaviour of financial and non-financial market actors alike. The dangers of market-based solutions to environmental crisis lies in the fact that they cannot escape the institutional setting tailored to the needs of fictitious accumulation and limitless growth.

Financialization of food and energy

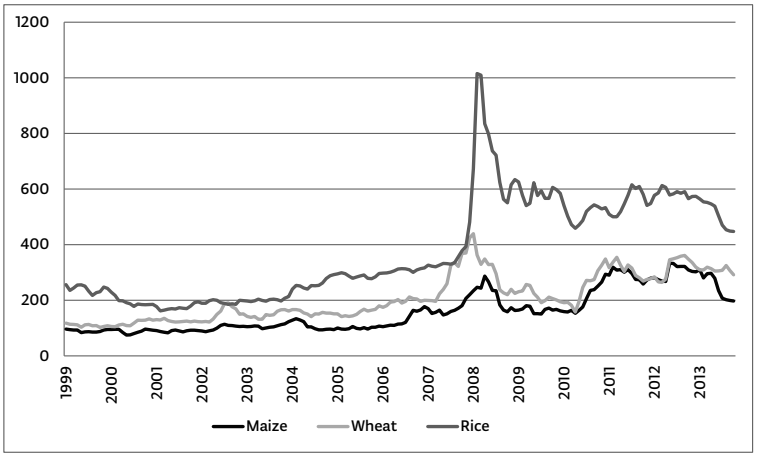
The process of financialization has over the last decades led to the profound changes in the pattern of capital accumulation. In the new regime of accumulation the relations between price, investment and production are under influence of the process of financialization, and that fact must

be taken into account if one is to understand the way nature and natural resources appear in the capitalist calculation. The term financialization refers to the rise of financial markets, institutions and motives, not only in size, but also in structural importance. For Palley the principal impacts of financialization are (1) elevation of the significance of the financial sector relative to the manufacturing sector, (2) transfer of income to activities based on finance and (3) increase in income inequality and contribution to wage stagnation. Moreover, financialization may in the period of decline put the economy at risk of debt deflation and prolonged recession (PALLEY 2007). On the level of non-financial firm financialization is related to "a pattern of accumulation in which profits accrue primarily through financial channels rather than through trade and commodity production." (KRIPPNER 2005, 175). Capitalist valuation of nature has always been saturated with ambiguities, which is not surprising given that nature is not a manufactured commodity and it therefore requires an elaborate social effort in order to appear in a commodity form. The link between financialization and capitalist valuation of nature can be most easily observed in the case of financialization of primary commodities (i.e. raw natural resources like oil, copper, iron, maize, corn, cocoa etc.). The focus on the financialized commodity markets does not imply that the traditional capitalist plundering of nature is gone out of fashion. On the contrary, in the new regime of accumulation old fashioned destruction and waste creation stand side by side with the new techniques of commodification. In synergy they bring the contradictory nature of capitalism to new heights with serious consequences for the ecosystem and the quality of human life. With massive capital inflows and rise in investment in these markets, movement toward a sustainable economy in which the fossil fuels would be kept in the ground and the protection of natural resources placed high on the political agenda, appears increasingly out of reach. Recent price boom in primary commodity markets that took place in the pre-crisis period, between 2002 and 2008 with the food prices reaching all-time high in early 2011 after temporary decline, clearly shows the adverse social impact that the financialization of food and energy may have on society (see figures 1A and 1B).

On the macroeconomic level, many of the developing countries that depend on imports have seen deterioration in their terms of trade as they are forced to spend a large proportion of their foreign exchange earnings on primary commodity imports (UNCTAD 2011). The price volatility can also have a negative impact on primary commodity exporters as the capital inflows give rise to currency appreciation which, in turn, undermines the position of domestic firms in their struggle to compete with foreign companies. In terms of social class, i.e. at the microeconomic level, excessive price volatility means that most vulnerable households, usually located at

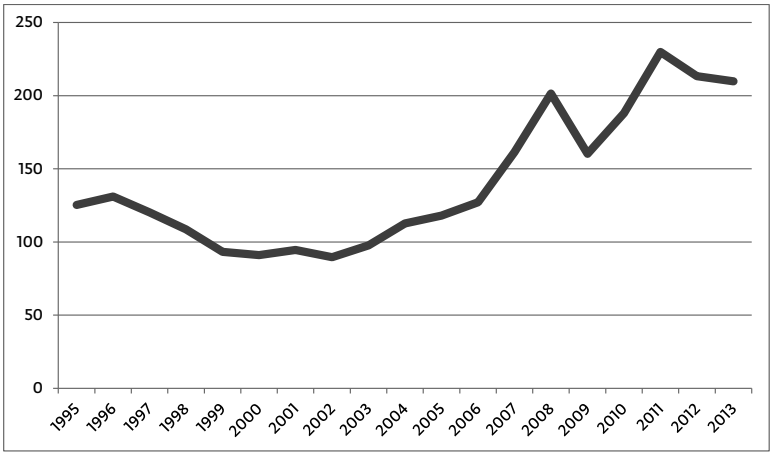
the bottom half of income distribution, will not be able to afford basic food and energy commodities. In fact, according to FAO report more than fifty countries had to confront a food crisis as the prices of commodities rose in the late 2000s (FAO 2008).

FIGURE 1A
Evolution of grain prices 2000-2013 (USD per ton);



SOURCE: *FAO database*

FIGURE 1B
FAO Food price index (nominal), 1995-2013;



SOURCE: *FAO database*

The poor in these countries have been hit not only through the price channel that forced them to switch to less nutritious food items, but also through the worsening of the fiscal position of the state since the public funds used to tackle the food crisis could not be used to improve health, education and other public systems (UNCTAD 2011). Global finance, armed with the opaque financial instruments and the ability of rapid movement of capital across national boundaries, can only fortify the existing competition between states and affirm the growth imperative in-built in the capitalist mode of production.

It is important to notice that the process of financialization uncovered forces that were always present in the capitalist mode of production. Therefore, the proliferation of new financial institutions and products should not be seen as a temporary deviation from the more moderate or less volatile capitalist development that one had a chance to observe during the Keynesian years. On the contrary, it is the class compromise, and the welfare state as its institutional expression that represents a deviation from the usual state of affairs in the history of capitalism. This point should be taken into account if one wishes to understand the predicaments of the contemporary environmental policy.

To cut the long story short, to be successful a radical environmental policy *must* influence the contemporary capitalist configurations in such a way that they deviate from the trajectory they would follow as a matter of course. In plain English, the institutional setting in which the motives and interests of developed and developing states are embedded revolves around the notion that economic growth has a paramount importance for social welfare on one hand, and accumulation of economic and political power on the other. The process of financialization is in the strict sense inherent to the growth imperative. Although we cannot go to great detail here, the reason for this can be traced back to the dual nature of credit as described in third volume of Capital. There Marx pointed out that credit accelerates the material development of the productive forces and the world market, but at the same time, inasmuch as it appears as the principal lever of overproduction and excessive speculation in the sphere of commerce, it also accelerates financial crisis that in the end can undermine the value created in the commodity production process. (For further discussion see ITOH and LAPAVITSAS 1999; TOPOROWSKI 1999).

Indeed, relatively high growth rates that the advanced capitalist countries have had in the decades after the Volcker shock[2] in comparison to

02 The decision of Paul Volcker, Chairman of the US Federal Reserve to raise interest rates in order to rid the US economy of inflation and strengthen the fast-falling dollar.

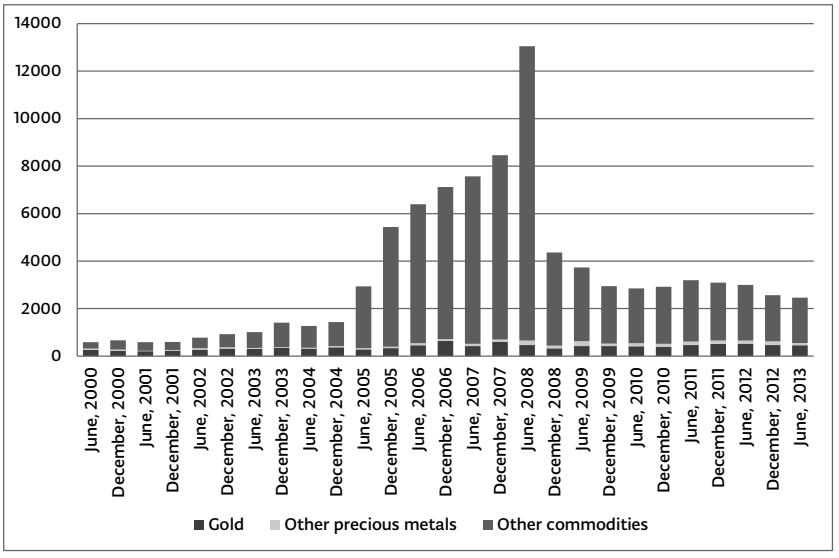
developing economies, can be to a large extent attributed to their ability to adjust their economic development to the new regime of accumulation and use the power of finance as a comparative advantage (VAROUFAKIS 2011; PANTICH and GINDIN, 2012) To make the relationship between capitalism and nature more transparent let us return to the issue of financialization of food and energy in the global commodity markets. The point is to develop a more complete understanding of the internal mechanics of financialization and to see again, from a different angle, the shortcomings of the allocation/scale demarcation.

Recent research in critical political economy suggests that the financialization of commodity markets represents the latest stage in the development of financialized capitalism. Wray argues that "commodities represent the latest asset class identified by money manager capitalism as ripe for financialization" (WRAY 2008, 9). The usual economic textbook story would tell us that the price volatility in commodity markets must be the result of supply and demand, and that any divergence from price fundamentals must be a consequence of an illegitimate intrusion into market mechanism.

However, the supply and demand explanation makes sense in the case of commodities as much as it makes sense in the case of the dot.com bubble or the housing price inflation that led to a global economic crisis after 2007. To understand why, one has to take into account that financial investors have been present in the commodity markets for a very long time. First commodity derivatives had the function to protect producers and buyers in commodity markets from the uncertainty inherent in the market game. Typical introductory story involves a wheat farmer and a flour miller. For both of them the price of wheat is of the upmost importance, and it is in their best interest to use commodity derivatives in order to circumvent the factors of uncertainty that can influence the price in the period between sowing time and harvest. A forward contract can help them to deal with the effects of uncertainty as they set out the terms for a future sale and delivery in advance of actual exchange of wheat (BRYAN and RAFFERTY 2006). By the same account, a futures contract allows investors "to buy or sell some standardised quantity and quality of a commodity, financial asset or index at some future date and place at a fixed price" (BRYAN and RAFFERTY 2006, 41).

However, in really existing capitalism the relationship between commodity derivatives and commodities cannot be assessed without taking into account the institutional and political changes that accelerate or impede market development.

FIGURE 2
Notional amount of outstanding OTC commodity derivatives (billions of USD)



SOURCE: *BIS Review, Statistical appendix*

Political pressures to deregulate, i.e. to regulate the market in the interest of major financial players surely represent a key feature of the recent economic history. De-regulation the commodity market finally paid off after the resignation in 1999 of Brooksley Born as the head of Commodities Futures Trading Commission (CFTC) and the enacting of new legislation, starting with the Commodities Futures Modernization Act which allowed that the over-the-counter (OTC) derivatives remain exempt from CFTC oversight. This opened the door, as Ghosh explains, for a variety of institutional investors to trade commodity futures contracts without any position limits, disclosure requirements, or regulatory oversight (GHOSH 2011, 53). Once it was understood that commodity prices do not exhibit correlation with returns of financial assets such as bonds or equities, it became rational for investors to hold commodities in their portfolio for the purpose of diversification and reduction of volatility (WRAY 2008). Of course, it is much more convenient to hold paper claims to commodities, rather than commodities themselves, and commodities futures were seen as a financial instrument that can provide all the benefits of investment in a commodity, without the trouble of dealing with the real thing (WRAY 2008, 22). Besides the new legislation which was designed to support deregulation of commodity markets, financial innovation also acted as facilitating factor through the setup of tracking

commodity indexes such as Standard and Poor's Goldman Sachs Commodity Index (S&P GSCI) (UNCTAD 2011). According to Masters and White, the commodities futures markets are a particular form of marketplace where two types of participants with quite different intentions and aims can be found side by side. On the one hand, hedgers are trying to access the market in order "to reduce the price risk of their underlying physical commodity business, while speculators trade in the markets to make maximum profits" (MASTERS and WHITE 2011, 11). Moreover, a new type of speculator emerged in the 2000s, after the Commodities Futures Modernization Act under the Clinton administration had been put in place. Index speculators such as hedge funds, pension funds, university endowments and other institutional investors use commodity futures in order, as was indicated above, to diversify their portfolio, and not because they would be interested in the underlying commodity (WRAY 2008, 6). Hence, they would simply buy one of the commodity futures index such as S&P GSCI or the Dow Jones AIGCI. As Wray makes clear, index speculators only take long positions, i.e. they buy commodity futures index in the anticipation of rising prices, and "because commodity futures contracts do not pay any yield, the only possible source of return is an increase in the price of contracts" which makes the purchase of commodity futures index "a fundamentally speculative activity" (WRAY 2008, 23). As these new financial players entered into the commodity exchanges, the corresponding proliferation of complex financial derivatives facilitated the transformation of natural resources into a type of asset. As a result, the value of unregulated OTC derivative market rose sharply. The Bank for International Settlements estimated that the value of outstanding OTC commodity-linked derivatives increased from around 5 trillion U.S. dollars in June 2006 to over 13 trillion U.S. dollars in June 2008 (BIS 2009).

This brief overview of recent developments in the financial markets reveals the inadequacy of the standard explanation, and the weaknesses surrounding the arbitrary division between allocation and scale. First, the institutional and political structures have a decisive impact, not only as factors that externally influence market outcomes, but, *prima facie*, as the determinants of the market game itself. Second, financialization, as the combined product of the proliferation of new financial institutions and instruments, and political efforts to deregulate the economy, should not be understood as some marginal supplement to the capitalist production process. It is, in fact, the core element of contemporary capitalism with often devastating consequences for the farmers and consumers in the developing countries where most of the basic commodities such as wheat, coffee or oil come from. Third, it is important to notice that the problem with the notion of *market as a mechanism for efficient allocation* goes beyond the simple lesson that "in capitalist societies employers seek to organize labour process in the most

profitable way, which does not need to be the most efficient" (BOWELS et al. 2005, 314). The point is that with the financialization of commodity markets the allocation of resources becomes dependent on price signals from the financial markets in contradiction to the standard theory in which fundamentals determine the spot prices, i.e., the supply and demand factors are presented as the causes of the price movement. As hedge fund manager Michael Masters succinctly put it in his testimony to the US Senate Committee: "In the present system, price changes for key agricultural and energy commodities originate in the futures markets and then are transmitted directly to the spot markets" (Masters as quoted in WRAY 2008, 31). Therefore, all the instability and volatility that is associated with financialization is instantly transmitted to the spot market[3], with the adverse effects for the small scale producers in developing countries, and clear distributional bias in terms of a new financial burden on the least well-off part of society.

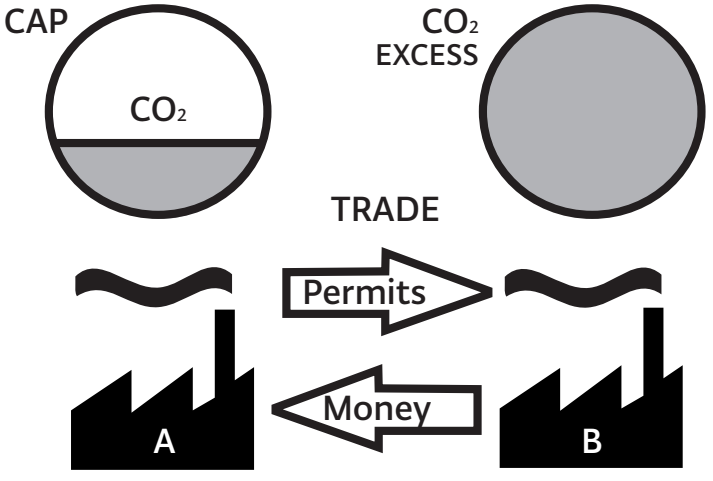
The discussion so far has indicated the extent to which the process of financialization changed the relationship between economy and nature. The commodification of food and energy on the background of rising power of finance capital has brought severe insecurity and volatility that leaves little room, as we have argued, for artificial division on allocative and scale aspects of the capitalist economic structure. Moreover, given the current state of play, it is almost impossible to produce a plausible political framework for the treatment of economic growth since the price system both on the level of allocation and scale acts as an obstacle to key questions of de-growth. Namely, if the latter is not meant to ossify the existing unequal relations between developed and developing countries, or between the rich and poor parts of society in a single country, use of natural resources, investment and production of food and energy must be set according to egalitarian principles. Global finance, armed with the opaque financial instruments and the ability of rapid movement of capital across national boundaries, prevents one from even starting to think about those issues in a coherent way, since the human needs and social justice do not appear at the level of allocation, nor the level of scale. Both allocation and scale are in the present regime of accumulation interrelated in such a way that brings about malnutrition in developing countries, obesity in developed countries, and fortifies the existing competition between states through the affirmation of the built-in growth imperative with little real concern for climate change and unsustainable waste production.

03 "The spot market or cash market is a public financial market, in which financial instruments or commodities are traded for immediate delivery. It contrasts with a futures market in which delivery is due at a later date." (Wikipedia definition http://en.wikipedia.org/wiki/Spot_market; accessed on 9th November, 2013)

Carbon markets: Targeting Carbon-Dioxide vs. Targeting Profits

To learn about uselessness of cap-and-trade and its connection to the world of finance one does not have to subscribe to Marxian theory nor read Capital. Perfectly good explanation can be found in the work of James Hansen, the leading scientist on climate issues. As he rightly points out, a nominal cap that corresponds to a limited number of certificates is nothing more than a tax. The "trade" factor simply means that a holder of the certificate doesn't have to use, but may sell it, instead. At that point, as Hansen explains, financialized capitalism kicks in: "There will be markets for these certificates on Wall Street and such places. And markets for derivatives. The biggest player is expected to be Goldman Sachs. Thousands of people will be employed in this trading business – the big boys, not the guy working for five dollars an hour. Are you wondering who will provide their income? Three guesses and the first two don't count. Yes, it's you – sorry about that. Their profits are also added to the fuel price" (HANSEN 2009, 213).

FIGURE 3
Simplified Cap and Trade Model



Still, it is true that from a Marxian perspective the development of carbon markets is closely related to the financialization of commodities. In fact, as Hansen said in passing, the commodification of nature is their common denominator. It is the task of Marxian theory to explain why the reduction of natural resources to the stock of productive assets is important for the dominant relations of production. By now it should be clear that "the scale of capitalist matter-energy throughput cannot be analytically divorced

from the system's allocation mechanism, that is, from market valuation" (BURKETT 2006, 169) – i.e. allocation and scale are interdependent. Similarities between carbon markets and markets for financial derivatives are not difficult to find. In a recent paper Lohmann listed the most important ones, namely, the close state – business relationship with the extreme dependence of regulators on the opinions of business figures, abstraction and subsumption of qualitative to quantitative relations, and radical disembedding (LOHMANN 2011, 87-90). Because of the revolving door between public and private sector, a system of legalized corruption has emerged in the carbon and financial derivatives markets alike, with the state "highly dependent on private sector judgements about how products should be regulated, and highly vulnerable to private sector lobbying regarding the commodity design" (ibid., 87). In addition to that, Lohmann makes a very important point with regard to the high presence of the financial sector in the carbon business. Notwithstanding the fact that financial players that were introduced in the discussion about commodity futures, such as Goldman Sachs or Barclays Capital, are also present in the carbon market, neither carbon markets nor financial derivatives markets function like a casino (ibid., 89). The casino metaphor is quite misleading since the business model in these markets cannot be related with the games of chance and the key process of radical disembedding, i.e., "disembedding the climate issue from the historical question of how to organize for structural, long-term change capable of keeping remaining fossil fuels in the ground" (ibid., 90), remains sealed under the weight of moralizing criticism.

Historically, the framework for carbon markets was first established through the Kyoto protocol in 1997, and it is still regarded as the key achievement of the international climate negotiations inasmuch as it set legally binding emissions targets for advanced capitalist countries (BÖHM et al. 2012, 4). Carbon trading or 'cap and trade' is a market-based solution which is designed with the purpose to function as a relief mechanism for the private sector, so that the implementation of climate policy can be based on cost-effective criteria. In other words, "the underlying assumption of this system is that emissions reduction can be achieved at the lowest possible cost by, first, quantifying the emissions that are caused by industrial activities; second, setting a cap on all GHG emissions; and, third, incentivizing companies and the entire industries on how to meet their caps in the cheapest possible way" (ibid., 4).

Now, the main problem with the carbon trading is that it doesn't work. Since the proposed aim is to achieve cost-effective GHG reductions there are no obligations to implement policies that will actually contribute to long-term environmental sustainability. In the centre of carbon trading is the one-size-fits-all assumption that makes cap-and-trade schemes blind

to the fundamental question about how reductions are made (LOHMANN 2010, 138). Inasmuch as carbon trading does not pay attention to what kind of industries are involved in buying and selling of carbon credits it can act as a vehicle for the prolongation of *status quo* as major polluters can keep their fossil fuel addiction by simply buying pollution permits. Indeed, a closer look at EU Emissions Trading System (EU-ETS), the world's largest cap-and-trade system, reveals that no reductions in emissions have been achieved. Neither the Kyoto Protocol, nor EU-ETS have managed to reduce GHG emissions, on the contrary, "[in the last ten years] the increase in atmospheric carbon-dioxide concentrations has accelerated to the fastest rate ever recorded and the global climate conditions have gone from bad to worse, as the worst-case IPCC projections (or even worse still) are being realized" (STORM 2009, 1013). These are, of course, only some of the contradictions associated with carbon trading, and we haven't exhausted them all. Other, equally important, schemes such as the Clean Development Mechanism (CDM), which is also part of the Kyoto Protocol framework, suffer from similar deficiencies. The CDM is a carbon offset market, designed to enable companies from advanced capitalist countries to buy carbon credits from the so-called clean development projects in the capitalist periphery (BÖHM et al. 2012, 5). On paper, the CDM would allow the advanced countries to meet the carbon emission caps with more flexibility and less difficulties, while stimulating "green and clean" projects in the less developed countries of the Global South. However, numerous authors on the Left have pointed to the contradictory nature of the CDM and argued that it provides shelter for corporate pollution, and does not make a contribution to the creation of a sustainable economy in the South in any meaningful sense. Cabello suggests that the CDM, as a keystone of the carbon market, pushes for the expansion of the capitalist agenda in two fundamental ways. The CDM, she argues, "allows the creation of the new financial markets, securing the conditions for accumulation and capitalist reproduction while allowing polluters to avoid making any real structural change", and it, furthermore, serves as an ideological legitimization of the on-going commodification of nature (CABELLO 2009, 192). Gilberson (2009), in her Thailand case study, reports that the majority of CDM projects are run by highly capitalized firms or agencies since only they have sufficient financial means "to hire expensive carbon consultants and accountants, liaise with officials and pay the fees needed for the UN registration. The result is the system that subsidizes some of the most polluting companies in the world" (GILBERSON 2009, 57). Along the same lines, the technology transfer that was enthusiastically projected to be an important side product of the CDM proved to be an illusion. Technology transfer, Lohmann writes, "[c]ontinues to carry the connotation, as it always has, of moving

Northern technology into a 'technology deprived' area in the South. In practice, this typically plays out in the degradation, skewing or destruction of one set of technologies in favour of another" (LOHMANN 2009, 1070). Admittedly, a lot more could be said about the corrupt and anti-ecological development of the CDM. The same goes for the voluntary offset market that has developed alongside CDM in order to enable companies and organization outside the formal Kyoto framework to buy carbon credits. However, to understand the contradictory nature of the CDM and the overall carbon offsetting business, it is necessary to historically situate the commodification of carbon within the relations of production in the period of financialized capitalism.

Böhm and Dabhi documented the expansion of the carbon offsetting business. In 2009 there were 1815 registered CDM projects producing more than 315,000,000 CERs[4] per annum, and it was projected that "it is to became a multi-billion dollar industry over the next few years, already attracting large market entrants, such as JP Morgan Chase, which recently bought the offset provider Climate Care" (BÖHM and DABHI 2009, 14). Unfortunately for the players involved, this marked-based solution for reducing the emissions of GHGs has another important feature, alongside the already mentioned flaws – it is fundamentally related to capitalism's boom and bust cycle. Not surprisingly, as the global economic crisis moved from the U.S. to Europe, bringing the Eurozone to the brink of disintegration, the repercussions were also felt in the global system of carbon trading. By 2012 the business press reported that the system of carbon trading had essentially collapsed (HARVEY 2012). Senior analyst at Thomson Reuters Point Carbon explained that "in Europe, prices plunged as it became clear that the EU's Emissions Trading Scheme (ETS) is over-allocated all the way to 2020, mainly due to the impact of Europe's economic troubles on emissions" (as quoted in MURRAY 2013). The Thomson Reuters report also confirmed that there are similar problems in CDM offset market, "where the value of the market crashed from 17.8 billion Euros in 2011 to just 6.1 billion Euros in 2012 despite an increase in traded volumes from 2,012 to 2,408Mt."(ibid.) The fears noted in the World Bank report prepared for the 2011 G20 summit, namely that "the carbon offset markets – and carbon market as a whole – now face major challenges as the value of transactions in the primary CDM market declined sharply in 2009 and further in 2010, amid chronic uncertainties about future mitigation targets and market mechanisms after 2012" (WORLD BANK 2011, 24), came true. From the Marxian perspective, the present crisis of the carbon market is just a temporary obstacle in the process of commodification of carbon, as the new market solutions will

04 Certified emissions reductions

inevitably arise. More generally, financialized capitalism demands, through "abstraction and commensuration", the transformation of nature into new asset class, i.e., a new form of capital. In that sense, financialization can be understood as a process that offers new possibilities for the accumulation of capital inasmuch as the growth imperative can now be served by enclosing natural resources through commodity form. Having said that, one must bear in mind that "the carbon prices flashing on electronic screens in trading rooms on Wall Street or in the City of London reflect a complex political movement to reorganize and redistribute knowledge and power" (LOHMANN 2009, 34). In other words, there is nothing natural or inevitable in the fact that carbon today comes in the commodity form. It is only a way of confronting the environmental crisis within a particular social order, the one in which knowledge claims put forward by market practitioners and supporters are given epistemic privilege on the assumption that market solutions are superior by definition. Thus, in this three-step waltz, first we are led to believe that neoclassical economic theory provides guiding principles in the realm of policy formation. In the second step, the blessings of real-world economics and politics are bestowed upon us. As Mirowski shrewdly indicated, "once the framework of permit trading is put into place, the full force of lobbying and financial innovation comes into play to flood the fledging market with excess permits, offsets, and other instruments, so that the nominal capon carbon emissions never actually stunts the growth of actual emissions." (MIROWSKI 2013, 339). In the final step, as we have identified the corrupt forces which had obstructed the market game, it is time to come back to the drawing board and devise a new market solution.

What is to be done?

In clear contrast to the never-ending story of market refinement, Marxian understanding of the present environmental crisis makes no illegitimate concessions for market solutions and takes limits to growth argument seriously. It does so because it is clear that nature, just like labor force, is not an infinite resource. In a nutshell, the final constraint of the exploitation of labor is set by human biology of each individual worker and, likewise, the limit for the exploitation of nature is set by the available quantity of low-entropy matter-energy. In that sense, the problem of growth is relevant inasmuch as the poverty and insecurity of the developing countries and material deprivation of those at the bottom of wealth and income distribution cannot be resolved without additional investment. However, the values of solidarity, sustainability and egalitarianism upon which the Left discourse has been built do not depend on perpetual growth. On the contrary, the critique of exploitation of labor and nature implies a commitment to de-

growth, as well as to change in the type and quality of produced output. There are two principal issues here: first, a need to end the plundering of natural resources, and second, to remove natural use values from market, i.e. exclude them from monetary valuation. Low growth rates are therefore the specific problem of the capitalist mode of production, and de-growth cannot even be considered as a possibility in a society in which firms are set to maximize their profits, consumers are set to maximize utility on the basis of their income, and governments win elections if national statistics show high growth rates. However, once it is understood that prosperity is not equal to growth and that the quality of life and the strength of democratic principles do not depend on perpetual growth, it becomes possible to think about economic structure based on democracy, sustainability and rational governance of common property. De-growth does not necessarily imply any decline of the quality of life. Contemporary capitalism, as we have seen, grows on the basis of extensive commodification of nature and its valuation in financial markets that has a lot to do with the process of financialized capital accumulation, and, hence, very little to do with improvement of quality of life. Throughout the history of capitalism the price of growth has been increasing misery of large parts of the population. That fact has often been overlooked because of the tendency to interpret the contradictions of capitalism in a biased and uncritical manner. Capitalism is a peculiar economic order in which the most devastating form of material and social deprivation appear in the midst of the most astonishing abundance created by the most developed productive forces. It is a type of economy in which human development and growth are inherently related to economic and environmental crisis. This ambivalence of growth was accentuated by Wilkinson and Pickett in their outstanding study, in which they demonstrate that material success comes with a price in terms of deterioration mental and physical health, and the proliferation of social dysfunctionalities. Their lesson that "greater equality is the material foundation on which better social relations are built (WILKINSON and PICKETT 2010, 272) corresponds well with the Marxian narrative that points to the need to resist the growth imperative and monetary valuation of nature mediated by the complex derivative products in financial markets. At this critical juncture, moving beyond capitalist relations of production is not a matter of utopian projection, but of most immediate political urgency. The warning issued by the scientific community about potentially devastating environmental, social and economic effects of climate change cannot be overstated. As Robert Watson, a former chair of the Intergovernmental Panel on Climate Change explains in detail: "Emissions at or above current rates could increase global mean surface temperatures by over 3, inducing changes in all components in the climate system, some of which would

be unprecedented in hundreds to thousands of years and many of which would persist for centuries. Changes would occur in all regions and would include land and ocean temperatures, the water cycle, the cryosphere, sea level, some extreme events and ocean acidification. This would reduce agricultural productivity, water quantity and quality in many parts of the world, undermine efforts to reduce poverty, displace large numbers of people, cause significant loses of biodiversity and degrade critical ecosystem services." (WATSON 2013, 42). Against this background, it is clear that the requirements for environmental sustainability overlap with requirements for solidarity and social justice. It is the task of the contemporary Left to bring them together in a coherent manner, and provide a blueprint for a sustainable and egalitarian alternative to capitalism. ●

4 What kind of economy does sustainable development require?

Dražen Šimleša

Introduction

The main goal of this text is to provide a survey of global literature concerning the growth imperative in economics, illustrating its connections to the situation and current practices in Croatia.

From the onset of the financial crisis at the end of the summer of 2007, discussions concerning the causes, consequences, and especially solutions to the crisis have been divided, moving in at least three directions. The first has been widely accepted by the majority of countries. On this view, savings and expenditures constrained by revenues, as well as deficit reduction at the end of each year are presented as an unquestioned mechanism for exiting the crisis, regardless of their consequences for society. The second approach anticipated using the crisis as an agent of change, as a crossroads from which we would ensure economic growth, but with the condition that we would reduce poverty, improve quality of life, and provide long-term protection, maintaining the planet's bio-capacity. This approach is best known as the concept of a *"Green New Deal"* and is promoted by so-called green circles, regardless of whether we are speaking about politics, civil society organisations, international organisations like the UN, interested business circles, the wider public, or media favouring the green cause. The third approach is the least represented and the least well-known, but it runs deepest and widest in its demands for change, for a *new paradigm*.

The reason why the third approach is less visible is that, regardless of the various authors and theoretical underpinnings from which they conduct their research and analyses, they all view economic growth as the ultimate value and goal of a society. Until recently it was primarily recognised by advocacy for and the promotion of localisation, from resource use to alternative currencies, and in recent years, although it is an unattractive name for a world that depends on growth, it is known as the concept of postgrowth

or even more precisely *degrowth*, which is defined as a socially sustainable and equitable reduction (and stabilisation) in society's throughput, where throughput denotes the materials and energy a society extracts, processes, transports and distributes to consume and return back to the environment as waste (CHARONIS 2012).

In this text we engage in a critique of the existing situation, including of the methods used to manage the crisis, as well as of other approaches, each of which in its own way re-examines the very foundations of economics and whose goal is the reordering of values and the manner in which society is organised. The first part of the work will present a critique of the existing system and economy using Robinson's concept (2004) of inherent crisis. Following this, the relationship between the economy and wealth, or prosperity in society and the influence of the dependency of the economy on two main unsustainable features – growth and debt – will be presented. At the end we try to provide an answer to the title question of this article: What kind of economy would really have as a purpose and goal the practical application of sustainable development? There is also a separate analysis of a Croatian position regarding all those questions and concepts.

We will try to present, regardless of whether we are speaking about the economic, social or ecological aspects of sustainable development, a holistic approach that seeks to construct a comprehensive picture before casting our glance in a specific direction. Peter M. Vitousek emphasizes how "humans are forcing qualitative and historical changes on the world that will alter the structure and function of Earth as a system. Hence, it is of utmost importance for the social sciences to take up these issues." We have written this article as a contribution to the idea of "the science of sustainability" or "systematic science," crucial to the understanding and analysis of a new vision and conceptualization of sustainability for the 21st century. (IUCN 2006B, 6).

Permanent crises

Although at the start it was announced as a win-win solution and one that could ensure minimum agreement for consensus regarding future trends in our society, sustainable development today is increasingly mentioned as a complicated model far removed from reality in which all social groups can express their commitment to it, even if they are not applying it at all. Today it is clear that a fundamental problem with sustainable development as one of the basic concepts of the transition from the 20th to the 21st century lies in its very foundations. Establishing the environment, society, and the economy as three overlapping dimensions, or the three supporting pillars, of sustainable development, has been shown to be an

unavoidable trap that appears before almost every concrete step toward a more sustainable and more just society. Right at the very beginning, the problem for sustainable development was that it was an attempt in which the three pillars that should bear its weight were understood to represent equally valid and powerful categories. However, in modern societies, the environment does not have the same level of political strength and acceptance as the economy, and each year, society is losing its capacity to facilitate a wish for continuous growth in the economy. Regarding this conceptual flaw, it is unsurprising that sustainable development has failed in practice.

The economy is a product of society and it does not exist in isolation from it. It must fulfil its function of facilitating the exchange of goods and services among members of a society. The economy emerges from society and it is subordinated to the interests of its members. The environment exists independently of both the economy and society (IUCN 2006A). Of course, society is not in a position to satisfy its interests if the situation in the environment is continuously deteriorating at an accelerating rate. This was also shown in a piece of ambitious global research by more than 1,000 scientists, the *Millennium Ecosystem Assessment* (2007), which concluded that we have already destroyed 15 of the 24 services of the global ecosystem due to their unsustainable use and an unsustainable approach. Some authors are stressing that we have already reached, or that we are approaching, peak use for the majority of the most important resources (HEINBERG 2007).

We can further add that the aforementioned research has led to an even further-reaching conclusion, which states that if the conditions within ecosystems are destroyed to a level whereby they cannot carry out their services, then in those areas society is not in a position to provide security, to satisfy basic human needs, and to ensure adequate health and social connections. More briefly stated, in the long-term there is no well-being in society or a high quality of life without sustainable ecosystems. Modern civilization overlooks this and behaves as if the status of the economy is a condition for everything and that everything is subordinated to the goal of continuous linear economic growth. In this work we will show why such an out-of-balance situation is the chief cause of all crises, and the cause of a situation in which the environment has been damaged, the cause of the deteriorating situation in most global ecosystems, while the economy has not succeeded in improving quality of life in a satisfying and equitable manner for most of Earth's population.

In other words, to approach the problem from another angle, we want to investigate whether it is possible for the economy to support sustainable development, and to uncover what kind of economy this would be, serving the needs of society and the sustainable management of the en-

vironment. In 2006, the IUCN, one of the largest global organizations for the preservation of the environment, organized a forum on the future of sustainable development in which several hundred participants took part via the Internet. One of the key conclusions in terms of our work was that:

> "Participants critiqued the traditional three-pillar model of sustainable development and referred to new models which conceptualize ecosystems as the foundation stone or life support systems of the economy and society." (IUCN 2006B, VII). So, for the purpose of this work we consider sustainable development only as a process of "improving the quality of human life while living within the carrying capacity of supporting eco-systems." (IUCN, UNEP and WWF 1991).

The damage to relationships between the environment, society, and the economy have never been clearer than today. And those relationships have become especially vivid since the summer of 2007, following the beginning of the global financial and economic crisis. Many people expected that the crisis would be used as an opportunity for a new beginning. Yet the disproportion between the three supporting pillars of sustainable development – the environment, the economy, and society – only became greater and deeper. Thus, as recently as at the end of 2008, an incredible seven billion dollars was invested in the troubled banks, and this was not the last attempt to "rescue" the economy in this way (JACKSON 2009C). The money was being given exactly to those banks that were responsible for the crisis because they had pumped up the balloon of demand and credit, turning around the same amount of money several times and betting on their uninterrupted growth and success. Governments had decided that the best solution to the crisis would be to reward those who created it at the expense of taxpayers, who are the least responsible for it. Furthermore, by this act they have, with regard to today's monetary and fiscal regulations, about which more will be said later, increased public debt and made dependents of future generations, increased unemployment (because banks do not wish to invest in times of crisis), and decided to compensate all of that spending in a way that reduces a taxpayer's right to and his or her contributions to social needs, education, health, and other things that are the foundation of the quality of life in any society.

We have already emphasized that this imbalance, or crisis, is to be found in the foundations of the system itself. Although before the global financial crisis became apparent to everyone and achieved its full breadth and scope, this internal instability and the inclination to a perpetual return to crisis, was best observed in the book *A Theory of Global Capitalism* by William Robinson (2004) as several smaller crises within a larger one that encompassed

all of them. Robinson emphasizes that the crisis of capitalism in the 21st century can be viewed in the following aspects or four smaller crises:

1. Overproduction or underconsumption (overaccumulation)
2. Global social polarization.
3. The crisis of state legitimacy and political authority.
4. The crisis of sustainability.

Let us examine each of the above in the context of their importance to our society and the planet.

1. Overproduction or underconsumption (overaccumulation)

Although the messages of mainstream politics and economics emphasise the need for a growth in production and a growth in consumption, and with that the growth of the economy, from the point of sustainability there is a need to slow down, and to change the direction of our development.

At present, we can speak of too large a quantity of production that is being offered to consumers by convincing them that they need those products. There are two publicly known techniques in industrial design that support such unsustainability: planned obsolescence, which mandates placing low-quality products on the market whose lifespan has been intentionally shortened and which cannot be repaired so that we quickly need new products; and perceived obsolescence, whereby we are constantly being convinced that we must have the latest possible product, otherwise we have devalued as people, regardless of whether, for example, our clothing, mobile phone, car or some other device is still functioning well. A problem arises because in this kind of economic system the majority of people never have enough money to buy everything that they think, or are convinced, that they need and so they go deeper into debt. Most of these same people will never be able to break this vicious circle of debt, which leads to a situation of complete dependence on further indebtedness with increasingly risky and dangerous consequences.

We can follow the consequences for the planet itself through the excessive exploitation and destruction at the beginning of this circle, and at the end by the weaker global ecosystems that cannot support this quantity of waste and consumption. As long as it creates the possibility of making a profit and the circulation of money, this economic system will recognize it as beneficial.

The problem with the capitalist system is the need for a never-ending increase in consumption. An even greater problem, as Robinson notices when he speaks about the internal contradictions of capitalism, is that "society is unable to consume the wealth it has created given the nature of capital-

ist relations" (2004, 148). These contradictions ease, or are less apparent, so long as it is possible to raise money and new credit, or as long as new markets can be found that will purchase a surplus. But the moment when this linear direction is disrupted, consumption is reduced and we are in crisis. This is why we can monitor the transition from hyper-production and excessive consumption to a reduction in consumption and overaccumulation.

2. The increasingly large gap between the rich and the poor

Whenever we have overaccumulation we have a blockage in society because an excessively large amount of amassed resources stand in the accounts of the wealthier layer of society and if they do not see an opportunity for a return on their investments, it is safer and better for them to keep their money in the bank and earn interest on their savings. Every new economic crisis, including the current one that began in 2007, always works to the detriment of those who have less, creating an even greater gap between the wealthy and the poor. We can note such trends in almost every country in the world, regardless of which group of countries we may belong to – the developed countries, those with a "fast-growing economy," or any other kind of development.

A society that is increasingly differentiated becomes a society that does not communicate and a society whose citizens are isolated from one another. When there is no communication and we are all mere individuals, or consumers, fear and enmity among the population increases. And where there is fear there is no trust, and without trust there is no sustainable development. The British researchers Richard Wilkinson and Kate Pickett (2010) have demonstrated this many times, bringing their findings together in the book, *The Spirit Level – Why More Equal Societies Almost Always Do Better.* Using the example of developed countries from the Organization for Economic Cooperation and Development (OECD), they showed how countries that have greater inequalities within their society have more problems with a whole range of social categories: the level of trust, mental illness (including alcoholism and drug dependency), lifespan and infant mortality, obesity, education, the teenage pregnancy rate, the murder rate, the percentage of the population in prison, and social mobility. Following Wilkinson and Pickett, many other authors began to gather information on the huge disproportions in society and the cost of inequality (DORLING 2012; LANSLEY 2012; STIGLITZ 2013).

Although the poor in societies with less economic inequality may also have health and social problems, in societies that have a higher rate of inequality, these problems affect more citizens. In this way, Wilkinson and Pickett showed that the level of economic inequality in a country also de-

termines the quality of life, and we might say the level of happiness in that country. Societies that exhibit growth in economic inequality and feelings of isolation and dissatisfaction are "dysfunctional societies" (WILLKINSON and PICKETT 2010).

3. Declining confidence in the system of democracy and political authority

The third crisis is a consequence of the previous two. It is logical that a society that cannot ensure happiness and satisfaction, or one in which happiness and satisfaction are achieved primarily through shopping and consumption, leads to a system in which a feeling of discontent prevails because something is always missing and our happiness is constantly slipping away, even though we have the feeling that it is within our grasp. Hyperproduction creates hyperneurosis. This is what the Slovenian theoretician Renata Salecl (2013) calls the greatest success of capitalism – the fact that regardless of the sheer number of choices, people are filled with a sense of dissatisfaction, auto-destruction, and an obsession with themselves and with an individualised life.

The foundation of democracy is that the people govern. However, today people do not have a sense that they are governing, but that they have been dragged into a show of political-media-corporate juggling of attitudes and values. It is logical that a feeling of powerlessness, apathy, and distrust is appearing. The problem is that today this feeling has reached the level of "cultural pathology" – a deeply rooted belief that those in authority are trying to deceive us (BREWER 2009).

Of course, this fear did not appear by itself and data from the largest global public opinion polling agencies show the level of that apathy and distrust is increasing, alongside declining confidence in politics, as well as in the opportunity for and the purpose of political activity (on an equal basis), and especially in representative democracy as it functions today. "Trust," political scientist Eric Uslaner has written, "is the chicken soup of social life" (WIKE 2008). On a global level, 46% of people state that "they do not believe that politicians in power ever speak the truth (*THE ECONOMIST* 2012). Of course, the connection between a low level of trust and a high level of corruption and crime can be even more clearly emphasised.

4. The destruction of ecosystems and the foundations of sustainability

Despite the omnipresence of sustainable development in public life, the increased number of protected areas, a greater awareness of the need to protect the environment and the importance of natural resources for our fu-

ture, we have not succeeded at the global level in reducing the destruction of ecosystems and in increasing sustainability compared to the resources that we are taking from nature.

In 2008, the ecological footprint, as an indicator of human influence on the planet, or rather of the level of our consumption, was 50% greater than the biocapacity of the planet, i.e. the biological resources that the planet offers us. That year, the ecological footprint amounted to 2.7 gha (global hectares) per person and the biocapacity limit demanded that we reduce our consumption to 1.8 gha. This means that at a global level we were living with a deficit of 0.9 gha, that is to say, our planet would need one year and five months to compensate for and absorb everything that we consumed that year (WWF and GFN 2012). It is interesting to note that we are in debt to the planet in the same way that we are in debt in strict economic terms.

The level of our capabilities and power to influence the environment and our planet is unparalleled in history. When all of the harmful acts against the environment and the problems of the planet are counted, many observers emphasise that we ought to speak of life on a new, different planet, one on which it will be more difficult to live (MCKIBBEN 2010; FOSTER, CLARK and YORK 2010; HEINBERG 2011). Immanuel Wallerstein has concluded that "historical capitalism is in fact in crisis precisely because it cannot find reasonable solutions to its current dilemmas, of which the inability to contain ecological destruction is a major one, if not the only one" (SPETH 2008, 185).

For the purposes of this work, it is interesting to emphasise the fact that all four of these smaller crises came into existence through the power, rules, and values of the financial sector and the global economy. And the situation in which that financial sector and the economy now find themselves, i.e. caught up in their own crises, further worsens and complicates the situation over the course of these smaller crises. This complication is, in fact, one of the main determinants of the financial-economic system so that fewer people understand what is going on. The extent to which the general confidence and attitude that, despite all the problems discussed and criticisms made, there was no alternative to the prevailing financial-economic system and that it was the only one in which we can believe, was widespread is shown in an analysis carried out by the Dutch academic Dirk Bezemer on a variety of scientific and media texts before the crisis. He found that only twelve people predicted the crisis with supporting arguments and explanations (KEEN 2011).

Although not cited as one of the twelve, Tim Jackson's seminal book, *Prosperity without Growth* (2009C), was extremely important in the period after the crisis and continues to be so for the topic of our work. The book received an incredible amount of publicity and recognition; it has been translated into fourteen languages, and was downloaded for free from the

Internet page of the Sustainable Development Commission (SDC) more than any other previous report. There are many reasons for this kind of success; one of them is, of course, good timing. This is a period when the concept of growth and the general rules and values of economic theory and practice are starting to be questioned. At the same time, some member countries of the European Union (EU), such as Austria, Great Britain, and France, have established expert bodies that have analysed the possibility of sustainable development and have called into question the use of GDP as a measure of progress on the part of some countries (WUPPERTAL INSTITUTE FOR CLIMATE, ENVIRONMENT AND ENERGY 2010). And in 2009, the European Commission itself announced its own development plan, unconnected with GDP (COM 2009). But it is even more important that Jackson succeeded in posing two mutually related and critical questions:

1. Is it possible to achieve prosperity in society without growth?
   or, more precisely:
2. How to separate prosperity from growth in a society in which prosperity depends on growth?

The basic problem is the structure and foundation of today's economy itself. The economy is designed so that it depends on a continuous increase in consumption, and accordingly, on the gross domestic product (GDP). If GDP does not grow each year by a certain amount, the system reacts negatively and we approach a crisis situation. We can say that if there is no economic growth, most incomes goes down, the government reduces its contributions, consumption declines, unemployment increases, the costs of investing increase, and the spiral of recession begins.

This is also one of the basic arguments of those who approved of the prevailing method of resolving the crisis, which, as we stated earlier, is by pumping incredible amounts of taxpayers' money into the restoration of failing banks and investment funds. The reason for this justification was extremely prosaic, and follows the attitude that a certain part of the financial sector and market is too important to today's economies and societies, that if something bad were to happen to that sector it would automatically have an effect on the rest of the economy, or on other areas of society. The mantra, "too big to fail," which was used to justify the rescue of those companies most responsible for the crisis – the major financial conglomerates on Wall Street – achieved its ideal goal: the possibility of blackmailing all of society because of the prevailing proportions that they had attained. Or as Jackson himself pointed out when considering the questions posed: "Growth may be unsustainable, but de-growth appears to be unstable" (2009C, 10).

In the United States it was manifested by paraphrasing the well-known slogan that it was necessary to help Main Street (the true, real economy

– industry – the employment of people) and not Wall Street (the large financial corporations that created the mechanisms for creating the crisis), with the message that Wall Street was the engine that moves Main Street and that the stability and health of the global economy, and society itself, would be impossible without this type of financial sector.

There is no doubt that economic growth has saved millions of people from poverty and has provided them with a more dignified life, which, as we said at the beginning, is one of the basic roles of the economy in society. But today, the question is increasingly being asked of whether this method of providing prosperity has reached its peak because the costs of maintaining it have become too high, and day by day, limitations on the spread of prosperity on a global level are ever more present. Even the United Nations, which is always positively oriented towards economic growth, in one of its most recent publications of the Report on Social Development (UNDP 2010) pointed out that there are more countries, especially poor ones, that are making progress in social development, but only because of investment in health and education, and not in economic growth as a category of the Human Development Index (HDI). Other research has also shown to a certain extent the importance of economic growth to quality of life, after which other indicators influence prosperity, feelings of satisfaction and general welfare in society (SPETH 2008; WUPPERTAL INSTITUTE FOR CLIMATE, ENVIRONMENT AND ENERGY 2010; HEINBERG 2011).

When a society reaches a certain level of economic prosperity, approximately 10-15,000 dollars per year per capita, variables such as relations with others, the safety of a local community, free time, health, etc. have more influence on further growth in the feeling of happiness and satisfaction with their own life than on further growth in earnings (WILKINSON and PICKETT 2009). This new realisation has resulted in more frequent research being conducted on the use of different indicators that would show prosperity in its entirety and not only in regard to the circulation of money and consumption as GDP does.

Although related, this topic is separate and too large for the scope of our work and we do not have enough space to enter more deeply into the area of alternative development indicators that applied around the world. We will only add that the Wuppertal Institute for Climate, Environment and Energy published *Towards Sustainable Development – Alternatives to GDP in Measuring Progress* (2010), which is to date the most extensive and systematic review of indicators besides GDP that measure quality of life and social progress in some countries;, after analyzing them, presented them with their main characteristics, advantages, and shortcomings. These indicators included: the Genuine Progress Indicator (GPI), Index of Sustainable Economic Welfare (ISEW), Genuine Savings, Human Development Index

(HDI), Ecological Footprint, Happy Planet Index (HPI), Sustainable Development Indicators (SDI), and many others. All of these indicators have experienced a renaissance in popularity after 2008, especially in scientific circles, which are trying to replace and expand in a more precise and empirically based fashion what the classification of countries based on GDP provides.

Always dependent

The end of the latest global financial crisis cannot really be discerned if we follow Robinson's concept of a crisis of the system with which we began this work. Heinberg (2011) emphasised that the economic growth to which we have become accustomed will never return, although short periods of economic upswings spurred by higher sales and consumption are possible, yet in the long-term he thinks we are entering an era without growth. An increasing number of writers are now looking not only at the global economy but at the entire structure of our civilization as a system in which crisis is inherent and constantly self-generating without end.

Although it has already been remarked in this work, we must now explain in greater detail the inherent crisis situation in the global economy, and in capitalism, with regard to its dependency on economic growth and debt:

THE DEPENDENCE ON GROWTH

We have already mentioned how the manifestation and rise of the promotion of 'economic growth' has clearly initiated new discussions, analyses and research related to the relationship between the economy and quality of life. We can also monitor the first appearance of new concepts, the accompanying literature, and the public events that have inquired into and criticised the concept of economic growth as such. Although we also had such paradigmatic shifts earlier, from the most well-known – *The Limits to Growth* (1972) – by the Club of Rome, and the joint work of William Nordhaus and James Tobin: *Is Growth Obsolete?* (1972); such attempts for the majority of the public and society as a whole were premature and very quickly forgotten, after which there were cyclical phases of prosperity and increased consumption. Today, this shift is being led by a large group of authors, from the programmatic *Farewell to Growth* (2013) by Serge Latouche to the already-mentioned *The End of Growth* (2011) by Richard Heinberg.

Some other scientists, activists, politicians, and the public are trying to separate this dependence on growth from resources and the ecosystem by separating the growth of energy and resource consumption from GDP growth. Decoupling, or separation, would ensure future economic growth

without an increase in size of the ecological footprint. In 2002, the OECD emphasized that decoupling should find a solution to separate "economic goods" from "environmental bads." This approach for the continued insistence on the need for growth found its place in the new concept of a "Green New Deal," or ideas for basing future growth on employment in clean industries, renewable energy sources, energy efficiency, waste management, and a generally green economy. This concept would maintain the level of economic growth necessary for prosperity and social peace, ensure employment in new professions, and reduce pressure on the planet and ecosystem thanks to lower consumption rates via the use of green technologies. It calls for a "green engine of growth" (JACKSON 2009C).

The United Nations Environment Program (UNEP), the institution that most energetically promotes the green new deal, stressed that a green economy is a winning combination that is simultaneously "pro-growth, pro-jobs and pro-poor," and an economy that results in "an improvement in the quality of life and social equality, and which significantly reduces the exhaustion of and risk to the environment (UNEP 2011, 16). The special driving force here should be renewable energy sources, which in 2011, directly or indirectly, employed 5.7 million people (REN21 2013). Global investment in 2011 grew by 17 percent compared to the previous year to a total amount of 257 billion dollars, which was a new record. Perhaps even more importantly, renewable energy sources in that year accounted for 44 percent of all new generation capacity (UNEP 2012). All of these developments are most welcome, but they only reveal part of the picture, and we have already stated at the beginning that our goal is to provide a comprehensive and holistic consideration of the relationship between the economy and sustainable development.

The problem is that today we might be facing a "relative decoupling," or the ability of technology to produce more with less consumption and less use of resources. We have a whole range of energy efficient technological solutions and there is no disputing the outcome of a reduction of energy intensity in highly developed and wealthy societies. We have already written about this elsewhere (ŠIMLEŠA 2011), so we will only reiterate the facts provided by the data that show how, since the 1970s, energy intensity – by which we mean how much energy we need to expend in order to achieve a certain level of GDP – has declined by 33 percent, especially in the wealthier countries. Since 1990, it has fallen every year by 0.7 percent. Despite this, since the1970s, CO_2 emissions have increased by 70 percent, and since the 1990s by 40 percent, because of an overall increase in energy consumption. Stabilising emissions requires an annual reduction in emissions of 4.9 percent (we now have growth at the level of 3 percent), and the index of energy intensity should be declining by at least ten times more than it

does at present. This means that despite energy efficiency, consumption is growing, as is the pressure on and exploitation of the ecosystem.

The term "rebound effect" (POLIMENI et al. 2008) summarises this and what is interesting is that in the UNEP plan for green development only half a page out of a total of 626 is devoted to this, although the report points out that in Western developed countries there is a parallel process as concerns the introduction of energy efficient devices or technology and growth in consumption, greenhouse gas emissions, and ecological footprint.

That is why it is a mistake to approach this problem only as a technological one and not also as a political-economic or evolutionary one, because countries with the greatest efficiency are those that use the greatest amount of natural resources (FOSTER, CLARK and YORK 2011).

We have not succeeded in attaining "absolute decoupling" or an overall reduction of the resource footprint only because in that situation this kind of global economy would not exist. Together with the accepted externalization of costs as a legitimate form of operation by global business and political elites (HEINBERG 2011), dependence on growth is woven into the very foundation, into the heart, into the bloodstream of the global economy. The problem, of course, is that this is unsustainable. Today, it does not pay to invest in savings or in an efficient design that would reduce absolute consumption, nor does it pay off economically to aim for a sustainable lifestyle directly, for that would really reduce economic growth, and the importance of growth is unquestionable.

That is why it should not surprise us that according to data from the Institut für Weltwirtschaft of the University of Kiel, only 13 % of the total global amount invested in economic recovery and labelled *green economy* was invested so as to result in the reduction of carbon dioxide emissions. These actual investments in absolute decoupling were so insignificant that they resulted in a reduction of only 0.5 percent of potential global emissions (WUPPERTAL INSTITUTE 2009). Also, proponents of the "Green New Deal" predict that the growth of investments in renewable energy (RE) or energy efficiency depends on the growth of the general, if not to say the "dirty," economy, so the media have rushed to announce the news of the decline in investments in RE by 11 percent in 2012 compared to the previous year because of the worsening crisis in the United States and the EU and the continued reductions in subsidies for green technologies (*THE GUARDIAN* 2013). In this sense, we should also be aware of the various types of developmental support that policy directs – for example, there are 300 billion dollars in annual investments for all of RE, but use of fossil fuels alone is being subsidized at the level of 650 billion dollars per year at a global level.

The Wuppertal Institute has drafted a report, *A Green New Deal for Europe*, where it was concluded that "support to eco-industries is not enough because even green economic growth can be damaging if it only contributes to an increase in already unsustainable high levels of consumption of natural resources" (2009, 12) and that we need more than a technological platform for "eco-industries;" we need structural changes at all levels of society.

THE DEPENDENCE ON DEBT

Dependence on debt is linked to a dependence on a belief in the need for ever increasing economic growth. The global economy is dependent upon the creation of new credit. The accumulation and growth of debt that today has reached unsustainable levels, means that it is now impossible to repay. The problem that emerges has likely grown as the process is this completely intangible. It is played out on computer screens and electronically stored, yet has a serious effect on the real economy and peoples' lives.

We do not have space here to delve deeper into a review of the emergence of the fractional reserve system upon which the current banking system of debt production rests, but with regard to what has been said until now, we deserve an explanation as to why it is impossible to get out of debt.

Economic growth depends on cheap loans and an increase in overall debt, and for us as consumers this provides the possibility to buy greater quantities of goods and services. The entire story is based on an unsustainable system of interest, and that is why today there is always more debt than there is money to pay for it (KENNEDY 2011). This is often neglected, because as individuals if we are lucky and/or able to, we can get out of debt, or a country might get out of debt if it engages in the massive production of goods or services that the world wants and thus make a huge profit in a short period of time. But here we forget that on the other side of the seesaw there is always someone or some country that had to go into debt in order to be able to buy the offered and desired good or service.

Ninety-seven percent of today's money has been created as debt, from the users' perspective, as a credit that the user promises to pay back with added interest. What is concerning is that private institutions – banks – are creating that debt and entire countries can be in debt to them. Of even greater concern is the fact that the banks themselves are not holding that money (BROWN 2010). There is virtually no limit to lending as long as there is some confidence that the credit will be paid back. In the real world we do not accept a promise from someone when they offer to lend us something that they actually do not have. Banks would not be able to do this without policy support.

The only way that we can settle a debt is to convert more of our life into tangible objects, or by borrowing even more. This is why debt is always larger than the amount of money that is available; the creation of money in essence always generates the creation of more debt. For an economy, everything is fine when the growth in interest can follow economic growth by converting more of one's life into tangible objects and their sale on the market. Possible social, ecological, and other consequences of this are omitted in such an analysis. In economics these are known as boom years. But even during those years, debt is almost always growing. We simply do not worry about growing debt because the economy is also growing (EISENSTEIN 2011).

Today, we are in crisis because there are fewer natural, social, cultural, spiritual, and other types of capital to transform into goods. Or at least there is not a large enough amount as today's economy requires.

Oliver Tickell (2013) explains that the banks are provoking the crisis via their "normal" business operations, so that we ignore other causes. In good years credit is cheap and optimism reigns, regardless of the fact that it is not founded on anything real. This is how it was in the years before the crisis; getting credit was not a problem. In bad years, those of so-called "belt tightening," banks behaved completely differently and became very selective in determining who is worthy of receiving credit. Since everyone took on debt during the good years, and they went into debt cheaply and easily, following the crisis citizens and businesses were unable to go further without incurring new debt, and if the crisis turns out to be long and serious, like the current one, such people would declare bankruptcy, leading to further crises in the property sector and others, whereby those who cannot survive the bad years are left with nothing. When the financial crisis also spills over into what we call real economy, we come to a reduction in consumption; a fear of the future emerges and unemployment increases, so that many everyday people have an even more difficult time paying back what once seemed to be easy credit. Money is then transformed into a scarce resource, even though there is enough of it, those who control it do not want to put it into circulation, and in that way they raise money's value and power, and also theirs as its owners.

Classical economics explains crises as part of the normal and almost natural cyclical movement between good and bad years, as if nothing structural or in the social sphere occurs as a result of these crises. The wealthy always come out of a crisis even wealthier, in the sense of ownership. They are then the only ones who have enough money to buy real estate, companies, etc. whose value has declined.

How can we achieve a sustainable economy?

Now we will turn to answer the main topic of the paper, i.e. the question posed in the title of the paper.

From everything written so far, it should be clear that creating a sustainable economy means creating a completely different kind of economy; deep reforms in the economic sector are also a condition for change as regards the environment, social justice, solidarity and equality, alongside social participation in political decision making by all citizens. It is also clear that it will also be necessary to change the manner in which money functions and is created if we want to apply and live by sustainable principles. In his latest book, Bernard Lietaer (2013), one of the most well-known and active authors in the field of alternative economics says that we must "rethink money" in order to move from resources that are scarce to resources that ensure prosperity and well-being.

Heinberg (2011, 237) cites the economic historian Niall Ferguson of Harvard, who states that states have six options at their disposal to resolve a debt crisis:

1. increasing the rate of GDP
2. reducing interest rates
3. offering bailout
4. accepting fiscal pain – reductions in benefits and standard of living
5. injecting more money into the economy
6. accepting defaults, including every type of non-compliance with the original terms of the debt contract.

As a proponent of "the end of growth," Heinberg emphasizes that in the long term we can immediately ignore the first option. In many highly consumer-oriented countries interest rates are already at record lows, so this does not help. As debt grows, the third option is more expensive and less effective. The fourth option is now occurring, but not only does it fail to reduce debt, it also destroys social cohesion and increases poverty. The fifth option is an option only for the United States, which can recycle dollars at the global level, but this is not sustainable in the long term. The conventional wisdom is that the sixth option, if widely applied, would lead to a collapse of the monetary-financial system.

However, Heinberg states that the last two options should be considered in a post-growth economy. It is necessary to implement a kind of organised and structured "debt jubilee" because the total debt is impossible to repay and its existence is a burden to all of society and is dragging down the quality of life of hundreds of millions of people.

As a second solution, a government itself should undertake to print money that is free from debt for strategic investment, public works, and generally those areas and sectors that benefit everyone.

None of these options is without its shortcomings and risks, but they are the only options that can ease the transition. Of course, the greatest fear is of unstoppable inflation if a government begins to print money, but Brown (2009) emphasises that this is a realistic option only if there is neither production nor work. Today, there is demand, but there is no offer because the banks do not want to lend money. There is no money because it is better, more fruitful and safer to hold it in the banks.

Both of these decisions lead to reduced economic activity, which the world has before it anyway, but they will at least mitigate the terrifying combination of recession and increased debt. Of course, a law should be enacted that all property below a certain size should be protected from repossession. Debt above some limit should be reduced by simply removing one zero. Such a proposal is controversial, painful, and confusing because it would rearrange relations in the economic field. But, according to Brown, such a process would allow us to take advantage of the crisis to transform the economy into one that is sustainable and resilient. In any case, the printing of money should be returned to the government; one without the other will not work. Douhtwaite (HEINBERG 2011) states that we should also reward those who are currently not in debt or those whose savings will be reduced, so that once the available money is shared out equally to everyone they end up in a slightly better position. Everyone should accept that with a deepening of the crisis their money would lose its value anyway in the long term.

We can find such proposals among all proponents of deep economic reforms: the previously mentioned Ellen Brown (2010), the economics think tank New Economics Foundation (NEF 2008; 2009), Thomas Greco (2010) and many others. In addition to the government printing money free from debt and a global jubilee day, they cite the following necessary measures and activities for a more sustainable and more just economy and society:

- abolishing the fractional reserve system, or the ability of banks to lend money that they do not have;
- strong taxing or at least greater supervision over the entire stock speculation mechanism and the models of business operations that have transformed the financial sector into a casino;
- separating the banking sector, in which are deposited salaries, pensions, and savings, from the investment, which risks their value;
- media reforms to reduce the influence of the private sector on the democratic process and elections;

- the establishment of local and regional banks on the model of the Bank of North Dakota, which is owned by the state government and whose primary goal is to support local entrepreneurship and farmers so that they do not fall into the slavery of indebtedness.

The economist Peter Victor has perhaps gone the farthest in his criticism of the existing economic system, the foundations upon which its rests, and the manner in which it functions. In his book *Managing Without Growth* (2008) he stated a direct and concrete proposal for Canada to reduce its dependence on economic growth with an increase in employment and the quality of life over a period of thirty years. The changes that Victor is proposing relate to the investment sector in which the role of the government is strengthened, a more just and general tax system, the establishment of an equitable and realistic taxation of greenhouse gas emissions, and discouraging consumerism of the kind "buying for buying's sake". Nevertheless, his major proposals are in the area of the labour market – a reduction in the length of the working week and in the number of working hours.

This also involves the globalisation of these localised solutions, so there are a series of proposals for the creation of a system for the exchange of national currencies according to an agreed upon index of standardised prices or on an agreed upon "basket" of products and their value (GRECO 2009; BROWN 2010; LIATAER 2013).

With this approach and solutions, the economy would become one of the pillars of sustainable development.

A post-growth Croatia?

We are now in a position to pose a fundamental question concerning Croatia's position in relation to the topic of this paper. Croatia as a state is an example of a state in a dependent position as concerns economic growth and debt – the primary basis of our criticism of the global economy in our work. We can argue that such a typical crisis situation in Croatia offers the perfect moment to make the required deep reforms in line with the well-known saying that a crisis is the best time for change. On the other hand, it must be emphasised that at present there is no relevant nor influential political option that could take advantage of the current crisis for the changes that we need (DOMAZET, DOLENEC and ANČIĆ 2012), or for changing the paradigm.

First impressions suggest the conclusion that, in the best case scenario, Croatia is at present far from the solutions advocated by Heinberg, Brown and others. The country has been in recession for several years. Since the beginning of the crisis in 2008, GDP has fallen by 7.2 percent, industrial production by 12 percent and the number of unemployed has increased to

the limit of 20 percent, whilst amongst younger people it is even higher. In addition, public debt is growing and the government claims to be unable to ensure normal functioning without taking on new debt under increasingly unsatisfactory terms. Therefore, many people are asking how realistic and how possible the "less work, less consumption" option is for Croatia. Wouldn't a more appropriate solution be "green growth" and a "green economy" (MATUTINOVIĆ 2012A; STUBBS 2013). Here the solution is being sought in the sectors of eco-friendly food production and the use of renewable energy sources. Of course, we have earlier cited that a better variant of post-growth or degrowth is considered to be inappropriate for Croatia, but we can say that the worse variant, degrowth, in the context of limiting economic growth, is considered a more certain means for the strengthening of extreme and radical political options. An additional problem is one of psychology and the insufficiently long period of enjoyment of a consumer paradise, which after the war and the postwar years (until the year 2000), lasted but a few years until 2008. Croatia's citizens are now having a difficult time accepting the idea that unsustainable indebtedness and consumption are an obstacle, so a concept or strategy that advocates this will have a difficult road to public acceptance (DOMAZET, DOLENEC and ANČIĆ 2012).

However, it should be emphasised that proponents of the degrowth concept are not advocating an unprepared and momentary halt to economic activities that would lead to "less work and less consumption." The degrowth concept implies a gradual, organized, and just transition to a society designed to ensure that a better quality of life can be achieved with "less work and less consumption." In addition, they warn that in any case there will be reduced growth for reasons that were explained at the beginning of this work and the only dilemma is whether we will do this in an organised way or leave it to the uncontrolled or unpredicted economic crashes 'elements' as we have until now (MARTINEZ-IGLESIAS and GARCIA 2012; CHARONIS 2012). But it is clear that it is impossible to begin to make such a huge change without a greater understanding, awareness, and increased level of solidarity in society and it is questionable whether such a sufficient level of these characteristics exists in Croatian society. In addition, research shows a growth in economic inequality and social polarisation between the wealthy and the poor and a low level of trust within society, not only in institutions and the political-economic elites, but amongst the citizens themselves (UNDP 2007; UNDP 2013). As Sandel has stated: "An increasingly socially stratified society has little chance of engaging in a democratic debate about alternative developmental trajectories" (DOMAZET, CVIJANOVIĆ and DOLENEC 2012).

On a more general level the biggest problem with the degrowth strategy, especially valid for states such as Croatia, is that there are few places where

it has been attempted and practiced. If we were to close our eyes to Kallis's explanation in defence of the degrowth concept, some might think that we are speaking about a green economy. In many places it also acknowledges integrating into "an economy after growth" certain characteristics of a green economy, such as attitudes toward waste, efficiency, energy savings, and others. Compared to the green economy, degrowth offers a next step, the advanced version, a long-term goal within which the limits of the growth of the economy and debt are clearly set. There remains only the question of whether it is possible to reach that goal without making the initial steps – whether it is possible to reach it without a greening of the economy.

More concretely, the greatest problem for Croatia remains its low level of production (which is also an obstacle for a quality degrowth strategy, although we would not think so at first glance), and the state's too great dependence on the import of energy, food and money: in short almost everything comes from abroad. Here it is important to emphasise again how we are talking about "selective degrowth" (LATOUCHE 2009), meaning that as a civilisation there is a need for less extraction–production–consumption activities, whilst there is obviously a need for more locally produced goods-designed for small input-products and services for quality living conditions.

The combination of insufficient production and debt that is burdening all sectors of society and strangling Croatia's production potential represents a slowing down of the movement towards a more just and sustainable society. From such a position it would be very demanding, to say the least, to transform the economy into one that is not based on debt and growth. In this context, it is rather unrealistic to copy the strategy of some Latin American countries that decided to invalidate a portion of their debt and to refuse to repay it (TOUSSAINT 2012).

Of Croatia's total foreign debt of 46.6 billion euros, a significant portion is citizens' private debts. The fact that these private debts amount to 41 percent of GDP tells us that the accumulation of debt was done in full awareness of the alluring framework of consumer capitalism. This means that it would be very difficult in Croatia to delegitimise debt by a dictatorial manipulation and by barring ordinary people from yielding responsibility for the results of the growth of debt. Here, Croatia is "hostage" to the possible success of global efforts to write off debt that was described earlier, where its legitimacy is disputed because of the impossibility of paying back the total debt and the devastating consequences of that on all of society. Because of its position, if Croatia were to pull off some instant act for negating its debt, this would certainly result in an even graver economic and social situation. The alternative to this would be the willingness of citizens for "external punishment" that would bring for most of the population an

unimaginably more modest and less prodigal lifestyle, to which, according to public opinion polling, the residents of Croatia are disinclined.

We can say that there are enough indications that confirm the position that "capitalist society is an immature system that intrinsically pursues growth as long as it is not kept in check by a response from the system at higher levels – in this case the natural environment. This means that only after the shock of a physical limitation will the capitalist system be in a position to accept radical reforms, or comprehensive institutional reforms in the economy" (MATUTINOVIĆ 2012A). But even if we believe in the possibility of institutional and structural changes from above, in the right place and at the right time, or if we think that this system is in a state to being undergoing the necessary changes for greater sustainability and equality only after outside circumstances and limitations "force" it to do so, then we are faced with the necessary and unquestioned need to prepare and strengthen as much as possible the most vital and essential sectors of that system so that the "day after" would be experienced more as a recovery, however difficult, than as a total collapse and chaos.

Croatia is definitely too small a country to initiate major global changes and that is a burden that it should not have to bear. But Croatia can use the "snowball effect" to bring together a large number of smaller local projects and approaches that could move in the direction of important changes to the economic and political paradigm. Then they could be gathered together and assisted in their expansion and strengthening of local production with longer term development. And here the situation does not look so bad. People are increasingly interested in the practical applications of sustainable living and are attending lectures, workshops, and fairs that promote "post-growth" solutions.

In several cities exchange groups have been established for food that link small producers with people in the city who want to become part of the food production cycle once again and to control what they are supporting with their money. There are also very frequent gatherings because of surplus or large quantities of some crops, fruits, and other foods that must be picked, gathered for free, or shared so they do not spoil. Both as regards food and energy there are an increasing number of examples of returning power to the people through the establishment of energy cooperatives to the benefit of local resources and the local community. There are also real and already functional models on city levels, such as at Krk, Čakovec or Koprivnica where they proved to provide at capacity levels and have gained public acceptance for responsible and sustainable waste management, the renewable use of resources and environmentally friendly buildings. Perhaps most important at this moment is the rise of social enterprises and cooperatives, which should receive institutional and systematic support

very soon with a new state back-up Strategy for the Development of Social Enterprises. Although the process of social enterprise development hasn't had an easy history and acceptance, today we can talk about a hundred of these kinds of business model that are not based on growth, but on economic stability, use of resources with awareness, social cohesion and local community development.

Although the situation here has lately become more muted compared to examples from the rest of the world, some initiatives are slowly being implemented here for strengthening a sustainable and just economy., We have seen initiatives such as the "time bank" project in Pula, where people divide up their own time to help those who need help, volunteering for the general good, and creating initiatives for founding ethical banks and transition cities. Such examples are worth following if we care about the future of Croatia.

Conclusion

> "Every society has its myths. Our myth is economic growth." (JACKSON 2009C, 8).

It is clear that every society takes its myths seriously as they constitute the foundation of its identity and values. How big is the influence of prevailing values in any given society? Our self-analysis of how much we have satisfied certain expectations is indicated by data that shows that of the 13 percent of the population of the United States that lives below the poverty level, 80 percent of them have air-conditioners, 75 percent of them have at least one vehicle, and 33 percent of them have a computer, a dishwasher, and a second car (WILKINSON and PICKETT 2010). This is why an increasing number of authors (KORTEN 2006; RIFKIN 2010; HEINBERG 2011) emphasise that, above all, we are faced with changes in the social aspect of sustainability, where psychology, pedagogy, epigenetics and anthropology will have much to say, because without these approaches it will not be possible to enact the required deep changes in society.

Changes in the use and consumption of energy are always followed by changes in communication that shape the way in which our brain understands and organises reality. New energy/communications revolutions have led to new social contracts. In his work *Emphatic Civilization* (2010) Rifkin states that we are on the brink of a new social contract, a contract that will encompass our entire planet and the life on it and that will lead us in the direction of true sustainable development.

Heinberg states that we are facing the fifth major turning point in the history of our species. The appearance of language, the discovery of fire,

the agricultural revolution and the industrial revolution were the first four epochs that delimited the key changes and processes that were essential to the shaping of our species. "We are now participating in the turn from fossil-fueled, debt and growth-based industrial civilization toward a sustainable, renewable and steady-state society" (2011, 284).

We have already stated that it is crucial for the government to take an active role in the creation of money that is free from debt.

One of the pioneers of a steady-state economy, Herman Daly, states that, in addition to government printing of money that is free from debt, the following actions are also required:

1. a cap-auction-trade (or cap-and-dividend) system for extraction rights for basic natural resources.
2. a shift away from taxing income toward taxing resource depletion and environmental pollutants.
3. limits on income inequality.
4. more flexible workdays.
5. the adoption of a system of tariffs that would allow countries that implement sustainable policies to remain competitive in the global marketplace with countries that do not. (see HEINBERG 2011, 251-252).

It is clear that Daly – as regards ecosystems and the social dimension of society – is advocating the strengthening of the *commons*, which David Bolier (2012) considers the "DNA for creating our economy, politics, and culture again." The first meaning of the *commons* is that it is something given to us as a gift and that we all use that gift. We can divide the common good into three groups:

1. Natural: air, water, photosynthesis, oceans, soil, minerals, solar energy
2. Community: public areas, vacations, libraries, museums, markets, playgrounds, universities
3. Culture: languages, science, music, astronomy, the internet (BARNES 2004).

Commons offers us a new perspective. Instead of ownership it focuses on management and administration, on the long-term protection of collective social and ecological interests, and not on short-term and quick profit. *Commons* refers not only to resources, but resources plus community with its protocols and values for the management of joint resources (BARNES 2006; EISENSTEIN 2011; ROWE 2013).

In this sense, alternative currencies of a local or regional character are also *commons* because ownership is less important; more important is the relationship itself toward a resource and the need for a just and equitable way for it to circulate, so that the resource is managed for the long-term

benefit of the user. Local currencies that are successful are always designed in a way that discourages accumulation and ownership, or control and power, and more movement and circulation. In some examples, the value of a local currency is reduced as time passes in order to encourage circulation fulfilling its main function, which is to make exchanges flow more freely. This would be a kind of tax on the possession of or a negative interest rate on the value of the money. The German-Argentine economist Silvio Gesell wrote about this in his epochal work from 1906 *The Natural Economic Order*.

The main idea is that people should not become rich by possessing nature, resources or money. If they have something, they are guardians and caretakers, and if they cannot guard it or care for it in a socially useful sense, then ownership should be given to someone who wants to and can.

We have tried in this work to explain the manner in which money becomes ownership, in which it becomes energy, a resource by which someone who accumulates it acquires power and influence. As with the commons, in alternative local currencies money again becomes only a means of exchange and it is difficult to manipulate it.

Unfortunately at this moment it is more certain that those who control production and the flow of money, i.e. those who have ownership of it, will not move towards a more sustainably designed economy and money. We have explained what would be a responsible and progressive role for policy in an economy designed on the principles of sustainable development. But as Rob Hopkins (2008; 2011), a permaculture designer and the founder of the concept and the movement Transition Towns, says: "If we wait for governments, it will be too late; if we act as individuals, it will be too little; but if we act as communities, it might be just enough, just in time."

Transition Town is a global movement of local and regional communities of activist citizens who in an organized way confront and find solutions for the major problems in the world today: climate change, the destruction of resources and their increasingly difficult availability, and the financial crisis. Hopkins also states that any concrete response to climate change and the excessive use of resources requires a response by and the participation of governments and the business sector. But he also emphasises that there is no longer time to wait for them and the strengthening resilience of local communities to the challenges and risks that they are facing today can only help alongside a possible, serious and coordinated series of actions coming from above.

It is important to emphasise that in addition to the opportunities and activities required for an economy based on sustainable development to emerge, it is necessary to carry out reforms from above, yet there is also a need for solutions that should be started and practiced today from below, for at least with regards to money 'the people' again become sovereign. The

best proof of local, regional, and credit solutions can be found in the book *People Money* (2012) by Margrit Kennedy, Bernard Lietaer and John Rogers, written after several years of research into alternative, complementary currencies around the world. The book cites 4,000 such economic initiatives from below and although they stress that while no currency has a wide influence on the overall economy, with the exception of the Swiss WIR Bank, a great number of them do play a role in strengthening local economies and social roles linking actors at the local level and the making of local community resilience. Also, following the unforeseen influence of major crises, they remain possible economic systems that will have to be adapted and improved, but are nonetheless present as living models ready for use.

Nevertheless, what is encouraging is that in contrast to times past, when the political elites, central governments, and banks destroyed vital and economically and socially important projects for local currencies without objection (such as in the 1930s with the Austrian Wörgl or in the 1950s with the French Lignières-en-Berry), today we have several examples of more friendly relationships. The central bank of Brazil and government agencies for "economic solidarity" are cooperating with the Institute Palmas, which started a regional currency, Banco Palmas, with the goal of expanding and promoting their concept. Another new currency, the Bristol Pound, has the support of the municipal council, which has employed one full-time person to assist in expanding and strengthening the project. In Nantes, France, an initiative has been undertaken for the creation of a regional currency, which has been included in the municipal Agenda 21 from 2006, but which the now advanced financial crisis has accelerated through the initial steps. Today the project is being supported by the chamber of commerce and the regional cooperative bank *Crédit Municipal de Nantes*. Such support and cooperation was impossible and unimaginable until a few years ago. For a positive exit from this general crisis it is not enough only to declare that global capitalism is passing through an organic crisis that contains within itself both a structural (objective) component and a legitimating (subjective) component (SPETH 2008).

For progressive and profound change we also need a visible and positive alternative that makes sense to people, and local currencies fulfill exactly that role.

In any case, we are of the opinion that it is rather unrealistic to expect it to be possible to return to the old way of doing things. The reasons for this are: reduced accessibility to the most important resources, a strengthening and widening of ecological problems arising from excessive and inefficient use of resources which then snowball into even greater ecological problems with resources and a financial crisis that is not able to solve the most important of today's problems. This is a situation out of balance. Although

it is clear that there cannot be a return to the old way, it is still not clear to the majority of people what a new way might entail, especially as regards the economy. We hope that we have succeeded in this work in presenting what this "new way" might entail.

Heinberg emphasises how the past behaviour of political and economic elites has shown us that we will learnt to live more sustainably, but across and through a crisis that will be more than a little unpleasant. The economist Peter Victor points out that we are faced with the need to build economies that are "slower by design, not by disaster" (JACKSON 2009C, 19). In this work we have tried to approach, explain, and present this kind of design for an economy that sustainable development requires. ●

II

COMPARATIVE EMPIRICAL INSIGHTS

5 Prosperity and environmental sacrifice in Europe: Importance of income for sustainability-orientation

Mladen Domazet / Branko Ančić / Marija Brajdić Vuković

Democratic change towards sustainability

It is taken as a given premise now by a number of expert institutions, as well as development agencies and business consultancies (MEADOWS et al. 1972; MUNSKGAARD and PEDERSEN 2001; BASTIANONI et al. 2004; STERN 2006; PETERS and HERTWICH 2006; PETERS and HERTWICH 2008; SPETH 2008; ROMM 2009; PWC 2012; SCHELLNHUBER et al. 2013) that climate change and overall global environmental change pose an insurmountable obstacle to the existing model of social metabolism (FISCHER-KOWALSKI 2000; MARX 1981; CIFRIĆ, THIS VOLUME; ŽITKO, THIS VOLUME). This is not just a matter of shortage of 'input' natural capital that such a process requires, but also a matter of global ecosystem's inability to absorb and neutralize its long-term harmful side-effects (ANDERSON and BOWS 2011; HUGHES 2001; D. MEADOWS 2000; ROCKSTRÖM et al. 2009; CIFRIĆ, THIS VOLUME). In absence of extinction of the large segments of global human population, this will require a change in social metabolism (material throughput), expectations and aspirations, behaviours and attitudes of the majority of the global population included into the global material and information flows we call civilisation (BIERMANN 2012; GRIGGS et al. 2013). For some it is a question of modifying aspirations and focusing on those whose realisation is most sustainable and most valued in the long-term period (developing world), whilst for others it is a matter of sacrifice of existing material manifold of wellbeing, a reduction in extraction of environmental resources and dumping of waste, in order to provide room for the most pressing needs of the three billion most vulnerable humans existentially pressed to improve the material underpinning of their living standard (MEYER and MANIATES 2010; BARNETTEW et al. 2010; MATTHEWS 2012).

All the countries covered in this chapter, despite noticeable differences between them, are European countries with very high level of develop-

ment from a global perspective (UNDP 2011). This, again from a global perspective, puts them in a group of countries for which the existing global predicament requires a new set of political and ethical demands to respond to the perceived limits of the key ecological and resource systems to deliver more wealth and absorb additional abuse. In that respect it is important to acknowledge a material connection between the level of development, as expressed by Human Development Index[1] (UNDP 2011), and the impact a particular nation has on the global environment, as expressed by the Ecological Footprint (GLOBAL FOOTPRINT NETWORK 2012).

TABLE 1 *Development, footprint and income indicators*

Country	Code	Human Development Index (HDI) 2011	Ecological Footprint (EF) 2008	Inequality-adjusted income index (III)
Austria	AUS	0,894	5,29	0,760
Belgium	BEL	0,897	7,11	0,756
Bulgaria	BUL	0,780	3,56	0,592
Croatia	CRO	0,804	3,92	0,537
Czech Republic	CZCH	0,872	5,27	0,712
Denmark	DEN	0,901	8,25	0,764
Finland	FIN	0,892	6,21	0,757
France	FRA	0,893	4,91	0,732
Germany	GER	0,919	4,57	0,741
Latvia	LAT	0,809	3,95	0,583
Lithuania	LITH	0,814	4,38	0,605
Norway	NOR	0,953	4,77	0,797
Slovakia	SLK	0,838	4,66	0,692
Slovenia	SLO	0,885	5,21	0,729
Spain	ESP	0,892	4,74	0,659
Sweden	SWE	0,915	5,71	0,772
Switzerland	SWITZ	0,912	5,01	0,760
United Kingdom	UK	0,875	4,71	0,709

01 The UN's Human Development Index (HDI) is a composite measure of life expectancy, literacy, education and standards of living for countries worldwide, used for comparative purposes of measuring relative development levels (UNDP 2011, 169).

For analyses in this text it is worth bearing in mind how selected European countries are spread according to development attainment and ecological footprint. In this sense Denmark, Finland and Belgium form a group of countries with much higher footprint than the development level would suggest, whilst Norway and Germany form a group for which the footprint is lower than the level of development would suggest. The other countries covered here more or less fall into clear groups of lower development- lower ecological footprint (Croatia, Bulgaria, Lithuania, Latvia and Slovakia) and the rest. In those development level increases from 0.87 to 0.95 as does EF from 4.5 to 5.7. The increase in development equivalent to change between the latter two groups (of about 0.1 on HDI scale) would, if globalized to the whole world at European rates of development-footprint ratio, require another half of planet Earth (from current 2.5 to 3 Earths) to support that level of development increase for everyone.

But, the common knowledge says that the citizens of wealthy consumer societies will never sacrifice their level of consumption, and policy makers aren't foolish enough to insist that they do, according to Meyer (2010). Which leaves only a catastrophic event that would shock people into action or efficient policing by expert eco-guardians, to impose necessary sacrifices before it is too late for the planet's biophysical systems (MEYER and MANIATES 2010; GARDINER 2010). Relying thus on the global calls for change (DOMAZET et al. 2012; UN SG HP GS 2012; GRIGGS et al. 2013), and mindful of the fact that neither catastrophe nor expert guardianship are particularly heart-warming future scenarios, this chapter sets to examine various dimensions of popular support for attitudes that would readdress the balance between respect for the environmental limits and material consumption in 18 European states, both core and semi-peripheral. In that respect it helps set off the populations from European semi-periphery countries against a wider background of a spread of differently wealthy, powerful and historically diverse European nations.

Transformation required for societies to adopt more environmentally sustainable practices whilst maintaining or improving achieved levels of individual wellbeing and social and political protection is indeed challenging (MEADOWS 2004; MEA 2005; IPCC 2007; UN SG HP GS 2012; DOMAZET et al. 2012). In terms of technical feasibility this is largely achievable relatively quickly (MCDONOUGH and BRAUNGART 2002; KARLSSON 2007; PARRY et al. 2009), but without popular support would require a scale of global redistribution, rebalancing of power and aspiration frustration that could only be brought about by enlightened tyranny which in itself is an abolishment of social and political structures and freedom protections historically achieved (GARDINER 2010; BOWERMAN et al. 2011). It would thus provide a survival that modern humans can legitimately wonder whether it is a sur-

vival worth having (BECK et al. 1994). And provided we can implement the ecological, societal, nutritional and technological adjustments needed to minimise the material throughput sufficiently swiftly but not in a radical authoritarian fashion, we could ask what kind of population would support these measures, rather than view them as outright curtailment of their inherited cultural and economic achievements (STONE 1997; BECK 2010; SWYNGEDOUW 2010).

In fact, despite threats being environmental and their implications economic, it is often emphasised in literature that transformation to sustainability (as a response to threats and understanding of their implications in economics) has a cultural and social essence that requires a fundamental transformation of attitudes and practices (SCHAFER 1994; URRY 2011; UN SG HP GS 2012). To achieve a different combination of environmental and economic priorities societies need to reassess dominant values and their roles in construction of social and economic institutions (SHI 2004; HULME 2009; HEDLUND-DE WITT 2012). This is because these values and attitudes lie at the heart of collective actions of individuals, whilst the institutions provide the modes to address both individuals' needs and overall societal constraints (SHI 2004; HULME 2009). This makes the analysis of individual attitudes and values, and their translation into aggregate national strategy potentials, critical to a solution involving transformation to sustainability (EHRLICH and KENNEDY 2005; BUENSTORF and CORDES 2008; URRY 2011). As Hedlund-de Witt points out, the sustainability-oriented attitudes and behaviour involve pro-environmental or pro-ecological, frugal, altruistic and equitable attitudes and appropriate behaviours, whilst the empirical evidence shows that there are significant interrelationships between these groups of actions and attitudes (DE YOUNG 1993; SCHULTZ 2001; CORRAL VERDUGO 2012; HEDLUND-DE WITT 2012). There is of course an awareness of the great gap between public expression of concern and attachment to values, and actual pro-environmental and sustainability oriented behaviour (the 'missing link' or 'paradox of epic proportions', 'attitude-behaviour gap'; cf. GLASSER 2004, based on surveys in NEETF 2001; CROMPTON and KASSER 2009; BRAJDIĆ VUKOVIĆ, THIS VOLUME). However, although expressing environmental concern does not in and of itself *guarantee* behaviours and political support for actions leading to sustainability transformation, it is a necessary step in that direction. Namely, there is even less connection between expressing anti-environmental attitudes and values whilst practicing conative sustainability-oriented behaviour.

Matutinović's (2012) analysis of values and behaviours with potential for transformation to sustainability, constructed into a European values and behaviours matrix, concludes that in the EU 27 society there is no immediate transformation potential to a sustainable society. This is because

most of the values and behaviours that European populations report holding and practicing with regards to environmental protection fall within the Old Paradigm which relies on low effort and does not have sufficient impact to signify transformation to sustainable throughputs by the said societies. What is more, a specific group of values and behaviours he terms as indicating the core of the potential for a sustainability transformation are insufficiently diffused throughout European and other leading economies' societies. However, with threshold set high at a deterministic 50%, it is perhaps almost theoretically impossible to reach a stage where the potential for transformation to sustainability dominates in European societies. Though his data shows that even the 30% threshold is barely reached in some societies, it nonetheless gives some indication of a more realistic starting point for political negotiation.

Three explanatory models dominate the issues of cross-national differences of environmental concern as one of the fundamental aspects of values and attitudes attuned to transformation to sustainability. These are Inglehart's (1997) prevalence of post-materialistic values in developed societies, Dunlap and Mertig's (1997) estimation of concern through spread of globalized attitudes and direct experience of environmental degradation and Diekmann and Franzen's (1999) prosperity thesis linking environmental concern to national wealth, regardless of the dispersion of value-sets. For our purposes, Diekmann and Franzen's thesis is most significant, arguing for the strongest correlation between national wealth and environmental concern. As populations become wealthier, they say, demand for higher environmental quality rises, as well as the ability to financially respond to that demand, which in the end results in a positive correlation between a country's average wealth and its level of environmental concern. What is more, Franzen and Meyer (2010) subsequently show on the preceding two intervals of ISSP Environment data-sets (from 1993 and 2000) that "cross-national as well as between individual differences in environmental concern are clearly related to wealth and income respectively, which lends strong support to the prosperity hypothesis" (FRANZEN and MEYER 2010, 220). It is worth warning that aggregate national data-sets, such as are used here as well, risk committing an ecological fallacy, i.e. hiding influences other than wealth behind the overall population's mean.

Aiming to go some way to uncover those factors where influences of wealth and income behind the overall population's mean weaken, we deviate somewhat from Franzen and Meyer (2010) in both instruments and initial assumptions behind their application. Original prosperity thesis of Franzen and Meyer (2010) is based on concepts of environmental economics (FIELD 1994), which are insensitive to nuances captured in prosperity indicator we will use in our analyses that is based on averages of inequality-

adjusted national incomes ("III", UNDP 2011). Namely, environmental economics attributes prevalence of environmental concern to commoditisation of environmental services in more affluent societies. That is, Franzen and Meyer say (following BAUMOL and OATES 1979; FIELD 1994) that environmental quality, both locally and globally, is not only a public good but also a good "the demand for which rises with income" (2010, 221). Furthermore, they say, individuals face a trade-off between consumption of goods and the quality of the environment. However, Haanpää (2006), reports that environmental concern can be high in lower income countries as well, both over direct effects of pollution and over global problems, even if lower income populations have other existential priorities to list above environmental concern. So as not to assume that quality of the environment is a commodity we prefer to rely on UNDP's inequality-adjusted income index, which is positively correlated with the overall GDP per capita in selected countries and, because of the measures involved in its calculations (presented in detail later in this chapter), is also perceived as less insensitive to inequality in individual incomes within those countries (for the spread see table 1).

Testing the relation between nations' wealth and environmental concern

As previously mentioned, in this chapter we go some way to testing the Prosperity Hypothesis at a finer level of detail. We disaggregate the Franzen and Meyer (2010) environmental concern index into several components, partially overlapping with the component measures they used on the 1999 and 2000 data. Though Franzen and Meyer (2010) used national GDP *per capita* as a measure of prosperity available to the population on a global scale, in the case of the selected European countries these values are actually not broadly dispersed, whilst we expect that individual attitudes are more sensibly connected to incomes available to individuals, correlated to relative income inequality levels within society in addition to overall national wealth. Therefore we test the national populations' performances on measures of environmental concern in correlation to the UN's 'Inequality-adjusted Income Index' (UNDP 2011). Inequality-adjusted income index (III – or *'triple I'*) is a component of the national Inequality-adjusted Human Development Index (IHDI) and is a composite measure of inequality-weighted national income averages, based on GINI and GDP (UNDP 2011, 170) data for the given country. We use this less familiar instrument for two reasons. On the one hand it is an indicator of overall national wealth and economic prosperity as it is positively correlated with the national GDP per capita in the group of selected countries. On the other, and with further analysis presented in Dolenec et al. (THIS VOLUME) in mind, we wanted to use an

instrument that is more sensitive to differences between countries concerning the social inequalities arising from individual income differences. Related to the divergence from Franzen and Meyer's construct, it is also important to say that we also focus on a narrower band of European countries in the ISSP dataset (ISSP RESEARCH GROUP 2012), with an intention to increase the validity of findings as background cultural factors are less diverse and can be provisionally 'held constant'. Thus the applied concepts are not overstretched as might be the case in global studies which use concepts as placeholders for very different phenomena.

Given this narrower selection of countries we expect to identify the aspects of environmental concern (as conceptualised through combinations of existing ISSP variables) which diverge from the pattern of prosperity thesis. On issues of willingness to pay or to commit to other sacrifices closely related to material prosperity it could be expected that prosperity thesis link between prosperity (based on income) and a mean of composite attitude measures and indicators will be re-created. On other attitudes and commitments necessary for sustainability transformation (especially from a global perspective), it is expected that differences in attitudes between selected European countries will begin to diverge from the trend in prosperity range (cf. DOLENEC, DOMAZET and ANČIĆ, THIS VOLUME).

Through such combinations of national development indicators and aggregate of populations' attitudes, we seek correlations between the objective indicators displaying a society's potential for sustainability-shift from an external perspective, with population's values and attitudes as a political and social reflection of that external potential. In this way we aim to elucidate possible correlations between society's objective potential to transform its practices and material throughput to those more suitable to a globally just long-term sustainability, and its population's support for required social transformations. The measures we use in this text focus on environmental protection and its trade-offs with economic activities as one of preconditions of support for sustainability-shift policies. Indirectly they measure the awareness of the extent of global environmental crisis, but also a more direct willingness to act with environmental sustainability in mind and commit to material sacrifices. We focus on environmental and economic oriented indicators in this text because we recognise the importance of environmental concern in motivating a sustainability switch (TAKACS-SANTA 2007), though we do not reduce the values and behaviours associated with sustainability solely to those oriented on environmental protection. Other texts in this volume (cf. PART II and PART III of THIS VOLUME) focus on indicators of social and developmental aspects of sustainability.

Although in each country investigation of the background factors is desirable, we are also looking for coarse and broad trends Europe-wide so as

to better situate the specific contextual findings for Croatia and Bulgaria (cf. KUFRIN, THIS VOLUME; BIERI and STOILOVA, THIS VOLUME). We must also not forget that though different, European countries enjoy a greater similarity of developmental paths and attainment than they do with other countries round the globe. Simply put, overall Croatia is still more similar to Switzerland than to Gabon or Mexico. It is of course acknowledged that next to macro level effects of national population averages of wealth and development, there are also individual level variables (such as age, gender, residence status, education, religion etc.) that are expected to influence environmental concern and attitudes identified as suitable to sustainability transformation. In that vein Franzen and Meyer (2010) report finding that individuals' concern for the environment (along their index measure) varies more within countries than between countries (2010, 229).

However, as states are still primary global political subjects we are concerned with reporting the differences between countries, and as income is still a strong predictor of differences within countries (FRANZEN and MEYER 2010, 229) we report on the European spectrum of measures related to income and increasing divergence from this trend. Whilst income, value-sets and education are all strong predictors of environmental concern, perhaps exceeding the macro level effect of national inequality-adjusted income, as attitudes and concern should translate into sustainability-oriented governance that is executed at the macro level of national states, we present the national macro level trends as potential for sustainability transformation at societal level.

DATA AND MEASUREMENT

We use the data for 18 countries (Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Latvia, Lithuania, Norway, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom) from ISSP module Environment, which was fielded during 2009, 2010 and 2011, together with the existing measures constructed in order to enable longitudinal and cross-sectional comparison, focusing on designing measurements of sustainability-ready populations in terms of values, expectations, attitudes and commitments from the sets of questions available in ISSP questionnaire (ISSP RESEARCH GROUP 2012; RYDZEWSKI 2010).

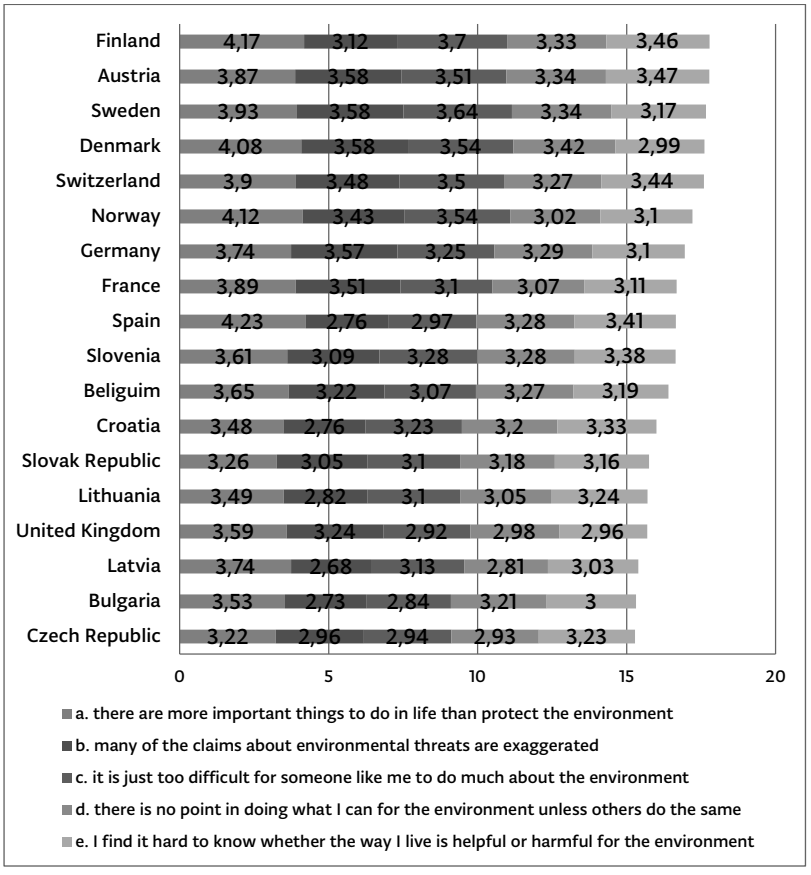
For the purposes of this text a set of two composite and three single-variable indicators are used in analyses as dependent variables together with a country-level aggregate measure of the inequality-adjusted income index as independent.

Our survey-based indicators are grouped into composites of variables that reflect values and attitudes on the individual level, and those expressing individuals' support for different wholesale societal strategies, based

on previous research findings but also on the results of reliability analysis. There are two composite indicators measuring individual concern, willingness to take appropriate action and commitment to material sacrifice named *Attitudes of Concern and Activation* and *Attitudes of material sacrifice*. The former consists of ISSP variables not reported in such configuration before, whilst the latter consists of variables that overlap with the *conative component* of the *environmental concern index* in Franzen and Meyer (2010).

FIGURE 1

Composite indicator of 'Attitudes of Concern and Activation', higher value signifies higher agreement with the statement, (mean) by country

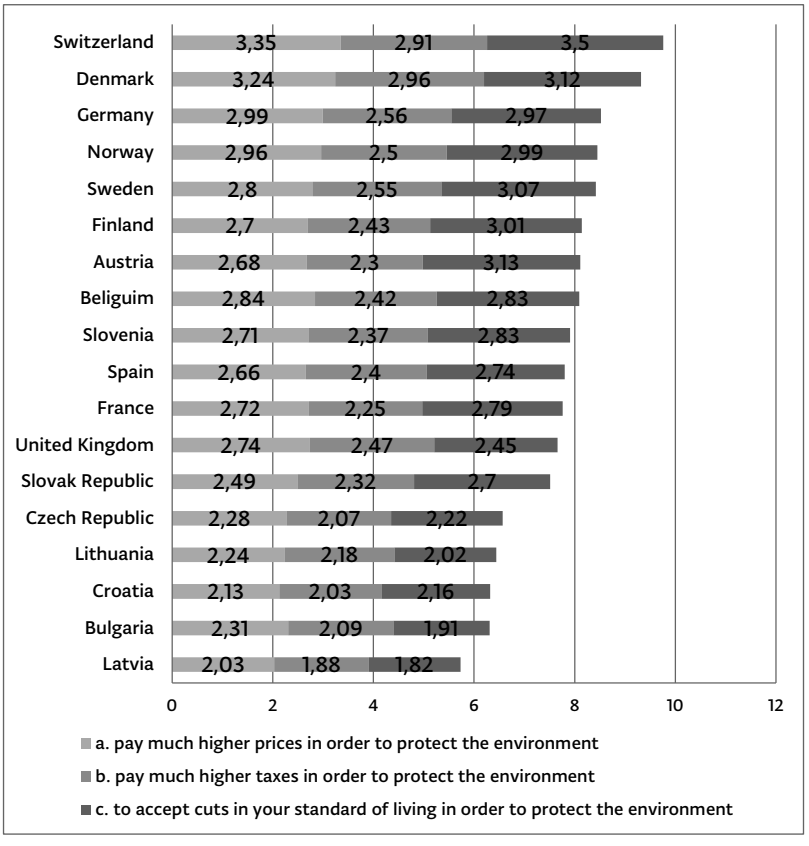


Composite indicator of 'Attitudes of Concern and Activation' includes measures of disagreement with statements playing down the level on contemporary environmental crisis, as well self-evaluation of individual's knowledge of

harmful and helpful activities. Higher performances on this composite indicator suggest a population with higher proportion of individuals who say that they know what effect their lifestyles have on the environment, as well as how truly worrying those effects can be. They also see themselves as efficacious in implementing appropriate behavioural and lifestyle changes based on their intrinsic motivation. Mean scores of the composite indicator for every country are presented in Figure 1.

FIGURE 2

Composite indicator of 'Attitudes of Material Sacrifice', higher value signifies more willingness to pay higher prices and taxes with environmental protection in mind (mean) by country



Composite indicator of 'Attitudes of Material Sacrifice' directly measures the individual's self-reported willingness to pay higher prices and taxes with environmental protection in mind. It is thus a direct expression of the dif-

fusion within a particular state's population of individuals willing to make sacrifices and support policies that demand greater material investments from individuals whilst providing smaller material benefits for them from resource extraction. The latter is what is required for reduction of the ecological footprint of individual societies, and the overall global population in the end, in order to bring them in line with the projected sustainable state. Mean scores of the composite indicator for every country are presented in Figure 2.

Besides composites, we use three single-variable (attitude) indicators. Indicator of *environment-economy trade-off* reports on the prevalence of individuals within states' populations who disagree with statements that concern for the environment is exaggerated and unjustifiably prioritised over economic activities and progress. It does not express statements about individual's personal values and behaviour, but their comment on the general societal development trends, particularly the trade-offs between environment and employment. This is linked to considerations of efficacy of action, as a prerequisite for transformative mobilization, not just on individual but on societal level, as part of collective-action problems (OSTROM 2010). Again, even on the collective level, perceptions of efficacy are vital to one's willingness to make sacrificial transformation commitments (MEYER 2010). In that respect we connect perceived and normative attitudes within populations following Meyer's (2010) conceptual sketching of when and how people might act on behalf of environmental concerns.

Two single-item indicators *Non-growth indicator1* and *Non-growth indicator2* measure the normative side of economic growth and environment protection. They capture the prevalence within European populations of individuals who disagree with a single item statement that their country needs economic growth in order to protect the environment, and agree with a single item statement that economic growth always harms the environment. It is important to stress that whilst congruent to it, these items do not on their own indicate prevalence of support for degrowth strategies (DALY 1996; KALLIS 2011). Whilst the latter might be seen as the only viable strategy to lessen the burden of the Anthropocene societies on the global ecosystem (KALLIS 2011), higher performances on our indicators do not imply unequivocal calls for degrowth and materially sacrificial social strategies (WAPNER 2010). They do however signal support for a shift away from the developmental paradigm by which economic growth leads to remedying of environmental problems and overall improvement of environmental quality within a given country, regardless of its effects on the global level. It can thus indicate a potential for deviation from a strategy of environmental protection through exporting of dirty industries based on increased affluence. Such a reading conceptually combines with the overall acceptance

that the all forms of economic growth necessarily have an environmental cost, as suggested by agreement with *Non-growth indicator 2*.

All indicators used in our analyses and described above are presented in more detail in Table 2. It is important to note that all responses are coded in a way that higher scores indicate greater concern for environmental protection, but also greater commitment to act with environmental protection in mind and more willingness to prioritise environmental stability over economic growth.

TABLE 2 *Instruments*

INDEXES	ITEMS
	"How much do you agree or disagree with each of these statements?"[a]
Attitudes of concern and activation	(a)"there are more important things to do in life than protect the environment"
The reliability coefficient (Cronbach's alpha) for the scale for 18 countries varied from 0.59 – 0.77	(b)" many of the claims about environmental threats are exaggerated"
	(c)"it is just too difficult for someone like me to do much about the environment"
0.35 – 0.54 inter-item correlation	(d)"there is no point in doing what I can for the environment unless others do the same"
	(e) "I find it hard to know whether the way I live is helpful or harmful for the environment"
Attitudes of material sacrifice	"How willing would you be to:"[b]
The reliability coefficient (Cronbach's alpha) for the scale for 18 countries varied from 0.73 – 0.89	(a) "pay much higher prices in order to protect the environment"
	(b) „pay much higher taxes in order to protect the environment"
0.56 – 0.80 inter-item correlation	(c) "to accept cuts in your standard of living in order to protect the environment"

SINGLE-ITEM INDICATORS	ITEMS
Indicator of environment – economy trade-off	"And how much do you agree or disagree with each of these statements?"[a] "We worry too much about the future of the environment and not enough about prices and job today"
	"How much do you agree or disagree with:"[a]
Non-growth indicator1	"Our country needs economic growth in order to protect the environment"
Non-growth indicator2	"Economic growth always harms the environment"

[a] *Measured on Likert scale: 1 = "strongly agree"; 2="agree"; 3="neither agree nor disagree"; 4="disagree"; 5 = "strongly disagree"*
[b] *Measured on Likert scale: 1 = "very willing"; 2="fairly willing"; 3="neither willing nor unwilling"; 4="fairly unwilling"; 5 = "strongly unwilling"*

Our study analyses the above described indicators for all European samples included in ISSP Environment dataset (18) in the context of the independent indicator of the respective populations' inequality-adjusted average income index – III, its results for 2012, and representing *State's level of prosperity* in our analyses.

Results and discussion

INDIVIDUAL-LEVEL SUSTAINABILITY-COMMITMENT GREATER IN RICHER EUROPEAN SOCIETIES

As Franzen and Meyer (2010) suggested, level of environmental concern in a society influences the population's environmental behaviour, and so the maintenance or even increase of environmental concern is an important component for environmental protection. The question remains, following Matutinović (2012) and Hall (2010), at what absolute level and extent of diffusion among population does such concern become high enough to indicate potential to surpass a given nation's activation threshold. Activation threshold would be a tipping point over which the environmental aspects of sustainability-orientation in European populations become sufficient to warrant the potential for transformation to a more sustainable

society (MATUTINOVIĆ 2012B; KELLY et al. 2003) that would be prepared to democratically support taking radical steps in order to avoid dangerous collapse of Earth's biophysical systems (cf. ROGELJ et al. 2009 for the severity of steps required).

Starting from these insights, next we analyse how components of sustainability behaviour relate to the respective countries' inequality-adjusted average income (III). Table 3 shows data on all chosen indicators, while the graphs that follow explore their relationship with inequality-adjusted average incomes.

TABLE 3 *Sustainability indicators*

	Concern and activation index*	Material sacrifice index**	Economy-environmenttrade-off indicator	Non-growth indicator 1	Non-growth indicator 2
	M	M	% of sustainability-oriented population	% of sustainability-oriented population	% of sustainability-oriented population
Austria (AUS)	17,33	8,11	46,7	32,4	34,2
Belgium (BEL)	16,01	8,09	34,5	26,1	21,7
Bulgaria (BUL)	14,29	6,31	38,7	9,5	38,2
Croatia (CRO)	15,68	6,32	32,0	18,4	19,9
Czech R. (CZCH)	14,89	6,58	34,2	14,1	28,5
Denmark(DEN)	17,02	9,32	54,3	29,2	23,8
Finland (FIN)	17,28	8,14	37,5	52,3	36,7
France (FRA)	16,17	7,76	29,2	27,6	32,1
Germany (GER)	16,32	8,52	49,1	26,5	29,0
Latvia (LAT)	14,62	5,73	30,3	15,8	25,3

	Concern and activation index*	Material sacrifice index**	Economy-environmenttrade-off indicator	Non-growth indicator 1	Non-growth indicator 2
	M	M	% of sustainability-oriented population	% of sustainability-oriented population	% of sustainability-oriented population
Lithuania (LITH)	14,75	6,45	31,7	13,2	30,5
Norway (NOR)	16,66	8,44	50,0	37,6	14,7
Slovak R. (SLK)	15,24	7,50	33,9	11,5	32,8
Slovenia (SLO)	16,34	7,91	29,6	18,9	35,7
Spain (ESP)	15,99	7,80	36,7	28,4	25,4
Sweden (SWE)	17,20	8,42	48,8	20,0	13,4
Switzerland (SWTZ)	17,33	9,76	50,0	50,9	38,5
United Kingdom (UK)	15,24	7,66	33,2	18,9	15,3
Total	16,07	7,77	38,7	26,0	27,6

** Range is from 5 to 25: 5-8=very unsustainable; 9-12=unsustainable; 13-16= undecided; 17-20=sustainable; 21-25=very sustainable.*

*** Range is from 3 to 15: 3-4= very unsustainable; 5-8= unsustainable; 9-10= undecided; 11-13= sustainable; 14-15= very sustainable.*

As Table 3 indicates, based on our construct of attitudes expected to be held by the populations with sustainability transformation potential, majority of European nations are not characterised by overwhelming sustainability-readiness. As we will show later, those are as a rule the more prosperous European nations, though as attitudes move away from the expressions of immediate personal material commitment this prosperity relation weakens and disappears. We thus find that on index of attitudes of concern and activation only Austria, Switzerland, Finland, Sweden, Denmark and Nor-

way fall into the sustainability-ready group by mean sample values, whilst all other countries are in the undecided range. On the index of attitudes of material sacrifice less prosperous countries (Croatia, Latvia, Bulgaria and Lithuania) and Czech Republic are on average in the not-sustainability-ready group, whilst all other countries covered here are in the undecided group. Denmark and Switzerland clearly diverge towards the top within the undecided[2] group.

In terms of percentage of population expressing adherence to sustainability-oriented interpretations of the single-variable attitude indicators related to trade-offs between environment and economy in most countries covered there are non-negligible segments of the population expressing sustainability-readiness-compatible attitudes (often at or over the level of 30% of population). More precisely, on environment-economy indicator of immediate trade-off between environmental health and current prices and jobs, most countries are positioned between 25% and 40% support for sustainability-orientation. In this group, there are no differences between more and less prosperous countries. Another group is again formed by the exclusively more prosperous countries with over 45% of population expressing support for sustainability-orientation on this trade-off (Austria, Denmark, Germany, Norway, Sweden and Switzerland; cf. Table 1).

These percentages drop somewhat when representing proportion of population that abandons their country's economic growth as a necessary requirement for further environmental protection (non-growth indicator 1). A group with proportion below 20% includes all the least prosperous countries, as well as Slovakia, Slovenia, Czech Republic, United Kingdom and Sweden. Most other countries are in the 20%-40% representation group, except Finland and Switzerland where just over 50% of population expressed support for disassociation of economic growth from environmental protection. Post-hoc tests also single out Switzerland and Finland's divergence from other European countries as statistically significant.

Finally, proportions of populations representing agreement with necessary detrimental impacts of economic growth on the environment (non-growth indicator2) display no difference between prosperous and less prosperous European countries covered in this chapter. The percentages are spread between 13% and 40%, with Sweden at the lowest point of 13.4% and Switzerland and Bulgaria at the highest (approx. 38%). As will be discussed later, no trends are extracted here; with Austria and Finland, for example, again being in the top of the range (with over 30%), but Denmark (23.8%) closer to the middle and Sweden and Norway (14.7%) at the very bottom.

02 Post-hoc tests to be reported below, show statistically significant difference in these countries' means from everyone else in the group.

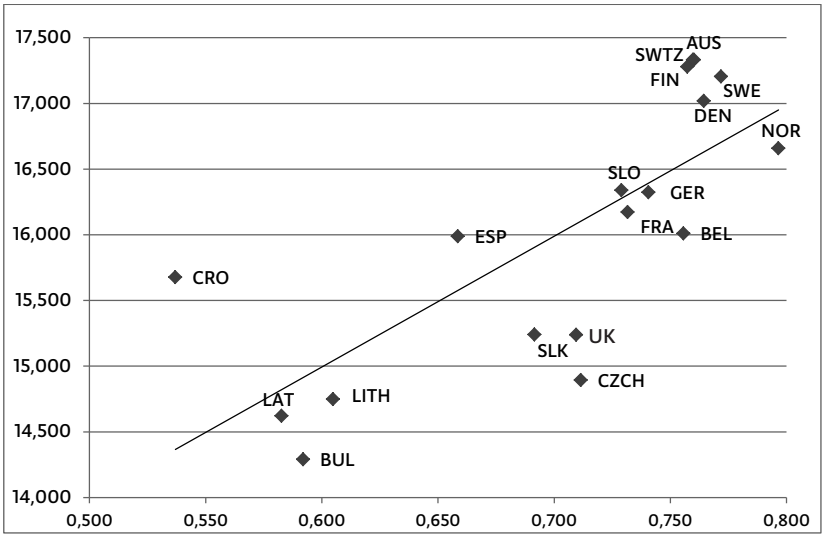
Overall, diversity of countries' performances on the range of indicators presented here suggests that sustainability-orientation is a multidimensional construct with multitude of socio-economic and cultural influences. Other texts in this volume (DOLENEC et al., THIS VOLUME; BRAJDIĆ VUKOVIĆ, THIS VOLUME) address other differences between European societies' performance on indicators of environmental concern and commitment to different development strategies.

'I VALUE ENVIRONMENTAL PROTECTION AND CAN DO SOMETHING ABOUT IT, EVEN IF OTHERS WON'T'

As can be seen from Figure 3, concern and activation attitudes are more positive in the prosperous European countries (r=0.752, sig. .000). This indicates that overall prosperity of a country can be seen as a significant predictor of population's readiness to prioritise environmental concern and individual potential for activation on environmental issues. It can be noted that countries with inequality-adjusted income index values below about 0.725 have similar average value of composite concern and activation attitudes indicator (about 15, except Croatia and Spain), regardless of great spread of inequality-adjusted income index values (0.575-0.725). It suggests that when differences in the individual income average are low, their effect on attitudes of awareness and activation is weaker.

FIGURE 3

Inequality-adjusted income index – Index of attitudes of concern and activation correlation



However, when inequality-adjusted income index value is above 0.725 average value of attitudes of concern and activation shows more positive direction, with Slovenia, Germany, France and Belgium making one group (below value of 16.5) and Switzerland, Austria, Finland, Denmark, Sweden and Norway another (above 16.5). It is the latter group where the mean of the index of attitudes of concern and activation value suggests a majority of population expressing both concern for environment, knowledge of its limits and the willingness to act upon the issues, and this comes about with a barely noticeable change in inequality adjusted income average (Inequality-adjusted Income Index) from about 0.750 to 0.775. Post-hoc analysis shows the differences between all these groups to be statistically significant, but only the latter group displaying overall sustainability transformation potential within respective societies.

In the case of countries with inequality-adjusted income index values below about 0.725, samples of Croatia and Spain present indicative detachment from the overall trend. For example, in the case of Croatia, despite lowest value of inequality-adjusted income index, attitudes of concern and activation regarding environmental issues are on average more positive than in a range of wealthier new and old European democracies[3]. To a degree, the Spain sample shows similar tendency which, together with the case of Croatia, presents indications of counterexamples to a theory that countries' overall prosperity available to the population results in more positive attitudes regarding environmental concern.

As stated above, this is in part caused by the use of instruments and background assumptions different to the environmental economics paradigm (FIELD 1994) employed in the prosperity thesis. Inequality-adjusted income index (III) is an indicator of prosperity sensitive to level of income inequality within a given population, and it places Croatia and Spain relatively lower on the prosperity ranking than their average GDP *per capita*. If environmental quality is a commodity the demand for which rises with available income (as assumed in environmental economics behind prosperity thesis) then, as we presume, indicator that is result of the calculation with less skewed distributions (III compared to GDP) should show more accurate correlation with overall population's expression of concern and activation. As our prosperity indicator, when compared to the general popu-

03 Post-hoc test for analysis of variance shows that there is no statistically significant difference of mean value on the index of attitudes of concern and activation between Croatia (from a lower income band) and Slovak Republic, United Kingdom, Spain, Czech Republic, or even Belgium for that matter. There is a significant difference of mean of the index of attitudes of concern and activation value between Croatia and Bulgaria, Latvia and Lithuania in the same income band.

lation survey samples in the individual countries, is presumed to be more sensitive to individual (as recorded in survey responses) trade-off between consumption and environmental protection we indicate possible deviations from the prosperity thesis trend. In this sense, despite the overall trend showing more positive attitudes of concern and activation in more prosperous European countries, examples of Croatia, Czech Republic and United Kingdom's deviations from the income-concern trend should not be lightly disregarded.

'TO PROTECT ENVIRONMENTAL QUALITY I WILL PAY MORE AND SACRIFICE MY LIVING STANDARD'

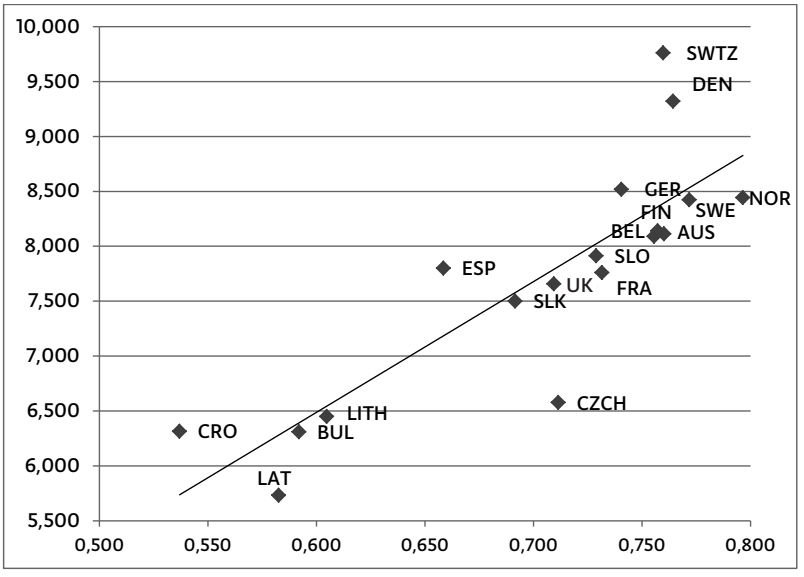
Transformation of material and social infrastructure into those more suitable to sustainability will also require willing sacrifices on individual level, in terms of greater costs of living or taxes for maintenance of public environmental services (WAPNER 2010). This is expressed in attitudes of material sacrifice composite indicator which partially overlaps with what Franzen and Meyer call 'conative component of environmental concern'. It expresses not just willingness to sacrifice (WAPNER 2010) but also a striving or commitment to purposeful action. Significant correlation between composite indicators of concern and activation attitudes and material sacrifice attitudes (r=0.358; sig. .000) suggests a close conceptual connection between individual concern and efficacy, and willingness for material sacrifice. Together they indicate an aware, concerned and efficacious population to act on sustainability imperatives.

There is of course an important obstacle, similar to general 'willingness to pay' problems, to the use of this in comparative indications of different countries' commitments to a common cause. Given the differences in affluence between countries, especially among our lower income countries, this might be more of a measure of 'ability to pay' than 'willingness', and thus be more of an objective development indicator than a measure of population's willingness for different development strategies (HAANPÄÄ 2006). In our case it is important to bear in mind both the income (III; Table 1) and difference in development level (HDI; cf. DOLENEC, DOMAZET and ANČIĆ, THIS VOLUME), as well as ecological footprint (EF, cf. Table 1) of the countries are in the overall 'not-sustainable' range (below 7 on the index of attitudes of material sacrifice).

Average results for countries' samples regarding attitudes to material sacrifice are mostly lower, or less directed in desired sustainability-orientation, than the averages regarding attitudes of concern and activation. It is still easier to express concern and willingness to act, than the willingness to commit to material sacrifice. Post-hoc analyses show that Czech Republic displays a significant deviation from the prosperity-sacrifice trend, with

statistically significant difference on the index of attitudes of material sacrifice indicator from all countries in its inequality-adjusted income index range and development ranges. Switzerland and Denmark, on the other hand, show the most positive average attitudes, despite not having the highest inequality-adjusted income index, and their disassociation from the rest of the group is also statistically significant according to post-hoc tests.

FIGURE 4
Inequality-adjusted income index – Index of attitudes of material sacrifice correlation



What is particularly interesting for our purposes, though, is that overall range of the inequality-adjusted income index is insufficient to flip any of the countries from undecided to clearly committed category along the established trend, i.e. that increase in ability to pay is still not a clear enough guarantee of overall majority commitment to commitment to pay more in aid of environmental protection. In other words, our data does not suggest a value of average income (and subsequently national GDP behind it) that would push the overall population in the direction of achieving sustainability through higher material and financial sacrifice.

So, we can see here that willingness to pay keeps increasing with available income, seemingly in disregard for the lower cost of environmental protection in the most highly developed societies. That is, environmental-economics-based prosperity thesis suggests that over certain level of

development environmental quality in a country increases, making the immediate willingness to pay for it among the population drop as it ceases to be a scarce commodity. As some of the European countries included in this sample are amongst the most highly developed in the world, and are those with historically highest investment in environmental regeneration, straightforward prosperity thesis would suggest their populations' willingness to pay should be lower despite the maximally high development and ability to pay.

On one hand these could simply reflect the socially desirable responses in the developed societies where cultural norm of the pressure of environmental sacrifice has enjoyed a comparatively greater penetration. On the other hand, absence of such drop might indicate either a greater penetration of global environmental issues whose relevance has not dropped with development, such as CO_2 emissions (KHANNA 2002; YORK et al. 2003) in the understanding of environmental concern, or the disassociation of environmental concern from the environmental economics justification based on marketable costs of environmental services. According to principles of environmental economics we would expect the willingness to pay to decrease with the decreased demand for environmental quality due to its shifting back to a freely available public good, perhaps most notably in a group of highly developed countries with a comparatively lower EF such as Germany and Norway. But this is not the case in this analysis (Figure 4).

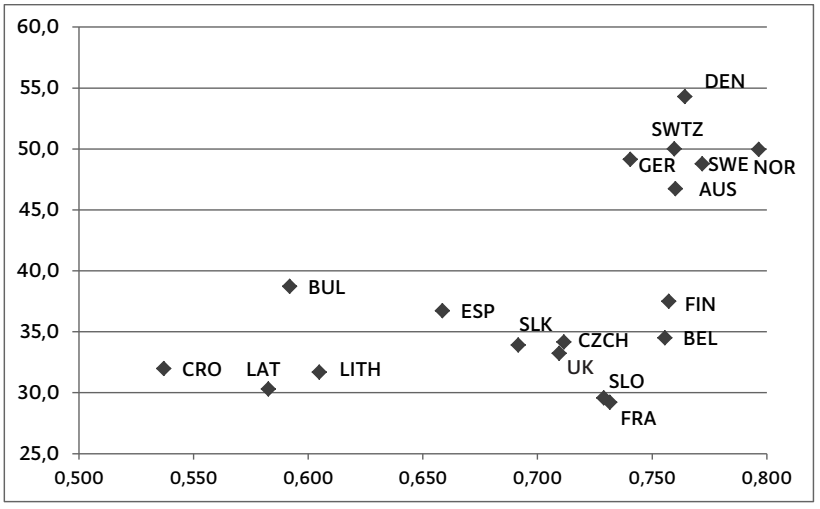
Overall, the differences between selected European countries along the two composite indicators charting individual prioritising of environmental concern, activation potential and willingness for material sacrifice are at first instance best explained by the inequality-adjusted prosperity of the population, as measured by the inequality-adjusted income index. Our data thus most readily confirms the prosperity thesis that a society's inequality-adjusted income level makes it more predisposed to adopting environmental attitudes in line with the sustainability switch. But consistencies in deviation from this trend in case of some countries indicate that factors other than sheer prosperity might be at play.

WEALTHIER, FOOTPRINT-HEAVY EUROPEAN SOCIETIES DO NOT DISPLAY MORE BALANCED ATTITUDES TOWARDS ENVIRONMENT-ECONOMY TRADE-OFFS

Other than individual behaviour, a population's acceptance of economic strategies that are not focused primarily on GDP growth is an important precondition of implementation of such strategies in order to strive to dematerialize and decarbonize the economy (RADERMACHER 2002; SPETH 2008; CIFRIĆ, THIS VOLUME; ŠIMLEŠA, THIS VOLUME; ŽITKO, THIS VOLUME). It is especially important to consider trade-offs between environmental

protection and economic activity. Our economy-environment trade-off indicator endeavours to chart support for just such strategies among populations of the European countries covered. It is important to note that this is not an indicator measuring support for *degrowth* strategies, but merely a more equitable balancing between respect for the environment and economic activities.

FIGURE 5
Inequality-adjusted income index – Economy-environment trade-off indicator



As presented in Figure 5, economy-environment trade-off indicator on average displays greater disagreement with prioritising economy over environment as a country's inequality-adjusted income average rises (Kendall´s tau_b r=0.493; sig. .004). However, a break in the linear pattern more prominent than in previous indicator-income relationships can be observed. The wealthiest countries like Denmark, Switzerland and Norway have about 50% of population considered sustainability-oriented in economy-environment trade-off frame. As some other prosperous European countries, such as Germany, Sweden and Austria are not far behind, the broken pattern is most prominent amongst the more prosperous and footprint-heavy European countries covered. Namely, Finland, Belgium, United Kingdom and France, though in the mid-range of European development and prosperity scales (cf. Fig. 3, and DOLENEC et al., THIS VOLUME) exhibit same or lower prevalence of support for environment over immediate economic concerns than the least prosperous European countries with 20% lower EFs. It seems that on this dimension, greater wealth does not necessarily tip societies

over into sustainability-ready attitudes (cf. MATUTINOVIĆ 2012B) and that a clear (perhaps developmental history path-dependent) division exists within the group of most highly developed European countries in terms of tipping the economy-environment trade-off in the direction of preference for the environment (cf. BRAJDIĆ VUKOVIĆ, THIS VOLUME).

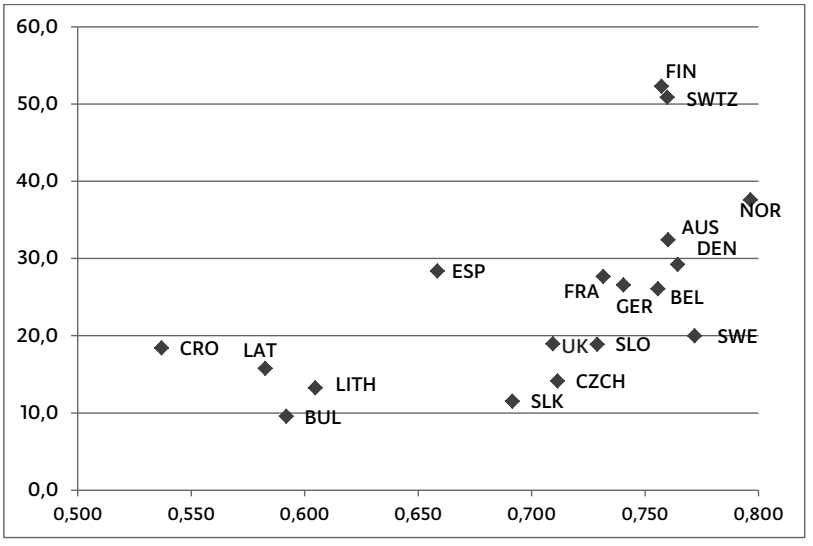
ECONOMIC GROWTH FOR ENVIRONMENTAL PROTECTION

Other than general attitudes to trade-off between development and environmental protection, it is also important whether populations of selected European countries perceive economic growth as a precondition of environmental protection within their own country. Whilst that might be a developmentalist attitude supported by the likes of prosperity thesis, structure of the shift to sustainability paths within this century will require separation of the growth-imperative from environmental protection, and population's support for such strategies (cf. HEINBERG 2011, cited in ŠIMLEŠA, THIS VOLUME).

In order to more closely test the populations' adherence to the environmental economics principles behind the prosperity thesis (cf. FRANZEN and MEYER 2010, and above), it is worth considering their disagreement with the statement that their respective countries need economic growth *in order to protect* the environment. The more population disagrees with that statement the more they exhibit the potential for separation from the concepts behind the prosperity thesis trend according to which wealthier societies (those with more disposable income produced by growth) will pay more and secure better environmental quality.

In this sense, post-hoc analyses show that only Switzerland and Finland's populations could be characterised as predominantly sustainability-oriented on this measure whilst everyone else falls into the undecided range. Those two are also statistically significantly different from the rest of the countries covered. Whilst an overall prosperity thesis trend is still evident (Figure 6), with most prosperous European countries covered displaying disagreement with growth-imperative towards the top of the scale (at about 40% or above) and least prosperous towards the bottom (at about 20% and below), differences between the prosperous and less prosperous groups are increasingly blurred. Thus, United Kingdom, Slovakia, Czech Republic, Slovenia and Sweden display only 20% or lower prevalence of disagreement with the statement that economic growth is a precondition of environmental protection in the respective countries, just like the least prosperous and lower-EF countries (Bulgaria, Croatia, Latvia, Lithuania and Slovakia). Post-hoc analyses show no statistically significant difference in this respect between United Kingdom and Bulgaria, or Croatia and Germany for that matter.

FIGURE 6
Inequality-adjusted income index – Non growth indicator 1

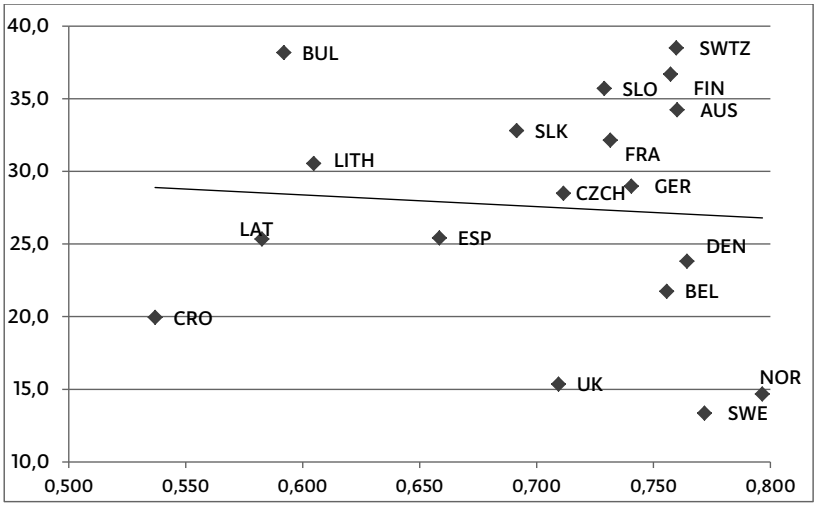


Other than contemporary imperative for economic growth, sustainability transformation also requires awareness of the historical detrimental impacts on the environment by growth-generating economic activities. As Šimleša (THIS VOLUME) describes our hopes for benefits of economic growth free from negative environmental impacts have largely not been realised. Thus, despite perhaps prioritising growth in order to raise their own living standards and wellbeing presently, we expect sustainability-oriented populations to be aware of the environmental impacts such growth might leave. *Non-growth indicator 2* is used as a measure of just that type of attitude amongst populations of European countries covered. In addition, as Figure 7 shows, this is where the prosperity thesis trend is entirely abandoned.

As Figure 7 illustrates, on a measure such as this universal statement, there is no correlation between prosperity and prevalence of the population agreeing with statement that economic growth is always harmful to the environment. Though prevalence of such agreement is below 40% in all European populations, it is above 30% in a segment of less prosperous and more prosperous European countries alike. Thus Bulgaria, Switzerland, Finland, Slovenia and Austria are characterised by the greatest prevalence of sustainability-oriented populations on this measure, whilst Sweden, Norway, United Kingdom and Croatia by the least. It is interesting that Croatia's population expresses relatively low agreement with that statement and Domazet et al. (2012, 45) note that the tendency to agree with

such statement is greater among the Croatian population with incomes below minimum wage than among those above that income threshold.

FIGURE 7
Inequality-adjusted income index – Non growth indicator 2



Conclusion

It is clear that there is an overall dominant trend of increasing sustainability-orientation with increasing prosperity among 18 European countries covered in this chapter on most of the measures employed. Whilst on issues of environmental concern and commitment to material sacrifice at the level of individual respondents this trend is more dominant, on matters of general strategies of trade-off between economic growth and environmental protection the trend is less prominent or altogether absent. The latter is the case with the support for statement that economic growth always harms the environment, where support is not found to be correlated to the inequality-adjusted income index of individual states. Overall, Franzen and Meyer's (2010) prosperity thesis that relates development attainment of individual states with their population's expression of sustainability-oriented attitudes is confirmed in our analysis as well

However, our analysis on a range of indicators disaggregating Franzen and Meyer's (2010) complex measures shows that there are many significant digressions from the prosperity thesis trend. Prosperity thesis thus cannot be taken as a single reliable predictor of the attitudes matching policies that will prepare populations for democratic support for para-

digm transformation of practices and value-sets needed to shift to a more sustainable existence within this century. Such a shift would not, given the examples of different European countries, require a drop in development achievement as fast as the necessary reduction in environmental impact. Although all European countries covered in this chapter need to substantially reduce their footprints to bring them down to long-term sustainable levels, for most this reduction needn't immediately herald an equally substantial reduction in development attainment and attendant wellbeing of the population. For some, in fact, the ratio of development attainment and environmental impact is comparatively favourable, whilst for others it is extremely unfavourable suggesting that climatic conditions, historic development paths and current socio-economic practices all play a part in how much wellbeing their populations eventually enjoy from the environmental extraction. But it is also a clear trend among European countries that material development comes at a greater environmental cost, whilst variations in the intensity of the trend are clearly noticeable in the case of different countries at top levels of development (cf. DOMAZET and MARINOVIĆ JEROLIMOV, THIS VOLUME).

The overall performances on indicators constructed in our analysis paint an inspiring picture of European potential for democratic transformation to sustainability, though serious obstacles remain. Namely, in the most direct expression of willingness to sacrifice material abundance for the sake of environmental protection (index of attitudes of material sacrifice) no European population covered here displays a majority support for a range of sacrificial measures. But the differences within the group of countries whose mean performances fall into the undecided range, as well as the abundance of countries in that range, indicate that potentials for transformation exist and not just in the countries with highest level of development, prosperity and environmental impact.

It is also encouraging that in many European countries covered 30% or more of the population will express support for the single-variable indicators critical of economic development's imbalanced trade-off with environmental protection. It is interesting that Switzerland's positive example here is accompanied by Bulgaria and other less prosperous countries, whose footprints (EF) are on the whole lowest of the European countries covered, and 30% lower than Switzerland's. However, the fact that some countries' populations exhibit consistently comparatively low levels of concern and notional support for sustainability-oriented attitudes despite very high development attainment; and the fact that there is across Europe least support for individual-level sacrificial acts to be implemented presently is a cause for concern over true depth of Europe's potential for democratic transformation to sustainability.

More to the point, when it comes to most direct expression of the prosperity thesis (including the environmental economics justification behind it), which is contained in our index of attitudes of material sacrifice, European countries exhibit neither great overall willingness to pay nor disassociation from prosperity thesis in comparative differences between nations. More income means greater willingness to sacrifice financial and material resources in Europe, and overall this income tends to be tied to a greater environmental impact (cf. EF, Table 1). This thus becomes a vicious circle, but some notable exceptions have been pointed out above. Likewise, when sacrifice is to be accompanied by appropriately directed concern, awareness of one's abilities and conviction of efficacy of one's actions (cf. HALL 2010), as combined in the index of attitudes of concern and activation here, incomes available in the country are overall again the most straightforward predictor of population's potential for voluntary sacrifice for sustainability.

But when considering economic strategies that would aim to prioritise environmental protection and, in absence of technological super-fix, aim to lower material throughput in the economy in general (i.e. degrowth or steady-state economics), the prosperity link, whilst still present, begins to falter. Thus, differences begin to appear both in the group of the more prosperous European countries covered, but also within the group of less prosperous ones; whilst general differences between the more and less prosperous lessen. In terms of specific tools for democratic transition to sustainability, one that avoids both environmental devastation and outright tyranny (HALL 2010, 80), knowledge of the veracity of external limits, appreciation of the greater value of the long-term good, focus on the bigger picture and alignment of actions with values are among necessary requirements. Dispersion of support for general attitudes of economy-environment trade-off from the income level of a nation becomes an indication of a reversal of "Promethean environmentalism" (WAPNER 2010, 37) that claims that greater prosperity is not so much the cause of greater environmental harm as the solution to it. This is the encouraging aspect of both prosperous and less prosperous European populations' sustainability-potential.

Finally, it is interesting to compare the ranges of performance on our sustainability-oriented indicators to the relationship between development and ecological footprints of the countries covered here. Thus, though Denmark often features at the top of the range of sustainability-ready commitments it is also the country with the highest EF (Table 1). Of the other countries from the top of the range covered here Finland, Sweden and Austria are in the top range of EF as well as HDI (cf. Table 1). Germany and Norway, on the other hand, have among the lowest footprints (EF) of the more prosperous and more developed countries covered, but still higher than those of the less prosperous and comparatively less developed (cf. HDI

range in DOMAZET and MARINOVIĆ JEROLIMOV, THIS VOLUME). It is thus encouraging to see Bulgaria and Croatia's occasional divergence from the prosperity- environmental concern- ecological footprint grouping, indicating that sustainability-orientation of the population is a multi-dimensional construct affected by much more than material prosperity. What is more, these comparisons with in Europe, though of a limited range from a global perspective, support Prescott-Allen's (2001, 107) findings that increases in human well-being need not be path-dependent, that a high level of development and quality of life can be achieved with a more limited environmental impact. Although our results indicate that, in terms of environmental aspects of sustainability-potential, money goes a long way in Europe, we can conclude that money alone does not go all the way. ●

6 Why power is not a peripheral concern: Exploring the relationship between inequality and sustainability

Danijela Dolenec / Mladen Domazet / Branko Ančić

Introduction

Unlike studies which define sustainability as mitigating the human impact on the environment so the latter could keep sustaining human societies, we start from a definition which Glasser (2004) terms eco-cultural sustainability. As an ideal, eco-cultural sustainability requires that we are able to support the flourishing of cultural and biological diversity, forms of governance that are democratic and socially just; and economies which are in tune with natural constraints, limiting the life-cycle costs of production and consumption. In other words, we start from a recognition that the world's current developmental paradigm, which is characterised by inequalities and hugely disparate life chances, at the same time as being destructive of the natural resources, is not sustainable (UNESCO 2011).

Inequality between the world's rich and poor is growing, and more than a billion people still live in poverty (UN SG HP GS 2012). According to the UNDP Human Development Report (2005), 80% of the world's population have experienced the negative side-effects of rising inequality. Even before the economic crisis of 2008 which further exacerbated this trend, while 40% of the world's population accounted for 5% of global income, the richest 10% accounted for 54% (UNDP 2005, 4). It seems hard not to recognise that environmental problems cannot be solved without addressing the failings of the dominant economic model, while solutions should be sought in the interconnections between the economy, society and the natural environment (DOMAZET, DOLENEC and ANČIĆ 2012).

This realisation is growing ever more urgent. According to the latest Intergovernmental Panel on Climate Change report (2013, 3), the "warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia". Similarly, the World Bank (2013) warns of an alarming scenario according to which the

world could reach 2°C within one generation, bringing 'widespread food shortages, unprecedented heat-waves, and more intense cyclones' (2013: xi). In other words, there is no doubt that climate change poses the gravest threat to human development today (FISCHER-KOWALSKI 2000; STERN 2006; PETERS and HERTWICH 2006; 2008; SPETH 2008, etc.). After the most recent report of the IPCC (2013), the debate about human impact on climate change has hopefully also been put to rest[1]. Our global footprint exceeds the world's regenerative capacity by a full 30 percent, which means that an extra planet would be required to sustain prevailing consumption patterns beyond (roughly) the next 25 years (LIVING PLANET REPORT 2008, cited in SORON 2010). In addition to that, the impact of climate change will disproportionally hit the poorest areas of our planet, greatly harming 'the lives and the hopes of individuals and families who have had little hand in raising the Earth's temperature' (WORLD BANK 2013, XI; cf. also PARRY et al. 2007; MARTINEZ-ALIER 2002).

Already well-documented impacts of global environmental change include unusual and unprecedented heat extremes, rainfall regime changes and water availability, changes to agricultural yields and nutritional quality, terrestrial ecosystem shifts, sea level rises, and damage to marine ecosystems (WORLD BANK 2013, XX). Once critical thresholds are reached, the world can expect abrupt system changes. While technological optimists tend to put their faith in heroic feats of engineering that will provide a solution, the World Bank report makes clear that the world is already at a point where it needs both dramatic technological change and full international cooperation to change the trajectory towards a more sustainable future. While "most aspects of climate change will persist for many centuries even if emissions of CO2 are stopped" (IPCC 2013, 19), the last global summit in Rio in 2012 failed to push the agenda for a global agreement forward. Ever since the first Rio Earth Summit in 1992, though there is a growing recognition of the ecological costs of overconsumption, 'this uneasy awareness has failed to engender an effective political response' (SORON 2010, 172).

In the face of this threat, some continue to put faith in economic growth and the commodification of environmental resources as the response to the current environmental crisis. In contrast to that, we start from the assumption that a fundamental reorientation is necessary, which cannot be pursued by extending the capitalist mode of production, but rather by im-

01 Quote from the IPCC Fifth Assessment Report *Climate Change 2013: The Physical Science Basis Summary for Policymakers*: "Human influence on the climate system is clear. This is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and understanding of the climate system" (2013, 10).

plementing radical changes in the basic institutions of property and work, to name only a few (KALLIS 2011). A serious commitment to sustainability entails a structured process of socially sustainable and equitable reduction in the amount of materials and energy that a society extracts, processes, and eventually returns to the environment as waste (ibid.). Simply put, a reorientation towards sustainability requires the integration of economic, social and environmental dimensions of development (DOMAZET, DOLENEC and ANČIĆ 2012).

Concepts and Main Argument

Given this context, this paper attempts to shed light on the relationship between inequality on the one hand, and the attitudes and behaviours needed for a switch to sustainable human societies on the other. Many argue that individual attitudes and values are critical for a sustainability reorientation (e.g. EHRLICH and KENNEDY 2005; BUERNSTORF and CORDES 2008). Studies have shown that pro-environmental attitudes cluster together, and they are related to behaviour and actions (DE YOUNG 1993; SCHULTZ, 2001; CORRAL VERDUGO 2012; HEDLUND-DE WITT 2012), though the attitude-behaviour gap (GLASSER 2004) must not be underestimated when devising developmental strategies. Although expressing environmental concern does not guarantee behaviours and political support for actions leading to sustainability transformation, it represents a necessary step in voluntary individual commitment to that direction (DOMAZET, ANČIĆ and BRAJDIĆ-VUKOVIĆ, THIS VOLUME). Taking this on board, we explore conditions under which citizens become more responsive to behavioural changes necessary for more sustainable development trajectories. At the same time, since the inequality of living conditions and life prospects are central to our analysis, we keep in mind the fact that, while sustainable or unsustainable practices are on the whole a matter of humanity's choice, for too many people on Earth the problem is not unsustainable choices, but a lack of choice in the first place (DOMAZET, DOLENEC and ANČIĆ 2012). Real choice is only possible where basic human needs have been assured.

While both the causes and the consequences of global environmental change are unevenly distributed, aggregate measures of wealth such as GDP per capita or the UN's measure of human development – the Human Development Index (which are most often used in empirical analyses) are average scores, which hide income and quality of life differences within societies that are sometimes truly substantial. The poorest segments of society are most vulnerable to instabilities in food supply and other basic infrastructure like water and electricity. Therefore, according to the prosperity thesis (DIEKMANN and FRANZEN 1999, FRANZEN and MEYER 2010),

their value orientations are directed towards achieving material security regardless of the environmental cost. This is one aspect in which income inequality poses a serious obstacle to a switch towards more sustainable development trajectories.

That inequality is an obstacle to human development more broadly speaking has already been fairly well documented in the literature. Wilkinson and Pickett (2010) showed that within-society inequality is linked to many negative social phenomena such as lower child well-being and poorer performance in schools, higher incidence of teenage births, higher incidence of drug abuse, higher homicide rates and rates of imprisonment etc. In addition to that, they showed that more unequal societies fuel status competition and consumerist behaviour. Needless to say, the latter two characteristics stand in direct opposition to value orientations and behaviour patterns conducive to a sustainability switch in highly developed European nations (see also ŠIMLEŠA, THIS VOLUME). Development experts at the UN have caught on the relevance of inequality for human development, recently supplementing their main measure of human development (HDI), with an inequality-adjusted measure, named IHDI. According to the UNDP[2], IHDI should be interpreted as indicating the actual level of human development, while the HDI stands for potential human development. Under perfect equality of income, educational chances and access to health-services, the two measures equal out, but for as long as there is substantial inequality in a society, it blocks its full development potential.

Approaching the question of sustainability from the perspective of inequality, we take issue with the simplifying assumptions that lie behind the prosperity thesis (DIEKMANN and FRANZEN 1999; FRANZEN and MEYER 2010). According to this proposition, the higher a country's level of development, measured as GDP per capita, the more its population exhibits environmental concern and willingness to change their behaviour towards more sustainable practices. In this line of reasoning, a nation's wealth is a precondition for raised awareness of the human impact on the planet and the need for human societies to undertake far-reaching changes in how they are organised. This finding is related to another well-established thesis in the literature, according to which only after securing their material wellbeing, individuals are able to devote their energy and time into seeking more individual freedom and autonomy (INGLEHART 1995; and later). Inglehart (1995) argued that people with post-materialist values, which emphasise self-expression and quality of life, give higher priority to protecting the environment and joining environmentalist groups.

02 For more information about these indicators visit the official UNDP website, http://hdr.undp.org/en/statistics/ihdi/.

Post-materialism is a value orientation that Inglehart and Welzel (2005) place within a wider cluster of self-expression values, arguing that their appearance and spread is directly related to a country's level of socioeconomic development. Using large datasets from the World Value Surveys, Inglehart and Welzel (2005) empirically verified the old modernisation theory that linked socioeconomic development to individual emancipation in the first step, and to the strengthening of democracy in the second step. According to them, the process of transformation towards post-material value systems starts with socioeconomic development, by raising incomes, improving educational attainment and diversifying human interaction, thereby reducing "constraints on autonomous human choice" in the economic, cognitive and social domains (ibid., 151). This in turn nurtures a sense of existential security and autonomy, leading people to give priority to humanistic self-expression values that emphasise emancipation, liberty, diversity and autonomy. According to the authors, autonomy does not mean egocentrism, but humanism; post-materialists endorse many universal goals, including those of environmental protection and ecological sustainability (2005, 12). These constituencies in developed Western societies challenge the emphasis on economic growth at any price and show increasing concern for sustainability (ibid., 25).

Along the same lines, theorists of post-modernity argue that increased individual autonomy in affluent Western societies has meant an increasing awareness of the risks of civilisation (GIDDENS 1990; 1991; BECK 1992). Post-modern individuals who have the time, information and resources, understand that humanity now has so much power over its environment that it can destroy life on this planet, and they represent the constituency that is most ready for a behavioural switch to sustainable development trajectories. However, this being so, it is said that behavioural changes should not be framed in terms of sacrifice. Demanding personal sacrifice for the sake of sustainability is often seen as a "political impossibility" (MANIATES and MEYER 2010). What is advocated instead is the power of incentives, which relies on assumptions of human nature as deeply individualistic and utilitarian. This neoclassical assumption treats environmental degradation as a market failure which can be ameliorated by introducing pricing signals, misframing the problem as solvable with technical solutions, without changing human behaviour that has proven destructive of our natural environment (MIROWSKI, WALKER and ABBOUD 2013). This was made possible by divorcing ethical and political aspects from economic thinking in the transformation from classical to neo-classical economics (MIROWSKI 1988; MIROWSKI 1989), reducing society to atomised individuals each pursuing their own interest. In the process, nature became separated from economics, becoming a free good to be used in the pursuit of growth

(KILBOURNE and POLONSKY 2005). The neoclassical position is necessarily resource optimistic (BURKETT 2006), believing that the market automatically secures resource substitution and technological advance (see also ŽITKO, THIS VOLUME).

However, today we know that "the clash between economy and the environment cannot be convincingly solved by pious invocations to 'internalize the externalities' into the price system" (MARTINEZ ALIER 2002, 54). Therefore, we start from the assumption that human behaviour must be modified in order to come in line with our natural environment. Hence, if people are not willing to "surrender something they value in the service of a greater value" (HALL 2010), then the world might be left with very few options, which do not have a democratic air about them. As Maniates and Meyer (2010, 6) emphasise, assuming that citizens will not forego prosperity today for future gain rests on the "implausible belief that most of us are wholly content with our lives and the society within which we live now". Not only does an overwhelming majority of people around the world live in conditions that are a far cry from desirable; the second missing factor in dismissing the politics of sacrifice is the fact that 'individual choice' of whether to drive a car or take the tram is made within a framework of social rules and social relationships which make certain choices 'natural' or given. Milbrath (1984) uses the concept of dominant social paradigm to refer to beliefs, institutions and habits that formulate a social lens through which individuals interpret the social world. As Brajdić-Vuković emphasises (THIS VOLUME), a paradigm is not dominant because it is held by the majority of people in society, but because it is used by dominant groups to reinforce and justify existing institutions. The imperative of economic growth, belief in limited government and faith in science and technology, as key elements of the dominant social paradigm, seem to be directly related to environmental crisis (BRAJDIĆ-VUKOVIĆ, THIS VOLUME).

Two important implications can be drawn from this. While sociologists of post-modernism emphasise affluent and well-educated citizens as the constituency for behavioural change towards sustainability, given that these groups are aware of human impact on the planet, if we approach the switch to sustainability from the perspective of giving something up in order to gain something else, then those groups in society that are less content with their current way of life become important constituencies in building a momentum for change. Second, in addressing any societal group it is important to keep in mind that changes in prevailing social norms affect what is perceived as sacrifice, as opposed to what is understood as a 'naturally' preferred choice. In other words, advocating a switch to sustainability inescapably entails challenging the dominant social paradigm of economic growth, limited government and faith in technocratic solutions.

To summarize, we do not dispute the basic assumption of the prosperity thesis, but we do reject the overly simplistic version that it often takes, whereby analysts conclude that "economic growth itself can be regarded as a remedy to environmental problems" (TORRAS and BOYCE 1998, 148), while distributional issues are supposedly taken care of by the 'trickle down' effect of economic development. As Grossman and Krueger (1995) emphasised, there is nothing automatic in the relationship between rise in income and better environmental protection. They introduce the question of power into the analysis, leaving behind the false reliance on automatic effects of average rises in incomes. Similarly, in analysing the relationship between inequality and sustainability from the perspective of balance of power between winners and losers of environmental degradation, Boyce (1994, 18) posited that greater inequalities of power and wealth lead to more environmental degradation, among other things, because "inequality raises the rate of time preference applied to environmental resources by both the poor and the rich, by increasing their poverty and political insecurity". The key implication here is that equality and democracy are not only important as normative ends in themselves, but as means to achieve a switch to sustainability. Economic development may or may not lead to a more equitable distribution of power within society, and without the second component environmental sustainability is much less likely. As Torras and Boyce put it (1998, 150):

> "efforts to achieve a more equal distribution of power, for example, via more equitable income distribution, wider literacy, and greater political liberties and civil rights, can positively affect environmental quality. The effects of these variables appear to be particularly strong in low-income countries. From an environmental standpoint, then, the distribution of power is not a peripheral concern".

In a nutshell, concentration of power and growing income inequalities pose fundamental obstacles to achieving sustainable human development. As Wilkinson and Pickett (2010, 272) argue, "greater equality is the material foundation on which better social relations are built". In contrast to that, when material conditions of life and resulting life chances become as vastly disparate as they are today, people live in disassociated realities (SANDEL 2012), lacking a basic sense of shared humanity without which we cannot engage in democratic debate on the features of a just society (WRIGHT 2011). Therefore, reducing inequality and ensuring basic human security are necessary ingredients in the reorientation towards sustainability.

In addition to that, Torras and Boyce (1998) challenged the prosperity thesis by postulating that people with higher incomes, because they gen-

erally own more assets and consume more commodities, reap a higher net benefit from pollution-generation. As a result, their preference for environmental quality is offset by their consumer preferences, so it may take the form of choosing private or semi-private goods such as luxury houses and pollution-free resorts. In this respect, less well-off groups in society may be faced with a simpler calculus in preferring more sustainable development trajectories. So, while inequality is an obstacle to sustainability, it is not exclusively the affluent post-materialists that represent the political addressees of appeals for environmental sustainability. Though poverty and material insecurity are indisputable obstacles to sustainability in that they narrow the scope of individual choice, there remains much to be said about the opinions and preferences regarding sustainability among the less well-off groups in society, rather than dismissing them off hand.

Right along those lines, Haanpää (2005) grounds her analysis on two varieties of environmental concern. The first relates to post-materialist values as hypothesised by Inglehart (1995) and others, whereby environmental concern is most pronounced among affluent, younger and educated populations which value self-expression and quality of life (INGLEHART and WELZEL 2005). In contrast, the second version of environmentalism stresses objective problems, whereby citizen's actual experiences with environmental hazards in poorer countries can motivate them to protect the environment (ibid.). In this version of the argument, environmental concern is not simply a value orientation, but a perception of direct, real environmental threats (BRECHLIN 1999). In the literature that focuses on the experience of environmental degradation in developing countries, this second variety has been conceptualised as 'environmentalism of the poor' (GUHA and MARTINEZ-ALIER 1997; GUHA 2000). Finally, Martinez-Alier (2002) associates 'environmentalism of the poor' with claims for distributive justice, arguing that social movements for environmental justice in Western countries and the environmentalism of the poor in the Global South belong to the same current that draws attention to ecological distribution conflicts. In our analysis we explore these two varieties of environmentalism, looking for evidence of sustainability orientations in less affluent European societies.

In the following sections we put two of the presented arguments to empirical scrutiny. The first hypothesis, designed to supplement the prosperity thesis, is that inequality of income and of material life circumstances is an obstacle to sustainability orientations in European societies. The second hypothesis is that, while wealthier societies overall exhibit stronger environmental concern, the perception of direct environmental risks is stronger in less affluent European societies.

Empirical strategy and measurements

The analysis relies in large measure on the results of a comparative survey conducted within the International Social Survey Programme (ISSP), the oldest annual international research project in the field of social sciences, which takes place in 48 participating countries. In 2011 the survey module on the environment was implemented in Croatia for the first time, enabling important new comparative insights into opinions and attitudes of Croatia's citizens. Overall the ISSP module Environment was fielded during 2009, 2010 and 2011, in a total of 32 countries. In this paper we focus on the European context, analysing 18 countries which participated in the module: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Latvia, Lithuania, Norway, Slovak Republic, Slovenia, Spain, Sweden, Switzerland and United Kingdom. Our analysis combines aggregate measures such as IHDI, GINI, and Eurostat's indicators with ISSP survey data on individual value orientations and attitudes. Data is for 2011, unless otherwise specified.

As has been introduced, the UNDP recently supplemented their main measure of human development (HDI), with an inequality-adjusted measure, IHDI, which should be interpreted as indicating the actual level of human development as opposed to potential human development that the HDI stands for. Hence, in the following analysis we contrast these two measures on a sample of European countries to draw attention to the differences between potential and actual human development. In addition to that, we use the GINI coefficient as a measure of inequality. According to the World Bank, GINI 'measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution'[3]. A GINI index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

Furthermore, in order to capture a more nuanced perspective of inequality as it relates to sustainability orientations, we use two Eurostat's indicators, risk of poverty and material deprivation. According to Eurostat's indicator 'risk of poverty', an individual is considered at risk of poverty if the equivalised income of her household is below 60 percent threshold of the national household equivalised median income, which means that poverty is defined in relative terms (EUROSTAT 2010). On the other hand, the indicator of material deprivation tries to capture the extent to which people are able to meet basic needs, irrespective of whether they access

03 World Bank online dataset, http://data.worldbank.org/indicator/SI.POV.GINI

this via income or not. The use of Eurostat's indicators in a comparative framework has only recently become possible, since Croatia started collecting and reporting this information in 2010. In that respect our analysis offers some novel insights.

TABLE 1 *Instruments constructed from ISSP Environment 2011 module*

Indices	Items
	"How much do you agree or disagree with each of these statements?"*
ACA Attitudes of concern and activation *The reliability coefficient for the scale for 18 countries varied from 0.59 – 0.77* *0.35 – 0.54 inter-item correlation*	(a)"there are more important things to do in life than protect the environment"
	(b)" many of the claims about environmental threats are exaggerated"
	(c)"it is just too difficult for someone like me to do much about the environment"
	(d)"there is no point in doing what I can for the environment unless others do the same"
	(e) "I find it hard to know whether the way I live is helpful or harmful for the environment"
	"How willing would you be to:"**
AMS Attitudes of material sacrifice *The reliability coefficient for the scale for 18 countries varied from 0.73 – 0.89* *0.56 – 0.80 inter-item correlation*	(a) "pay much higher prices in order to protect the environment"
	(b) „pay much higher taxes in order to protect the environment"
	(c) "to accept cuts in your standard of living in order to protect the environment"

NOTES: ** The 5-point Lickert scale ranges from 1=strongly agree; 2=agree; 3=neither agree nor disagree; 4=disagree; 5=strongly disagree.*
*** The 5-point Lickert scale ranges from 1=very willing; 2=fairly willing; 3=neither willing nor unwilling; 4=fairly unwilling; 5= strongly unwilling*

With respect to indicators and indices from the ISSP 2011 dataset, we rely on indices and indicators introduced in Domazet, Ančić and Brajdić-Vuković (THIS VOLUME). We analyse the *Attitudes of concern and activation* index (ACA), the *Attitudes of material sacrifice* index (AMS) and the *Non-growth 1* indicator. Information about the two composites constructed from ISSP survey items used is shown in Table 1, while for the mean country scores of the two composites we refer to Figures 1 and 2 in Domazet, Ančić and Brajdić-Vuković (THIS VOLUME).

The ACA index attempts to measure the prevalence of attitudes among citizens that signal concern for environmental protection but also a commitment to act with environmental protection in mind. It aggregates responses to the following statements: (a) there are more important things to do in life than protect the environment, (b) many of the claims about environmental threats are exaggerated (c) it is just too difficult for someone like me to do much about the environment, (d) there is no point in doing what I can for the environment unless others do the same and (e) I find it hard to know whether the way I live is helpful or harmful for the environment[4].

The AMS index aggregates responses to the following statements: How willing would you be to: (a) pay much higher prices in order to protect the environment; (b) pay much higher taxes in order to protect the environment and (c) accept cuts in your standard of living in order to protect the environment[5]. This index is taken as an expression of prevalence of attitudes among citizens that are willing to make sacrifices in order to reduce the ecological footprint in order to bring it in line with a projected sustainable trajectory. The strength of the non-growth preference among citizens of European countries is assessed by analysing responses to the statement: our country needs economic growth in order to protect the environment[6].

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04 The items were measured on a 5-point Lickert scale (1 = "agree strongly" through 5 "strongly disagree"). The reliability coefficient for the scale for 18 countries varied from 0.59 – 0.77 with 0.35 – 0.54 inter-item correlation. Responses were coded so that higher scores indicate greater concern for environmental protection, but also commitment to act with environmental protection in mind.

05 The items were measured on a 5-point Lickert scale (1 = "very willing" through 5 "strongly unwilling"). The reliability coefficient for the scale for 18 countries varied from 0.73 – 0.89 with 0.56 – 0.80 inter-item correlation. Responses were recoded in a way that high scores indicate respondents are more willing to take sacrifices.

06 Measured on a 5-point Likert scale (1 = "agree strongly" through 5 "strongly disagree"). The scores are coded in a way that the high scores indicate more non-growth oriented attitude.

In addition to these, we use several other items from the ISSP 2011 Environment module which aim to measure the extent of trust in fellow citizens, citizens' preferences for redistribution, both domestically and internationally, as well as direct awareness of specific environmental risks. The extent to which they exhibit interpersonal trust was captured by analysing the survey item where respondents could choose whether they think that most people could be trusted or that you can never be too cautious. On a scale of 1 to 5, 1 signalled maximum distrust, while 5 signalled maximum trust in people. Preference for within country redistribution was measured with the question "is it the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes", while the question "poorer countries should be expected to make less effort than richer countries to protect the environment" was used as an indicator of the preference for international redistribution[7]. Finally, we explore perceptions of risk from environmental pollution, captured in 7 items in the survey which asked respondents to assess the danger of specific sources of pollution such as driving cars, using GMO crops and river pollution, as is explained in more detail in sections that follow[8].

Analysis

Figure 1 shows HDI and IHDI scores for 18 European countries, data for 2012. The selection of European countries is based on those countries that were included in the ISSP survey in 2011, which makes it possible to analyse aggregate country scores against survey data, as well as enables comparison with findings from Domazet, Ančić and Brajdić-Vuković (THIS VOLUME).

Figure 1 shows that out of the 18 European countries included in this analysis post-communist countries unsurprisingly show lower levels of development than the Western European group. *Nota bene*, Slovenia and the Czech Republic represent somewhat of an exception since in terms of development they are on a par with their Western counterparts. However, the main finding of Figure 1 is the shortfall between HDI and IHDI as a

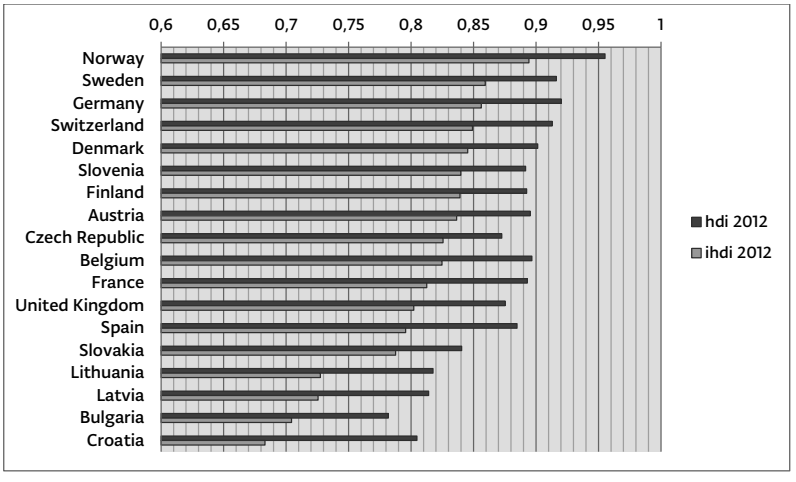
07 Since both question had the same 5-point Lickert scale (1 = "agree strongly" through 5 "strongly disagree") it was recoded in a way that higher scores indicate greater sustainability orientation (answers "agree" and "agree strongly" were recoded in "sustainability orientation", while the other three answer points were recoded in "un-sustainability orientation").

08 For each environmental risk, the respondents were asked to assess it on a 5-point Lickert scale, ranging from 1- extremely dangerous for the environment, to 5 – not at all dangerous for the environment.

result of introducing data on income inequality, which is easy to establish since countries are ranked according to IHDI status. As can be seen, Croatia fares worst of the group of 18. Even though its HDI is higher than that of Bulgaria, when inequality is factored in Croatia convincingly falls to the bottom of the group. Finally, while the average distance between HDI and IHDI for these 18 countries is 0.07, in the case of Croatia the drop is 0.12 – again the largest of the group. Overall this finding indicates that in Croatia inequality poses a significant obstacle to realising the full potential of human development. Among the Western European countries there is a noticeable difference between Norway, Sweden and Germany as a cluster where inequality has a smaller effect on development, and France, UK and Spain on the other hand, where inequality leaves a stronger negative impact on development.

FIGURE 1

HDI and IHDI indices for 18 European countries, 2012

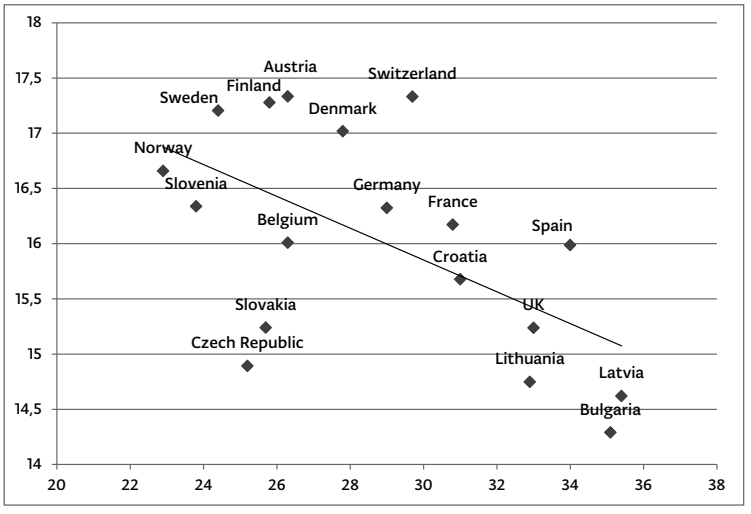


SOURCE: *UNDP data, website: http://hdr.undp.org/en/statistics/ihdi/*

Linking this back to the prosperity thesis, according to which environmental concern is clearly related to wealth and income (FRANZEN and MEYER 2010), we suggested that it was not enough that a nation was wealthy and had a sufficient proportion of the population embracing post-materialist values. In addition to that it needs to have strong redistributive policies to avoid large differences in income and access to public services such as education and health. In order to explore this hypothesis, in the following paragraphs we analyse relationships between measures of inequality and

items from the ISSP survey that capture various aspects of the sustainability orientation. Figure 2 shows the relationship between income inequality, measured by GINI coefficient, and the *Attitudes of concern and activation* index (ACA) that was introduced earlier. The GINI coefficient is commonly used as a measure of inequality of income, where higher values indicate more inequality of income.

FIGURE 2
GINI and ACA index

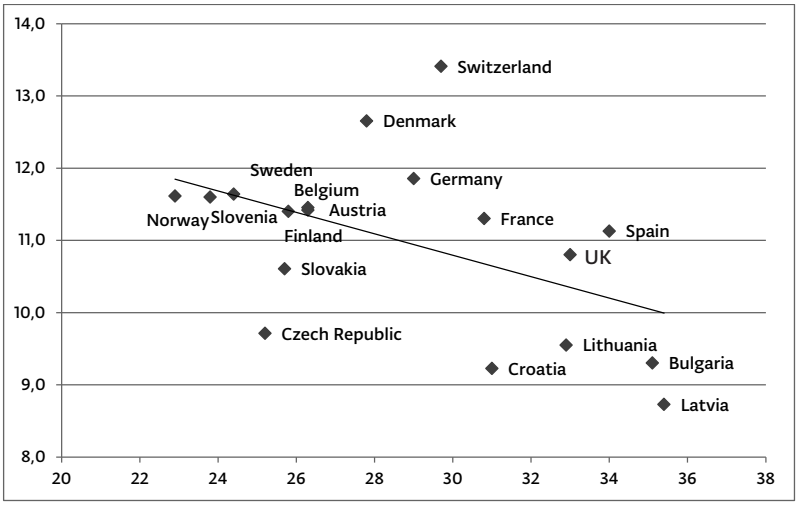


As can be seen in Figure 2, the GINI coefficient is inversely correlated with the ACA index, meaning that in more unequal societies the population is less concerned and willing to act on environmental issues. The correlation is moderately strong (-0.58), and significant at 0.05 level, offering an initial tentative confirmation of our first hypothesis.

Next, GINI is also inversely correlated with the readiness of the population for material sacrifice, as shown in Figure 3.

The correlation is -0.48, significant at 0.05 level. Though among the developed affluent European countries such as Switzerland, Denmark and Germany differences with respect to readiness for material sacrifice do not seem to be related to the level of inequality, overall this relationship holds. It is perhaps most pronounced in the lower right hand corner of the distribution, where it can be seen that in the most unequal European countries – Latvia and Croatia, which are also least affluent, their populations are least ready to make individual material sacrifices for the sake of sustainability.

FIGURE 3
GINI and AMS index



That income inequality is an obstacle to sustainability orientations in European populations is also confirmed when observing its relationship with other items from the ISSP survey. GINI is inversely correlated with the non-growth orientation (r=-0.48; sig. 0.05) as well as with trust (r=-0.47; sig. 0.05). The non-growth preference captures the extent to which respondents see economic growth as necessary for environmental protection, and this inverse correlation suggests that people who live in more unequal societies more often tend to see economic growth as a precondition for environmental protection.

Next, we also explore the relationship between inequality and trust, which has been recently theorised by Michael Sandel (2012). According to him, increasing commodification of spheres of life means that life becomes harder for those with modest means; it is becoming increasingly difficult to ensure one's material reproduction without insufficient income. How is this related to trust? Democratic regimes rest on the assumption of sharing in common civic rights and obligations, and so in order for the social glue to work, citizens should have a sense of community and nurture social bonds. This is being eroded when differences in income separate them into groups that populate separate spaces, rarely encountering each other except through monetary exchange and generally leading increasingly disparate lives. A corollary of increasing inequality is segregation of the well-off, the strengthening of corrosive individualism and a lack of community spirit.

From there it seems obvious why a lack of trust is problematic for a switch to sustainability – accepting material sacrifices and changing your behaviour for the benefit of not only your identifiable local population, but for the benefit of the global population and of future generations seems possible only if citizens share a minimum consensus about what constitutes a community and if they trust that their behaviour will be rewarded with the behaviour of others. Alternatively deeply individualistic behaviour shall prevail, whereby the conviction that others will not modify their behaviour leads us to free-ride, refuse to change our behaviour, and incur further costs on the environment. In other words, Hardin's (1968) tragedy of the commons represents a self-fulfilling prophecy of sorts, since increased commodification of all spheres of life corrodes a sense of community, thereby leading to even fiercer disregard for the commons. Conversely, reducing inequalities and democratising the political and economic spheres are preconditions for launching virtuous circles towards sustainable development trajectories.

Summarizing the findings so far, income inequality measured by the GINI coefficient corroborates our first hypothesis according to which inequality is an obstacle to sustainability. In the following analysis we show that these findings also hold if we use an alternative measure of income inequality – Eurostat's indicator of risk of poverty. This indicator captures those living in a household with an equivalised disposable income below 60% of the national median equivalised disposable income (after social transfers)[9]. Using data for 2011 and comparing this indicator with elements of the sustainability orientation from the ISSP dataset for the same 18 countries, we find strong and statistically significant correlations, shown in Table 1.

TABLE 2 *Risk of poverty and sustainability orientations*

	Concern and activation	Material sacrifice index	Trust	It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes.
correlations	-0.723**	-0.728**	-0.589**	0.5888*
significance	0.01	0.01	0.01	0.05

09 More information about the indicator and data sources: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/People_at_risk_of_poverty_or_social_exclusion

As can be seen from Table 2, crucial elements of individual sustainability orientation – concern and activation and readiness for material sacrifice– show significant association with the prevalence of risk of poverty, in an inversely correlated relationship. The more poverty there is in society, less are citizens concerned about the environment, ready to change their behaviour or incur material sacrifice to this end. Interestingly, this holds even in more affluent European countries, where the absolute level of the poverty risk threshold is as high as the national median income in poorer countries. This might indicate the importance of relative prosperity within one's community alongside absolute national prosperity presented in Domazet, Ančić, Brajdić-Vuković (THIS VOLUME). That segments of society exposed to existential risks of poverty and other forms of material insecurity are less prepared to modify their own behaviour seems reasonable given that their scope of choice is severely constrained, and that their consumption is substantially lower from the consumption of their well-off fellow citizens. Furthermore, the same inverse relationship holds for the extent to which citizens are willing to trust each other, corroborating our previous findings.

If we accept that inequality is an obstacle to sustainability, then redistribution seems a necessary logical step in realising more egalitarian societies. As can be seen from column five in Table 2, societies with a greater proportion of citizens at risk of poverty are more supportive of income redistribution by the government. The respondents were asked whether they agreed that the government was responsible for reducing income differences among people with high and low incomes, with higher scores indicating a stronger preference for redistribution. This finding seems to suggest that, while overall inequality is an obstacle to sustainability orientations, being exposed to risk of poverty unsurprisingly produces demands for redistribution. In societies where greater proportions are exposed to risk of poverty perhaps it is more visible that changes to individual consumption patterns form only a part of the changes required for a switch to sustainability, which may help explain their stronger preferences for redistribution by the government.

Next, since both GINI and risk-of-poverty are measurements based on income, a possible objection to our analysis may be that measurements of income only partially capture actual social dynamics when it comes to inequality. Apart from their recorded income, people also rely on unrecorded income, both from the grey economy and from other non-monetized sources of social reproduction, like unpaid domestic labour or access to food via subsistence farming. These practices are fairly widespread in less developed countries (ILO 2011). EU data agencies have recently introduced an indicator measuring material deprivation, which tries to capture the extent to which people are able to meet basic needs, irrespective of whether they access

this via income or not. The difference between this indicator and the one measuring risk of poverty is in that the former aims to capture real material conditions of livelihoods which are not fully reliant on monetary exchange. This indicator is based on measuring whether individuals are able to face unexpected expenses, have one week of annual holiday away from home, pay mortgage and rent (utility bills etc.), have a meal with meat, chicken or fish every other day, keep the home warm, have a washing machine, colour TV, telephone and personal car. It is defined as the proportion of people living in households who lack at least 3 of these 9 items because they cannot afford them (EUROSTAT 2010).

Table 3 shows correlations between material deprivation and the same items from the ISSP survey as before. The analysis was done for 16 countries since there is no data on material deprivation for Germany and Slovakia.

TABLE 3 *Material deprivation and sustainability orientations, 2011*

	concern and activation	material sacrifice	trust	It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes.
correlations	-0.758**	-0.740**	-0.627**	0.535*
significance	0.01	0.01	0.01	0.05

Table 3 shows that when a measure of inequality of income is replaced with a measure capturing material deprivation, associations with crucial elements of sustainability orientation remain strong. As was the case when analysing risk of poverty, the extent of material deprivation of a given country's population is inversely strongly associated with the concern and readiness of those populations to modify their behaviour towards sustainability, accept some material sacrifices and trust their fellow citizens. Similarly, the more material deprivation is widespread in a given country, the stronger the preferences for redistribution by the government.

Up to this point, our analysis has returned consistent findings regarding the relationship between inequality and sustainability orientations. Regardless of which measure of inequality we use (GINI, risk of poverty or material deprivation), and irrespective of which aspect of individual behaviour we focus on, the findings support our first hypothesis according to which inequality is an obstacle to sustainable orientations. In addition

to that, these findings support our amendment of the prosperity thesis, since in addition to a country's average level of wealth, it is the distribution of that wealth within society that provides an important driver of environmental concern.

Building on this, in the rest of the analysis we focus on our second hypothesis, according to which important aspects of sustainability orientation may be found in less affluent societies. In order to try to capture this empirically, we use Haanpää's (2005) thesis about two types of environmental concern. The first is related to the spread of post-materialism in affluent Western societies (INGLEHART and WELZEL 2005), while the second variety of environmentalism is not simply a value orientation but a perception of real environmental threats (BRECHLIN 1999; GUHA 2000; GLASSER 2004). While Haanpää's thesis is stronger when applied to the global North and South, in the following sections we explore whether it holds when observing differences among European countries.

Haanpää (2005) tested this hypothesis of two types of environmentalism on ISSP data from the 2000 implementation round. She divided the countries in her sample into two groups, more and less affluent, using as the cut-off point the GDP per capita of $20,000. After creating two groups of countries, she compared the attitudes of respective populations to environmental risks such as pollution caused by cars, industry, pesticides in farming, water pollution and a rise in the world temperature. Her main findings supported her thesis regarding the two types of environmentalism between more and less affluent nations. In the following section we replicate her analysis by using the ISSP 2011 data for our set of 18 European countries. If we apply the same threshold of $20,000 GDP per capita in 2011, two groups of countries emerge, as shown in Table 4.

TABLE 4

Affluent European countries	Less Affluent European countries
Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Norway, Slovenia, Spain,Sweden, Switzerland, United Kingdom	Bulgaria, Croatia, Latvia, Lithuania, Slovakia

Following Haanpää's procedure, we analyse the difference in means between the two groups, looking at descriptive data in Table 5, as well as performing independent sample t-tests. Table 5 shows the means for a number

of items in the survey which asked the respondents about their perceptions of risk of environmental pollution. In the survey respondents chose from a five-point Lickert's scale, where 1 stood for 'I strongly agree', while 5 stood for 'I strongly disagree'. In other words, a lower mean in Table 5 should be read as stronger awareness of a given environmental risk.

TABLE 5

Item	Affluent			Less Afluent		
	N	Mean	SD	N	Mean	SD
Air pollution caused by cars	17650	2,58	,81	5335	2,26	,86
Air pollution caused by industry	17683	2,12	,79	5312	1,99	,81
Pesticides and chemicals used in farming	17527	2,22	,89	5305	1,96	,84
Pollution to rivers and lakes dangerous	17583	2,25	,91	5303	2,08	,87
Rise in world temperature caused by climate change	16970	2,38	,98	5132	2,22	,96
Genetic modifying of crops	15945	2,59	1,07	4901	2,22	,99
Nuclear power stations	17181	2,40	1,06	5160	2,11	1,06

As Table 5 clearly shows, for all seven items included in the 2011 module, respondents from less affluent countries are more aware of environmental risks than respondents from more affluent countries. These findings echo those from Brajdić-Vuković (THIS VOLUME); though instead of a measure of wealth she uses indicators of a knowledge economy and dominant social paradigm, she finds that respondents from countries that have a weak knowledge economy and less prevalent neoliberal values (growth imperative, limited government and technocratic optimism) are highly aware of environmental risks. Our analysis points to the same conclusion.

In addition to that, independent samples t-tests show these differences among groups to be statistically significant at 0,001 level. Therefore, our findings support Haanpää's (2005) argument according to which poorer populations may have a stronger perception of direct, real environmental threats despite not expressing great individual activation and commitment to personal material sacrifice. Taken together, the findings regarding redistributive preferences, and these which suggest that less affluent societies are more aware of environmental risks can be taken to support our second hypothesis according to which important aspects of the sustainability orientation are present in less affluent societies.

Conclusion

How do our findings reflect on the general proposition of the prosperity thesis, according to which wealthier societies are more environmentally friendly? Overall, by finding empirical support for both our hypotheses, we have managed to challenge the simplistic versions of the prosperity thesis. We argued that inequality should be considered a major obstacle in the reorientation towards more sustainable developmental trajectories, both within societies and globally. The empirical support for this argument seems clear – regardless of which measure of inequality we used, it proved corrosive for environmental concern, readiness for material sacrifice and, no less important, the preparedness of people to trust each other. Our findings corroborate the argument according to which the relationship between rise in income and environmental protection is anything but automatic (GROSSMAN and KRUEGER 1995). When economic development is not accompanied by a more equitable distribution of power and income within society, environmental sustainability is directly jeopardised.

Secondly, we have argued that, just as we should not expect economic prosperity to deliver solutions to environmental crisis, it is also a fallacy to expect that only affluent societies hold value orientations important for the switch to sustainability. While post-materialists are important in that they have the resources to push this political project forward, sometimes their consumer preferences take the form of choosing gated communities, while less well-off groups may face a simpler calculus in preferring more sustainable development practices (TORRAS and BOYCE 1998). Our analysis shows that less affluent European societies where large segments of society are exposed to risk of poverty and various forms of material insecurity exhibit important aspects of the sustainability orientation. First of all, they exhibit stronger redistributive preferences, which arguably represent a crucial aspect of a determined societal effort for a reorientation towards a sustainable development trajectory. Secondly, our findings suggest that

less affluent societies exhibit a heightened awareness of the risks posed by environmental degradation, which is in line with the second variety of environmentalism (MARTINEZ-ALIER 2002) that stresses power relations and ecological distributional conflicts.

In summary, we hope to have made a case in support of an argument according to which what matters for sustainability is a more equitable distribution of power within society, which may or may not occur with economic development. Following Torras and Boyce (1998, 150), we argue that "distribution of power is not a peripheral concern" – on the contrary, a more equitable income distribution combined with stronger political rights and individual emancipation are key factors in garnering public support for the reorientation towards sustainable development trajectories. ●

7 The sustainability potential of the knowledge society: Empirical study

Marija Brajdić Vuković

Introduction

An opinion poll on climate change carried out in Germany in 2013 by 'Spiegel Online' (the Internet portal of one of the most influential political and daily news magazines in Germany, 'Der Spiegel') asked respondents whether they were 'afraid of climate change'. According to the poll results, 60% of respondents answered 'no', yet 67% believed that 'climate changes predictions are credible' and 60% perceived that 'global warming mainly entails drawbacks'[1]. This combination of beliefs and attitudes reveals an interesting – and somewhat paradoxical – perception of environmental risks within the sample of German citizens. If the respondents perceive global warming as a real and scientifically proven threat that will mainly cause drawbacks for the population, what is the explanation for the lack of fear about climate change?

Researchers have long been preoccupied by how little concern both citizens and politicians express about climate change and its consequences (WEBER 2006). Researchers argue that most citizens, especially in the Western world, have not yet experienced the effects of global warming and that 'the time-delayed, abstract, and often statistical nature of the risks of global warming does not evoke strong visceral reactions' (ibid., 103) and that the perception of risks is mediated by self-interest and personal gains/losses (BLAKE 2001). Other authors have discussed the fact that most of the public has misconceptions about climate dynamics and that their lack of knowledge prevents the development of a more explicit or active concern for the environment (STERNMAN and SWEENEY 2007). Such explanations for the lack of fear about climate change deal with micro-level, individual

01 http://www.spiegel.de/fotostrecke/photo-gallery-global-warming-on-pause-fotostrecke-101776-8.html

responses to the global threat. From the sociological point of view, however, it is important to understand whether adopting a 'relaxed' position on climate change is influenced by the wider sociopolitical framework of a given society (and if so, how) and whether such a position on climate change also influences pro-environmental behaviour (both of individuals and societies).

In searching for such answers, this study will focus its discussion on two concepts that are widely used in political debates, and yet are often used imprecisely: 'knowledge society' and 'sustainable development'. This study examines the idea (or even 'ideology') of the knowledge society that has dominated the political narrative of liberal democracies of Europe since the signing of the Lisbon Treaty in 2000 (ROOM et al. 2005). The study is especially concerned with the belief implied by politicians that the development of the knowledge economy and, more broadly, of knowledge societies will result in sustainable development (RODRIGUES 2002; ROOM et al. 2005). This study aims to establish how the cultures and contexts of countries that can be considered as knowledge economies/societies affect, on one hand, citizens' perceptions of environmental risks and, on the other hand, the extent to which they engage in pro-environmental behaviour. To answer this question, an analysis will be made of the relationship between the level of development of the knowledge society in specific countries, perceptions of environmental risks and engagement in pro-environmental behaviour, with an aim to determine whether sustainability and the knowledge society grow together – that is, whether the development of a knowledge society at the same time results in what Beck (2010) calls 'the greening of modernity'. For this purpose, I use data from the International Social Survey Programme (ISSP) (the *Environment* module) carried out in 2010. I analyse data for 17 European countries (mainly European Union member states with the addition of Norway and Switzerland), together with knowledge society indicators gathered by the European Commission in 2011.

The next section presents the theoretical framework, Section 3 introduces data and measurements and Section 4 presents the results. The findings and limitations of the study are discussed in Section 5, which also draws conclusions.

Theoretical framework

The concepts of the 'knowledge society' and 'sustainable development' have been the subject of diverse research and debate. The following literature review is therefore intended as being illustrative and not exhaustive, with a primary aim to explain the theoretical background of the ideas that are questioned and researched in this study.

Beginning with the Lisbon Treaty in 2000, the European Union directed its development towards the goal of creating a 'knowledge society'. This 'new direction' of the European Union (which actually had more to do with creating a 'new knowledge economy' than a knowledge society in its broader sense) was a direct result of recent global developments. Rodrigues (2002) emphasises that the most prominent problem relating to the future of the European Union at the beginning of the century was the impact of globalisation, technological change and an ageing population on the welfare state, resulting in its need to be redefined. Through the Lisbon Treaty, two important demands were made of European leaders: to speed-up the transition towards a knowledge economy, with more jobs and more social cohesion; and, at the same time, to make Europe more a competitive and dynamic economy. In other words, the knowledge economy was seen as solution that could to produce economic growth, which in turn would ensure employment and welfare and thus improve the lives of all members of society (RODRIGUES 2002).

However, as a result of the growing awareness of the limited environmental potential of exploiting the planet's natural resources, the European Union also, at least in principle, became concerned with the limits of its member states' potential for economic growth, and thus called for the development of 'green policies' of economic development. As Beck (2010) argues, the main question for 'green politics' has been how to reach the goal of an 'alternative modernity' that includes a 'new vision of prosperity' (which yet needs to be invented and pioneered) and that defines wealth 'not in gross economic terms but as overall "well-being"' (p. 256). Although initially being oriented towards creating more cohesion in society, better jobs and ensuring well-being for all citizens, the highest political structures of the European Union in practice have avoided such an approach and have instead framed discussions about the creation of a knowledge society almost exclusively in terms of the knowledge *economy*. Especially so through emphasising the priorities of 'competitiveness', 'development of digital technology', 'innovativeness' and 'private investment in R&D and ICT' (RODRIGUES 2002; ROOM et al. 2005). In such a context, the knowledge economy presents new challenges to European societies, especially in the domain of education, because it 'treats people as forms of human capital that can be rendered more or less productive in the economy depending on the extent of their knowledge' (GUILE 2010). Such an approach also presents a challenge to the domain of politics and the economy, because not all European member states are equally likely to successfully develop knowledge economies.

Recent research has shown that a given society's culture or dominant values, as well as its politics, influences its scientific, technological and (at a general level) innovation development (COLE and PHELAN 1999; INONU 2003;

SCHOFER 2004; CARILLO and PAPAGNI 2006; KAASA and VADI 2010). Research has also shown that the relationship between science and technology on one hand, and the economy on the other hand, is not a simple or straightforward one (CARILLO and PAPAGNI 2006; DOSI et al. 2006). Regarding the potential of countries to contribute to sustainable development, researchers have claimed that science and technology policies can influence the orientation of a given country's sustainability policy in different ways, depending significantly on how scientists and scientific information are regulated by government policy (DRAHOS and BRAITHWAITE 2002; YOUNG 2002; CASH et al. 2003; STEHR 2003; EC 2007). The approach that a given society takes to sustainability also depends on the ethics, knowledge and attitudes to risk prevalent within that society (ADGER et al. 2009). As a result, European countries struggle with the development of the 'knowledge economy' in different ways. The extent to which certain countries put emphasis on having 'green politics' in place or the level of priority that the country places on the goal of economic competitiveness, varies significantly in Europe, from west to east and from south to north (DAVID and FORAY 2002; ROOM et al. 2005; DOSI et al. 2006).

In this study, I focus on citizens and their potential for pro-environmental behaviour in the context of the knowledge society. There are diverse possibilities for carrying out research on beliefs, attitudes, perceptions and behaviour of the public regarding the environment and there is a wealth of empirical results available on this topic. Many authors have examined the link between environmental beliefs and the intent to engage in pro-environmental behaviour or, more precisely, between clusters of environmental beliefs (such as three varieties of environmentalism – altruistic, egoistic and biospheric) and their correlation to the willingness of individuals to take political action to protect the environment (STERN et al. 1993). These correlations have consistently been demonstrated as positive, irrespective of whether the research is older or more recent (for example WEIGEL and NEWMAN 1976; DUNLAP and VAN LIERE 1978; GIGLIOTTI 1992; GROB 1995; STEEL 1996). For the purpose of this study, I will not focus on the perception of environmental beliefs and attitudes, but rather environmental risks, conceptualised as the perceived likelihood that a specific environmental phenomenon will have negative consequences to oneself and/or to society. Research on the topic of perceived environmental risks and behaviour is not as rich as on environmental beliefs and attitudes, but it has been established that perception of environmental risks is also a powerful independent measure of pro-environmental behaviour (O'CONNOR et al. 1999). As O'Connor and associates argue, the very nature of long-term and uncertain environmental problems makes it likely that specific perceptions of risk will significantly relate to pro-environmental behaviour (1999, 462), and, according to their findings, the risk perceptions are 'not a

surrogate for general environmental beliefs but have their own power to account for behavioural intentions' (ibid., 469).

According to Beck (2010), environmental risks are:

> 'man-made, incalculable, uninsurable threats and catastrophes which are anticipated but which often remain invisible and therefore depend on how they become defined and contested in knowledge. As a result their "reality" can be dramatized or minimized, transformed or simply denied, according to the norms which decide what is known and what is not.' (p. 256).

Environmental risks are thus socially (or even politically) constructed. Therefore, in the same way as the likelihood of developing a knowledge society varies depending on specific characteristics of a country, beliefs and attitudes on environmental issues and pro-environmental behaviour of citizens can also be perceived as mediated by the dominant culture and especially the sociopolitical context of a given society (KAASA and VADI 2010; KILBOURNE et al. 2002; SPANGENBERG 2005).

The starting point of this research, according to which an analysis of the wider sociocultural context is imperative to an understanding of the underlying causes of environmental decline (KILBOURNE et al. 2002, 195), is not a new one. This top-down approach to citizens' beliefs and attitudes is well elaborated in the concept called the 'dominant social paradigm' (DSP) used by Milbrath (1984) in explaining environmentalism and pro-environmental behaviour. Milbrath defines the DSP as 'the values, metaphysical beliefs, institutions, habits etc. that collectively provide social lenses through which individuals and groups interpret the social world' (ibid., 7). However, a paradigm is not made dominant by virtue of being held by the majority of people in society, but only by virtue of being held by dominant groups who use it to justify a prevailing institution. As Cotgrove (1982, cited in KILBOURNE et al. 2002) explains, a paradigm 'becomes a justification for social and political action by the group, and, as such, functions as ideology' (p. 194). In a study on environmental attitudes and the DSP, Kilbourne and associates (2002) argued that the relevant dimensions of the DSP in the environmental context are political, economic and technological. These dimensions are parallel to those of state, business and science, which (according to BECK 1995) are the dimensions whose powerful interplay characterises modern industrial societies. Empirical research findings on the DSP and environmental attitudes support abovementioned concept. Although Cotgrove (1982) and Milbrath (1984) did not measure the political, economic and technological dimensions, they included items on each of these dimensions in their multinational surveys. They concluded that 'paradigm issues are at the heart of the

environmental crisis' (KILBOURNE et al. 2002, 195) and they found that significant dimensions of the paradigm were faith in science, technology and economic growth, as well as support for *laissez-faire* government. In more recent research, Kilbourne and Carlson (2008) also found that the political, economic and technological dimensions of the DSP are inversely related to environmental attitudes.

Kilbourne and associates (2002) have extensively tested batteries related to the three socioeconomic dimensions of the DSP and defined the dimensions in the following way:

- Political dimension: defined as the normative framework of liberal democracy, with its focus on freedom of the individual, private property and limited government;
- Economic dimension: defined also from the liberal democracy perspective, with self-interest expressed through economic rationality as generally considered as being the sole motivator of behaviour. It is also defined through the belief that the economic growth will solve short-term inefficiencies of free markets;
- Technological dimension: defined as a general character of technological optimism and technological politics, a belief that technology can and will solve problems when they become severe.

Together, the values that are inherent in these three dimensions reflect the individualisation and normative framework of liberal capitalism. It has also been suggested that, because the sum of individual goods does not automatically result in a collective good, the combination of these three dimensions, which represent the DSP in Western industrial societies, inevitably leads to "the tragedy of the commons"[2] (OPHALUS 1977; DRYZEK

02 In his widely cited article from 1968 that focuses on the worlds' overpopulation problem, Garrett Hardin criticised, among other subjects, the invisible hand and the concept of freedom as a good way of regulating market and societies' goods in general. In describing of the dangers of unregulated market behaviour and its consequences for common material (natural) goods, Hardin used a metaphor of open pasture and herdsmen: „As a rational being, each herdsmen seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks: „What is utility to me of adding one or more animals to my heard?" (...) the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his heard. And another, and another... But this is the conclusion reached by each and every rational herdsman shearing a common. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without the limit – in a world that is limited. Ruin is the destination towards all men rush, each pursuing his own interest in a society that believes in the freedom of the commons. The freedom of the commons brings ruins for all. " (ibid., 162).

1996 in KILBOURNE et al. 2002). As Kilbourne and associates (2002) have found in their empirical study, environmental attitudes of individuals are directly influenced by their attitudes towards the DSP, and the political, economic and technological dimensions of the DSP are inversely related to the measures of environmental concern, but also to the willingness to engage in pro-environmental behaviour (p. 202-203).

Spangenberg (2005) also argues that the normative framework of Western liberal democracies, being (neo)liberal capitalism, is opposed to sustainable development because it promotes a concept of individualisation and dismantling of social structures. For the most part, the mostly used 'technology-supply-focused' instead of 'demand-centred' technological paradigm as Spangenberg writes:

> 'can be disruptive force for social cohesion (... and) the short term orientation and the mixtures of commercial, military and other preoccupations that motivate much of the science-based technology development are most often controversial from a sustainability perspective based on peace, justice and environmentally sound development' (2005, 88).

Spangenberg does observe that there is potential in several European countries for the development of sustainable knowledge society, but this potential lies in supporting active citizenship, a demand-centred economy and the development of science and technology.

Based on the concepts previous research described above, this study aims to establish whether the orientation of European countries towards the goal of becoming knowledge societies also develops or encourages an orientation of its citizens towards pro-environmental behaviour. The study will examine the wider sociopolitical and normative framing of European countries (their DSP), the beliefs and attitudes of their citizens towards environmental risks and their engagement in pro-environmental behaviour, all in the context of citizens' broader attitudes towards the success of their countries as knowledge societies.

HYPOTHESES

Approach of this study is based on the notion of 'postmodern industrial democracies' (BECK 1995) and Spangenberg's critiques of the (neo)liberal framework of knowledge societies (2005), together with the concept of the dominant social paradigm empirically tested by Kilbourne and associates (2002). Based on these authors' perspectives and research findings, it can be expected that the development of a knowledge society will be accompanied by a widespread values that are tied to liberal capitalism, such as a belief in economic growth, limited government and powerful science.

> H1: The level of development of the knowledge society is higher in the countries where the DSP is higher – that is, in societies in which the norms of liberal capitalism are prevailing.

Based on previous research (O'CONNOR et al. 1999), I expect that the rise in individuals' perception of environmental risks will be an important indicator of their intent to engage in pro-environmental behaviour, irrespective of other contextual differences between European countries.

> H2: The intent to engage in pro-environmental behaviour rises together with the perception of environmental risks.

Because previous research has established that the socioeconomic dimension of the DSP is reversely correlated to general environmental beliefs and attitudes (KILBOURNE et al. 2002), I expect that both the perception of environmental risks and pro-environmental behaviour will be lower in the countries where the DSP is higher. And because of the hypothesised relationship between the DSP and the level of development of the knowledge society, I expect that rise in the knowledge society indicators will also have a negative effect on the perception of environmental risks and pro-environmental behaviour.

> H3a: The perception of environmental risks is lower in countries where the DSP has a stronger emphasis on liberal capitalism.

> H3b: The perception of environmental risks is lower in countries with a higher level of development of the knowledge society.

> H4a: The intent to engage in pro-environmental behaviour is lower in countries where the DSP has a stronger emphasis on liberal capitalism.

> H4b: Pro-environmental behaviour is lower in countries with a higher level of development of the knowledge society.

Methods

DATA SOURCES AND PROCEDURES

The analyses in this study were made based on data from the *Environment* module of the International Social Survey Project (ISSP), which was carried out in 32 ISSP member countries in 2010. For the purpose of this study, 17 European countries were selected: nine 'old' European Union member

states (Austria, Belgium, Denmark, France, Finland, Germany, Spain, Sweden and the United Kingdom), six 'new' member states (Bulgaria, Croatia, Czech Republic, Latvia, Slovak Republic and Slovenia) and two non-member states (Norway and Switzerland)[3].

The *Environment* module of the ISSP consists of different batteries related to general environmental beliefs and attitudes of individuals, such as awareness and concern for environmental issues or the willingness to change one's way of life in order to contribute to environmental preservation. For the purpose of this study, the 'perception of environmental risks' and 'pro-environmental behaviour' batteries were chosen. Variables for the perception of environmental risks are those that measure the respondents' perception of the dangerousness of certain pollutants or new (bio) technologies for people and nature (such as car gasses, industrial pollution, pesticides and chemicals, genetic modification and nuclear plants). Pro-environmental behaviour is presented by a set of variables that, rather than measuring actual behaviour, measures respondents' intentions to take part in pro-environmental behaviour environment, such as recycling of glass, plastic and paper, buying 'green' products, saving water and choosing alternative means of transportation instead of travelling by car or saving energy.

The *Environment* module of the ISSP is not constructed with the aim to test for the political, economic and technological dimensions of the dominant social paradigm (DSP) concept. In the previously cited research from Kilbourne and associates (2002), four variables are used to account for each of these three DSP dimensions[4]. However, for a better understanding of the influence of sociopolitical and normative contexts on environmental risks perception and environmental effort of the analysed countries, this study will use variables from the ISSP *Environment* module that can represent the three dimensions of the DSP. After statistical testing, three variables were selected in order to test the level of the DSP of the countries analysed in this research. The variables that were selected are optimism about science[5], belief in economic growth and belief in limited government, which

03 The data are weighted based on age, sex and educational level for more than half of countries- samples, excluding Croatia, Denmark, Germany, Latvia, Norway, Slovenia, Sweden and Switzerland for which no weighting procedure was avaliable.

04 At the same time, however, Kilbourne and associates themselves acknowledged that these variables do not necessarily represent the best fit and call for more statistical testing (KILBOURNE et al. 2002, 200)

05 Science related optimism represents or is inserted in our study instead of the technological dimension, basing on the Becks' notion of state, business and science whose powerful interplay characterises modern industrial societies (see page 5).

are all beliefs and attitudes that can usually be associated with the concept of liberal democracy and liberal capitalism.

The data used as knowledge society indicators for all the countries in the sample were gathered from the *Innovation Union Competitiveness Report – 2011 edition*, specifically from Chapter 2 and from the Chapter entitled 'Overall review of EU member states and associated countries' (EC 2011). The latter consists of country reports on indicators related to innovation and research investment and outcomes such as the intensity of research and development (R&D), business enterprise expenditure on R&D, patent applications, patent revenues from abroad, but also numbers of doctoral graduates, numbers of researchers per thousand labour force, scientific publications within the top 10% most cited publications worldwide as a percentage of total scientific publications of the country, etc. Based on the reviewed literature and on previous research findings, the following indicators were selected as knowledge society contextual variables: business enterprise expenditure on R&D as a percentage of GDP (BERD), researchers per thousand labour force (full-time equivalent – FTE), scientific publications within the top 10% most cited publications worldwide as a percentage of total scientific publications of the country and PCT (Patent Corporation Treaty) patent applications per billion GDP (in PPS€)[6].

INDICATORS

Environmental risks perception indicator: this indicator is a composite of the answers to seven questions related to the perception of environmental risks. Perceived risks are measured according to a scale of 1 to 5, based on the following possible responses: (1) 'not dangerous at all', (2) 'not very dangerous', (3) 'somewhat dangerous', (4) 'very dangerous', (5) 'extremely dangerous'. The frequencies for the countries are presented in the Table 1

06 According to the Eurostat "The purchasing power standard, abbreviated as PPS, is an artificial currency unit. Theoretically, one PPS can buy the same amount of goods and services in each country. However, price differences across borders mean that different amounts of national currency units are needed for the same goods and services depending on the country. PPS are derived by dividing any economic aggregate of a country in national currency by its respective purchasing power parities. PPS is the technical term used by Eurostat for the common currency in which national accounts aggregates are expressed when adjusted for price level differences using PPPs. Thus, PPPs can be interpreted as the exchange rate of the PPS against the euro." (http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Purchasing_power_standard_(PPS), accessed 1.10.2013)

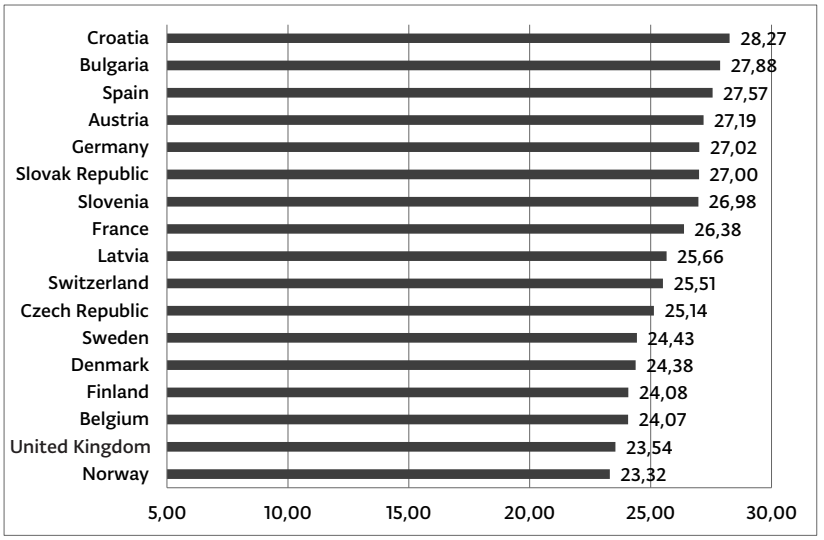
TABLE 1 *Perception of environmental risks by countries (very and extremely dangerous %)*

	Air pollution caused by cars	Air pollution caused by industry	Pesticides and chemicals used in farming	Pollution river, lakes	A rise in world temperature caused by climate change	Modifying genes of certain crop	Nuclear power stations
Austria	45.9	72.2	61.9	52.9	58.6	61.5	76.9
Belgium	27.1	48.7	38.3	39.5	31.4	18.7	31.3
Bulgaria	55.4	64.6	66.3	67.4	60.8	58.7	49.1
Croatia	57.9	75.7	72.5	39.5	67.8	61.1	77.4
Czech Republic	44.1	63.5	57.0	55.0	43.0	36.7	26.4
Denmark	31.1	43.1	48.4	42.5	37.0	25.4	33
Finland	23.1	54.1	43.0	48.7	43.0	34.7	39.3
France	31.4	61.3	64.4	61.8	42.3	48.9	39
Germany	44.1	69.6	57.9	59.1	59.1	53.6	57.8
Latvia	34.2	46.9	53.4	45.6	36.6	46.6	58.6
Norway	23.5	39.0	32.1	28.8	33.0	25.3	48.5
Slovak Republic	61.8	69.0	61.2	60.5	55.8	44.1	43.5
Slovenia	37.9	67.1	69.5	64.9	58.9	54.7	64.7
Spain	55.2	66.5	61.4	66.9	60.8	42.8	55.7
Sweden	36.0	52.6	46.3	48.2	40.2	32.1	27.6
Switzerland	33.3	57.5	51.4	39.0	53.0	44.2	70.4
United Kingdom	24.7	42.3	33.4	40.8	56.6	28.1	32.1

All of risks perception variables are highly saturated on the single factor (47% of the explained variance) and the scaling reliability (Cronbach's alpha) for the whole sample is 0.80, ranging from 0.74 (Austria) to 0.85 (Croatia). Based on those indicators, all risk perception variables were added to a scale, ranging from 23.31 (Norway) to 28.26 (Croatia). The result is a meas-

ure of overall perception of environmental risks of the sample countries, according to which higher values represent a higher perception of risks. The average for the sample countries for the *environmental risks perception indicator* is presented in the Figure 1.

FIGURE 1
Environmental risks perception indicator (average) by country (> extremely dangerous)



Pro-environmental behaviour indicator: this indicator is a composite of the answers to six questions related to the intended environmental behaviour of respondents. Pro-environmental behaviour is measured on a scale from 1 to 4, according to the following responses: (1) 'never', (2) 'sometimes, (3) 'mostly', (4) 'always'. Frequencies for the sample countries are presented in Table 2.

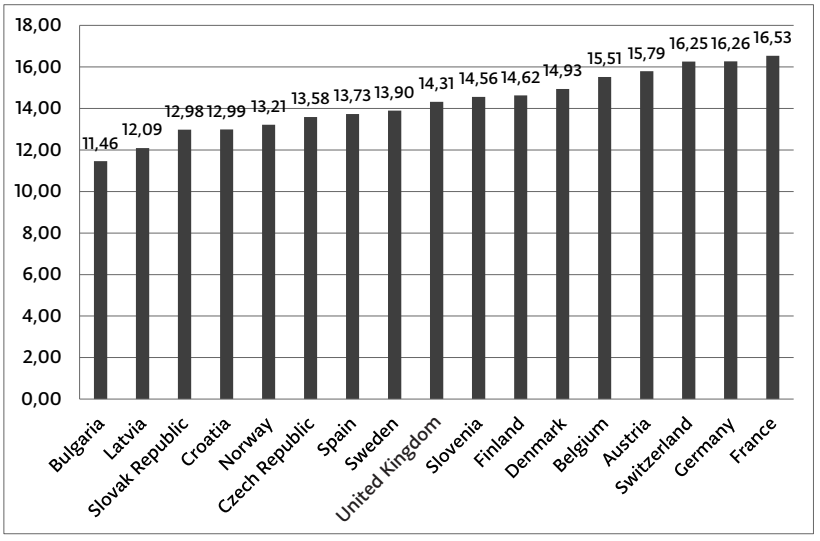
All pro-environmental behaviour variables are highly saturated on the single factor (47% of the explained variance) and the scaling reliability (Cronbach's alpha) for the whole sample is 0.77, ranging from 0.69 (Slovenia) to 0.86 (Croatia).

Based on those indicators, the variables were added to a scale ranging from 11.45 (Bulgaria) to 16.52 (France), thereby measuring the level of pro-environmental behaviour in the sample countries, with higher values representing a higher level of engagement in pro-environmental behaviour. The average for the sample countries for the pro-environmental behaviour indicator is presented in Figure 2.

TABLE 2 *Pro-environmental behaviour by sample country (% of ten and always)*

	Sort glass for recycling	Buy fruit and vegetables without pesticides or chemicals	Cut back on driving a car for environmental reasons	Reduce the energy or fuel at home for environmental reasons	Save or re-use water for environmental reasons	Avoid buying certain products for environmental reasons
Austria	93,8	53,9	27,4	39,9	43,1	46,6
Belgium	96,9	29,8	23,0	53,1	50,8	27,7
Bulgaria	25,9	25,4	3,3	5,2	14,5	24,3
Croatia	42,4	45,7	13,4	20,8	33,5	25,5
Czech Republic	72,4	22,0	15,1	27,0	46,9	22,6
Denmark	82,0	45,7	16,6	42,7	44,4	36,0
Finland	87,9	24,6	18,2	42,3	39,6	35,0
France	92,8	43,8	29,8	26,8	65,6	55,7
Germany	94,2	57,1	29,0	44,9	55,3	42,7
Latvia	27,0	35,5	5,6	7,6	17,0	30,0
Norway	85,8	19,4	18,3	38,2	17,2	20,7
Slovak Republic	65,5	20,6	9,8	16,0	28,6	17,0
Slovenia	85,7	40,5	17,5	42,0	36,9	29,5
Spain	74,4	16,2	12,3	31,0	55,3	31,6
Sweden	89,3	36,2	17,6	37,5	16,4	27,7
Switzerland	95,4	57,4	34,1	46,6	45,9	48,2
United Kingdom	85,9	36,6	18,8	33,4	32,1	28,3

FIGURE 2
Pro-environmental behaviour indicator (average) by country (> more often practiced)



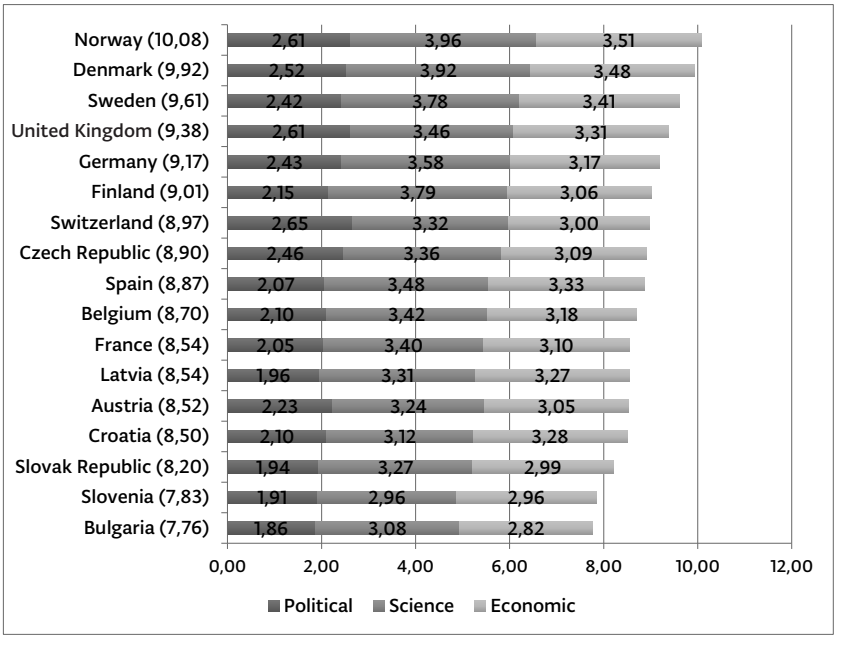
Dominant social paradigm (DSP) indicator: this indicator is based on previous research findings and is a construct that is derived from the *Environment* module of the ISSP. Based on their statistical characteristics and their scope, the following three variables were selected as representative of the DSP:

- The variable for the political dimension of the DSP is the response to the statement 'It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes', measured on a Likert scale from (1) 'strongly agree' to (5) 'strongly disagree' (= 2.23, SD = 1.17). Because the variable is skewed in the direction of agreeing strongly, for the purpose of using it as a single variable in statistical analyses it was recoded as (1 – 0) 'strongly agree and mostly agree' and (0) 'neither agree nor disagree, mostly disagree and strongly disagree';
- The variable for the economic dimension of the DSP is the response to the statement 'Economic growth always harms the environment', measured on a Likert scale from (1) 'strongly agree' to (5) 'strongly disagree ' (= 3.19, SD = 1.01);
- The variable for the scientific (technological) dimension of the DSP is the response to the statement 'Overall, modern science does more harm than good', measured on a Likert scale from (1) 'strongly agree' to (5) 'strongly disagree' (= 3.45, SD = 1.07).

All three dimensions/variables have a significant level of mutual correlation, with all correlations being positive ($p > 0.001$). Because the variables in themselves represent beliefs and attitudes about completely different social problems, no scaling procedures were used in order to construct the DSP indicator. The DSP indicator was calculated separately for each sample country based on the arithmetic mean of the three variables (which were not recoded) for each of the sample countries. This procedure is illustrated in Figure 3 In this way, the resulting DSP composite indicator ranges from 7.76 (Bulgaria) to 10.08 (Norway), with the higher result indicating a DSP that has a stronger orientation towards liberal capitalism.

FIGURE 3

Dominant social paradigm (variable – dimension arithmetic means) by country (> higher liberal capitalism orientation of the DSP)



Knowledge society contextual indicator: this indicator represents a composite of contextual indicators from the European Commission Report „Research and innovation performance in EU Member States and associated countries" (Norway, Switzerland and, at that point, Croatia as a candidate country) (EC 2011). As mentioned earlier in this study, based on the review of previous research findings (STEHR 2003; RODRIGUES 2002; ROOM et al.

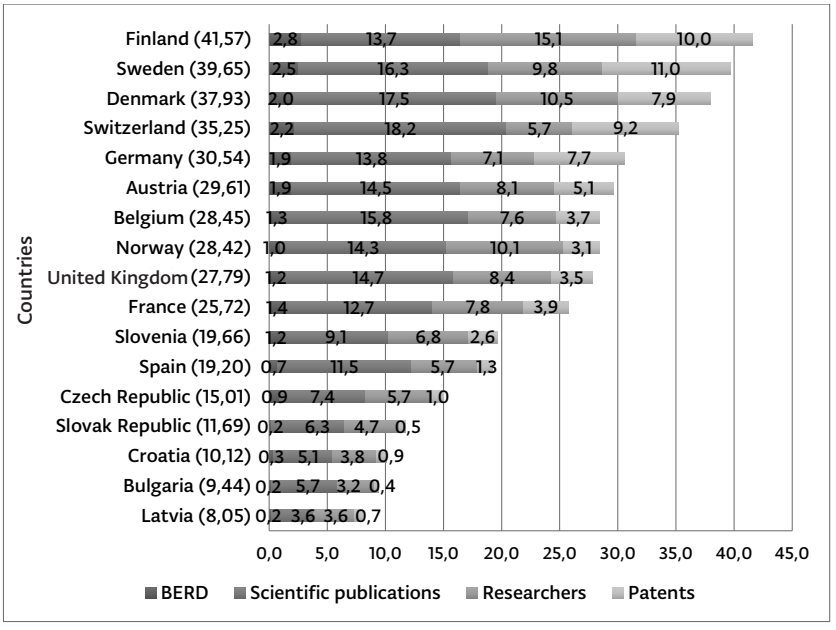
2005; DOSI et al. 2006), the following indicators were selected as knowledge society contextual variables:

- business enterprise expenditure on R&D as % BDP (BERD)
- researchers per thousand labour force (FTE)
- scientific publications within the top 10% most cited publications worldwide as % of total scientific publications of the country
- PCT patent applications per billion GDP (PPS€).

Indicators for all the sample countries are presented in Figure 4. They were all added to the composite that represents the knowledge society indicator and they range from 8.05 (Latvia) to 41.57 (Finland), with higher values on the scale indicating a higher level of development of the knowledge society.

FIGURE 4

Knowledge society contextual indicator (values of four separate indicators added) by country (> rise in knowledge society)



Finally, for the purpose of a multivariate analysis, the following standard demographic variables were used: age (in years), sex (1: 'male'; 2: 'female') and educational level (from 0: 'no formal qualification' to 5: 'university and higher') of the respondents.

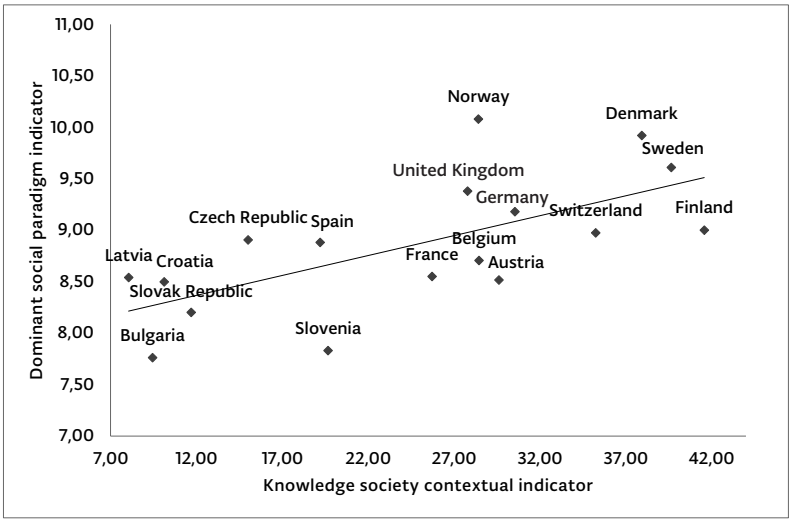
Results

RELATIONSHIP BETWEEN THE DOMINANT SOCIAL PARADIGM AND THE KNOWLEDGE SOCIETY

Firstly, I explore the relationship between the indicator of the dominant social paradigm (DSP) and the contextual indicator of the knowledge society in order to better understand the sociopolitical and normative framing of the knowledge society. There are statistically significant differences between the sample countries in each of the three DSP dimensions: the political (F = (16, 21 543) 73.026, p = .000), economic (F = (16, 20 979) 43.071, p = .000) and scientific dimensions (F = (16, 21 213) 88.308, p = .000). As can be seen from Figure 3, the DSP is more oriented towards liberal capitalism in Scandinavia, followed by the United Kingdom, Germany and Switzerland. On the other hand, countries such as France, Spain, Austria and especially the ex-socialist countries/new EU member states (Bulgaria, Slovenia, Slovak Republic and Croatia) have a DSP that is less oriented towards liberal capitalism (with the Czech Republic being an exception). We can see a similar situation with the contextual indicator of the knowledge society: Finland, Austria and Belgium have a somewhat higher result and the United Kingdom and Norway lower.

FIGURE 5

Dominant social paradigm indicator (> more liberal capitalism oriented DSP) by Knowledge society indicator (> rise in knowledge society indicator)



(r= .632, p > 0.001)

It is therefore no surprise that Figure 5 shows that the DSP increases together with the contextual variable – the knowledge society indicator – with the Pearson correlation being significant and positive ($r = .632$, $p > 0.000$). The bottom left-hand corner of the graph shows the countries with the lowest values of the scale of the knowledge society indicator, and these are primarily eastern and south-eastern European countries that also have lower results on the scale of the DSP indicator: Latvia, Slovak Republic, Croatia and Bulgaria (new EU member states). In the top right-hand corner of the graph we find the countries with the highest values on the knowledge society scale but also with higher values on the DSP scale and these are the Scandinavian countries Finland, Sweden and Denmark. Norway is a bit lower regarding the knowledge society indicator when comparing to other Scandinavian countries, but has the highest DSP value of the whole sample.

The described results confirm the hypothesis that knowledge society indicators are higher in the countries where the DSP is more oriented towards liberal capitalism.

RELATIONSHIP BETWEEN PRO-ENVIRONMENTAL BEHAVIOUR AND PERCEPTION OF ENVIRONMENTAL RISKS

Secondly, I explore the relationship between individuals' perception of environmental risks and the extent to which they engage in pro-environmental behaviour. In Figures 1 and 2, we can see that the sample countries have statistically significant differences in the perception of environmental risks ($F = (16, 18\,615)\ 152.881$, $p = .000$) and in pro-environmental behaviour ($F = (16, 16\,761)\ 158.914$, $p = .000$). Both environmental risks and pro-environmental behaviour indicators show mixed results when comparing the different European countries in the sample. On one hand, the ex-socialist countries/new member states Croatia and Bulgaria have the highest perception of environmental risks, with Austria, Germany and Spain also showing similar results. On the other hand, Scandinavian countries have a lower perception of environmental risks (the difference in perception is statistically significant), as do the United Kingdom and Belgium. There are also mixed results regarding the indicator of pro-environmental behaviour, whereby such behaviour is most prominent in France, Switzerland, Germany and Austria and is lowest in the new EU member states Croatia, Latvia, Bulgaria and the Slovak Republic. Interestingly, pro-environmental behaviour is not high in Scandinavia, with Norway having the lowest result of all Scandinavian countries, at a level that is similar to ex-socialist countries.

However, as can be seen from Table 3, the correlation between the indicators of pro-environmental behaviour and environmental risk perception is significant and positive for all of the sample countries in the study (with the exception of Latvia and Bulgaria), even though the results were mixed when

separately comparing the countries' indicators of environmental risks and pro-environmental behaviour. I can therefore accept the overall hypothesis linking pro-environmental behaviour and perception of environmental risks and state that the propensity to engage in pro-environmental behaviour increases with the level of perception of environmental risks.

TABLE 3 *Pearson's correlation between the indicators of perceived environmental risks and pro-environmental behaviour, by country*

COUNTRY	Pearson's r
Austria	.290***
Belgium	.284***
Bulgaria	.118
Croatia	.364***
Czech Republic	.305***
Denmark	.336***
Finland	.394***
France	.343***
Germany	.261***
Latvia	.004
Norway	.402***
Slovak Republic	.132**
Slovenia	.379***
Spain	.259***
Sweden	.332***
Switzerland	.226***
United Kingdom	.355***

** $p > 0.05$ ** $p > 0.01$ *** $p > 0.001$*

RELATIONSHIP BETWEEN PERCEPTION OF ENVIRONMENTAL RISKS, THE DOMINANT SOCIAL PARADIGM AND THE KNOWLEDGE SOCIETY

Thirdly, I explore the hypothesis on the indicator of perceived environmental risks. For this purpose, two different linear models were built because

of the high partial correlation that exists between the contextual indicator of the knowledge society and the DSP indicator. Since the indicator of perceived environmental risks is dependent in both models, the first model contains the contextual indicator of the knowledge society as a predictor (together with age, sex and educational level of respondents), while the second model contains the knowledge society contextual indicator, combined both with the aforementioned demographic variables with the dominant social paradigm. The overall model is not the strongest because there are obviously other predictors not included in this study that influence environmental risks perception. However, as can be seen from Table 4, the statistic for the first model on environmental risks and the knowledge society shows that older respondents, men and those who are more educated are less perceptive regarding to environmental risks. When controlled for age, sex and educational level, the knowledge society contextual indicator is negatively correlated to the perception of environmental risks.

TABLE 4 *Linear regression models of the indicator of perceived environmental risks*

	Model A. Environmental risks perception (> higher risks)	Model B. Environmental risks perception (> higher risks)
	Beta Coeff.	Beta Coeff.
Age of respondent in years	-.046***	-.046***
Sex (1 = male)	.144***	.146***
Educational level (from 0 = no formal qualification to 5 = university)	-.025***	-.035***
a. DSPI	-.230***	—
b. KSCI	—	-.199***
F-ratio	393,620	325,863
F-Sig.	.000	.000
R-squared	.079	.066
Adjusted R-squared	.078	.066

** p > 0.05 ** p > 0.01 *** p > 0.001*

NOTES: *DSPI = dominant social paradigm indicator;*
KSPI = knowledge society contextual indicator

The findings of Model B also show that, although the model is not strong, it is sufficient for our purposes because it shows the correlation of the DSP indicator to the indicator of perceived environmental risks, even after controlling for age, sex and educational level of respondents. The model therefore confirms the hypotheses 3a and 3b: that perception of environmental risks is lower in societies which have higher values on the scale of knowledge society indicators and where the DSP is more oriented towards liberal capitalism.

RELATIONSHIP BETWEEN PRO-ENVIRONMENTAL BEHAVIOUR, THE DOMINANT SOCIAL PARADIGM AND THE KNOWLEDGE SOCIETY

Fourthly, I explore the relationships between three sets of indicators: the pro-environmental behaviour, the DSP and knowledge society contextual indicators. These relationships are explored within two models with the same demographic variables as in the predictors.

The results of this analysis are somewhat unexpected. In Table 5, we can see in Model A (which is a significant, but not particularly strong model) that older, more educated respondents and women have a higher likelihood of engaging in pro-environmental behaviour, and when controlled for age, sex or educational level, the DSP is negatively correlated with pro-environmental behaviour.

However, Model B presented in Table 5 (which, although it is not a strong model, is significant and sufficient for the purpose of this study's research question) shows that – when controlled for age, sex or educational level of respondents – pro-environmental behaviour increases together with the contextual indicator of the knowledge society. The presented results are in favour of the hypothesis that the orientation towards liberal capitalism is not in favour of society's pro-environmental behaviour, but on the other hand opposes the hypothesis on the relationship between the knowledge society and pro-environmental behaviour. Rather, it seems that countries with a higher level of development of the knowledge society are more in favour of pro-environmental behaviour.

However, such interesting results also require further statistical analyses. Namely, if the DSP indicator and the contextual indicator of the knowledge society increase together, how can I explain that I have found opposite results regarding pro-environmental behaviour? Is it possible, as Spangenberg (2005) argues, that there are sustainable and less sustainable knowledge societies, depending on their normative framework? To explore this emergent thesis, I have built two additional models that include all the assumptions that need to be tested.

TABLE 5 *Linear regression models of the pro-environmental behaviour indicator*

	Model A. Pro-environmental behaviour (> more effort)	Model B. Pro-environmental behaviour (> more effort)
	Beta Coeff.	Beta Coeff.
Age of respondent in years	.186***	.161***
Sex (1=male)	.114***	.109***
Educational level (from 0 =no formal qualification to 5 = university)	.064***	.046***
a. DSPI	-.042***	—
b. KSCI	—	.169***
F-ratio	198,668	322,161
F-Sig.	.000	.000
R-squared	.046	.077
Adjusted R-squared	.045	.077

** p > 0.05 ** p > 0.01 *** p > 0.001*

SUSTAINABLE (KNOWLEDGE) SOCIETIES?

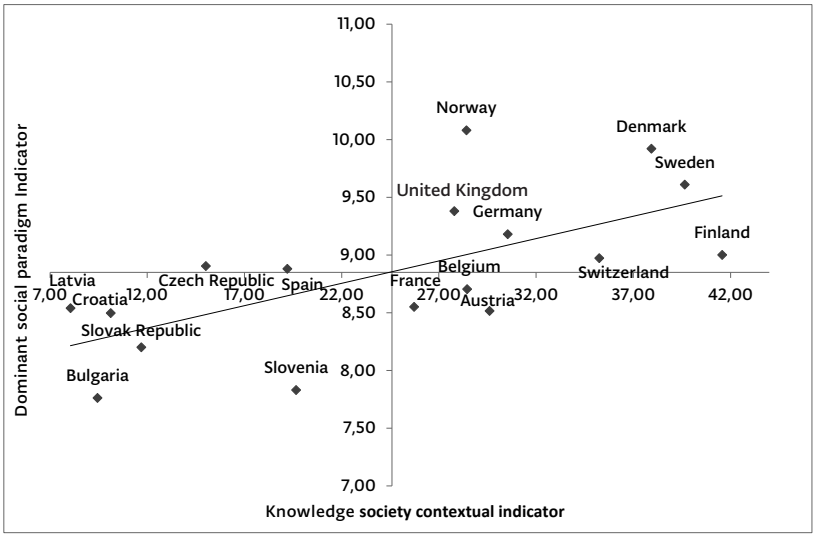
For the purpose of the final analysis I have built two models using pro-environmental behaviour and perception of environmental risks as dependents (similarly to the previous models in this study), but using a different approach with regards to the knowledge society and DSP indicators. By intersecting the averages of both indicators I have created four groups of sample countries, based on the arithmetic mean of the DSP indicators and contextual indicators of the knowledge society for the whole sample[7]. The intersection and the four resulting groups of countries can be seen in Figure 6 and are the following:

07 Averages for the countries are shown in Figures 1 and 2 The average of the DSP indicator for the whole sample is 8.85 and the average for the contextual indicator of the knowledge society is 24.95

- High DSP / highly developed knowledge society: the following countries have higher (above average) values on the scale of DSP indicators and higher (above average) values on the scale of knowledge society indicators: Denmark, Finland, Germany, Norway, Sweden, Switzerland and the United Kingdom;
- Low DSP / highly developed knowledge society: the following countries have lower (below average) values on the scale of DSP indicators and higher (above average) values on the scale of knowledge society indicators: Austria, Belgium and France;
- High DSP / less developed knowledge society: the following countries have higher (above average) values on the scale of DSP indicators and lower (below average) values on the scale of knowledge society indicators: Czech Republic and Spain;
- Low DSP / less developed knowledge society: the following countries have both lower (below average) values on the scale of DSP indicators and lower (below average) values on the scale of knowledge society indicators: Bulgaria, Croatia, Latvia, Slovak Republic and Slovenia.

FIGURE 6

Dominant social paradigm indicator (> more liberal capitalism oriented DSP) by Knowledge society contextual indicator (> rise in knowledge society indicator)



In the Model A (Table 6), I use environmental risks perception as the criterion, the demographic variables as predictors and the sample countries (representing categories of interference of the DSP and knowledge society

indicators) as dummies. The sample countries with high values on the scale of DSP indicators and high values on the scale of knowledge society contextual indicators are used as the reference category. All predictors in the model are significant, showing that, when controlled for age, sex and educational level of respondents, the group of sample countries with high values on both the DSP and knowledge society scales are significantly less aware of environmental risks compared to the three other groups in the model.

TABLE 6 *Linear regression models of the indicator of perceived environmental risks and the indicator of pro-environmental behaviour*

	Model A. Environmental risks perception (higher risks)	Model B. Pro-environmental behaviour (> more often practiced)
	Beta Coeff.	Beta Coeff.
Age of respondent in years	-.045***	.106***
Sex (1 = male)	.145***	.159***
Educational level (from 0 = no formal qualification to 5 = university)	-.031***	.051***
DSP/KSC: Higher DSPI and higher KSCI	Reference	reference
DSP/KSC: Higher DSPI and lower KSCI	.116***	-.091***
DSP/KSC: Lower DSPI and higher KSCI	.162***	.154***
DSP/KSC: Lower DSPI and lower KSCI	.237***	-.151***
F-ratio	256,839	347,135
F-Sig.	.000	.000
R-squared	.077	.111
Adjusted R-squared	.077	.111

** $p > 0.05$ ** $p > 0.01$ *** $p > 0.001$*

Model B, which is related to the pro-environmental behaviour of respondents (Table 6), shows that (when controlled for age, sex and educational level) sample countries that have lower values on the DSP scale and higher values on the knowledge society scale have a higher propensity to engage in pro-environmental behaviour compared to those that have high values on both the DSP and knowledge society scale. However, the sample countries with low values on both the DSP scale and the knowledge society scale (as well as those with high DSP values and low knowledge society values), express significantly lower levels of pro-environmental behaviour compared to the countries with high values on both scales. These findings show that pro-environmental behaviour indeed increases with the development of the knowledge society, but increases more in countries where the DSP is less oriented towards liberal capitalism.

Discussion and conclusions

Before considering the study's findings and implications, a note should be made of its methodological limitations. The limitations are related, first of all, to the use of contextual indicators related to the knowledge society and to the use of dominant social paradigm (DSP) indicators.

The contextual indicators of the knowledge society, and especially of the sustainable knowledge society, can be a matter of discussion (BOSSEL 1999; SPANGENBERG et al. 2002; SPANGENBERG 2005). By choosing indicators that rely on private investment in R&D, patents, scientific productivity and the number of researchers, it can be argued that the study positions itself critically towards the normative framework of liberal capitalism because it chooses indicators of competitiveness rather than indicators of social cohesion and well-being. Had different indicators been chosen, the study may have yielded different results. These indicators were chosen because they are used in the official policy documents and reports of the European Commission and because most authors who write about the concept of the knowledge society stress the importance of the European Union's orientation towards the commercialisation of science, technology and education (see, for example, DRAHOS and BRAITHWAITE 2002; RODRIGUES 2002; ROOM et al. 2005; DOSI et al. 2006). The chosen indicators therefore seem to be the best choice when trying to understand the sociopolitical framing of European knowledge societies.

The limitation related to the DSP indicator used in this study represents a more serious methodological challenge. Using a single variable for each of the three dimensions of the DSP (the political, economic and scientific dimensions), instead of a set of variables for each of the dimensions is an objective weakness of this study. However, using such a larger set of vari-

ables was not an option: on one hand, the data from the Environment module of the ISSP cannot provide such variables; on the other hand, there are currently no available tested set of variables with a good statistical fit that could measure each of the dimensions of the DSP, since the concept is still in the phase of empirical testing (KILBOURNE et al. 2002). The single variables used in this study for each of the three dimensions have shown consistency in terms of their mutual correlation and the correlation of each with the perception of environmental risks and pro-environmental behaviour. They are therefore in the line with the results of previous research on the DSP dimensions regarding general environmental beliefs and attitudes, in the sense that all three dimensions of the DSP are negatively correlated with perception of environmental risks and pro-environmental behaviour (KILBOURNE et al. 2002). For this reason, I consider that the variables used in this study are credible and reliable in our findings, although I do call for more empirical exploration of the concepts of political, economic and scientific/technological dimension of the DSP. As a consequence of the above-mentioned limitations, the results of this study should be viewed tentatively.

The first hypothesis of this study was confirmed by the findings: the indicator of the knowledge society and the DSP indicator are positively correlated, since the knowledge society develops together with the acceptance of norms related to liberal capitalism. At the same time, however, looking at the spread of countries in this study's sample (according to both the indicators of the knowledge society and of the DSP), we find results that are somewhat (although not entirely) unexpected. At the lower end of the spectrum (the countries with the lowest results regarding knowledge society contextual indicators but also regarding the level of the DSP) we find ex-socialist countries that were weakened by the process of socioeconomic transition and whose economies are not strong and mostly not competitive. It is therefore not surprising that those countries have not made much progress in the transition to the new economy and also have a lower acceptance of the DSP norms that are related to liberal capitalism. However, it is surprising that Spain is only a little bit higher than the ex-socialist countries on the interception of the DSP and the contextual indicator of the knowledge society. Another surprising finding is that the acceptance of the DSP is highest in Scandinavia and not so high in 'the heart of the Europe' – in Austria, France, Belgium and Switzerland.

According to Spangenberg (2005), the normative framing of knowledge society can be found in two forms. The first is a (neo)liberal framing, which suggests that public funding should be decreased in all areas, and in particular in the field of development and fusion of new technologies. Instead of public funding, the 'free market plus free expression of individual preferences should be the institutions which define future trajectories for tech-

nology and its societal applications' (p. 87). Spangenberg argues that this view has long dominated the political philosophy of the United States. The second normative framing of the knowledge society, on the other hand, is one that can be ascribed to Europe, where 'the market is perceived as a powerful and indispensable institution for optimisation, whereas the institutional framework (society, expressing its preferences through the political mechanisms of the state) was considered the main institution for defining orientation' (2005, 87). Comparing this view with our results on the DSP indicator (which measures optimism about science, limited government and economic growth), we find that the heart of Europe is consistent with Spangenberg's second form of normative framing of the knowledge society, whereas we find that the social democracies of northern Europe are more consistent with the first (and more neo-liberal) form of normative framing.

Even if we accept that the results regarding the DSP should be viewed tentatively, other results of the study are also consistent with the argument mentioned above. Spangenberg (2005) also argues that the (neo)liberal normative framing of the knowledge society is detrimental to the development of a sustainable knowledge society. His opinion echoes the findings of Kilbourne and associates (2002), according to which the three dimensions of a given society's DSP are negatively correlated to pro-environmental beliefs and attitudes. The findings of this study confirm both Spangenberg and Kilbourne and associates to some extent. Firstly, the study has shown that the perception of environmental risks and pro-environmental behaviour is significantly lower in countries with higher DSP. However, looking at the countries' results regarding perceived environmental risks and pro-environmental behaviour separately, the study shows mixed results that are difficult to interpret. Perception of environmental risks is lowest in Scandinavian countries (especially Norway and Sweden) and is not so low in the countries of 'old Europe' (Austria, Spain and France), whereas the perception of environmental risks is extremely high in ex-socialist countries such as Bulgaria and Croatia. At the same time, however, pro-environmental behaviour is highest in Spain, Austria and Finland, but is not so high in France and in the ex-socialist countries (with the exception of Slovenia). Based on the models built for this study, it is obvious that pro-environmental behaviour increases with the level of development of the knowledge society, while – at the same time, and somewhat counterintuitively – the perception of environmental risks lowers. A deeper analysis of these findings has shown that we can indeed distinguish between the countries that have both high values on the DSP scale and high values on the scale of knowledge society indicators (Denmark, Finland, Germany, Norway, Sweden, Switzerland and the United Kingdom) and those that have lower values on the DSP scale and higher values on the knowledge so-

ciety scale (Austria, France and Belgium). A comparison between those two groups of countries has shown that there is a significant difference between those two groups regarding their sustainability potential, as measured by the level of their perception of environmental risks and by the level of engagement in pro-environmental behaviour. It would therefore appear that countries with a lower DSP (that have lower acceptance of the normative framing liberal capitalism) are more likely to be sustainable because of being more likely to perceive environmental risks and more in favour of pro-environmental behaviour.

I can only speculate as to the reason for this finding. One possible explanation is that the countries that have achieved a higher level of development of the knowledge society automatically request more pro-environmental behaviour of their citizens (such as different waste disposal, or lower taxes for energy saving technology), since they have a higher level of GDP and technologically modern infrastructure. However, even such a top-down approach to pro-environmental behaviour has its limits and those limits are set in the dominant values of society. If those values are more in favour of scientific optimism, endless economic growth and limited government, the sustainability potential of that society is significantly lowered.

Despite some identified shortcomings in the research methodology, the study does show an interesting (even intriguing) development related to the sustainability potential of European societies. Firstly, the study shows that the indicators of the knowledge society are not an end in themselves not just in terms of the policy implication, but rather that the indicators should be examined in a broader cultural and political context, especially within the normative context of given societies. Secondly, although the concept presented here should be more thoroughly researched, one of the most important findings of the study is that the sustainability potential of the knowledge society varies depending on the type of knowledge society, which echoes the findings of all critical researchers that have warned of the negative consequences of the normative framework of (neo)liberal capitalism. ●

III

COUNTRY CASE STUDIES

8 Environmental concern in Bulgaria: The role of social trust

Franziska Bieri / Rumiana Stoilova

Introduction

Environmentalism has received the attention of scholars across disciplines. Theoretical treatment of environmentalism as a multidimensional concept is primarily distinguished by studies conceptualizing environmentalism as a *behavior* or as an *attitude*. Environmental behavior has been treated in the public and private spheres of social life (HADLER and HALLER 2011). Public green behavior includes participation in green governmental and non-governmental organizations and active support in their goals through petition writing or protests. Private green behavior has been measured in actions like recycling, conservation, and consumption of ecological products (STERN 2000). In addition to the analyses on ecological behavior, environmentalist attitudes have also received much scholarly attention. Attitudinal aspects of environmentalism that have been studied are perceptions regarding threats posed by various environmental problems; attitudes toward local, national, and global level regulations; and opinions regarding the importance and compatibility of environmental protection relative to other values, especially vis-à-vis economic growth. Some studies have also linked behavior and attitudinal aspects of environmentalism; however correlations and causal links between the two are surprisingly weak (DIAMANTOPOULOS et al. 2003).

In this chapter, we explore social factors that shape individuals' environmental concern as a key component of green attitudes. Previous literature has found that income, post-materialistic values, and various socio-demographic factors are important in predicting environmental attitudes. What remains underexplored in the environmental concern research is the role of social trust. This issue however, appears particularly salient when exploring environmental concern in periphery contexts, where social trust levels tend to be significantly lower (PALDAM and SVEDSEN 2002; RAISER 1999; KUNIOKA and WOLLER 1999; KAASA and PARTS 2008). Empirical investigations on

the determinants of environmental concern have predominantly focused on North America and Western Europe and little is known about causal factors explaining environmental attitudes in the transition nations. Central and Eastern European (CEE) countries have received much less attention in this literature, despite strong evidence that regional and local contexts matter when it comes to environmental concerns (MARQUART-PYATT 2012; HALLER and HADLER 2008): "concerns in CEE countries may be higher given their experience with abject environmental conditions that might heighten such awareness. The communist model of industrial development's emphasis on heavy industry produced severe regional environmental degradation, and citizens in these countries were often exposed to polluted environmental conditions as a result… heightened levels of concern remain anticipated given the industrial legacy of the former communist system" (MARQUART-PYATT 2012, 652).

In Bulgaria, two particular events shaped public consciousness and led to reduced trust in government to protect the population from trans-border ecological risks: the explosion in the Chernobyl nuclear power station and the pollution from Romania's Giurgiu chemical works. Complete silence was maintained regarding the dangers resulting from the Chernobyl disaster. An information blackout was imposed by the Bulgarian communist authorities and very scarce data exist on the impacts of Chernobyl in Bulgaria. School children were asked to march in the customary First of May parade in 1986, despite the radioactive rainfall that day. "Except for the top rank nomenklatura, all others were left at the mercy of fate. A select group of people were supplied with food and mineral water from abroad" (KOVACHEV 2010, NP). Maintaining solidarity with foreign communist governments was more important to the Bulgarian authorities than citizens' health or their rights to be informed about those ecological risks.

Quite similar were the circumstances in the Bulgarian Danube town of Ruse. During the 1980s, Ruse was heavily polluted with chlorine and other byproducts from the chemical plant in the Romanian city of Giurgiu on the opposite river bank of the Danube. The Bulgarian communist ruling party and government authorities closed their eyes to the ecological disaster. In response, a highly significant citizens' movement – the Ruse Committee – formed. The Ruse Committee later helped spark the national Ekoglasnost efforts, which in turn played a key role in the dismantling of the communist leadership (BAUMGARTL 1995). "More so than in any other ECE [East Central European] country, it was concern about the deteriorating environment and its impact upon health that sparked off the protest which led to the collapse of the old regime in Bulgaria" (BAKER and BAUMGARTL 1998, 195).

In this chapter, we investigate the determinants of environmental concern with case study evidence from Bulgaria, treating environmental at-

titudes in a transition country. Building on previous research, we investigate the relative effect of income, post-material values and social trust on environmental concern in Bulgaria using data from the International Social Survey Programme (ISSP) 2010 Environmental survey. In the first part of this chapter, we review the literature that has linked environmental attitudes with people's economic situation, their value systems, social demographic characteristics, and the role of social trust. Next, we introduce our case study country and present empirical data comparing levels of environmental concern and perceived threats toward specific environmental issues in Bulgaria and Europe. In the following section, we discuss our regression analysis (probit model) results on the determinants of environmental concern in Bulgaria. We conclude the chapter with a brief review of our results, offering some reflections on the implications of the findings, and put forward suggestions for further research.

Explaining Environmental Concern

Individual financial well-being has been found to be positively related to various environmental attitudes and behaviors. Higher income individuals in a society tend to be more likely to express concern over environmental problems, to favor environmental regulation, to be willing to sacrifice, and to engage in ecological consumption (JONES and DUNLAP 1992; KLINEBERG, MCKEEVER and ROTHENBACH 1998). Others argue however that, rather than income, it is the value system tied to material well-being that is in fact explaining those differences: economically better situated citizens possess post-materialistic values, which support pro-ecological attitudes (INGLEHART 1990; 1995; GERHARDS and LENGFELD 2008). According to Inglehart's theory, as societies develop and become richer, people experience a fundamental shift in their value systems. They are less concerned about fundamental survival problems and instead can focus on so-called post-materialistic objectives, including self-fulfillment, political rights, or environmental protection.

A significant body of research has assessed various socio-demographic factors in shaping environmental attitudes and behaviors. Specifically, the effects of age, gender, education and ethnicity have been theorized and empirically studied. While there are studies which find no or inconclusive results about whether age matters with regard to environmentalism (DERKSEN and GARTRELL 1993), much of the empirical findings suggest that younger people are more environmentally concerned than their older counterparts (MOHAI and TWIGHT 1987; VANLIERE and DUNLAP 1980; JONES and DUNLAP 1992). There are several competing arguments on why young people might be more environmentally concerned. Some argue that it is due to youth's norms and values of freedom and spontaneity that lead them to be

more environmentalist (KANAGY, FIREBAUGH and HUMPHREY 1994), having more time and resources to partake in social movements and their activities (GILLHAM 2008), growing up in times of economic prosperity which promotes post-materialistic values (INGLEHART 1990), or because young people have more to loose from environmental destruction (MURPHY 1994). However most research does not assess whether the age effect captures life-stage or cohort dynamics: do individuals change their attitudes and behavior on environmental matters due to reaching a certain stage in their life or because they belong to a certain cohort/generation? Life-stage arguments hold that there are particular age relevant characteristics that shape environmental attitudes and behavior over the course of one's lifetime, as the ones discussed above. Cohort based arguments stress that generations share political and cultural norms that likely have an impact on environmental attitudes, concerns, and behavior. For instance, individuals born prior to1960 were socialized during a time when environmental problems were rarely discussed and environmental threats were not yet defined as major social problems requiring solutions: "Socialisation of people born after 1960 in EU-15 countries took place when environmental damage, such as air and water pollution or the risk of using nuclear energy, were increasingly perceived in the public as societal problems. Environmental issues were barely discussed in public during the socialization period of people born before 1960" (GERHARDS and LENGFELD 2008, 15).

Some studies have found higher environmental concerns by women compared to men (BLOCKER and ECKBERG 1989; MOHAI 1992; DAVIDSON and FREUDENBURG 1996; ZELEZNY, CHUA and ALDRICH 2000). Gender differences concerning environmental concern are grounded in gender socialization theories. Women's and men's beliefs, attitudes, and values are rooted in gendered environments: "as the children grow, the male is able to objectify and control his environment, and to define himself as separate from the world around him. The female, on the other hand, defines herself in relation to the world around her, or as part of a community in a subjective environment" (DAVIDSON and FREUDENBURG 1996, 304). Socialization assigns males and females different roles, responsibilities, and interests, which in turn may affect differences in public opinion on environmental matters.

Overall, race and ethnicity appear only weakly and inconsistently linked to environmental concern (VANLIERE and DUNLAP 1980). For example, Mohai and Bryant (1998) found that blacks reported higher concern over some environmental risks (air pollution), while whites were more concerned about other risks (ozone layer depletion). Theoretically, two arguments are put forth: on the one hand, following relative deprivation theory, minority groups express higher environmental concern due to their greater exposure to environmental degradation. On the other hand, according to Inglehart's

post-materialism theory, the more well-to-do and those that have enjoyed the privileges of civil liberties, care more about the environment. Therefore racial and ethnic minorities, who are more likely not taking for granted civil liberties and material well-being, would display less environmental concern.

Education appears to have a positive effect on green behavior and attitudes, however empirical results are not consistent (VANLIERE and DUNLAP 1980; OLSEN, LODWICK and DUNLAP 1992; INGLEHART 1995; BAKVIS and NEVITTE 1992). Education is linked to knowledge about environmental issues, which in turn has been identified as an important precondition for green behavior and concern. A further theoretical reasoning links education with exposure to pro-environmentalist global norms: "Higher education increases an individual's number of contacts with global ideas and is considered as the most important institution propelling world societal ideas" (HADLER and HALLER 2011, 317-8). These macro level norms on environmentalism, translate into more green attitudes amongst educated individuals.

Social trust has been identified as an important determinant of environmental attitudes and concern in the United States (ADEOLA 2007). Higher trust in authorities and government has been linked to lower levels of perceived environmental risks (ADEOLA 2007; LEE et al. 2005). Similarly, people with high trust have been found to associate less risk with specific technologies, like nuclear or chemical plants (BORD and O'CONNOR 1997; SIEGRIST, GUTSCHER and EARLE 2005; SPIES et al. 1998). Thus, environmental concern is lower for those individuals who have high trust in the institutions that are in charge of managing those risks and environmental threats. People who lack trust are unsure that environmental risks can be properly safeguarded and therefore exhibit higher environmental concern. However much of the empirical investigations have focused on North America and Western Europe, while is little known about the links between trust and environmental attitudes in the transition countries. Building on this research, we investigate the relative effect of social trust on environmental concern in Bulgaria.

Environmental Concern and Perceived Threats: Situating Bulgaria in the European Context

Bulgaria has experienced rapid social and economic changes in the past two decades, which have also affected public environmental attitudes. On the one hand, public opinion and societal attitudes, including on nature protection, have been shaped by the socio-economic transformations moving from a communist to a capitalist economy (BAUMGARTL 1995; DESAI and SNAVELY 1998; DAINOV 2000; GENOV 1993). In addition, the country has witnessed rapid economic growth, including the expansion of mass tourism

(STOILOVA 2007). The protection of nature areas rich in biodiversity and the construction of new resorts in the mountains and the seaside has led to important public debates regarding environmental protection and sustainable development across the country (STADDON and CELLARIUS 2002; STOILOVA and BIERI 2010; MANTAROVA 2010). Survey research shows that a majority of Bulgarians oppose excessive building in protected nature areas, especially on the coast and in the mountains; are against the imports of genetically modified foods; favor a ban on the extraction of shale gas; and oppose the development of nuclear energy in the country, specifically, the plans for building a second nuclear power station (PICKARD 2013; VAISOVA 2013).

Moreover, the emergence of the third sector including a host of green non-governmental organizations (NGOs) marks one of the key socio-political changes in Bulgaria (CELLARIUS and STADDON 2002; DESAI and SNAVELY 1998). The rise of Bulgaria's green civil society sector is evident in the sizable number of active green NGOs and the frequency and visibility of campaigns and protests organized on environmental issues (STOILOVA 2007; MANTAROVA 2010). The green sector of civil society in Bulgaria comprises numerous group initiatives and organizations in defense of natural territories or endangered animal and bird species. A most recent example is the "Occupy Wall Street" inspired "Occupy Orlov Most" movement, which was joined by thousands of protestors in early June 2012. The movement and protests emerged in opposition to amendments to the Forest Act that would allow for new constructions infringing on nature protected areas, forest cutting and further developments of the ski resorts.[1]

Despite these civic society developments important challenges remain. Numerous reports have identified low membership numbers and persistent public distrust in non-governmental organizations as key obstacles for an effective and sustainable third sector in the country (KABAKCHIEVA and HRISTOVA 2012; CIVICUS 2011; USAID 2010; 2012). Still, environmental NGOs appear to enjoy greater public trust than organizations in other sectors. A recent analysis showed that more than 80 percent of Bulgarians believe that environmental organizations help to preserve nature; while

01 Although quite prominent and visible, this green civic movement "Occupy Orlov Most" was overshadowed by a new and entirely unrelated initiative named "Orlov Most Movement" protesting high electricity prices in early 2013. Aside from the common name – locating their protests on the Eagle's Bridge (Orlov Most) and using its symbolism – there is no connection between the two civic initiatives. In fact, they have very diverging political orientations. Political analysts have interpreted these second Orlov Most protests as "attempts at taking over civil society by creating imitations of civic organizations and activities" (STOYANOV 2013, NP). Such imitations or co-optations contribute to public confusion and to public distrust against civic initiatives in Bulgaria (VAISOVA 2013).

fewer than 20 percent believe that green NGOs hinder economic growth (STOILOVA and BIERI 2010).

The processes outlined above have all likely impacted on societal attitudes on environmental issues, including environmental concerns and perceived environmental risks. Table 1 displays the percentage of people that report being concerned about environmental issues. The findings are based on data from the International Social Survey Programme (ISSP) 2010. In addition to showing the levels of concern in Bulgaria, we also display average rates for EU and transition countries in order to situate Bulgaria in the larger European context.

As shown in table 1, on average, Bulgarians report significantly higher levels of concern on environmental issues compared to other EU and transition countries. Fifty-six percent of respondents in Bulgaria report being very concerned or concerned about environmental issues. In comparison, that level stands at 53 percent in the EU and at 46 percent in transition countries. A similar picture emerges with respect to a diverse set of environmental issues.

When asked about the environmental danger of air pollution caused by cars, 63 percent of Bulgarian respondents state that the issue is extremely or very dangerous. Lower average levels of concern can be observed in transition countries, with 56 percent, and even lower levels of perceived danger – 50 percent – in the EU. Although significant differences in public opinions can be noted with respect to air pollution caused by cars, no such divergence is observed when looking at air pollution caused by industry. Here the perceived levels of threat are similar across the countries.

In Bulgaria, 77 percent perceive the environmental threat from the use of pesticides and chemicals in farming as extremely or very dangerous. Only slightly lower is the percent in transition countries (with 74 percent) and in the EU it stands at 70 percent. As shown in table 1, the level of concern over river, lake and stream pollution once again is highest in comparison to other transition or the fellow EU countries. In Bulgaria, 71 percent of respondents report the rise in the world's temperature caused by climate change as extremely or very dangerous. The average level of concern in EU and transition countries is markedly lower, with 58 and 57 percent respectively. When compared to the other environmental threats, fewer Bulgarians rate nuclear power as dangerous. Still the country's share of concerned individuals (60 percent) is significantly higher compared to average levels of concern in the EU (55 percent) or transition countries (56 percent).[2]

02 The Fukushima nuclear disaster in March 2011 likely had significant effects on public attitudes toward nuclear power in the various countries. The data for ISSP 2010 Environment III were collected in 2010 for some countries and in 2011 for others. Comparisons on this item are therefore problematic.

TABLE 1 *Levels of environmental concern and perceived dangers: EU Countries, Transition Countries, and Bulgaria.*

	EU Countries	Transition Countries	Bulgaria
Percent of respondents that report being very concerned or concerned about	%	%	%
environmental issues	53*	46*	56
Percent of respondents that report specific issue extremely dangerous or very dangerous	%	%	%
air pollution caused by cars	50*	56*	63
air pollution caused by industry	72	75	75
pesticides and chemicals used in farming	70*	74	77
pollution of rivers, lakes and streams	68*	68*	79
a rise in the world's temperature caused by climate change	58*	57*	71
nuclear power stations	55*	56*	60
modifying the genes of certain crops	53*	58*	70

Data Source: ISSP 2010.

EU Countries: Bulgaria, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Latvia, Slovak Republic, Slovenia, Spain, Sweden, and United Kingdom; Transition Countries: Bulgaria, Czech Republic, Latvia, Lithuania, Slovak Republic, and Slovenia.

* Indicates that the difference between Bulgaria and comparison countries (EU or Transition Countries) is statistically significant (t-tests).

The largest difference – 17 percent – between the EU and Bulgaria in perceived threats can be observed on the issue of Genetically Modified Organisms (GMOs). Seventy percent of Bulgarians report GMOs as extremely or very dangerous to the environment. Among its fellow European Union members that percentage stands at 53 percent. What likely explains the high levels of concern over GMOs in Bulgaria is a widely publicized and successful anti-GMO campaign in 2009-2010. The campaign was organized against a new law permitting the dissemination and use of GMOs in the country (STOILOVA and BIERI 2010). Initially the campaign was mostly internet based, but quickly caught major media attention, which in turn was followed by developments in institutional decision making at governmental and parliamentary level. Eventually, it led to the adoption of the Genetically Modified Organisms Act, which introduced even stricter restrictions than those maintained in a number of European countries with regard to GMOs[3].

Empirical Analysis: Determinants of Environmental Concern in Bulgaria

To investigate the determinants of environmental concern, we use data on Bulgaria from the International Social Survey Programme (ISSP) 2010 Environmental III. The ISSP 2010 survey asks a broad set of questions regarding environmental attitudes, behavior, and beliefs. In addition, the data allow us to study the effects of income, post-materialistic values, and trust on environmental concern. The ISSP 2010 survey in Bulgaria was based on a nationally representative sample, with a sample size of 1003. After exclusion of missing values the total number of respondents included in this analysis is 788.

We now discuss the specific survey items that we use for our analysis. Our dependent variable is environmental concern. We use the following survey question to measure environmental concern: "Generally speaking, how concerned are you about environmental issues?" The answer options range from 1 "Not at all concerned" to 5 "Very concerned". As table 2 shows, only 5 percent of Bulgarian respondents reported that they are not at all concerned about environmental issues. Twenty-six percent stated that they are very concerned and another 30 percent marked the second highest level of concern. The distribution of the answers indicates that more Bulgarians hold rather strong concerns, while a minority of the population is not concerned about environmental issues.

03 A law banning GMOs on the territory of Bulgaria was passed on March 18, 2010.

TABLE 2 *Levels of Environmental Concern, Post-Material Values, and Trust.*

ENVIRONMENTAL CONCERN	Not at all concerned (1)	(2)	(3)	(4)	Very concerned (5)
Generally speaking, how concerned are you about environmental issues?	5%	10%	29%	30%	26%
POST-MATERIAL VALUES	**No post-material item marked (0)**	**One post-material item marked (1)**			**Two post-material items marked (2)**
Give people more say in government decisions; protect freedom of speech selected as Bulgaria's highest priority.	48%	49%			3%
TRUST IN GOVERNMENT	**Strongly Agree (1)**	**Agree (2)**	**Neither agree nor disagree (3)**	**Disagree (4)**	**Strongly Disagree (5)**
To what extent do you agree or disagree with the following statement: Most of the time we can trust people in government to do what is right.	2%	18%	21%	35%	23%
GENERALIZED SOCIAL TRUST	**You can't be too careful (1)**	**(2)**	**(3)**	**(4)**	**Most people can be trusted (5)**
Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?	39%	32%	17%	7%	5%

The ISSP 2010 survey includes two questions that measure post-materialistic values based on Inglehart's theory. Respondents are asked to mark the highest and second highest priority the country should have. The post-materialistic items on the list are: give people more say in government decisions and protect freedom of speech. The materialistic items are: maintain order in the nation and fight rising prices. The maximum post-material score is 2 for people who select a post-materialistic item as the country's first and second priority. The minimum score is 0 for people who select two materialistic items. Three percent of Bulgarian respondents marked two post-materialistic items as the desired priorities for the country and therefore exhibit strong post-materialistic values. Nearly 50 percent of Bulgarians selected at least one post-materialistic item, and 48 percent marked exclusively materialistic items as desired priorities for Bulgaria.

Following previous literature, we study two aspects of trust: trust in government (ADEOLA 2007; LEE et al. 2005) and generalized social trust (KUNIOKA and WOLLER 1999; PALDAM and SVEDSEN 2002; RAISER 1999). We measure trust in government with the following survey question: "Most of the time we can trust people in government to do what is right". Respondents could mark whether they strongly agreed, agreed, neither agreed or disagreed, disagreed, or strongly disagreed with that statement. When looking at governmental trust, we can observe that only a small minority (3 percent) of respondents expressed strong trust, while 18 percent stated that people in government can be trusted. A larger share of the population expressed lack of trust: 35 percent disagreed and 23 percent strongly disagreed that people in government can be trusted. Thus, nearly sixty percent of respondents lack trust in government.

The following survey item is used to measure generalized social trust: "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?". Answer options ranged from 1 "You can't be too careful" to 5 "Most people can be trusted". As shown in table 2, the distribution is strongly tilted toward distrust, with over 70 percent of respondents reporting not trusting unknown others. Nearly 40 percent of respondents stated that you can't be too careful in dealing with people. A relatively small fraction of respondents, five percent, reported that most people can be trusted. The social trust patterns that we observe in this survey with respect to government and to unknown others mirror similar findings from other sources (i.e., Eurobarometer, World Value Survey).

The socio-demographic characteristics of the survey respondents are shown in appendix table 1. Survey respondents were asked to report their average monthly income in the local currency, leva. The average personal income reported is 347 leva, with a minimum of 0 and a maximum of 2,500

leva. The average age of survey respondents was 52 years. The youngest respondent was 18 and the oldest was 90 years old. Fifty-eight percent of respondents were women, indicating a slight over-representation. Sixteen percent of the respondents were minorities, identifying themselves either as Turk or Roma. Twenty-four percent of respondents have completed a college or university education.

Next we investigate how environmental concern is impacted by people's post-material values, their trust levels in addition to income and socio-demographic characteristics. We expect that people with higher incomes, those with post-materialistic values, and higher education express greater levels of environmental concern. Bulgarians who trust the government are expected to be less concerned. The effect of generalized trust is unclear. Younger people and women are expected to show greater concern, while the direction of the effect of ethnicity is unclear.

For our regression analysis we recoded the above specified variables as follows. We recoded the dependent variable – environmental concern – as a dummy variable, which equals to 1 for respondents who report being very concerned or concerned with the survey item and 0 for all others. To analyze our binary dependent variable we use a probit model. The independent variables also were recoded. Income was recoded as categorical variable with values ranging from 1 to 10, capturing monthly personal income in increments of 100 leva: 1=less than 101 leva, 2=101-200 leva....10=more than 900 leva. Both trust measures were recoded as dummy variables. Trust in Government takes on the value of 1 for respondents who strongly agree or agree with the statement "most times we can trust people in government to do what is right" and 0 for all others. Generalized Trust equals to 1 for those that report to high or very high trust in people and 0 for all others. A summary of the recoded variables is provided in appendix table 1.

In column one, we present our baseline results from our probit model[4]. We find no significant effects of income on respondents' environmental concerns. The results indicate that women are significantly more likely to state concern about environmental issues. The coefficient suggests that women are 8 percent more likely to state being very concerned or concerned compared to men. Similarly, we find significant effects for ethnicity. Respondents that identify as either Turk or Roma are nearly 20 percent less likely to state concern over environmental issues compared to respondents identifying as ethnic Bulgarians. We note no significant differences

04 We also conducted robustness checks with different specifications. We included various age measures, income as continuous variable, and trust as categorical variables, as well as the inclusion of additional control variables. The results remain unchanged.

by age. We also tested for non-linear effects of age on concern, but found no significant evidence of this. Higher education appears to have a positive effect: respondents with higher education are 22 percent more likely to report being concerned compared to respondents without higher education.

TABLE 3 *Determinants of Environmental Concern.*

	(1)	(2)	(3)
Income	0.001 (0.009)	0.001 (0.009)	-0.002 (0.009)
Post-Materialism		0.023 (0.033)	0.018 (0.034)
Trust in Government			-0.084* (0.047)
Generalized Trust			0.193*** (0.049)
Female	0.084** (0.039)	0.090** (0.039)	0.075* (0.040)
Minority	-0.195*** (0.049)	-0.190*** (0.050)	-0.177*** (0.052)
Age	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Higher Education	0.223*** (0.007)	0.214*** (0.046)	0.215*** (0.046)
Pseudo R-squared	0.0566	0.0566	0.0667
No. of Observations	788	778	757

The model presented in the second column includes an additional variable: post-materialistic values. When controlling for gender, education, ethnicity and age, we find no significant effects of income or post-material values on respondents' level of environmental concern. The results for the socio-demographic characteristics are consistent with the findings in the previous model.

Next, we introduce social trust as explanatory variables: trust in government and generalized social trust, that is, trust in unknown others. We

find that trust in government has a significant negative effect on concern: respondents who strongly agree or agree that those in government can be trusted are 8 percent less likely to report being very concerned or concerned about environmental issues compared to respondents who report not trusting people in government. This supports previous findings that point to the fact that trust in government reduces concern (ADEOLA 2007; LEE et al. 2005; SIEGRIST, GUTSCHER and EARLE 2005; SPIES et al. 1998). The argument is that those who trust the government have confidence that environmental problems can be resolved through government policies.

The opposite pattern can be observed with generalized trust, which appears to raise people's level of concern. Respondents who trust unknown others are 19 percent more likely to report being concerned compared to respondents that do not trust others. The process may be as follows: individuals who have greater trust in unknown others are more likely to trust information about environmental threats by the media, by NGOs, by experts or risks communicated in conversations with others. Further research is required to establish the precise mechanisms through which generalized social trust affects people's concern over environmental problems. The findings presented here point to the importance of considering social trust in research on environmental concerns. In addition, the results indicate the need to differentiate in the analyses between specific components of social trust, taking into account its multi-dimensionality.

Conclusions

In this chapter, we explored the social factors that shape individuals' environmental concern. Previous literature has found that income, post-materialism, and various socio-demographic characteristics are important in predicting environmental attitudes. Building on these studies, we have investigated the effects of income, post-materialistic values and social trust – a factor that remains underexplored – on environmental concern in Bulgaria, using data from the International Social Survey Programme (ISSP) 2010 Environmental survey. The analysis sheds light on the determinants of environmental concern in transition contexts, an area which has received only marginal attention.

We find that in Bulgaria, income or post materialistic values do not significantly affect environmental concern. Higher education appears a consistent and strong predictor for people's environmental concerns. Similarly we note consistent and substantial gender differences, with Bulgarian women reporting higher levels of concern compared to men. Age does not appear to influence environmental concern in Bulgaria. We find that ethnic Bulgarians state higher levels of environmental concern compared to

ethnic minorities in the country. We find that people's social trust has significant consequences for their respective levels of concern.

When differentiating between different types of trust, the following pattern emerges: while trust in government decreases people's concern over environmental issues, trust in others increases their level of concern. We offer the following interpretation: higher trust in authorities indicates higher confidence in the ability to solve environmental problems, while at the same time, higher generalized trust means greater confidence in information about the seriousness of environmental calamities. These findings suggest that more nuanced measures of social trust are important in order to disentangle those differential effects.

Particularly useful would be further research on the effects of the following dimensions: trust in various information providers including the media and non-governmental organizations, trust in scientists, and trust in different levels of government (local, national, and international). Such studies would be able to analyze how people's environmental concerns are linked to their trust in green NGOs, in the enforcement of particular legislation, in various political institutions in and beyond the nation state. Further attention is also required to assess how trust in government affects concerns and risk perceptions of specific environmental issues, like GMOs, global warming, or nuclear power. Lastly, comparative investigations are needed in order to test macro level theories on environmentalism. Concretely, empirical comparative work should study various dimensions of globalization and its impact on environmentalism, examining the particular realities of globalization in the local contexts of transition countries. ●

Appendix

APPENDIX TABLE 1 *Description of Variables.*

Variable	Range	Mean	Description
Concern	0, 1	0.56	0=original answer options 1, 2, 3 1=original answer options 4, 5 "Generally speaking, how concerned are you about environmental issues?" 1 "Not at all concerned" – 5 "Very concerned"
Income	1-10	3.74	1=less than 101 2=101-200 3=201-300 .... 10=more than 900 Monthly personal income in Bulgarian leva (recoded from continuous original variable)
Post-Materialism	0, 1, 2	0.56	0=No post-materialistic item 1=One post-materialistic item 2=Two post-materialistic items 4-Item Ranking Scale on Highest / Second highest priority in Bulgaria. Materialistic items: Maintain order in the nation, fight rising prices; Post-materialistic items: give people more say in government decisions, protect freedom of speech.

Trust in Government	0, 1	0.20	0=original answer options 3, 4, 5 1=original answer options 1, 2 "Most of the time we can trust people in government to do what is right." 1 "Strongly agree"- 5 "Strongly disagree"
Generalized Trust	0, 1	0.12	0=original answer options 1, 2, 3 1=original answer options 4, 5 "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?" 1 "You can't be too careful" – 5 "Most people can be trusted"
Female	0, 1	0.58	0=Male 1=Female
Minority	0, 1	0.16	0=Ethnic Bulgarian 1=Ethnic Minority (Roma, Turk)
Age	18-90	51.93	Age in years
Higher Education	0, 1	0.24	0=Secondary education or lower 1=College or higher

9 Structure and action potential of environmental attitudes and knowledge of environmental problems in Croatia

Krešimir Kufrin

Introduction: Socio–Ecological Studies in Croatia

There is a relatively long tradition of survey based studies examining socio–ecological[1] issues in Croatian sociology. The first study of this kind was conducted in 1986 as part of the project "Environmental Awareness among Young People" (CIFRIĆ and ČULIG 1987; CIFRIĆ 1988) and another was conducted in 1987 as a part of the project "Environmental Aspects of Social Development" (CIFRIĆ 1989). These initial studies were conducted on specific and relatively small samples: the first one on a sample of high school and university students in Zagreb (N=548), and the second one on a sample of inhabitants of three rural settlements in Posavina[2] (N=164). These first research efforts attempted to shape a theoretical framework considered appropriate for examining socio–ecological issues in the Croatian context and to check the initial research instruments, bearing in mind contemporary theoretical discussions and empirical studies conducted in other countries.

As early as 1988–9, also in the scope of the project "Environmental Aspects of Social Development", the first major socio–ecological study was conducted on a nationally representative sample (N=2714). This study used a particularly extensive questionnaire to explore attitudes on various socio–ecological issues (the relationship between nature, technology and humans, problems associated with pollution, ways of solving environmental problems, problems concerning population, food and resources, participation in solving environmental issues etc.). A large portion of the question-

01 The adjective "socio–ecological" is used because the sociological approach to the issue of environment is characterised by examining the interaction between society and the environment; the environment is not regarded primarily as an objective fact but as a social relation and construct.

02 A region in central Croatia, around the river Sava (ed.).

naire was reserved for topics relating to production and the consumption of energy. In addition, different concepts of progress and development were also examined and an array of individual and societal values was studied in detail. Relatively complex statistical procedures were used in data analysis, such as factorial and multiple regression analysis as well as the canonical correlation analysis, although these were not commonly used in works from the field of sociology. The aim of these complex analyses was to investigate "environmental consciousness", that is, the structure and presence of socio–ecological orientations (anthropocentrism, naturalism, technocentrism).[3] This study had a manifold effect on later studies of socio–ecological topics in Croatia, which mainly followed its conceptual postulates and analytical and interpretative framework, using verified research instruments with minor or major modifications. In addition, the above mentioned projects had a considerable impact on the establishment of environmental sociology (social ecology)[4] within the Croatian sociology, as well as on the founding of the journal "Socijalna ekologija" (eng. Social Ecology) which today represents the main forum for studies and research in the field of environmental sociology and related domains.[5]

It should also be noted that all the stated projects and the rest of the survey studies mentioned in this overview were conducted by the Research unit of the Department of Sociology at the Faculty of Philosophy in Zagreb. This fact is not a result of the author's bias; to our knowledge, no other scientific or teaching institution in Croatia has conducted systematic socio–ecological survey studies. Some smaller studies conducted outside of the Department of Sociology were performed in the scope of postgraduate level dissertations (RACZ 1992), or were a result of certain authors' specific interests concerning local environmental problems (KANTAR et al. 2009; STANIĆ et al. 2009), or problems regarding their profession (ŠAJKOVIĆ 1993; UZELAC et al. 1997).

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03 A more detailed explanation of this study's conceptual framework was given in CIFRIĆ 1990 and ČULIG 1992. The discussed analytical and interpretative approach, aimed primarily at questioning socio–ecological orientations, is visible not only in the mentioned publications but also in the works of the mentioned authors and other members of the research team published in the journal "Social Ecology". The later works – especially those by I. Cifrić – use the terms "biocentrism" and "ecocentrism" instead of the original term "naturalism".

04 One should also bear in mind that the course "Social Ecology" was introduced into the undergraduate curriculum for Sociology at the Department of Sociology, Faculty of Philosophy in Zagreb even earlier, in the school year 1985–6, and postgraduate study of "Social Ecology" was also introduced in 1986 at the same department (CIFRIĆ 2011).

05 In 1994, journal "Social Ecology" has started to publish books in a series called "Razvoj i okoliš" (eng. Development and the Environment).

Due to financial difficulties, the following several survey studies by the Department of Sociology were conducted on smaller samples, using either convenience or intentional samples. So, the 1992 study[6] (CIFRIĆ 1994), that was based on the previous research both in concept and operationalization, was conducted on a representative sample of students at the University of Zagreb and the University of Rijeka (N=547). The 1994 study[7] encompassed seven professional groups (N=682) and it predominantly explored various topics regarding environmental policies (CIFRIĆ et al. 1998). The following study, conducted in 1997[8], used a sample of students from four faculties at the University of Zagreb (N=685). Along with the socio–ecological topics, this study also examined attitudes towards the use of genetic technology (CIFRIĆ 1998). Another study was conducted on a student sample in 2002. This study was more specific than earlier studies, as it paid more attention to proenvironmental behaviour and knowledge of environmental issues (KUFRIN 2002A).

The later studies, conducted by the Department of Sociology in the scope of the project "The Modernisation and Identity of Croatian Society", placed a much smaller emphasis on environmental issues. Thus, the questionnaire used in the 2004 study (N=1202, representative national sample) included only a few questions on this topic, and the 2010 study (N=1008, a representative national sample) contained only one question that allowed for the categorization of participants according to their socio–ecological orientation. The questionnaires in these two studies were dominated by other topics, relevant for the construction of social identities (CIFRIĆ 2008B; CIFRIĆ et al. 2013). Socio–ecological orientations were considered to be just one of the relational dimensions of identity (CIFRIĆ and NIKODEM 2006).

In addition to the above stated studies, the Department of Sociology conducted some other research dedicated to specific, but still socio–ecologically relevant topics such as toxic waste disposal (KUFRIN and SMERIĆ 1992), the utilisation of municipal waste (KARAJIĆ and SMERIĆ 1992), production and the use of energy (ČALDAROVIĆ and ROGIĆ 1990; DOMAC et al. 2004A; KUFRIN et al. 2004) and perceptions of landscape (CIFRIĆ and TRAKO 2008A; 2008B).

All in all, one can assume that environmental sociology (social ecology) has been one of the most active research fields in Croatian sociology over the past quarter of a century and that many valuable insights concerning the relations between various segments the population and a number of

06 The study was conducted in the scope of the project "Socio–ecological Aspects of Development".

07 The study was conducted in the scope of the project "Socio–ecological Aspects of Development".

08 The study was conducted in the scope of the project "Socio–ecological and Modernisation Processes in Croatia".

issues regarding the environment and environmental problems have been realized owing to these survey studies. However, even though the studies were relatively numerous and conducted over intervals of several years, a variability of samples used (regarding the size, type and population they represented) makes the job of accumulating and systematising these findings, of comparing their results, and studying trends quite difficult. In addition, the predominant research focus was on socio–ecological values and attitudes concerning various aspects of socio–ecological problems. This has resulted in relatively less research having been conducted on the other two members of the "holy trinity" of socio–ecological space – knowledge of environmental problems and proenvironmental behaviour. The smaller number of studies on these topics has been influenced by – besides the personal preferences and interests of research teams – the fact that institutions in charge of environmental protection and finding solutions to environmental problems have shown no interest in applying the results obtained. Applied studies were conducted very sporadically and only a small portion of their results have been published.

As concerns the described history of socio–ecological studies in Croatia, we cannot fully agree with the remark made by Domazet et al. that "until the ISSP conducted their survey, there were no systematic studies or examinations of attitudes towards ecology and environmental issues in Croatia, only isolated parts of studies of a small number of interested scientists" and that "because of this, there has been no insights into how informed the citizens of the Republic of Croatia are on issues concerning the environment and what their attitudes are on this topic" (DOMAZET, DOLENEC and ANČIĆ 2012, 26). However, we do agree that the inclusion of Croatia in *The International Social Survey Programme* (ISSP) and research into socio–ecological issues in the framework of ISSP's module dedicated to the environment "does not just provide researchers with new possibilities for discovering the attitudes of the public on environmental topics but it also allows us to compare Croatia to other countries that are taking part in this research programme, opening up the possibility of further longitudinal research." (DOMAZET, DOLENEC and ANČIĆ 2012, 26). These "new possibilities" are considered extremely significant, even though the questionnaire used in the ISSP's module on the environment can be regarded as only a partial elaboration of the socio–ecological issues[9].

09 For instance, ISSP's module does not permit something that has been a dominant topic in studies conducted by the Department of Sociology as well as in some other research traditions (DUNLAP and VAN LIERE 1978, DUNLAP et al. 2000, MILBRATH 1985, HERRERA 1992) – the reconstruction of rather complex structures of values and attitudes, such as ecological paradigms or socio–ecological orientations. In addition, the ISSP's survey marginalises knowledge of environmental issues.

Scope and the Aims of the Study

The basic aim of this study is to examine the action potential of attitudes and knowledge on environmental issues, that is, to determine to what extent their variations can explain the differences in Croatian citizens' readiness for personal contribution to environmental protection. The analysis will be conducted using results obtained in 2011 on the ISSP module "Environment III" for the Republic of Croatia.[10] Previous studies have shown that Croatian citizens tend to have proenvironmental attitudes and value orientations, but that their knowledge of the environment and environmental problems is quite modest, as is their willingness to demonstrate their dedication to proenvironmental values through actions and behaviour for the benefit of the environment (KUFRIN 1996; KUFRIN 2002B). In spite of this, studies conducted so far – especially those that used samples from general population – have rarely investigated the relationship between proenvironmental behaviour and attitudes or knowledge regarding environmental issues (CIFRIĆ 1997A; KARAJIĆ 1999). We are hoping that this paper will fill this void, at least to a certain degree. In addition to theoretical relevance, the correlation of behaviour with attitudes and knowledge has a practical relevance as it allows for the efficient evaluation of potential attempts to stimulate proenvironmental behaviour amongst certain parts of population through activities aimed at improving their knowledge of environmental problems, or strengthening proenvironmental attitudes.

In the following part of this work, we shall first present and interpret the results from certain instruments that are used to measure environmental knowledge, attitudes towards the environment and environmental problems with various degrees of generality and foci, and proenvironmental behaviour. The following instruments – i.e. survey questions – were used:

- level of knowledge regarding the causes of and solutions to environmental problems (questions 8a, 8b)
- general sensibility (concern) for environmental issues (question 6)
- the importance of environmental protection in comparison to other social problems (question 1a, 1b)
- the importance of certain environmental problems for Croatia with regard to their individual effects (questions 7a, 7b)
- the estimated danger for the environment from various sources of pollution and the use of certain technologies (questions 14–14g)

10 The research was conducted in Spring 2011 on a sample of 1210 respondents. The sample can be considered representative for the population of adult citizens of Croatia considering their regional background, residential status, age and sex. The data were gathered through individual interviews. More details on this sample can be found in DOMAZET, DOLENEC and ANČIĆ 2012, 26.

- attitudes towards the purpose and effects of personal participation in environmental protection (questions 13a–13g)
- willingness to make material sacrifices in order to protect the environment (questions 12a–12c)
- proenvironmental behaviour (questions 20a–20f, 21, 22a–22c).

After the assessment of proenvironmental orientation of Croatian citizens expressed through their answers to the questions mentioned above, measurement instruments (scales) needed to determine the relationship between proenvironmental behaviour and environmental attitudes and knowledge will be constructed and evaluated.

The instruments obtained will be used in multiple regression analysis intended to provide an answer to primary question of this study: to what extent can proenvironmental behaviour be predicted from environmental attitudes and knowledge?

Finally, conclusions resulting form the conducted analyses will be presented, as well as some recommendations for further research on the relationship between environmental attitudes, knowledge and behaviour.

Bearing in mind the fact that earlier socio–ecological studies in Croatia were conducted using different research instruments and that some of them were limited to studying specific populations, their results do not permit us to develop empirically–based hypotheses that could be tested here. Therefore, the analyses presented in this work are of an explorative nature.

Results of the Study and Discussion

KNOWLEDGE ABOUT THE CAUSES OF ENVIRONMENTAL PROBLEMS AND SOLUTIONS TO THEM

There are two possible approaches to the measurement of environmental knowledge, i.e. two types of survey instruments that can be used.

Objective knowledge tests are instruments consisting of a number of items that can differ regarding the question format and tasks set to the participants, as well as regarding the format of the answers. There are two frequently used kinds of instruments of this type. The first includes a series of sentences displaying facts or misconceptions regarding certain topics, and participants are required to evaluate whether or not they are correct/true. The other type of objective knowledge test offers several answers to each question among which participants are required to choose the answer considered to be correct. The number of given answers can vary from test to test (most usually from three to five with only one correct answer). It is desirable that the number of answers is the same for all questions in a test. It is also beneficial to have a large number of alternatives as this prevents

one from selecting the right answer by choice alone, but it is often rather hard to formulate a large number of incorrect answers that are neither too apparently incorrect nor too close to the correct answer. The objective character of these tests stems from the fact that grading these answers is strictly guided by an unambiguous list of correct answers, which means that the test results do not depend on the subjective assessment of a person that evaluates the answers. The element of arbitrariness that may be introduced by the evaluator's subjective assessment of an answer is the reason why tests without pre–established answers, i.e. tests with open–ended questions are seldom used. Regardless of the style of test, they themselves may differ in the extent and homogeneity of content they include: from those focused on a relatively narrow single topic (for instance, the effects of climate changes, energy efficiency etc.) to those which include a whole range of content that can be considered part of some general topic (for instance, the causes of global environmental problems).

The second way of measuring environmental knowledge is self–evaluation: respondents themselves evaluate their own knowledge, placing themselves on a certain point of a given scale. Some instruments of this kind are quite simple, reduced to a single variable. Such instruments are used to measure general environmental knowledge rather than knowledge of specific environmental issues. The more complex measurement instruments may ask participants to position themselves on several continua, grading their knowledge of multiple topics, more or less related. Measuring environmental knowledge through respondents' self–assessment also has its difficulties. First of all, the consistency of the assessment criteria is very questionable – some participants will make self–assessment by comparing themselves with experts, others will assess themselves in comparison to friends or acquaintances, while some will base the evaluation on their own assumptions regarding the knowledge of the majority of the population. In addition, self–assessment largely depends on certain personal traits. Finally, the question is – especially when single item instruments are used to measure general knowledge – which aspects the participants take into consideration when making their assessment.

Even though both methods of measuring environmental knowledge are often used, we believe that a well–designed objective test is a more valid measure of environmental knowledge than a well–designed instrument based on participants' self–assessment.[11]

11 For additional discussion concerning conceptual and operational approaches and problems with measuring environmental knowledge, see KUFRIN 2003.

In three waves of the research on environmental issues in the ISSP programme, both types of instruments have been used. The first two studies used a certain modification of the objective test. The survey questionnaire used in the first wave, conducted in 1993, contained twelve questions, six of which were predominantly used to measure scientific knowledge (however, some of those questions were also relevant to environmental knowledge). Further two questions measured inclinations towards superstition or a scientific world view, and four focused on measuring certain elements of environmental knowledge – two covered the causes of the greenhouse effect and two dealt with the decreasing biological diversity and air pollution caused by road traffic. Interestingly enough, these questions came with four degrees response set, making it unclear whether the instrument was designed to measure knowledge or attitudes.[12]

The second wave, conducted in 2000, kept six of the twelve questions used in 1993, two of which can be considered to measure environmental knowledge in the narrow sense of the word. The assessment scale remained the same as in 1993.

In the third wave (2010) – covered in this work – the questions measuring environmental knowledge were completely changed. On the one hand, participants' self–assessment was used instead the objective test; on the other hand, question focus was shifted from very specific topics to general knowledge of "environment–related problems" and their current and possible solutions.

We welcome this change as it allows for an easier examination of the relationship between environmental knowledge, attitudes, and behaviour. The expected correlation between the three entities is somewhat greater when all three are at the same level of generality and deal with a similar topic (PRIŠLIN 1993; KUFRIN 1996). In this respect, the measure of general environmental knowledge – even if it is based on a self–assessment – better fits a general character of measures of attitudes and behaviour used in the 2010 questionnaire than would be the case with the thematically narrow questions used in the 1993 and 2000 surveys.

According to the distributions and mean values of the results given using the two scales, the average level of environmental knowledge can be

12 1 – definitely true; 2 – probably true; 3 – probably not true; 4 – definitely not true. The correct answers were considered to be 1 and 2 or 3 and 4, depending on the question (GENDALL et al. 1995). So, participants are left a certain margin within which their answers were considered correct or incorrect. Of course, one could also grade their answers differently, depending on the degree of certainty in choosing the "right side" of the scale. Some studies by the Eurobarometer (for instance: EB 55.2) use almost identical questions but with a dichotomous answer format (correct/incorrect).

described as moderate (Table 1). The difference between the (somewhat better) knowledge of causes and the (somewhat worse) knowledge of solutions to environmental problems is not large, but it is also not so small to be devoid of any theoretical and practical relevance. One should also note the tendency of the participants to place themselves in the middle of the scale and their aversion to choosing more extreme answers. This "escape from extremes" is not an uncommon phenomenon with instruments based on participants' self–assessment.

TABLE 1 *Self–assessment of general knowledge concerning the causes of and solutions to environmental problems (valid percents, valid number of participants, mean value, standard deviation)*

8. How much do you feel you know about	KNOW NOTHING AT ALL 1	2	3	4	KNOW A GREAT DEAL 5	N	M	SD
8a the causes of these sorts of environmental problems?	6.2	15.5	42.0	25.5	10.7	1192	3.19	1.03
8b solutions to these sorts of environmental problems?	11.1	22.1	41.3	18.6	6.8	1183	2.88	1.05

GENERAL CONCERN FOR ENVIRONMENTAL ISSUES AND PROBLEMS

The term *environmental concern*, usually used in the English social science literature to refer to a set of attitudes towards environmental issues and problems, is hard to translate to Croatian language. In this phrase, the noun *concern* has several layers of meaning that need to be taken into consideration. First of all, *concern* can be understood as being concerned or worried *about* something (in this case, the environment) which represents a real or potential threat. However, this term can also be interpreted as taking care *of* something we are related to. Ultimately, *concern* can refer to the interest,

attention that we give to something as it affects us.

Bearing in mind all the above mentioned meanings, it seems worthy to note that the formulation of the question and the assessment scale used in the Croatian version of the questionnaire to examine general relation towards "environmental issues and problems" was aimed primarily at the first meaning mentioned above – concern *about* environmental issues and problems, that is, about the threat they represent.[13] Even though the survey question does not specify whether it refers to "environmental issues" on a global, national or any other even narrower level, we believe that the answers to this question can be used as a measure of general concern about environmental issues and problems.

The results (Table 2) show that the level of environmental concern amongst the Croatian population is moderate: even though the answers that refer to higher levels of "concern about environmental issues" are almost twice as frequent as those that deny or minimise that concern, the mean value of the results is close to the midpoint of the assessment scale.

TABLE 2 *General concern for environmental issues and problems (valid percents, valid number of participants, mean value, standard deviation)*

6. Generally speaking, how concerned are you about environmental issues?	NOT AT ALL CONCERNED				VERY CONCERNED			
	1	2	3	4	5	N	M	SD
	7.4	14.8	36.3	28.1	13.0	1204	3.25	1.09

This finding is in accordance with the low importance attributed to the "environment" in relation to other social questions and problems: only 2% of citizens consider the "environment" to be "the most important question in Croatia today", and another 5.2% place "environment" in second

13 Editors' note: In this text the original phrasing of questions from the English language version of the questionnaire is used in tables. Possible variations in meaning between English and Croatian questions are explained in the text.

place when listing the most important problems. Problems relating to the economy, poverty, and social services such as healthcare and education, and criminality are regarded as much more important social issues.[14]

If the comparison is limited to environmental problems and their relative importance in Croatia today, one can see that citizens do not consider any of the environmental problems to be important enough to be clearly separated from the rest. When dealing with assessments that refer to "Croatia in general", the biggest importance is attributed to the pollution of the water (16.4%) and air (15.5%), as well as the depletion of natural resources (15.3%). Estimates of the effect of environmental problems on the personal and family level are even more balanced: the biggest threat here is considered to be water (15.3%) and air (13.4%) pollution, while genetically modified food (12.9%), household waste disposal (12.5%), the use of chemicals and pesticides (11.7%), and the effects of climate change (11.2%) are considered to be just slightly less dangerous.[15]

If we try to draw a conclusion concerning how Croatian citizens perceive the state of the environment, one could say that they consider it to be relatively good, both regarding the level of their own general concern about the environmental issues and regarding the urgency and the effect of specific – both classic and "modern" – environmental problems at the local and national level. However, one should bear in mind that estimates in certain locations could significantly deviate from the described overall values, since the territory of Croatia is most definitely not homogenous in terms of the particular environmental problems and hazards affecting it, including air pollution, water pollution and the quality of the water supply, the inadequate management of household and other types of waste, and the contamination of soil and water with pesticides and other chemicals. Since this analysis is not the focus of our work, we are simply warning that a generally favourable perception of the general state of the environment and of the risks form various environmental problems possibly obscures pronounced inequalities between different areas, even micro locations, in Croatia. It is possible that a more detailed analysis of this issue would show that "environmental inequalities" should be added to the image of Croatia as a country of growing inequalities (DOMAZET, DOLENEC and ANČIĆ 2012).

14 More details regarding the answers to this survey question (1a, 1b) can be found in DOMAZET, DOLENEC and ANČIĆ 2012, 31–33.

15 More details regarding the answers to this survey question (7a, 7b) can be found in DOMAZET, DOLENEC and ANČIĆ 2012, 34–35.

PERCEIVED DANGER FOR THE ENVIRONMENT FROM VARIOUS SOURCES OF POLLUTION AND TECHNOLOGIES

The results obtained on the sixth question in the survey that measured general sensibility to environmental issues and problems, i.e. the general level of concern about the environment, can be somewhat complemented with the answers to the question no. 14 that measured the perception of dangers to the environment from various activities and technologies (Table 3). The seven variables included in this question allowed the participants to evaluate the "classic" environmental hazards caused by industry, agriculture and traffic (air, water, and soil contamination) as well as some newer hazards, which already have the status of "global ecological problems" (nuclear power plants, global warming, GMO).

Among the mentioned threats to the environment, the greatest danger was attributed to nuclear power plants. More than half of the participants (55.7%) considered them to be "extremely dangerous for the environment", and nearly a further quarter considered them to be "very dangerous".

The difference in the degree of perceived danger for the environment from other sources is very slight: a relative majority of participants (36–40%) described each of these hazards as "very dangerous", and the portion of those that consider them as "extremely dangerous" is generally only a few percents smaller. On the other hand, less than 10% of participants have relativized – completely or to a very high extent – the dangers that any of these hazards pose to the environment. Consequently, the estimates were quite similar regarding their mean values that fluctuated around the value 2 ("very dangerous"). Only after acknowledging the afore mentioned similarities in the estimates, one can say that somewhat more danger was attributed to air pollution caused by industry whilst slightly less danger was ascribed to genetically modified crops and car traffic pollution.

In conclusion, one can say that the citizens of Croatia attribute very high degree of danger to different activities, facilities, and technologies – as they are conducted/used and applied today – embedded into the foundations of the "modern way of life". However, a similar level of perceived danger does not imply that the same activities, facilities, and technologies will be similar in terms of assessments of the feasibility and desirability concerning the means through which it is possible to reduce dangers resulting from them. Should some technologies be abandoned or is it possible to "have everything under control" and to minimise the resulting dangers? In what cases are the technological fixes possible and good enough, and when the change is needed in policies, values, and even in the "modern way of life"? Since these issues are not the focus of interest in this work, they are simply marked here as a potential topic for further research, especially since the survey questionnaire does not allow for more direct and complete answers.

TABLE 3 *Estimated danger for the environment from various sources of pollution and technologies (valid percents, valid number of participants, mean value, standard deviation)*

		EXTREMELY DANGEROUS FOR THE ENVIRONMENT 1	VERY DANGEROUS 2	SOMEWHAT DANGEROUS 3	NOT VERY DANGEROUS 4	NOT DANGEROUS AT ALL FOR THE ENVIRONMENT 5	N	M	SD
14a	In general, do you think that air pollution caused by cars is...	22.5	37.7	32.8	6.8	.2	1203	2.24	.88
14b	In general, do you think that air pollution caused by industry is...	39.4	40.3	17.8	2.2	.2	1203	1.84	.81
14c	And do you think that pesticides and chemicals used in farming are...	36.8	39.1	20.9	3.0	.2	1202	1.91	.84
14d	And do you think that pollution of Croatia's rivers, lakes and streams is...	36.2	37.4	21.0	4.9	.5	1205	1.96	.90
14e	In general, do you think that a rise in the world's temperature caused by climate change is...	35.7	36.0	22.4	5.5	.4	1191	1.99	.92
14f	And do you think that modifying the genes of certain crops is...	26.3	38.7	25.4	7.9	1.6	1167	2.20	.97
14g	And do you think that nuclear power stations are...	55.7	26.0	14.7	3.0	.6	1199	1.67	.88

It should be noted that the problems discussed here are not devoid of interpretative difficulties that stem from differences in the character of the estimates requested in certain questions. Some of them (14a, 14b, 14e) emphasise that they are looking for a "general" assessment, but only one question (14e) stated that it refers to the global environment ("world"); it is not certain that all participants understood the remaining two questions in the same way. Furthermore, in one question (14d), the estimate was limited to Croatia alone, while some other questions (14c, 14f, 14g) were set more indeterminately, without specifying "the area of risk".[16]

Finally, it seems useful to compare the results of assessments of the dangers associated with major threats to the environment with the expressed level of "general concern about the environmental issues". While a large majority of the participants perceive all the threats to be "very" or "extremely" dangerous, the level of "general concern about the environmental issues" is only moderate (the mean value is 3.25 on a 5–degree scale). Such results seem to suggest that the level of "environmental sensitivity" increases with specification of environmental threats. The validity of such a conclusion should be tested in further research, as well as the possible reasons for this kind of discrepancy in the assessments.

PURPOSE AND EFFECT OF PERSONAL PARTICIPATION IN ENVIRONMENTAL PROTECTION

The inclination towards personal participation in activities that contribute to environmental protection depends, among other things, on opinions regarding the prerequisites, context and the effect of these activities. These opinions, that can stimulate or inhibit proenvironmental behaviour,

16 In short, the problem with questions from 14a to 14g is that they do not clearly indicate whether the participants estimated the dangers on a global or a more narrow level, that is, whether they used the same referential framework in all their estimates except in 14d. If not, their estimates are not mutually comparable. It is interesting to compare these survey questions to those used in 1993, when the environment–related module was first used. In that research wave, each danger was estimated twice: the first time as in our questionnaire from 2010, and the second time with regard to dangers for the participants and their families. In the questionnaire used in 2000, the estimated danger for the participants and their families was kept only in the case of air pollution from car traffic, and this aspect was completely abandoned in the third wave. Even though this double estimate of danger somewhat minimises the problem of consistency regarding the referential framework, it does not solve the problem completely. Cf.: ISSP 1993 source questionnaire (GESIS 2013A); ISSP 2000 source questionnaire (GESIS 2013B); ISSP 2010 Overview on questions, variables and replications (GESIS 2013C).

are guided primarily by the effect of environmental problems on people's everyday life, the importance they have over "other things in life", and the credibility of warnings regarding their severity.

By commenting on questions 1a and 1b, we have already pointed out the low priority the environment has when compared to other current social issues. Thus, it is no wonder that – when the relative importance attributed to protection of the environment is shifted from the collective to the individual level – the number of those who consider that "there are more important things in life" that one should focus on rather than the protection of the environment is twice the size (42%, Table 4) of those who disagree with this claim (22.1%). In addition, a third of the participants (33.2%) agree that environmental problems have a direct impact on their everyday life, while the share of those who disagree with this statement is barely smaller (30.2%). The attitude towards the credibility of claims about environmental threats is only slightly proenvironmental: 26.1% citizens believe that many of these threats are exaggerated, while 41.5% disagree.

Attitude towards personal competence to assess the effect of one's individual "way of life" on the environment is characterised by the same orientation: almost half of the participants (46.5%) think they can properly evaluate the benefits and harm that they inflict on the environment, and 22.8% consider themselves unable to do so. The two items that reflect the expected effect of individual proenvironmental engagement provide analogous results. The ratio of people who do not accept the claim that personal engagement has no purpose unless we can expect that such behaviour is a social norm is 46.4%: on the other hand, 29.5% participants tend to insist on such a reciprocal relation. A relative majority of the participants (43%) disagree that "people like them" can not make a major contribution to environmental protection, but those who disregard the possible effect of the "common people" also make up a significant part of the population (35.8%).

The described opinions can be summed up in the results on the remaining item of this survey: one third of the citizens (35%) do what is good for the environment even if it costs them more time or money, and an equal portion of them do not do so (33.8%) or cannot evaluate which category they belong to (34.2%). In conclusion, one could say that the opinions regarding the prerequisites, context and the effect of personal involvement in environmental protection are factors that encourage or inhibit proenvironmental behaviour of comparable portions of general population.

TABLE 4 *Opinions on the purpose and effect of personal participation in environmental protection (valid percents, valid number of participants, mean value, standard deviation)*

13. How much do you agree or disagree with each of these statements?		AGREE STRONGLY	AGRE	NEITHER AGREE NOR DISAGREE	DISAGREE	DISAGREE STRONGLY			
		1	2	3	4	5	N	M	SD
13a	It is just too difficult for someone like me to do much about the environment	6.7	29.1	21.3	30.3	12.7	1199	3.13	1.16
13b	I do what is right for the environment, even when it costs more money or takes more time	3.5	27.3	34.2	27.5	7.5	1186	3.08	.99
13c	There are more important things to do in life than protect the environment	8.7	33.3	35.9	18.2	3.9	1184	2.75	.98
13d	There is no point in doing what I can for the environment unless others do the same	6.2	23.3	24.1	33.1	13.3	1194	3.24	1.13
13e	Many of the claims about environmental threats are exaggerated	3.6	22.5	32.3	32.9	8.6	1182	3.20	1.00
13f	I find it hard to know whether the way I live is helpful or harmful to the environment	2.4	20.4	30.7	33.9	12.6	1162	3.34	1.01
13g	Environmental problems have a direct effect on my everyday life	3.8	29.4	36.7	22.0	8.2	1165	3.02	1.00

WILLINGNESS TO MAKE MATERIAL SACRIFICES FOR ENVIRONMENTAL PROTECTION

The willingness to make material sacrifices to protect the environment was measured by an instrument which included three items formulating the "sacrifice" in various terms: as a willingness to pay higher prices and taxes, and as a readiness to accept a lower standard of living.

Regardless of the indicator, the willingness of Croatian citizens to contribute to environmental protection in a way which would imply a decline in their material standard is very low: nearly two thirds of the participants express a lack of willingness to accept any of the three types of sacrifice, and this figure is dominated by those that are "very unwilling" to do so (Table 5).

TABLE 5 *Willingness to Make Material Sacrifices to Protect the Environment (valid percents, valid number of participants, mean value, standard deviation)*

12. How willing would you be to ... in order to protect the environment?		VERY WILLING	FAIRLY WILLING	NEITHER WILLING NOR UNWILLING	FAIRLY UNWILLING	VERY UNWILLING			
		1	2	3	4	5	N	M	SD
12a	...pay much higher prices ...	1.8	10.0	21.4	32.9	33.9	1170	3.87	1.05
12b	...pay much higher taxes ...	1.1	8.4	21.4	29.9	39.2	1171	3.98	1.02
12c	...accept cuts in your standard of living...	2.4	12.2	20.8	28.4	36.2	1174	3.84	1.12

We cannot discuss here to what extent this attitude reflects the generally unfavourable material situation and uncertain existence with which a

growing number of Croatian families faces, and to what extent it reflects the perception of efficiency in spending assets collected this way, assessment of the probability that these assets will be used what they are intended for, or the level of responsibility for environmental problems that should be attributed to citizens in comparison to other social actors. In any case, it is indubitable that any measure that would place an additional financial burden on citizens in order to collect assets to protect the environment would result in a failure. One should also bear in mind that two out of three items included in this survey question are formulated in an extreme fashion (*significantly higher* prices; *significantly higher* taxes). The fact that citizens do not accept *significantly higher* increases in prices and taxes does not necessarily mean they would be as opposed to *moderately* higher expenditures. However, we may only speculate about this. We believe that this option is worth investigating in further research, with appropriate modification of the survey question.[17]

We should also mention another feature of the answers to the survey question that is not visible from the Table 5. Almost 60% of the participants used the same answer for all three items, which suggests that their responses were predominantly affected by the assumed intention ("the government wants to snatch from the household budget"), whose execution mode was mostly irrelevant.

PROENVIRONMENTAL BEHAVIOUR

Proenvironmental behaviour was measured using three instruments including 10 variables.

The most comprehensive instrument measured individual proenvironmental behaviour that was mostly under personal control and dependent on the will of participants and members of their households. The participants were asked to estimate the frequency of several actions that objectively contribute to the well–being of the environment, and some of them could even have a direct positive effect on family health. In some cases (using cars, the decreased use of energy sources, saving water, buying fruits and vegetables grown without the use of pesticides and chemicals), it was difficult for participants to distinguish to what extent their actions were the results of proenvironmental intentions and to what extent they were motivated by economic reasons or caring for one's own health. This

17 It seems that – instead of insisting on *significantly higher* prices and *significantly higher* taxes – a more useful result would emerge if one tries to determine *the margin* to which citizens would be willing to accept an increase in prices or taxes in order to protect the environment. For example of such a formulation of a survey question see DOMAC et al. 2004B.

problem in measuring proenvironmental behaviour is nothing new. Regardless of the motivation, all these types of actions are objectively proenvironmental and may be considered as a measure of proenvironmental behaviour.

The other two instruments operationalised those types of actions that are achieved on a collective, societal or political level.

In terms of the frequency of individual proenvironmental actions (Table 6), the most common is "buying fruits and vegetables grown without the use of pesticides and chemicals", which is a common practice of approximately one fifth of the population (20.4%). In all likelihood, it is no accident that this is the action which has the most apparent and direct positive health effect. Of the activities that can be considered primarily proenvironmentally motivated, sorting useful waste from domestic garbage (16.4%) and conserving water (10.2%) are the most common practices. These same three types of behaviour remain the most common when we include participants that practise these activities "often", but even then, the portion of those who perform them does not exceed one half of the population. Any other kind of proenvironmental behaviour is somewhat rarer. Less than one tenth of Croatian citizens that are able to perform these actions do so "always", while only a third or less perform them "always" or "often".[18]

It is interesting to note that reducing car use seems to be the hardest "environmental sacrifice" – almost half of respondents with a car never do that. However, on the basis of this question it is not possible to assess to what extent this reflects an adopted cultural pattern or a way of life, and to what extent it reflects the presence of various obstacles such as inadequate public transportation, the particularities of certain work places, or overly high fuel prices that reduce the possibility of a completely proenvironmentally motivated decision to use the car less, since the car usage has already been reduced to a minimum.

The other two instruments, the results of which are presented here, refer to those types of proenvironmental behaviour achieved through the common actions of interested citizens.

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18 The percentages, means and standard deviations in Table 6 were computed excluding the participants unable to perform certain actions: those who do not have a car and those who do not live in places which have facilities for depositing sorted useful waste, or who do not have access to fruits and vegetables grown without the use of pesticides and chemicals. The share of these participants is reflected in the difference between the size of the sample and the number of those that answered particular questions (N).

TABLE 6 *Frequency of certain types of individual proenvironmental behaviour (valid percents, valid number of participants, mean value, standard deviation)*

		ALWAYS	OFTEN	SOMETIMES	NEVER			
		1	2	3	4	N	M	SD
20a	How often do you make a special effort to sort glass or tins or plastic or newspapers and so on for recycling?	16.4	30.1	33.5	20.0	1101	2.57	.99
20b	How often do you make a special effort to buy fruit and vegetables grown without pesticides or chemicals?	20.4	30.7	32.2	16.6	1169	2.45	.99
20c	And how often do you cut back on driving a car for environmental reasons?	4.6	13.7	30.5	51.2	998	3.28	.87
20d	How often do you reduce the energy or fuel you use at home for environmental reasons?	7.3	21.2	43.0	28.5	1209	2.93	.89
20e	And how often do you choose to save or re–use water for environmental reasons?	10.2	23.3	41.0	25.5	1210	2.82	.93
20f	And how often do you avoid buying certain products for environmental reasons?	5.8	19.7	46.3	28.2	1209	2.97	.84

The results from the first instrument (Table 7) show that the number of survey participants that belong to "groups whose main goal is to preserve and/or protect the environment" is extremely low, almost marginal – 2.6%, regardless quite benevolent question formulation that permitted participation in some "ecological groups" considered less formal, more temporary and fluid, in addition to "green" organisations and associations.

TABLE 7 *Membership of groups preserving and/or protecting the environment (valid percents, valid number of participants)*

21. Are you a member of any group whose main aim is to preserve or protect the environment?	YES	NO	N
	2.6	97.4	1210

This finding is in accordance with the results of earlier studies, which give a similar proportion of citizens who are members of these types of groups. In the European Values Study (EVS) in 2008, 2.2% of participants said that they are members of organisations for "preserving the environment, ecology, animal rights", and almost the same percentage (2.1%) was obtained in the EVS study conducted in 1999. One should also note that the share of those who performed unpaid voluntary work in those organisations is much smaller: 0.7% in the 1999 study and 1.5% in the 2008 study (RIMAC 2010, 432). The World Values Study conducted in Croatia in 1995 also recorded a significant difference between the number of "members" and "active members": the proportion of members of eco–organisations is estimated at 4.4% while the share of those who consider themselves to be active members is only 1.2% (ŠTULHOFER and KUFRIN 1996, 180). Therefore, we consider the 2.6% who declare themselves as members of "ecological groups" noted in our study at least partly overrated, as it – in all likelihood – includes those who are completely or mostly inactive.[19]

The second instrument used to measure collective proenvironmental behaviour asked the respondents about their participation in specific col-

19 Rimac and Štulhofer have already noted the difference. Considering the proportion of participants included in non–governmental organisations obtained "through measuring the density of social networks" (...) to be of "questionable reliability since it is insensitive to different levels of activity", they used "the amount of free time that participants spend working on activities relating to the associations of which they are members" as a more appropriate measure of the density of social networks (RIMAC and ŠTULHOFER 2004, 300–301).

lective actions regarding environmental issues over the past five years. The results show (Table 8) that a negligible segment of the population took part in a "protest or demonstration about an environmental issue": 1.9%. Donating money to an "environmental group" is also rare (4.1%), while the share of those who "signed a petition about an environmental issue" is several times higher, but the frequency of this type of activity is still small (15.7%)

TABLE 8 *Participation in collective proenvironmental activities over the previous five years (valid percents, valid number of participants)*

	22. In the last five years, have you ...	YES	NO	N
22a	... signed a petition about an environmental issue?	15.7	84.3	1209
22b	... given money to an environmental group?	4.1	95.9	1209
22c	... taken part in a protest or demonstration about an environmental issue?	1.9	98.1	1209

We should also mention that 81.7% of participants did not take part in any of the four types of collective proenvironmental behaviour. About 14.2% of participants engaged in one type of behaviour, 2.9 % engaged in two types, and the number of those who were engaged in three or four types of behaviour is a single–digit one.

Based on the results presented, one can conclude that proenvironmental behaviour mostly consists of individual activities, some of which may also be motivated by expectations of economic or health benefits, while the membership in environmental groups and the participation in collective political activities for the well–being of the environment are rare, especially when it comes to those types of activities which imply a more significant sacrifice, whether expressed in terms of money or through the possible resultant inconveniences and risks if practiced.

CONSTRUCTION AND EVALUATION OF MEASUREMENT SCALES

In order to examine to what extent proenvironmental behaviour can be explained by various attitudes and level of environmental knowledge, we have created – based on the previously described survey questions – a se-

ries of scales designed to summarise the respondents' proenvironmental behaviour, knowledge and various types of attitudes. All the constructed scales are additive: the result of a person on a scale is equal to the sum of his/her results on items constituting that scale, provided that he/she has a valid result on all the items; participants who do not meet this criterion are excluded from procedure, that is, they are assigned a *system–missing* value on a scale. For some items, the response scale was reverse–coded before calculating the result on a scale. In other words, the items were recoded so that the same numerical values on all the items of a scale express the same orientation and intensity of attitude or some other measured entity.

We used factor analysis and internal consistency measure (Cronbach alpha) to evaluate the basic metric properties of the constructed scales.

Factor analyses were conducted using the principal components method of factor extraction and the Kaiser–Guttman criterion to determine the number of common factors to be retained. In the case of multiple latent dimensions, initial factor solution was transformed into a simple solution using the oblimin rotation. Finally, the adequacy of a single factor solution was examined through the exclusion of particular items.

When assessing the reliability of a scale using the Cronbach alpha coefficient, we tried to maximise the reliability, provided that its increase through the exclusion of an item would not significantly deteriorate the content validity of the instrument.

The basic properties of each of the constructed scales, presented in the following text, will include:

- the title of the scale
- its constituent items
- the theoretically possible range of scale values
- the factor structure and percentage of instrument variance explained by common factors
- the reliability coefficient
- basic descriptive statistics of the distribution of results (number of cases with valid values on the scale, minimum and maximum recorded value, mean, standard deviation).

Additional remarks shall be used to describe the particularities of a certain scale and the procedure used in its creation.

Knowledge of environmental problems scale

- **Scale Items:** 8a, 8b
- **Theoretically possible range of scale values:** 2–10
- **Factor structure; percentage of explained variance:** single–factor; 84.7%

- **Reliability coefficient:** $\alpha = 0.819$
- **N** = 1176; **Min** = 2; **Max** = 10; **M** = 6.07; **SD** = 1.91
- **Remarks:** Higher results reflect a better knowledge of environmental problems.

Scale of perceived danger for the environment
- **Scale Items:** 14a, 14b, 14c, 14d, 14e, 14f, 14g
- **Theoretically possible range of scale values:** 7–35
- **Factor structure; percentage of explained variance:** single–factor; 53.2%
- **Reliability coefficient:** $\alpha = 0.851$
- **N** = 1139; **Min** = 7; **Max** = 35; **M** = 13.73; **SD** = 4.48
- **Remarks:** Higher results reflect a smaller perceived danger.

Attitude towards the purpose and effects of personal participation in environmental protection scale
- **Scale Items:** 13a, 13b, 13c, 13d, 13e, 13f; excluded item: 13g
- **Theoretically possible range of scale values:** 6–30
- **Factor structure; percentage of explained variance:** without item 13g single–factor; 43.9%; two factors with all the items; 55.3%;
- **Reliability coefficient:** $\alpha = 0.742$; with item 13g $\alpha = 0.730$
- **N** = 1114; **Min** = 7; **Max** = 30; **M** = 18.60; **SD** = 4.14
- **Remarks:** (1) Higher results on the scale reflect stronger proenvironmental attitude orientation. (2) Due to their different formulation, items 13b and 13g were recoded. (3) In the initial factor analysis, items 13b and 13g were forming a separate factor. By omitting item 13g, which was dominant in this latent dimension, a single–factor solution was achieved. This situation, in which items that have to be recoded constitute separate latent dimensions, is not rare in the factor analysis of similar instruments. Unfortunately, it is difficult to asses whether the multidimensionality of the instrument is primarily determined by the item contents or whether it is a result of their different formulation.

Individual proenvironmental behaviour scale
- **Scale Items:** 20a, 20b, 20c, 20d, 20e, 20f
- **Theoretically possible range of scale values:** 6–24
- **Factor structure; percentage of explained variance:** single–factor; 59.8%
- **Reliability coefficient:** $\alpha = 0.859$
- **N** = 899; **Min** = 6; **Max** = 24; **M** = 17.01; **SD** = 4.24

- **Remarks:** (1) Higher results on the scale indicate weaker or less frequent proenvironmental behaviour. (2) It should be pointed out that only 899 out of 1210 participants have a valid result on the scale. The others were assigned a system–missing value on the scale, as they were unable to engage in at least one type of behaviour. These were the participants that do not own a cars, so the item 20c cannot refer to them, and those that cannot recycle secondary raw materials (20a) or buy fruits and vegetables grown without the use of pesticides and chemicals (20b), as they are unavailable in their place of residence.

Based on the three items in question 12, we have created a *Scale of willingness to make material sacrifices for the protection of the environment*, but we decided against using it. At first glance, by adding the results of items 12a, 12b, and 12c a scale with good metric properties is obtained: it is unidimensional (with 81.9% of the instrument variance explained by the common factor) and highly reliable considering the number of items ($\alpha = .888$). However, using this scale in further analysis would be problematic due to the pronounced asymmetry and multimodality of the distribution of results. Such a distribution is the result of an already mentioned tendency of the participants to select the same answer for all three items, which means that the values 3, 6, 9, 12, and 15 appear with a much higher frequency compared to their neighbouring values. Because of this, the only measure of material sacrifice that will be used is variable 12c, whose formulation we consider to be the least problematic of the three. However, its distribution is also quite asymmetric.

An attempted construction of the *Scale of collective proenvironmental behaviour* based on items 21, 22a, 22b, and 22c did not result in a usable instrument either. The reliability of the scale that includes all four items is not satisfactory (KR–20=0.515), and neither is the reliability of the scale that would include only the items 22a, 22b, and 22c (KR–20=0.419). The low reliability of these scales reflects the fact that the same individual was rarely engaged in several types of collective proenvironmental behaviour. For instance, out of 31 participants that are members of an environmental protection group, 22 signed a petition, 14 donated money to the environmental protection group, and 8 took part in protests or demonstrations. In addition to low reliability, this also caused the distribution of the results on the additive scales consisting of these items to be extremely asymmetric. For this reason, our further analysis will be limited to attitudes and environmental knowledge as predictors of individual proenvironmental behaviour.

ATTITUDES AND ENVIRONMENTAL KNOWLEDGE AS PREDICTORS OF PROENVIRONMENTAL BEHAVIOUR

In order to determine to what extent the variations in frequency of individual proenvironmental behaviours can be explained by variations of the results on the other previously described scales and variables that measured attitudes and knowledge, we have conducted a multiple linear regression analysis with the results on the Individual proenvironmental behaviour scale as a dependent variable. The set of predictors consisted of the following instruments:

- Knowledge of environmental problems scale
- General Concern for Environmental Issues and Problems (question six, one item)
- Scale of perceived danger for the environment
- Attitude towards the purpose and effects of personal participation in environmental protection scale
- Willingness to accept cuts in personal standard of living in order to protect the environment (question 12c, one item).

Regression analysis was conducted using the *forward* method to include predictor variables in the regression model, with probability of F set to $P_{IN} < 0.05$ as entry criterion. The regression analysis included only those participants who had a valid value on all the variables used. Since the number of participants without valid values was significant for some scales, the regression analysis included a total of 772 participants (64% of the sample).

Before turning to the results of the regression analysis, we present the matrix of inter–correlations of all the variables used (Table 9). Although all the correlations are statistically significant at α level of 0.001, the strength of association between variables is only moderate, and in some cases even weak. The direction of all correlations is logical and expected. The item that measured the willingness to accept cuts in personal standard of living in order to protect the environment has a somewhat lower correlations with other variables, which is expected considering the expressed lack of willingness to make this sacrifice; this unwillingness is only partially reduced by eventual proenvironmental orientation of attitudes, knowledge and behaviour. On the other hand, somewhat higher correlations with other measures were obtained on variables which measured general concern for environmental issues, proenvironmental behaviour and attitude regarding the purpose and effects of personal participation in environmental protection.

TABLE 9 *Pearson correlations between measures of attitudes, knowledge, and behaviour*

	Individual proenvironmental behaviour scale (–)	Knowledge of environmental problems scale (+)	General Concern for Environmental Issues (+)	Scale of perceived danger for the environment (–)	Attitude towards the purpose and effects of personal participation in environmental protection scale (+)	Willingness to accept cuts in personal standard of living in order to protect the environment (+)
Individual proenvironmental behaviour scale (–)	1.000	–.364	–.444	.395	–.421	.250
Knowledge of environmental problems scale (+)	–.364	1.000	.444	–.242	.380	–.267
General Concern for Environmental Issues (+)	–.444	.444	1.000	–.289	.408	–.196
Scale of perceived danger for the environment (–)	.395	–.242	–.289	1.000	–.345	.150
Attitude towards the purpose and effects of personal participation in environmental protection scale (+)	–.421	.380	.408	–.345	1.000	–.351
Willingness to accept cuts in personal standard of living in order to protect the environment (+)	.250	–.267	–.196	.150	–.351	1.000

N=772; all coefficients are statistically significant at α level of 0.001

** In order to make the results in the table more transparent, we used the (–) sign to mark the variables for which lower values reflect the marked "proenvironmental orientation", and the (+) sign to mark those for which such an orientation is reflected by higher values.*

The results of the regression analysis are in accord with the described correlation matrix (Table 10). First of all, it should be noted that the regression model, which included all the predictor variables as statistically significant, explained 33.1% of the variance of the results on the Individual proenvironmental behaviour scale. Given that few similar analyses have been conducted in Croatia, and even then using different samples and instruments (for instance: KUFRIN 2002, 297–217), we are not able to discuss whether proenvironmental behaviour is more present in Croatia now in comparison with other periods, and whether the importance of attitudes and knowledge as factors that foster environmental behaviour has changed. Regardless of that, the above mentioned percentage of explained variance of the criterion variable points to the fact that attitudes and environmental knowledge are important determinants of proenvironmental behaviour. However, the inclination of Croatian to proenvironmental behaviour is also affected by numerous other factors, such as material status, level of education, age, region, and the size of the place of residence etc. Due to limited space, the importance of these factors can not be discussed here.

The values of standardized coefficients (beta) show that the measures of attitudes are slightly better predictors of proenvironmental behaviour than the measure of environmental knowledge. The only exception is the "notorious" willingness to accept cuts in personal standard of living in order to protect the environment; that variable was the last to enter the regression model (and just barely, due to relatively low entrance criteria), making a small contribution to the explained variance.

Finally, the last two columns in Table 10 show that correlations between predictor variables are not of such a magnitude to cause a severe multicolinearity, which would threat validity of regression analysis.

TABLE 10 *Multiple regression analysis with measured attitudes and knowledge as predictors, and measure of proenvironmental behaviour as the criterion*

	Beta	t	sig.	direct correlation	partial correlation	Tolerance	VIF
General Concern for Environmental Issues [+ higher concern]	−.241	−6.925	.000	−.444	−.243	.721	1.386
Scale of perceived danger for the environment [− higher perceived danger]	.226	7.052	.000	.395	.247	.850	1.177
Attitude towards the purpose and effects of personal participation in environmental protection scale [+ proenvironmental attitude]	−.174	−4.893	.000	−.421	−.174	.691	1.447
Knowledge of environmental problems scale [+ better knowledge]	−.116	−3.372	.001	−.364	−.121	.736	1.358
Willingness to accept cuts in personal standard of living in order to protect the environment [− higher willingness]	.076	2.394	.017	.250	.086	.856	1.169
							R^2=0.331

Conclusion

1. The data gathered in Croatia in 2011 using the ISSP's module "Environment III" enable us to examine Croatian citizens' inclinations towards proenvironmental behaviour on two levels: at the level of individual behaviour, which is mostly under control of individuals and their households, and at the level of participation in collective actions, by which citizens can – through various social networks – achieve their specific interests that relate to their use of the environment as a societal resource.

The inclination towards individual proenvironmental behaviour is not at a level that could be considered satisfactory. Even when we limit the analysis to only those participants who can objectively contribute to the well–being of the environment performing activities stated in the survey questionnaire, the share of those who take part in any of such activities "regularly" is below 20%, and for some activities this share is even several times smaller. If we include those persons who take part in such activities "often", we will rarely reach half of the population. On the other hand, at least one half of the population does not participate in such activities at all nor does so sporadically. Based on the modal values and means of the results on items that measure the frequency of proenvironmental behaviour, we can summarily claim that the citizens of Croatia "sometimes" take part in such activities. A particular aversion was shown towards those activities which have a less evident direct health benefit, and which imply a reduction in comfort or an additional expense.

Participation in collective proenvironmental activities is extremely rare. A very small part of the population see these activities as a way through which they can achieve their specific goals and satisfy needs that the "government" does not deal with or does not handle in a way deemed appropriate by citizens. Participatory democracy (the active engagement of citizens in environmental issues) is far from the Croatian reality at present, and far from the world view of most citizens, who are very inclined towards state paternalism in this respect. The answers to the survey question 15a show that a large number of citizens (74.6%) think that "government should pass laws to make ordinary people protect the environment, even if it interferes with people's rights to make their own decisions", rather than to "let ordinary people decide for themselves how to protect the environment, even if it means they don't always do the right thing " (25.4%).

Proenvironmental behaviour should definitely be improved, either through legislature that would bind people to it, or through stimulating participation in non–governmental organisations and other forms of self–government of the people regarding the environment. Some measures pre-

scribed "from above" in Croatia are to be expected soon.[20] A longer period of time and bigger efforts are needed to increase the engagement of citizens in participatory activities, and this implies not only financial investments that are hard to expect at this point, but also a different political and civic culture, which in itself happens to be a scarce resource in Croatia for the time being.

2. The studies conducted so far have shown that Croatian citizens are very much inclined toward proenvironmental value orientations and paradigms, bearing in mind that these orientations are analytically reconstructed based on very general attitudes on desired ways of "humankind's" relationship towards the "environment". The expression of such attitudes should be expected also because they belong to the domain of values that are considered normal, desirable and "politically correct". However, expressions of proenvironmental value orientations were not followed by willingness to give up certain unsustainable practices that form the basis of a "modern lifestyle". The ambivalence between the recognition of manifestations of the ecological crisis and a lack of willingness for the necessary social and political change was bridged through expectations that environmental problems will be settled through development and the application of technology (KUFRIN 2002). Attitudes concerning the environment presented in this work were not measured at such a general level, as the survey did not contain variables needed to reconstruct general value orientations of that type. Therefore, we are unable to either support or to reject the findings of previous research.[21]

The results on attitude measures used in this work show that almost all threats to the environment are considered to be "very dangerous", but also that general concern for environmental issues is only moderate and that the "environment" does not fall into the category of the most important social problems to be addressed. Attitude towards the purpose and ef-

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20 Cf.: "Minister Zmajlović: 'Sorting the waste and using secondary raw materials is becoming a standard for all Croatian citizens'", published on 3rd July 2013 on the website of the Croatian Government under the heading "News and announcements" (VLADA REPUBLIKE HRVATSKE 2013).

21 The "lack" of variables that could be used to reconstruct socio–ecological value orientations is a result of two facts – (1) the limited number of variables that a module can include; and (2) the thematic orientation of the module, with an inclination towards attitudes on economic and political aspects of environmental protection rather than towards general opinions on the relationship between society and the environment. This focus of the survey is, of course, completely legitimate, so the remark regarding the insufficient representation of variables that would allow a reconstruction of socio–ecological value orientations should be taken as an observation of fact, rather than as an objection emphasising a shortcomings of the questionnaire.

fects of personal participation in environmental protection is only slightly proenvironmentally oriented. The weakest sensibility for environmental problems is expressed through a lack of willingness to make a personal financial sacrifice in order to solve environmental issues, exhibited by two thirds of the participants. In general, all these attitudes point to the general conclusion that the population covered by the survey is at best mildly proenvironmentally oriented.

3. The level of knowledge of environmental problems and ways of solving them have also proved to be moderate, with knowledge of potential solutions being somewhat lower. When evaluating this finding, one should also bear in mind that previous studies warn that the results from objective knowledge tests only moderately correlate with the results of participants' self–assessment. In addition, the results were also probably influenced by the already mentioned tendency of participants to assess themselves choosing the middle value of the response set. In any case, the level of knowledge of Croatian citizens can be significantly improved, especially with regard to means of solving those environmental problems that have a more direct effect on their everyday life.

4. The regression analysis confirmed that approximately a third of the variations of the results registered on the measure of proenvironmental behaviour can be explained by the results on attitudes and knowledge measures, wherein attitudes, knowledge, and behaviour are connected in a logical and coherent manner[22]. The relationship between attitudes, knowledge, and behaviour is most often conceptualised through the assumption that attitudes and knowledge affect the behaviour. That assumption – which, from the statistical viewpoint, is neither necessary nor the only possible one – is also implicit in the logic of the multiple regression analysis and the usual manner of interpreting its results. By relying on socio–psychological theories regarding the relationship between attitudes, knowledge, and behaviour, we conform to this common understanding, aware of the simplification that it involves. Having this reservation in mind, the results of the regression analysis allow for the assumption that promotional and educational activities aimed at strengthening proenvironmental orientation of attitudes and enhancing the environmental knowledge amongst Croatian citizens would have an effect on proenvironmental behaviour that should not be neglected.

22 The coherence of space defined by the applied measures of attitudes, knowledge, and behaviour is also indicated by the fact that the factor analysis of all variables used in the regression analysis results in a single–factor solution, explaining 44.7% of the overall variance.

5. This paper was limited to testing the role of attitudes and knowledge as determinates of proenvironmental behaviour. Due to space limitations, we were unable to examine the effect of other factors which may have a much larger cumulative effect, since two thirds of the variance of results on the measure of proenvironmental behaviour remains unexplained by applied measures of attitudes and knowledge. Such an analysis would significantly complement the findings stated here; we hope this work will encourage it.

6. At several points in this work we stated some remarks regarding the character and execution of survey questions and the resulting interpretative inaccuracies. Even though the ISPP's module "Environment III" surely provided renewed encouragement to faltering socio–ecological studies in Croatia and introduced some new topics characteristic for *policy* studies, our suggestion is that some of the instruments should be improved, at least to a degree that allows for the comparison of results obtained in different waves of the survey.

7. More as a result of the features of the surveyed population, rather than emerging from the difficulties stemming from the survey questions, the problem of collective proenvironmental behaviour has been merely touched upon here. Considering the potential importance and effects of such activities, it would be beneficial to examine the reasons why these activities are fairly uncommon in Croatia. The possibilities offered by the ISSP's "Environment III" module are limited in this respect; further research in this domain should be conducted on different populations using qualitative methods, more appropriate to studying "rare events". ●

10 Industrial policy for sustainability

Igor Matutinović

Introduction

In 2008 the Western economies were hit by the strongest recession since the Great Depression. In itself this was not an unexpected phenomenon: upturns and downturns are systemic properties of a capitalist economy and their magnitude is power-law distributed (ORMEROD and MOUNFIELD 2001; MATUTINOVIĆ 2005; 2006). Therefore, once in a while large-scale events will necessarily happen for one reason or the other – from productive overcapacity, energy shocks, to financial recklessness, or, as it happened, all of them together. What makes this event particular is only its larger historic context: a decade in which critical global problems like climate change and the rising price of conventional oil were calling for major changes in energy supply mix and consumption habits. Such structural changes, which are necessary if the humanity is not soon to cross the threshold of 2C° of global average temperature increase, require very focused and consistent national and international policies: at the one side they should keep the two-thirds of fossil fuel reserves in the ground prior to 2050 (IEA 2013A), at the other, they should provide renewable, carbon-free energy to compensate required curtails in fossil fuels extraction.

A hope appeared at the beginning of recession that this time countercyclic policies may result in a different direction of economic recovery – the so called New Green Deal – named after an investment plan announced by the US President Barrack Obama (BLOOMBERG 2008). This hope, however, was short-lived and as soon as in 2009 one could tell, on the basis of economic and policy signs reported in business media, that Western economies will miss this opportunity to "change course" (MATUTINOVIĆ 2009). In Europe, political attention was soon turned to sovereign debt crisis and quantitative easing was replaced by austerity programs which

immediately cut subsidies to renewable energy sources and discouraged new investments[1]. In the US, the success of hydraulic fracturing technology opened up large reserves of shale gas while horizontal drilling increased domestic conventional oil production, driving down the energy prices and equally discouraging new investments in renewable energy[2]. The overall result has been a global decrease of investments in clean energy over the past few years, the largest one – 22% – was recorded in the first quarter of 2013 (BLOOMBERG 2013B).

This is not only an episodic account of Western government's inability to act in a consistent way towards major goals – reduction of CO2 emissions and increasing rapidly renewable energy supply. More than twenty years after the initial political commitments stated at the Earth Summit in Rio we record a total failure to reach its objectives: according to IEA (2013B), the "global energy supply is as carbon energy intensive today as it was in the nineties" while global emissions of carbon dioxide increased by 3% in 2011, reaching an all-time high of 34 billion tonnes (OLIVIER et al. 2012)[3].

This failure to reach long-term goals of major systemic importance suggests following insights: (1) the policies promoted so far by governments have not only been inconsistent but basically inadequate; (2) in the absence of stable and mutually consistent institutional framework, markets will not be able to guide business investments and consumer preferences in a desired direction (reduction of greenhouse gases by whatever amount required to keep climate within 2C° increase). Since the world's major CO2 emitters are far behind the schedule and some of them are actually promoting policies that work in an opposite direction, we can conjecture that 2C° goal will not be attained and that adaptation and mitigation should be considered together with emission reduction policies. Indeed, a recent World Bank-commissioned report (2012) warns that the world is on track to a "4°C world" marked by extreme heat-waves and life-threatening sea

01 Besides cuts in subsidies to renewable energy, falling prices for carbon credits in the EU weakened the incentive to invest in low-emission technologies such as wind, solar and nuclear power" (BLOOMBERG 2013A).

02 Lower prices of natural gas are pushing the US energy policy in a opposite direction than the one announced in the Green New Deal: "Sixteen of the 29 states with renewable portfolio standards are considering legislation that would reduce the need for wind and solar power" (BLOOMBERG 2013B).

03 In the period 1990-2011 the EU 15 countries reduced their total CO2 emission by 10%, the US increased by 8,7%, Japan by 6,9% and China by 3,86 times (OLIVIER et al. 2012). Note that in 2007 the EU 15 emissions were 1% higher than in the base 1990 year, meaning that the major contribution to overall reduction came from a slowdown in economic activity instead as a result of a consistent policy implementation.

level rise, which will asks for increased support for adaptation, mitigation, inclusive green growth and climate-smart development.

The path to the "4°C world" carries three basic features that will be discussed in more detail later: (1) higher energy prices due to either (a) expected policy measures that would aim at discouraging extraction of fossil fuels, or (b) the growing scarcity of conventional oil and cheap coal (extraction peaks); (2) higher food prices as a consequence of heat waves, droughts, and higher agricultural production and transport costs due to more expensive energy: and (3) higher global prices of industrial goods caused by higher transport costs.

Here I discus policy implications of this scenario for small economies that, in most of the cases, are only marginal CO2 emitters but because of their relative economic weakness and low endowment with natural resources and energy are likely to experience a strong impact with the above mentioned features of the transition to the "4°C world". I argue that in order to adapt to new environmental constraints and mitigate the negative consequences of the "4°C world" governments must not rely on markets only, but should pursue an *active industrial policy* (see also NAUDÉ 2011). However, under the new constraints, they must adopt a different approach to industrial policy than the traditional one oriented at increasing national competitiveness in a global economy (HOCHFELD et al. 2010). I call this new approach the industrial policy for sustainability, which is oriented at serving society's material needs under the treathening boundary conditions arising from treats of global warming, energy scarcity, water scarcity, and general deterioration of world ecosystems. The analysis is focused on Croatia but it may be well applied to the neighboring countries – from Slovenia and Hungary across Balkans to Greece.

The text is organized as follows: first section deals briefly with impending resource and climate issues; second is addressing the rationale for the new industrial policy; third presents the current economic and resource situation in Croatia; fourth proposes industrial policy outline and the fifth closes with conclusions.

Change in boundary conditions

CLIMATE CHANGE

Socioeconomic systems depend on larger scale systems for their functioning and survival– ecosystems – from which they extract resources and a multitude of biological services and into which they discharge wastes, heat, and emissions. They represent immediate boundary conditions for their operations. Long-term patterns of precipitation, local temperature variations, and consequently, biological productivity in ecosystems is controlled at a

higher scale by global climate – the average global temperature variations which tend to be constant over millennia. Global climate, as a higher level constraint, may be affected by perturbations that humans induce at a lower level – that of ecosystems – like, for example, large scale deforestation and burning of fossil fuels. Scale refers to spatial dimension and rates of change in relevant processes, which differ by at least one order of magnitude across the hierarchical levels (SALTHE 1993; 2012). Therefore, economic processes that refer to material throughput and energy degradation change much faster than analogous macro-ecological processes (e.g. changes in standing biomass and in energy throughput per unit mass in mature ecosystems) while global average temperature appears as a "constant" with respect to ecological dynamics.

This separation of dynamics across hierarchical levels has been providing stable operating conditions to socioeconomic systems and, in absence of large perturbations, stability to natural processes at the higher levels. Since the Industrial Revolution, however, Western economies have been perturbing global climate by burning fossil fuels at an ever increasing rates with the consequence of raising the level of CO_2 in the atmosphere from 280ppm to 400.03 ppm[4]. This cumulative effect of lower level perturbations manifests itself at the uppermost level as an increase in the average global temperature and in the intensity of extreme weather events like droughts and hurricanes. So destabilized boundary conditions are already affecting global ecosystems in a discernible way (ROSENZVEIG et al. 2008) and creating a complex cascade of feedback loops between rising temperature and other climate variables like, for example, respiration rates of plants (SCHIERMEIER 2013) and permafrost thaw (SCHUUR and ABBOTT 2011). This process of destabilization, initiated at the human system level, is feeding back from global climate trough ecosystems back to our societies where we expect major negative consequences in agricultural productivity[5] and water management in the short term, and in flooding of coastal regions and mass migrations of affected populations in the longer term. As these complex feedback loops initiated by climate change process are not fully understood (SCHIERMEIER 2007; MASLIN and AUSTIN 2012) the humanity is playing a global experiment which risks cannot be entirely and precisely

04 Measurement of atmospheric CO2 for April 2013 taken at Mauna Loa Observatory, National Oceanic and Atmospheric Administration (http://ftp.cmdl.noaa.gov/ccg/co2/trends/co2_weekly_mlo.txt. Accessed on June9, 2013.

05 Here I am principally referring to the fact that weather extremes like droughts and floods are likely to damage crops everywhere while average increase in temperature and regional changes in precipitation will have different impact on different regions in the world.

captured in climate change models. This is the key reason why we need to reduce carbon dioxide concentration in the atmosphere to the level that is believed by climate scientists to be safe for humanity.

However, in spite of two decades of global political summits and initiatives, carbon intensity of energy has been decreasing nowhere in the world (RAUPACH et al. 2007; IEA 2013B) and, expectedly, global emissions of carbon dioxide has slightly increased (OLIVIER et al. 2012). This trend is not likely to be reversed any time soon as the world seems to be on a development and energy path that will bring with it a surge in CO_2 emission (PIELKE et al. 2008) and where the "4°C world" scenario (WORLD BANK 2012) is a logical consequence[6]. In such a situation, some warn that "The time of irreversible change may be so close that it would be unwise to rely on international agreements to save civilization from the consequences of global heating" (LOVELOCK 2006, 16). This brings to the forefront the need for envisaging regional and national policies aimed at adaptation and mitigation, which implementation should start long before the cascade of negative events erodes valuable resources necessary for the task at hand.

ENERGY CRISIS

Carbon dioxide emissions result from burning of fossil fuels, which have been the basic energy input for industrial civilization and still represent 85% of the world total energy mix (TOLLEFSON 2011). In spite of the lip-service paid to de-carbonization of the energy sector, fossil fuels extraction is supported worldwide by governments with subsidies that amounted to $523 billion in 2011, up almost 30% on 2010 and six times more than subsidies to renewables (IEA 2013A). Besides giving clear preference to subsidizing fossil fuels, governments reduced funding for energy research and development in the past two decades (NATURE 2006). No wonder that renewable energy sources, excluding the burning of traditional biomass such as wood, make up only about 7% of global energy production (TOLLEFSON 2011). While there is huge potential for growth in renewables, we cannot expect in the foreseeable future, even with more commitment from governments, that wind, solar, biomass, tidal and geothermal energy sources could substantially substitute fossil fuels in the global energy mix.

The intrinsic dynamics of capitalist economy and the socially-dominant paradigm of growth provide a relentless push to consumption of energy and

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06 "Strong growth in non-OECD energy consumption, especially of coal, translates into continued growth of global CO2 emissions. The growth of global CO2 emissions from energy averages 1.2% p.a. over the next twenty years (compared to 1.9% p.a. 1990-2010), leaving emissions in 2030 27 percent higher than today" (BP 2011).

resources which has moved southwards in the past twenty years with rapid industrialization of China and India. A typical projection into the future sees economic growth and energy consumption as a "natural givens"- the West will continue to grow while the South will keep catching up. For example, the European Commission estimates the GDP growth in EU 27 from 2010-2030 at 46% with a gross energy consumption increase of mere 2.4%, thanks to technological innovations and the efficiency of markets (CAPROS et al. 2010)[7]. Even if EU manages to reduce the energy intensity of its GDP to that extent, by 2030 the world primary energy consumption is likely to grow anyway by 39%, most of which in Non-OECD countries (BP 2011).

The underlying assumption of increase in consumption of fossil fuels is their continued availability and price-affordability. However, a number of studies are pointing at approaching of Hubbert's peak in extraction of conventional oil (see Matutinović (2009) for an overview) ¸which, once crossed over, represent a "phase transition" in the world transport patterns and trade flows (RUBIN 2009). Murray and King (2012) demonstrated that oil supply has become inelastic and that since 2005 the world production fluctuated around 75 million barrels per day, suggesting that we might have already reached the plateau. The sign that conventional oil reserves cannot meet further demand increases is supported by the fact that new oil wells are drilled in ever more expensive sites like deep sea beds or tap expensive and environmentally destructive unconventional reserves like tar sands (SCHINDLER 2010; PFEIFER and CHAZAN 2013). The situation is similar with coal – the major fuel for generating electricity: recent studies show that useful coal – in terms of extraction costs and energy return on energy investment (EROI) may be less abundant than previously assumed and that peak of world coal production may be only years away (PATZEK and CROFT 2010; HEINBERG and FRIEDLEY 2010). Taken together, passing the peaks in world oil and coal production will raise energy costs in all economic sectors and thus transform radically our current patterns of production, consumption and world trade. Given these trends, Heinberg and Friedley (2010) suggest that "nations should immediately begin to plan for higher fossil fuel prices and to make maximum possible investments in energy efficiency and renewable-energy infrastructure".

DE-GLOBALIZATION

At the level of national economy, globalization process have been producing over decades a structural shift from an "integrated" to a "segregated" economy in the sense that industrial production has been losing its primary function of serving local needs and adapting its output for

07 Calculated from tables at p.56 and p.68 (CAPROS et al. 2010).

distant markets whereby less competitive national sectors were gradually replaced by foreign imports from cost-efficient global suppliers (MORRIS 1996; DALY 1999). As a result, the functional logic of national industrial structure has been disrupted to a different extent in different countries, and more in those that run trade deficits across many sectors. As a consequence of high transport prices, which would make long-distance trade in many food and manufacturing products uneconomic, current globalization process would come to a halt and be replaced by an abrupt transition to a smaller world (RUBIN 2009). For small, import-dependent countries with segregated industry, such a transition may present a challenge for national security as it would suddenly create shortages and price spikes of imported food or manufactured goods (MATUTINOVIĆ 2000). This perspective calls for the use of industrial policy as a tool for reinforcing functional integrity of national economies and reducing their import dependency from far-away markets.

Industrial policy for sustainability

THE OLD PARADIGM IN A NEW CONTEXT

Taken together, the challenges presented in the previous section cannot possibly be resolved through the markets alone and need a timely and long-term policy commitment from governments.

Industrial policy has always been one of the salient characteristics of capitalism. Targeted investments in infrastructure, like railways, roads and ports were undertaken by all states on their way to industrialization (ROSTOW 1960). Later, and especially after the World War II and until 1980, industrial policy "meant the direct intervention of the state in the economy, the direct control by the government of large parts of the production apparatus and a set of public actions aimed at limiting the extent of the market and at conditioning productive organization" (BIANCHI and LABORY 2006, *xv*). Afterwards, the focus of policymakers shifted more towards creating favorable environment for firm creation, cluster development, and innovations – all with the goal of enhancing the competitive advantage of national firms and industries in a global economy. The latter policy orientation is usually labeled "horizontal" and the former "vertical", distinguishing between undifferentiated interventions with respect to firms and sectors and concentration of efforts on the development of selected domains or activities (DE BANDT 2006, 107). As a passing note, the shift towards horizontal policy coincided with the rise of neo-liberal ideology in the UK and USA and the belief that government should not interfere with the working of free markets. In a certain sense, horizontal policy with all its merits in creating an enticing environment for all players seems incapable

to respond to pressing societal needs and to commit to specific goals, like reducing carbon intensity of the economy.

> Already in the past, the industrial policies which have proved to be efficient were essentially those which, referring to some type of plan rationality, were pursuing specific targets, whether "grand programs" (in the case of France) or sectoral restructuring policies (in many countries) or industrial development strategies (in the case of Japan). With increased complexities and uncertainties, the justifications for such a selective approach and for the concentration of efforts and resources on specific domains, projects or subsystems are again much stronger (DE BANDT 2006, 107).

Given the changing boundary conditions in which our economies operate, discussed in the previous section, industrial societies are facing unprecedented uncertainties and complexities. Under such circumstances, standard industrial policy oriented towards creating national "competitive advantages" in a world of unlimited growth potential and abundant energy sources is no longer adequate. Instead, policy makers must return to its historic origins and look at the new challenges that lie ahead in the similar fashion as they did in the past when new infrastructure and industries had to be built in order to enable take-off of the industrialization process (ROSTOW 1960) or quick reconstruction and development after the WWII. This time, however, the goal is not any longer growth and development but adaptation to new constraints and mitigation of negative consequences that the "4°C world" and similar scenarios may bring along. In other words, industrial policy for sustainability is not about what an industry needs to be globally competitive but about what kind of industries a society needs to be sustainable over long run and under conditions of uncertainty posed by climate change and energy crisis. Moreover, according to Hochfeld et al. (2010, 21-22) modern and postmodern industrial policy as a strategic approach broadens the focus from manufacturing sectors to all economic sectors including among others agriculture and energy .

Industrial policy for sustainability (IPS) is, therefore, oriented at serving society's material needs under the new historic conditions arising from treats of global warming, energy scarcity, water scarcity, and general deterioration of world ecosystems[8]. Its principal goals are creating new infrastructure and restructuring current industries in order to respond to new

08 I do not mention explicitly population growth here, but it is clear that it represents one of the most important driving factors of present negative resource and environmental trends.

challenges. These goals are accomplished by coordinated action of government and private sector.

THE ROLE OF GOVERNMENT

The principal task of government is to set social priorities and then operationalize them through the standard set of industrial policies: industrial strategy definition, competition policy and regulation, technological policy, regional and territorial policies, methodological approaches and conceptual analysis (BIANCHI and LABORY 2006, 26). Defining long-range social priorities, like for example, decarbonizing energy sector or increasing self-sufficiency in food production is a crucial feature of IPS. Such goals have economy-wide repercussions and require at least a decade of consistent policy making and regardless who is currently in political power. Industrial strategy would refer to identify crucial sectors and industries which are needed to realize social priorities and to assess their current strength and development capacity through cluster analysis (PORTER 1990). Cluster analysis would also identify the extent of new investments (setting-up of missing links in a cluster) and the preferred technologies to be pursued as well as the nature of potential investors: state-owned firms, public-private partnerships, private domestic investors and Greenfield investments. Conceptually, the IPS does not mean returning to import-substitution policies or autarchic economy: clusters may function at a supranational level as some of their members may be outsourced regionally and production back-ups may even exist in distant markets. Besides setting-up state-owned firms where necessary and financing infrastructure projects, government can intervene directly also by supporting selected technologies via its procurement policy and R&D grants (ALIC et al. 2010), and, more conventionally, by providing subsidies and enacting selective tax policies.

THE ROLE OF MARKETS

Compared to governments' 'designer' role in setting the goals of IPS, markets take on the vital part of self-organization which is irreplaceable in the implementation process (MATUTINOVIĆ 2006). Markets are not only intrinsically tied to economic complexity that characterizes industrial society but are also instrumental to its evolutionary capacity. They constantly generate a variety of products and services on which the selective pressure of competition acts – the necessary precondition for technological change and adaptation to unknown challenges that may appear in the future (MATUTINOVIĆ 2010). The private sector, therefore, covers two main roles: (1) the role of self-organizing division of detailed sub-goals and of fine-detail execution of single tasks under the general rules set by indus-

trial strategy[9], and (2) the role of generating innovations under the joint stimulus of subsidies and competitive processes. Markets and the private sector cannot set societal priorities nor can they look far enough into the future but are, nevertheless, instrumental to efficient realization of the IPS goals.

IPS AND FREE TRADE

Strategic execution of IPS at the national or regional (EU) levels is likely to clash with free trade arrangements under WTO rules, as these were designed for the world of unbounded resources and economic growth. This opens up space for possible protectionist policies disguised as IPS like protecting a certain industry or national employment instead of pursuing long-term societal goals. Under the new constraints, however, protectionism as a goal in itself would miss the track to create more energy efficient and resilient local or regional economy.

However, by looking ahead in the future, countries may decide to apply protective measures for industries that under new constraints emerge as strategic ones. For example, Germany who has the world strongest solar energy industry and the highest number of installed solar panels in the world, may find it more attractive to protect its cutting-edge solar energy cluster from Chinese low-cost imports in order to give it more space for technological development. If such a policy would be adopted across different sectors and by a wide number of countries, the current free trade arrangements under the WTO would unravel and world trade may revert again to regional and bilateral arrangements. Conceptually, this would imply returning to Ricardian comparative advantages of trade instead of insisting on absolute advantages, which are based on the total mobility of capital and relocation of production to countries with the lowest labor cost (DALY 1999) – the paradigm that drove globalization process since the eighties of the past century but becomes counterproductive under the new constraints.

An outline of IPS for Croatia

INITIATING CONDITIONS

Before going into details of IPS for Croatia, let me briefly state the overall situation in the economy and in the target sectors as they represent a set of initial conditions in which policy measures will be operating and which, to a certain extent, constrain the range of choices and define priorities.

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09 All details concerning cluster development – entries and exists of firms and sourcing of a myriad of small suppliers is left to self-organization of markets.

MACROECONOMIC PROFILE

Unjust and ill-conceived privatization, the ensuing crony capitalism and more than two decades of economic mismanagement destroyed industrial sector and created high public and external debts – 66% and 112% of GDP respectively. These debts considerably constrain government's capability to deal with short-term and long-term issues, like counter-cyclical policies and IPS.

In 2013, Croatian economy has been through its fifth year of recession, which left deep marks on its output and employment: the first contracted by 11.9% since 2008 and the second reached one of the highest the levels in Europe – 21.9% – with youth unemployment at 52%[10]. Such a high unemployment level creates fertile ground for political instability as rising income inequality and poverty erode social fabric. Data for 2010 show that in Croatia 20.6% of the population was below the poverty line while inequality in the distribution of family income measured by Gini index was 32, compared, for example, with Sweden's score of 23 (CIA 2013).

Croatian GDP structure is typical of middle-income industrialized economies: agriculture 5.1%, industry 24.9%, and services 70% (CIA 2013). Industrial production has never reached its pre-transition levels and has still been contracting in 2013, thus increasing the import dependency of the economy: exports covers only about 55% of imports, out of which 90 percent refers to manufactured goods (HGK 2013). Under the changing boundary conditions, such a high import dependency may result in price shocks while a weakening industrial sector is not providing a safe basis for meeting challenges of an uncertain future.

FOOD SECTOR

In spite of the relatively high contribution of agriculture to GDP, Croatia imports 50% of its food requirements. We can summarize the weakness of the agricultural following Znaor (2009):

- Nearly two-thirds of its farmland are not put to productive use
- With 1.2 million acres of farmland under current use, Croatia is among the European countries with the least agricultural land per capita (0.27 ha)
- The livestock in 2008 was 1.5 times smaller than in1991, and as much as 2.4 times smaller than in 1911

10 Youth unemployment of 52% refers to the age group 15-24. The significance of this reading, which refers to the March 2013, can be grasped when we compare it to pre-recession times when it read 22.30% (March 31, 2008). Source: Eurostat, http://ycharts.com/indicators/croatia_youth_unemployment_rate_lfs. Accessed on July 5, 2013.

- Bad agricultural practices result in loss of soil fertility.
- Outdated technology commands low agricultural productivity and expensive production.

To that we can add a weak irrigation network that stands in stark contrast to large freshwater endowments: Croatia has about 5.790ha under irrigation while, for example, Hungary irrigates 292.147ha and Serbia 163.311ha. In the context of likely threats posed by reduced precipitation, heat waves, and droughts (SETH et al. 2008), this is not only suboptimal in a technical sense but presents a risk for preserving agricultural yields at their current level.

ENERGY SECTOR

In terms of energy mix, its use efficiency and the prospects of self-supply, Croatia is far from being on a sustainable pathway. In 2010, the Croatian total primary energy supply or use[11] per inhabitant was 2226 kilograms of oil equivalent or 34.7% lower than the EU27average (MGRP 2011, 52). At the same time it used 14.6 percent more energy than the European average to produce 1.000 US$ of GDP at PPP (MGRP 2011, 38). Looking at its energy balance, Croatia exports 48% of its primary energy production (PEP) and imports 72% of its energy consumption, most of it – 91% – refers to fossil fuels. In total, 25% of Croatian PEP comes from renewables: hydropower, fuel wood and renewables (solar energy, geothermal energy, and biogas). However, according to projections until 2030, its energy self-supply, defined as the ratio between total primary energy production and total primary energy supply, will be declining from 55,5% in 2010 to 30% in 2030 (MGRP 2011) – a sign that substantial investments in renewables will be needed if Croatia wishes to keep its energy import dependency at the present level and reduce its imports of fossil fuels.

A recent study concluded that Croatia is on a development path that puts excessive pressure on the environment whilst deepening social inequalities but is in a comparatively good position to pursue change and embark on the path to a more sustainable existence (DOMAZET, DOLENEC and ANČIĆ 2012, 59). Here I would add that under the changing boundary conditions, current economic profile and especially high imports of food, weak in-

11 Total primary energy domestic supply (sometimes referred to as energy use) is calculated by the International Energy Agency as production of fuels + inputs from other sources + imports - exports - international marine bunkers + stock changes. It includes coal, crude oil, natural gas liquids, refinery feedstocks, additives, petroleum products, gases, combustible renewables and waste, electricity and heat. http://stats.oecd.org/glossary/detail.asp?ID=6328

dustry, and increasing energy dependency represent a threat to economic security and social stability in the next ten to twenty years.

POLICY OUTLINE

The issue of how to pursue sustainability in Croatia has been addressed by different authors and from many different perspectives providing a comprehensive framework for policy making (HORVAT and DVORNIK 2004; MATUTINOVIĆ 2006A; HORVAT 2007; LAY and ŠIMLEŠA 2012; DOMAZET, DOLENEC and ANČIĆ 2012). Most of these works, in one way or another, point at the importance of increasing local food production and improving energy security while at the same time creating a more just and equitable society (LAY and ŠIMLEŠA 2012; DOMAZET, DOLENEC and ANČIĆ 2012). These works, combined with the present assessment of initial and impending boundary conditions represent a background for setting an outline for IPS, a theme that was initially addressed in Matutinović (2000).

The strategic goal of the policy is to streamline new capital formation towards economic restructuring which is necessary for adaptation and mitigation under the negative consequences of climate change, rising energy prices and global environmental degradation. At the same time, new capital formation would have positive short to medium term consequences on employment, industrial production and economic recovery. Based on the preceding analysis, I discuss briefly following target investment areas divided by specific policy goals: food, transport and energy.

FOOD SECURITY

Large-scale transition to *organic farming* in Croatia might provide more jobs, grow more food, create less environmental costs and be more profitable than the current production methods (ZNAOR 2013). The role of the state in enacting this transition is twofold: it should provide funding for education and training to farmers because organic farming requires high human and social capital; secondly, it should offer the vast portions of state-owned unused agricultural land under preferential conditions for long-term lease if it is used for organic produce. In that respect, long standing inefficiency (unused fertile land) would be turned into sudden advantage as chemically untreated land is ready for quick organic produce certification. Another investment area in the food sector is the large scale application of *smart irrigation systems*[12] with the aim of increasing crop yields and mitigating

12 Smart irrigation systems let farmers know when to switch their watering system on or off depending on the levels of moisture in the soil. It knows exactly how much water any crop needs to be fully grown by the day it is picked.

negative effects of droughts along with optimizing water usage efficiency. Here a combination of public works (for building the required infrastructure) and private investments may be an optimal way to go, where in the latter case the Croatian Bank for Reconstruction and Development can provide loans to farmers for purchasing equipment under favorable interest rates. Since we can expect that warmer climate and intense heat waves will put traditionally used crop varieties under pressure, state should provide funding for research *of heat resistant crops* to protect future yields from undesirable losses. Having provided basic support for a more efficient and resilient crop production, the state should streamline domestic and foreign private investment into *food processing* industry to round up the production chain and secure enough capacity for domestic needs and surpluses for exports[13]. This is a clear example of the systemic interrelatedness betweeen crop production and food processing goals under the single roof of IPS.

On the more general level of policy making, there are a couple of institutional changes that would underpin the aforementioned vertical policies. In the first place, government should change current legislation that enables agricultural land conversion to urban or industrial uses by charging only a minor premium fee to investors. It should be replaced with a special permission, which would enable a societal control of this critical resource and discourage its depletion driven by market value of land usage and not long term societal interests. Fertile land – this critical resource for survival and physical well-being that belongs to the category of national wealth – should be protected from "land-grabbing", which has taken global momentum in the past ten years. Government should make institutional provisions that forbid long-term lease of agricultural land to foreign owners that invest with the primary interest to produce food for their own domestic needs. Finally, the state should lease its unused land to domestic farmers and enterprises with the priority of enhancing the capacity of small and medium-scale farmers as the only way to bring their productivity closer to European levels. In this context, state could run special programs of land lease and for unemployed and particularly for unemployed youth who are willing to make their living off land. If successful, this policy would reduce social tensions that arise from high unemployment rates and improve demographic profile of agricultural settlements.

13 According to business press, EU imports about 50% of organic food it consumes annualy in the value of more than 10 billion Euros (Poslovni dnevnik. Zelenim planovima udobrovoljili Bruxelles, a ekoproizvođače ostavili na tržišnoj vjetrometini. http://www.poslovni.hr/hrvatska/zelenim-planovima-udobrovoljili-bruxelles-a-ekoproizvoace-ostavili-na-trzisnoj-vjetrometini-242924. Accessed on 30.06.2013.

TRANSPORT EFFICIENCY

High prices of fossil fuels and the pressure to reduce CO_2 emissions, both of which will increase in the near future, require transport systems different from the ones that defined the era of low energy prices. State and public-private investment partnerships (PPIP) are needed to improve the current and develop new infrastructure. For example, obsolete and declining railroad network should be turned into the main interurban transport mode. Here, one of the major investment areas is building a high- speed rail on the east-west and south-north axis with the aim to increase energy efficiency of major traffic flows and reduce its carbon footprint. In the urban areas, investments are needed to improve density and efficiency of public transport via new generations of surface tramways, self-service bicycle stations, and appropriate traffic regulation that would stimulate public over individual transportation. Foreign and domestic investors should be attracted to invest in the existing manufacturing cluster that produces trains and tramways, which may well be one of the most dynamic industries of the future. Complementary to policy measures that drive private transportation towards mass and public modes is the monetary incentive for switching to low-carbon options by providing, for example, a stimulating VAT to consumers for purchases of hybrid or electric cars[14].

ENERGY SECURITY

The basis for an integrated and efficient production and distribution of renewable energy in Croatia – solar, biomass[15], hydro, and to a smaller extent wind – is a well designed (decentralized) and managed electricity transmission infrastructure. Public investments in smart grids is one of the major steps in increasing current efficiency of electrical energy transmission and building the appropriate infrastructure for future transition to low-carbon energy system. As in all cases where an infrastructure project is de-facto a public good, like railways, ports and bridges, its primary investor is the state. Generation of renewable energy in large power plants should then be left to the state, PPIP, and to private investors depending on the strategic importance and value of an individual project. An indispensable element of energy security policy is efficiency, like investments in energy efficient buildings: large-scale renovation of public buildings that will be in use in the next 20 and more years and tax incentive for private owners to do the

14 Behavioral research (ARIELY 2008, 63-64) indicates that a zero VAT may the appropriate level needed to engender large-scale behavioral changes. It is clear that in that case there should be in place a plan for developing an adequate nation-wide charging stations network.

15 Refering to forest residues, timber industry waste, and agricultural waste.

same. Part of that policy can be a program of installing a solar panel on "every roof" in the coastal area, which the state could support with income tax deductions and zero VAT on equipment. Since it is very unlikely that in the foreseeable future Croatian energy consumption can be entirely supplied with renewables, the state should look for the lowest carbon energy mix for the remaining balance. This means giving preference to natural gas over coal and, providing that the issue of storage of nuclear waste is successfully solved, taking into consideration the nuclear option in cooperation with the neighbouring countries. In the context of energy sector de-carbonization, phasing out subsidies to fossil fuels and redirecting them to renewables[16] is an unavoidable policy step. However, this requires an EU-wide policy coordination as an isolated action in the common market would likely be a self-penalizing move in economic competitiveness. Last but not least, a recent UNDP report (VLAŠIĆ 2013) showed that a focused and comprehensive policy aimed at increasing energy efficiency and share of renewables in the energy mix, could create about 80.000 new jobs in the green sector, which is a goal to be pursued on its own merit given that it represents a reduction of more than one fifth of the current registered unemployment.

Conclusions

The IPS outline in the preceding section is by no means exhaustive: not all areas have been covered[17] and there are many other policy measures that have already been proposed in order to cope with the challenges of climate change and related energy and food problems (see for example SETH et al. 2008; VLAŠIĆ 2013). What I have proposed here is the very concept of IPS, its rationale (changing boundary conditions), and the prioritized areas of action as I see them. The imposing constraints coming from the current

16 Currently, Croatia spends 5-6% of its GDP on subsidies for imported fossil fuels (VLAŠIĆ 2013, 4-5)

17 In the context of sustainability, areas like waste and water management are intrinsically tied to success of IPS. On the other hand, I do not see, for example tourism to be a relevant area for IPS because it hardly connects to its main goal – that of serving society's material needs under the global threats, which arise from global warming and the sunset of fossil energy sources. Tourism sector growth exerts pressure on land conversion to recreational uses, leading to losses of natural ecosystems and fertile land destined for food production. It puts under seasonal strain local water and landfills capacities. For that reasons, in the context of IPS tourism belongs to those economic activities that have to be socially constrained rather than being unconditionally stimulated in the pursuit of short-term economic growth.

macroeconomic weaknesses – the level of public debt and budget deficit – restrain any government's short-term capability to engage in investment projects. The government has, however, the option to use foreign and domestic private investment in the pursuit of IPS goals. So far, Croatian government has been very far from this strategy (MATUTINOVIĆ 2013).

In order for industrial policy for sustainability becoming politically acceptable and consistent over many changes of government, we need to have in the first place a socially shared belief that negative trends are real: that global climate is posing immediate treats which may only increase in the future; that fossil fuels are finite and can only become more and more expensive in the future; that all of these, in concert with growing global population, will cause food scarcity, which will heavily impact on small import-dependent economies. Finally, we have to recognize that current model of economic growth and neoliberal ideology cannot offer solutions to these problems, but can only make things worse in the future. The nationally oriented IPS outline proposed here is viable within the current EU political and economic settings: to the author's best konwledge none of its measures is running against published EU policy papers and sector strategies. Investing taxpayers money in smart irrigation systems, smart grids, solar panels, or in modern railways is in no way an exceptional proposal. Under the current EU market conditions, the investments in organic food is verly likely to be profitable for the private sector. What is exceptional is that none of the above has been happening at a scale that would nearly match the challenges discussed in the first section. This lack of political and private action provides the rationale for defining and implementing IPS at the national level.

For IPS to become real we need a vision and political commitment beyond a single election term. Then extant societal resources – technology, institutions and markets – can be effectively employed to work in the socially preferred direction – that of sustainability. While the world at large will most likely continue to play roulette with natural systems, for small economies like Croatia's, being passive and disoriented as it currently is, may result in bearing large (un)predictable consequences in the not so distant future. ●

11 Are we ready for climate policy? – A qualitative study on the state of climate change policy in Croatia

Jelena Puđak

The climate change threat

Climate change has become one of the most serious consequences of the global environmental crisis of the past few decades and one of the biggest threats to life as we know it. Whilst climate change affects and has its roots in processes occurring in nature, its hazards are caused by modern forms of social organisation: the economic, political, and cultural system that has spread from the West throughout the rest of the world. Since the 1980s, there has been an increasing amount of evidence that mankind has an effect on the global environment – the global temperature is rising, and consequently, the global climate is changing. Global warming has had a cumulative long-term effect over the entire history of modern society and its attitude towards nature, an effect which was ignored until the consequences became apparent. The greatest influence on anthropogenic aspects of climate change has been the burning of fossil fuels through basic industrial processes, followed by the use of cars over a period stretching over more than a hundred years, modern agricultural production, and deforestation. In 2013, the latest report from the International Panel for Climate Change (IPCC) reported with great confidence that human activities increase global warming. It also warned that the increase of temperature must be limited to below 2 °C, the margin that mankind will be able to withstand and adapt to[1]. However, emissions keep growing year after year, and an efficient international agreement which would bind all countries in the world to reduce their emissions has not yet been achieved. Scientists have signalled warnings several times that if "business-as-usual" continues, the temperature will rise by 4 °C by year 2060 due to the reduced capacity of forests and oceans

01 IPCC (2013), Cimate change 2013 – Physical Science basis, http://www.climatechange2013.org/images/uploads/WGIAR5-SPM_Approved-27Sep2013.pdf

to absorb the excess of CO2. Such catastrophic predictions were unheard of ten years ago. Today, as climate science improves, they have become a regular occurrence, a part of the mainstream. The concepts of a tipping point and positive feedback loops have become widespread in scientific discourse.

The need to understand global warming and climate change constitutes a high level complex problem for those whose duty it is to understand the phenomena. This complexity includes society and social relations, which means that the social sciences have to respond to the changes manifested in society, as well as to the changes in public, scientific, and political discourse.

It is such changes within science that have pushed climate change to the fore as a political problem. Climate science has become a springboard for topics that keep appearing on the political agenda, and which are a cause of political negotiations and conflicts.

Research into the geophysical processes of anthropogenic climate change is constantly improving and one can assume that contributions to understanding this phenomenon will further improve. However, the burning issue of social reactions relating to political, economic, and social structures; the relations between human action and beliefs, and between natural processes and social consequences remains. Climate change, therefore, is not an exclusively environmental problem but is also connected to a wide array of social and political issues, first and foremost to the question of the environmental sustainability of the current generation's lifestyles, that is, towards questions regarding the planet, and humanity's survival.

A Political answer to the climate change problem

Climate changes do not only mark the consequences of human influence on the global environment but also require an unprecedented political consensus necessary to stop the global average temperature rise (preferably through reducing and stopping the emission of greenhouse gases) and alleviating the consequences of climate change. The international political response to climate change is reflected in the Kyoto Protocol and attempts to establish a new agreement which should have followed it in 2013. Since the Kyoto Protocol and the international negotiations that followed did not yield the desired results, an increasing number of sociologists are considering the option of using alternative political and legal instruments which would serve as a model for creating a new, more efficient global climate change policy. Attempts to create a new agreement include analysis and reviews of market mechanisms, regulatory approaches, decentralisation and the democratisation of the decision-making process, ways of connecting heterogenous opportunities, or a new universal policy to be conducted by international community elites.

Olmsted and Stavins (2012) believe that global climate policy has to contain three elements in order to be successful: a) a framework which will ensure the participation of developing countries; b) an emphasis on extended deadlines or emission reduction goals; and c) flexible, market-oriented mechanisms that will enable a lower cost for emission reduction. Even though the authors claim that the Kyoto Protocol was oriented towards short-term emission reduction and included only developed countries, a proposal currently under their consideration may be equally inefficient. Unclear goals with delayed actions and without short-term mechanisms for implementation and monitoring have a much bigger chance of failure than modest short-term goals. The participation of developing countries is expected in the post-Kyoto period, with a particular emphasis on historical rights and common but differentiated responsibilities. The necessity of developing countries' participation in international negotiations has not been questioned so far, but it is important to bear in mind aspects of climate justice and complex geopolitical and economic relations between the developed and the developing countries, in which the principle of common but differentiated responsibilities is used as an excuse for avoiding international obligations for emission reduction. In addition, the flexible mechanisms that rely on market regulation were included in the first period of the Kyoto Protocol, but even they have not ensured a reduction in greenhouse gas emissions. The elements of international climate policy to which Olmsted and Stavins refer actually make up declarations that stem from international negotiations concerning climate change since 2009. The analysts regard these as inefficient, non-binding, unclear in terms of goals, declarative, and in any case, a step away from an agreement that would ensure a reduction in greenhouse gas emissions as recommended by the scientists spearheaded by the IPCC.

Some authors believe that the key lies in connecting heterogeneous and decentralised policies, as experience shows that a universal and global agreement is almost impossible to accomplish (METCALF and WEISBACH 2010; HAYWARD 2008).They claim that the global trend is a step further away from a universal policy for creating and implementing various local, national, and regional level policies. These policies include various implementation mechanisms, from the market-oriented to regulatory mechanisms in which the state has the key role. In order to avoid the recent errors of several regional policies, such as carbon leakage[2], the authors find it neces-

02 Carbon leakage occurs when the price of carbon (either directly through the carbon trade system or indirectly through taxes) drives away the carbon-intensive industry into countries with cheap carbon. In the case of recent international climate change policy, these were the undeveloped countries that were not obliged to reduce greenhouse gas emission.

sary to establish legal instruments for connecting heterogeneous policies instead of homogenising the existing policies. The linking mechanisms would allow each country to determine how to control its emissions for itself, but they would also establish a network that would prevent the shortcomings with which previous international climate policy was faced. The precondition for efficient regional or national policies is the establishment of a unique price for carbon. In this case, the linking policy would enable an interaction between various regional emission reduction policies, which would reduce the cost of climate policies aimed at alleviating climate damage. Bearing this in mind, it is important that all countries making a large contribution to total emissions of greenhouse gases take part in the integrating of these heterogeneous policies.

However, what the advocates of such an approach are failing to see is a need for drastic short-term emission reduction in order for global warming to remain within the margins humanity will be able to bear. Regardless of whether this is achieved through a universal policy or a network of policies, it is necessary to extensively redirect the economic policies of both developed and developing countries. It is this, and not the lack of flexibility of existing instruments concerning the Kyoto Protocol that constitutes an obstacle to efficient international climate change policies.

Bearing this in mind, Vezirgiannidou (2009) emphasises the participation of all countries as a precondition for efficiency of (and the ability to implement) any international agreement. This has to be done in a way which ensures their participation. Even though maximising the participation of all countries is necessary for efficient international policy, it can lead to "weaker" agreements as a large number of various interests and potential conflicts lead to a solution using "the lowest common denominator". Guided by the example of the Montreal Protocol[3], the Vezirgiannidou suggests a plausible framework for generating climate policy. Universal participation does not have to be ensured immediately to keep track of climate justice and the (in)abilities of undeveloped countries, but this can be done within a certain time frame. Contrary to the practice of helping, the author suggests that, in order to increase participation, a combination of strict institution-

03 The Montreal Protocol is an agreement on stopping the production and usage of chemical substances that affect the depletion of the ozone layer. The agreement was signed in 1988 and was put to effect immediately with the aim of completely stopping the production of certain gases (halon, freon, and other chlorofluorocarbons) until 1996. Undeveloped countries were given the possibility of postponing the implementation of the Protocol guidelines and a certain amount of help was also agreed. The results of the agreement were visible immediately after it was put into effect – a decrease in the production of these gases was recorded and it is assumed that the ozone will be replenished by 2050.

alised mechanisms with determined sanctions and help for undeveloped countries would be useful in order to ensure participation and efficiency. In the context of climate change, an agreement between the countries emitting the largest amount of greenhouse gases regarding detailed measures and policies for emission reduction in accordance with reduction goals, should include market instruments that would provide financial benefits to the participants and would disadvantage those that are not participating. Vezirgiannidou argues that a detailed elaboration of a political and legal framework which would ensure the participation and implementation of further agreements would prevent the shortcomings of the previous (Kyoto) protocol and ensure quality monitoring, implementation, and efficiency of the agreement, combining it with a demand for urgent action.

The increasing complexity of climate change policy, which in this case does not refer simply to particular industrial processes (as was the case with the Montreal Protocol) but all aspects of human activity, makes reaching an agreement which would serve as a new political framework for the international community much more difficult. In addition, the success of reaching an international agreement ultimately depends on the political will of member states to take part in such an agreement and to establish the need to reach a new agreement which has only been considered a delayed option until now.

Croatia as a high emission society?

The social causes of climate change are a result of the social organisation of life. Increase in emissions is not a result of individual behaviour and choices but is caused by historically rooted modes – systems – in which certain types of social practice are established and maintained in interaction with nature's carbon cycle[4]. This interaction enabled deeply rooted routines and

04 In order to explain the complex relations between society and the environment, many authors use Marx's term "metabolic rift" (FOSTER 2002A; YORK, ROSA and DIETZ 2003; FOSTER, CLARK and YORK 2011; URRY 2011; etc.). Society, in interaction with nature, takes part in its metabolism and through its metabolism it constantly recreates and transforms social forms. The energy and materials that society extracts from the environment cannot disappear; they can only be transformed so that the output of waste is equal to the input of resources (except in cases of "delay" through the accumulation of materials). Therefore, even though it seems that nature is separated from society, especially during increased industrialisation, there is always a material metabolism, and forcefully separating nature and society creates a metabolic rift. The circulation of goods through the systems for communication and transport based on the consumption of fossil fuels "upgrades" capitalist industrialisation and rescinds space by time. This becomes a necessity as production increasingly relies on the exchange of goods and the increasing rate of exchange between the mechanised, fossil fuel-based mobility of goods and human beings.

lifestyles that constitute modern culture and technology and define desired forms of accepted behaviour in many contemporary societies.

The standard of living in the wealthy North which has been marked by an increase in income, security, mobility, prosperity, and a longer life expectancy, has become standard in Eastern Europe from 1945 onward, and especially following the collapse of communism in 1989 (URRY 2011). The socialist countries of Central and South Eastern Europe experienced intense transitional changes (political systems, systems of ownership, culture, etc.).

In terms of the organisation of production and overall social life, Croatia follows the example of developed countries, having moved to a capitalist mode of development. This means that the process of "carbonisation"[5] is an inevitable process which accompanies the overall production process and the organisation of life.

Urry (2011) detects five notable systems, each possessing a powerful "conservative moment", pointing to "the path dependence" of large socio-technical systems:

- the development of systems of electric power generation and consumption (especially fossil fuels), and national electric grids which ensure that all homes in the developed North are lit, heated, and supplied with electricity-based consumer goods;
- the expansion of fossil fuel-based automobiles and roads, along with a widespread infrastructure connecting remote places of residence, work, and rest;
- the development and expansion of suburban settlements, located away from places of work to which one must travel by car, and furnishing homes with consumer goods, such as televisions and other electric appliances;
- the increasing ownership (especially in the private sector) of places of rest, supermarkets, theme parks, stadiums, and restaurants that are travelled to by car or plane, and which also involve the long-distance transportation of goods (URRY 2011, 51-52).

These are not only social patterns or individual preferences, but also high carbon systems. Each of these systems simultaneously include trade, transportation, and consumption and each of them constitutes an important condition for the existence of other connected systems.

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05 We define carbonization as the developmental process that is based on excesive use of fossil fuels for mantaining the basic needs of population, which in turn have a vast amount of greenhouse gas emissions as a consequence.

When talking about net emissions of greenhouse gases, Croatia is in the middle between rich countries that are high emitters and poor countries that are low emitters[6]. If we take into consideration the emission per capita, Croatia moves a few spots higher[7]. In its history, Croatia has recorded two major drops in emissions[8]. The first occurred immediately after it became independent and was caused the by the breakdown of the economy due to war. During the UN meeting on climate in Morocco in 2001 (COP7[9]), Croatia asked for its greenhouse gases quotas[10] to be increased for the base year, 1990, as this was the year in which Croatia was founded under the specific conditions of war. At the moment of its creation, Croatia took part in the construction and consumption of energy outside its borders on the territory of former Yugoslav countries. In fact, Croatia received 22 % of its energy from these power stations. Taking into account that the initial greenhouse gas quotas were higher (as energy consumption was higher), the reduction in emissions would ultimately be smaller for Croatia. Even though the quotas were permitted at the meeting of parties present at the Kyoto Protocol in Nairobi in 2006, in 2009 (just before the Copenhagen conference) the UN Executive Board for the Kyoto Protocol revoked Croatia's starting (higher) emission quotas which put Croatia in an unfavourable position. At the Copenhagen conference, Croatia reissued its request and

06 In absolute figures, Croatia's share of greenhouse gases is 0.08% (International Energy Statistics http://tonto.eia.doe.gov/cfapps/ipdbproject).

07 The carbon dioxide emission is measured through Land Use, Land-Use Change and the Forestry method (LULUCF) which primarily refers to direct human/society's use and conversion of land and forestry practices that decrease, that is, it represents a huge decrease in CO_2eq net emission. Without the LULUCF segment, Croatia has to decrease the total inventory of greenhouse gases that itemits. In the case of Croatia, LULUCF represents a bigger difference in the end-result of CO_2 net emissions by a meagre 0.9% in the period of 1990-2008, while it reduced its emissions by 13.7% in the same period if we include the LULUCF segment, and a decrease in emissions is also recorded in the following years.

08 A detailed display of individual and group data on greenhouse gas emission in Croatia can be found on the UNFCCC website (http://unfccc.int/di/DetailedByParty/Event.do?event=go.

09 The abbreviation COP refers to Conference of the Parties, which gathers all members of the UN convention on climate change, held once a year. The Kyoto Protocol was voted on the third summit (COP3). The summit held in Morocco was the seventh summit which is why it is referred to as COP7.

10 Croatia asked for its starting quotas to be increased by 4.46 million tons of CO_2eq, which would make a total of 35 million tons instead of 31 million tons of CO_2eq (http://unfccc.int/resource/docs/2009/irr/hrv.pdf).

de facto requested a 6% increase in emission11, at a time when even undeveloped countries committed, at least declaratively, to reduce emission by twenty or more percent in the following ten years or until 2050.

The second major reduction in greenhouse gas emissions occurred parallel to the great economic crisis in 2008. A similar event took place in almost all developed countries, in which the crisis resulted in many industrial complexes being closed down and a decrease in the consumption of energy. Therefore, the reduced emission of greenhouse gases (in Croatia and the rest of the world) was not a result of conscious efforts and creative policies, but a result of economic crisis. Another element that surely influenced emission reduction in Croatia was population change: Croatia had a negative natural change, that is, a decrease in the number of inhabitants which to some degree implies reduced consumption and consequently, a decrease in emissions[12] (NEJAŠMIĆ and MIŠETIĆ 2004).

If we go back a little earlier, the picture becomes much clearer. In the period before the economic crisis, from 1990 to 2007, emissions in Croatia had grown by 3.2 percent from the base year. An inadequate government engagement concerning climate change was confirmed by the Climate Change Performance Index (CCPI), an instrument which aims to show the efficiency of climate change policy in 57 countries that are responsible for over 90 % of global CO2 emissions. In fact, ever since the Kyoto Protocol was ratified, the efficiency of the greenhouse gases reduction policy has been marked as "poor" by the CCPI[13]. The biggest increase in CO2 emissions has been recorded in the energetics and industrial processes sectors.

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11 Croatia's move did not go unnoticed in the world media even at the Copenhagen summit, and numerous criticisms soon followed. The Ministry of Environmental Protection and Physical Planning, in charge of the implementation of the UN's climate change convention framework argued that it was not true that Croatia asked for an increase in emissions but rather asked for a revision of the starting quotas. However, a simple calculation shows that such an increase in starting quotas would not "cost" Croatia 5% of emissions but would give it a margin of an additional 6% for emission.

12 Demographers predict that by 2031, Croatia will have 756,710 fewer inhabitants, that is, 17% inhabitants less than in 2000. Many demographers mark the negative demographic trends in terms of natural growth and population age structure as a "demographic extinction", which will have many (negative) socio-economic repercussions (NEJAŠMIĆ and MIŠETIĆ 2004).

13 The aim of the index is to increase the transparency of national and international measures and policies for climate change. This tool illustrates who does what in order to prevent climate change. The criterion that the index uses for assessing particular countries includes objective indicators of the situation with greenhouse gas emission and emission trends (80 %), and professional assessments of national and international measures (20%). See: http://www.germanwatch.org/klima/ccpi.htm.

Fossil fuel energy is one of the biggest sources of carbon dioxide in the world. Croatia gets the majority of the energy it produces from fossil fuels (for which the energetics sector contributes more than 74% of total greenhouse gas emissions), which means that a large amount of greenhouse gases that Croatia emits relates to carbon dioxide, even more than 75%[14]. Supply problems concerning non-renewable energy sources (mostly oil), and climate change go hand in hand as energy-intensive systems and systems of centralised electrification are one of five major interdependent locked-in systems that make up the high emission society. Croatia has inherited the centralised, highly energy-intensive systems from the previous political system along with its political situation and attitude towards the environment. Following its dependence, it did not develop sustainable energetic strategies but continued down an old path that was not characterised by the ecological modernisation of energetics and development in the direction of reducing greenhouse gas emissions in this sector.

Another feature of modern systems, or high emission systems, is spatial mobility. This is reflected in Croatian society as well, as its certain patterns of increased consumption and high mobility resembles (and aspires to resemble) Western consumer societies. An interesting fact in this context is that, even in the crisis years when the total emissions from the energetics sector dropped due to decreased consumption, the emissions from the traffic subsector increased by more than 50 % relative to the base year.

In terms of territory and population, Croatia is a small country and is not a major polluter on a global level. As a transitional society, Croatia has found itself within the context of market globalization, forced to adapt to social processes that are destructive in some aspects of development, especially in terms of its effect on the environment (LAY 2003). Anthropogenic global warming is an example of global pollution that transcends national boundaries and Croatia will not be able to avoid further deterioration in the quality of life caused by climate change. We agree with the opinion that despite this, Croatia may still pursue a strategy that will nurture the "culture, measures, and practice for preserving nature and the environment (...) for long-term social gain" (LAY 2003, 322). In addition, in the context of systems science that focuses on the interrelatedness between systems, it is clear that measures for reducing greenhouse gas emissions directly correlate with overall sustainability, independence, and the quality of life. Even though there has been a trend towards decreased emissions from 2008 onward, analysis of the causes of such trends and of basic strategies regarding attitudes towards controlling the emission of greenhouse gases (energy strategies and sustain-

14 http://unfccc.int/files/ghg_emissions_data/application/pdf/hrv_ghg_profile.pdf.

able development strategies) shows that the overall development trend is not in the direction of low emission societies. All sectors are in need of public and economic policies aimed towards the decarbonisation of society.

The state and the efficiency of measures for reducing greenhouse gas emissions in Croatia

Even though Croatia ratified the Kyoto protocol and implemented some measures to reduce emissions, Croatia did not achieve the desired results. Climate policy is complex and in order to be successful, it has to incorporate instruments and measures from all economic sectors. In addition, climate policy has to use positive instruments that would enable multi-level benefits (GIDDENS 2009; LATIN 2012). Giddens explains the comprehensiveness of climate change though the term "political convergence". Latin explains the same idea with the term "strategy of pure replacement technology". Both terms denote the extent to which political measures for reducing greenhouse gas emissions overlap with other public policy measures so that they mutually support and strengthen each other and bring multiple benefits. It is also important that the overlap between these measures is positive and that the measures themselves are positive, that is, that they support not just economic prosperity, but overall social development and quality of life, in both the short and long term[15].

In the following part of our work, we shall present the results of research concerning the situation and the efficiency of policies and measures in Croatia for reducing climate change. The research presented is a part of a wider study conducted in the scope of a doctoral dissertation[16]. In this work, we focussed on the aspects of our study that are used to analyse the state of climate policies in Croatia, as well as obstacles to implementing measures for reducing emission within the climate policy framework[17].

15 Perhaps the best examples of such policies are the energetic development strategies based on using renewable sources of energy. Not only do they accomplish a significant reduction in emissions of greenhouse gases, the usage of renewable sources of energy can be a positive factor for investments and generating new jobs, it contributes to the country's energetic security, saves its resources, and improves the quality of the local environment. It is also cost-effective in the long term and ensures the country's energetic independence.

16 Puđak, J. (2013) Croatia and climate change: Sociological analysis of state and efficiency of policies for greenhouse gas emission reduction, doctoral dissertation, Faculty of Humanities and Social Sciences

17 The final results of analysis for this study conducted in the scope of a doctoral dissertation were 156 codes, distributed into 22 topics, categorised into 6 dimensions. This work provides a review of 24 codes distributed into 3 topics.

METHODOLOGY

In order to describe the situation and the efficiency of policies aimed at reducing greenhouse gas emission in Croatia, we have decided to conduct qualitative research[18]. Since there have not yet been any studies of this type on this topic in Croatia, our study has a guiding character. We have tried to give an overview of this field, without in-depth and detailed analysis of every specific topic that were found to be relevant for this work. The qualitative approach has allowed us to gain better insight into the area without any further knowledge (studies) which would permit us the a priori creation of categories. A qualitative approach also allows us to understand and explain the state and efficiency of climate policies in Croatia, from the perspective of crucial actors, directly or indirectly involved in processes of decision making and policy implementation.

The main goal of this research is to explore the views of the relevant practitoiners (i.e. actors from public administration, civil, science, political and business sectors) concerning the state and efficiency of climate change policy in Croatia, and also their views on (possible) implementation obstacles to these policies. This should give us a better understanding of state and efficiency of the national climate policy. The main hypothesis put forward in our research is that the relevant actors from public administration and politics do not create a coherent and efficient climate politics[19].

As concerns the survey questions in this study, we decided to gather data through semi-structured interviews[20]. This enabled us to gather a broad spectre of data and information, but also to keep track of particular topics of interest. We used open-ended questions to allow participants to give us their broad opinion on the different aspect of the matter under consideration.

Since the study involved actors from five social sectors, we used additional questions to adapt the interviews where necessary, according to the level of expertise of various actors in order to cover all basic topics that the author initially created[21]. In some cases, new questions were added as new information appeared in earlier interviews. The interview was divided

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18 The study was conducted from March to June 2012.

19 In the original research there was one more specific goal and several more hypothesis concerning relations and (self)perceptions among diffrent research groups, but those were left out in this overview bacause it is not directly conected to this part of research.

20 The interviews were conducted solely by the author of this paper.

21 This is a common procedure when conducting semi-structured interviews using the Grounded Theory methodology and does not imply inconsistency regarding the end results.

into four basic areas: climate changes as a problem, global climate politics, domestic climate politics, context and implementation of measures for cutting GHG emissions in Croatia.[22]

The material we obtained was then analysed by using particular procedures relevant to Grounded Theory. The choice of method of data analysis depends on the research questions and research questions depend on their context and everything available to the researcher in this given context. The author chose the Grounded Theory procedures to process the data in order to interpret them in the best possible way, considering the nature of the given information (interviews concerning the attitude of crucial actors) and research aims (understanding certain social phenomena – in this case, the state and the efficiency of climate policies). Grounded Theory is an iterative process through which the researcher becomes increasingly "grounded" in the data and has the ability to develop complex concepts and models that explain the phenomenon in question. Using the Grounded Theory method, the researcher wants to identify the categories and concepts derived from the text and connect them with formal theories (CORBIN and STRAUSS, 1990). Since the author's primary goal is not to develop a theory but to understand the social phenomenon, only certain procedures of Grounded Theory were used, such as multi-level coding and comparative analysis.

Since this is a narrow and highly specialised topic, we opted for a deliberate sample. The sample included relevant persons from the civil, business, and public sector, politics, and science. By doing things in this manner, we wanted to include key actors from all social sectors that are directly or indirectly involved in climate change policies in Croatia. Due to the diversity of relevant actors, we decided to divide the sample into five narrow sectors (groups), instead of a traditional distribution in democratic societies into three wider sectors (public, civil, and business). A total of 32 out of 40 contacted participants agreed to an interview: seven scientists, four politicians, four public administrators, eight members of non-governmental organisations and nine businessmen[23].

22 The interview scheme is attatched in the anex of this paper.

23 Fewer survey participants from public administration and politics sectors are not only due to less interest among contacted individuals, but also due to overall small number of people working on climate change policy in public sector (for instance, main government department dealing with climate change is under the authority of Ministry of environmental protection and spatial planning, and in the time of conducting a survey only three people were working on the department).

Results

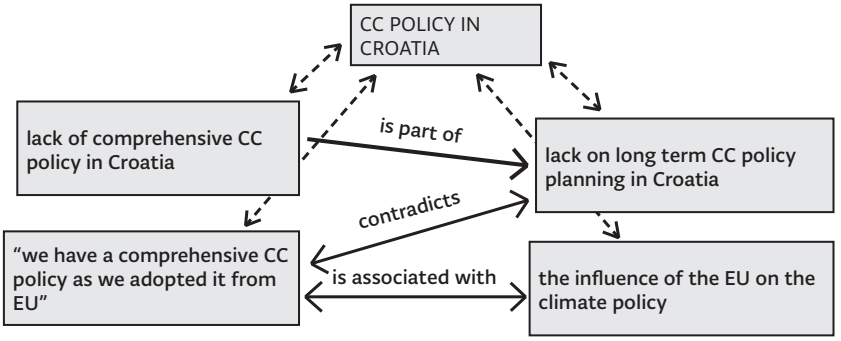
Following the first reading of the data for analysis, the relevant topics and codes became apparent and answers to our research questions were constructed around them. Through multilevel coding we came to the final net of twenty-four codes divided into three topics:

CODES	TOPICS
Croatia has taken on too big a responsibility; Croatia has a comprehensive climate policy; Croatia does not have a comprehensive climate policy; there is a lack of long-term climate policy planning in Croatia; the EU influence on climate policy.	Climate change policy in Croatia
Fund: realistic role incongruent with the idea; Croatia will not achieve its reduction goals; unregulated emission reduction in Croatia.	Emission reduction in Croatia – the situation
Absurdities concerning the emission reduction policy; bureaucracy as an obstacle to development; existential questions have priority; measures are good but their implementation is not; inadequate basic strategies; lack of measures across sectors; no political will for climate policy; lack of understanding of climate policy; no cooperation among the government; disorganised public sector, lack of transparency in the fund's work; partial measures due to EU pressure; obstacles within the system; a conflict of interests.	Obstacles to implementing emission reduction measures

THE TOPIC "CLIMATE CHANGE POLICY (CP) IN CROATIA"

Croatia ratified the 2005 Kyoto Protocol and started implementing measures to reduce the emissions of greenhouse gases. The level of emission reduction attained does not necessarily reflect a comprehensive and well-rounded climate policy. Due to the complexity of the problem itself and the legislative framework, particular measures from different sectors do not have to be compatible or even effective. The topic "Climate change policy in Croatia" includes four codes and fifty-eight quotes.

FIGURE 1
The topic "Climate change (CC) policy in Croatia" and its respective codes



The question of whether Croatian climate policy is considered comprehensible or not yielded mostly negative opinions.

TABLE 1 *Climate change policy in Croatia*

	Civil society	Politics	Public administration	Business	Science	TOTAL
We have a comprehensive CC policy as we adopted it from the EU	0	0	1	1	0	2
Lack of long-term CC policy planning in Croatia	2	0	1	5	2	10
Influence of the EU on climate policy	5	0	1	6	5	17
Lack of a comprehensive CC policy in Croatia	9	3	1	5	10	28
CLIMATE CHANGE POLICY IN CROATIA	17	3	5	17	16	58

A negative response was the most common answer amongst participants from all sectors. The reason why most participants think that Croatian climate policy is not comprehensive largely refers to the lack of interdis-

ciplinarity, a lack of cooperation amongst the ministries, and the lack of a framework which would encompass all measures from each sector, according to participants.

When explaining their attitude, the participants emphasise the lack of relatedness between particular measures, i.e. paradoxes across certain measures which disables implementation, thanks to contrasting measures from other departments. This is a result of a lack of cooperation between the ministries, a lack of coordination and interdisciplinary thinking in the creation of complex policies, such as climate policy. When asked "What are the reasons for ineffective climate policy in Croatia?" the participants responded:

> Scientist2: "There were some examples in countries where they exist, where the bodies that cover all ministries decide together. If a question is really important, the connection between institutions shows you how important the people find it to be. It apparently is not an important issue here as everyone decides for themselves...Each ministry has its jurisdictions and this policy is not entirely recognised in this aspect."

The participants often stated that neither the wider environmental protection policy nor the climate change policy was set up systematically.

> Politician4: "I think they have opened a way towards thinking about the necessity of a comprehensive system within Croatia, but I think we are far from having a comprehensive nature protection policy and climate protection policy."

Another recognised problem is the lack of staff in public administration dealing with this topic, which some participants perceive as a lack of political agility regarding climate policy. This reflects the lack of systematic implementation of particular measures for greenhouse gas emission reduction and a lack of long-term planning. Croatia has certain legislation and subordinate legislation that refer to emission reduction, but a certain number of participants think that these regulations are not implemented, which resulted in an increased emission of greenhouse gases. In addition, one gets the impression that political planning is done only within a single term which prevents creating a comprehensive climate policy which should set goals for a much longer period (the following twenty to fifty years). According to participants the lack of political will is also reflected in the lack of institutional cooperation on the same problem. On this topic, the participants once again referred to examples from foreign countries in which government bodies coordinate climate policy and they recognized that as an important problem in political leadership. Therefore, a lack of

communication between institutions is an indicator of the government's stance on climate change, which leads us to conclude that the Croatian government still has not recognized this problem as an important one. When asked "Does Croatia have a comprehensive climate policy?" a scientist answered:

> Scientist1: "No, we do not. If we start from the top, that is, the public administration, government, ministries – they are the ones creating and implementing the policy and monitoring if their design is achieved. I don't think these policies are connected there nor can you clearly say 'This is the climate change policy and it consists of policies for energetics, industry, transportation, finance…'"

When talking about the lack of long-term planning, a number of the participants reflected on Croatia joining the climate policy discussion through the signing of the Kyoto agreement. They are dissatisfied with governments' unpreparedness when entering negotiations on climate and the poor negotiation body which put all those obliged by this agreement into an unfavourable position. Comparative analysis allowed us to notice that such opinion was voiced by the participants who believed that the quotas assigned to Croatia through this protocol were unjust. The possibility of not fulfilling these goals was seen as a responsibility of the delegation who gained a poor starting position in the negotiations, and not as a problem of Croatia's climate policy.

"Unpreparedness" is reflected in the later phase of climate policy preparation, that is, the harmonisation of chapters on the environment during Croatia's accession to the European Union; a number of participants found that adopting the framework came down to copying EU regulations without adapting these regulations to particular conditions and other public policies in Croatia.

Apart from that, certain participants detected a lack of long-term planning in current Croatian government projects, mostly related to industry and energetics, which largely contribute to greenhouse gas emissions.

Only two participants think that Croatia has a comprehensive climate policy. They base their attitude on the claim that Croatia took on EU climate policy during its negotiations and that this policy is regarded as good and comprehensive.

Even without being prompted directly about it, a large number of participants refered to the influence of the European Union on Croatia's internal politics, which is reflected in climate policy as well. A number of participants with negative opinions concerning Croatian climate policy have the attitude that the European legal framework will bring the desired results

in the future. These participants believe that EU membership will compel actors in Croatia to reduce greenhouse gas emissions. This mostly refers to public administration through enforcing European goals and implementation instruments, as well as industry through the emission trading scheme. The participants who share this view, much like the supporters of European climate policy, do not find the fact that Croatia joining the EU does not change the governing structure and implementation instruments to be relevant. By joining the ETS (Emission Trading Scheme)[24], the industry will have to make certain adjustments, that is, purchase certain permits for emissions. These costs will eventually be shifted onto consumers, thus neutralising a part of their costs. Even though this does not guarantee a reduction of emissions in industry or energetics, or any other sector for that matter, the participants have the impression that our obligations towards the European Union will make us more responsible in managing emissions and related costs (in particular, the Environmental Protection and Energy Efficiency Fund). When asked "How do you view the influence of EU policy on climate policy in Croatia?" the participants provided two-sided answers:

> Businessman1: "Unfortunately, this has to happen, I have always said that I am for Croatia joining the EU, as I believed this would have positive results, be a step forward, a framework in which you move and you get less room for manoeuvre..."

Some participants, when reflecting on the influence of the EU on domestic climate change policy, talk about the influence of the EU on withdrawing demand for the revision of quotas. In this respect, the influence of the EU is understood to be negative, especially in terms of participants' attitude towards the justification of Croatia's request. In addition, a number of the participants regard the EU's influence on climate policy during the negotiations as negative as they think that no attention was paid to the quality of adaptation of Croatian legislature to the European framework due to the rush to meet the EU deadlines, although we think that the European Union should not be held accountable for that. This is illustrated in the response from one of the participants from the business sector to this question:

> Businessman8: "We are always caught up in some deadline to meet certain EU demands and what has always troubled me was 'let it go now, let's meet the EU demands, and we will take care of it as we go' – so many things were done superficially."

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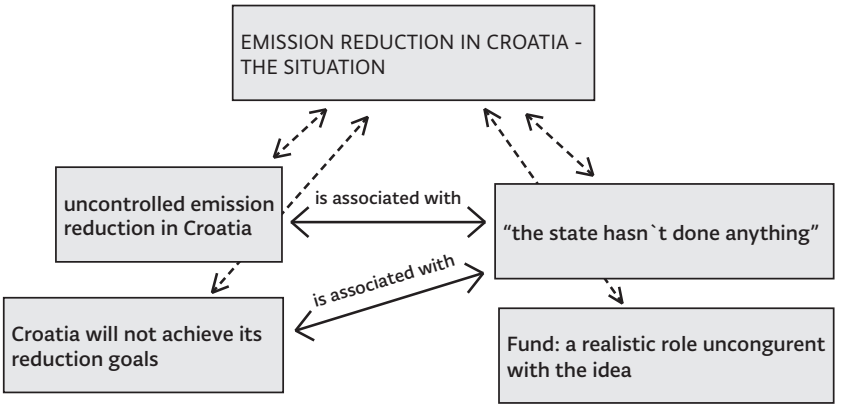
24 The emission Trading Scheme (ETS) is the market approach used for controlling pollution, that is, the emission of greenhouse gases, which offers economic incentives for reducing greenhouse gas emissions, or the emission of pollutants.

THE TOPIC "EMISSION REDUCTION IN CROATIA – THE SITUATION"

Much like the state of the country's climate policy, the participants reported on the state of greenhouse gas emission reduction in Croatia and on future aims for reduction. When asked about their attitude concerning Croatia's climate policy, participants often referred to the real state of reduction/increase of emission, and the role of the Environmental Protection and Energy Efficiency Fund (hereafter: the Fund). We think that concentrating on these two topics is not arbitrary. Perhaps unconsciously, the participants speak of the two most obvious indicators of how climate policy in Croatia works, as the functionality of the policy is reflected through (un)achieved results, and the Fund represents one of the most important instruments for investments in emission reduction in industry and energetics (the largest emitters). The topic "Emission reduction in Croatia – the situation" includes four codes and twenty-six quotes.

FIGURE 2

The topic "Emission reduction in Croatia – the situation" and its respective codes



A number of participants wanted to express their doubts over achieving certain goals relating to emission reduction, such as increasing energetic efficiency through increasing the share of renewable energy sources. This almost completely refers to goals set by the European Union for 2020. The reasons for this current attitude lie in the lack of infrastructure and projects for renewable energy sources, and the current state of such power plants in Croatia. Aware that we are far from the goals that were set for 2010, the participants find it impossible to achieve such a "leap" in order to fulfil the goal of 20 % of energy sources being renewable. The lack of market for quotas and political planning (converging policies) are also stated as reasons for thinking that Croatia will not fulfil these goals. When asked "Why do you think

Croatia will not achieve the set goals in emission reduction in the framework of EU climate policy?" the participants provided the following answers:

> Scientist1 "... the problem is that there is no such market in Croatia. It exists in Europe, but here no company has to buy carbon and we have already lost the chance to make this switch in this short period, for someone in Croatia national electric company (HEP)[25] or our cement industry to say 'let's go change something.'"
>
> Scientist7: "We had partial goals for 2010 that we missed by a wide margin and I believe we will not achieve these goals either, but I think it's more important that we at least try to achieve this, to make pre-conditions."

However, a common attitude among the participants is that it is not so important to fulfil the goals as to move towards them.

TABLE 2 *Emission reduction in Croatia – the situation*

	Civil society	Politics	Public administration	Business	Science	TOTAL
"The state has not done anything"	1	0	0	0	2	3
Fund: a realistic role incongruent with the idea	3	0	1	4	0	8
Croatia will not achieve its reduction goals	0	2	1	3	2	8
Uncontrolled emission reduction in Croatia	1	2	2	0	2	7
EMISSION REDUCTION IN CROATIA – THE SITUATION	5	4	4	7	6	26

With reference to the previous code, a number of participants finds that the "state has not done anything" to achieve these goals. Even though a large number of measures have been established, the participants did not

25 Hrvatska Elektroprivreda (HEP) – Croatian national electricity company.

find the results apparent. They have a feeling that it is another case of a *"business-as-usual"* scenario, despite the declarative dedication to greenhouse gas emission reduction.

This brings us to the attitudes of participants towards the Fund's actions. The participants from the civil and business sector believe that its realistic role is not congruent with its original idea. The basic purpose of the Fund is considered to be the reduction of emissions at their source by reinvesting the money charged to industry and citizens, in which the Fund eliminates its own purpose as it removes the focal points of greenhouse gas emissions. The Fund is perceived to be radically different: first of all, the participants think that it has not fulfilled its basic function of reinvestment into projects for reducing emissions, which leaves an impression of dysfunctionality concerning the state's base instrument for reducing greenhouse gas emissions. When asked "Why do you find the realistic role of the Fund incongruent with the nominal role?" a participant from the civil sector gave the following answer:

> Civil-society1: "...however, the Fund did completely the opposite. It cemented its survival, it dealt with things that were not their job, and it is funded by industry – I don't know if any of these companies that paid for these emissions, that any of them got any money back, which I think is an error on behalf of the public sector as a whole."

Some participants mention numerous specific examples from their own experience regarding an inability to fund projects for emission reduction of which the Fund is in charge. Members of the business sector feel the most struck by this situation as they are the ones to whom this money should have returned in order for them to be able to finance projects that would reduce their costs of entering the ETS system.

The accomplished greenhouse gas emission reduction in Croatia, according to the participants, is not the result of a joint effort of public administration, entrepreneurs and citizens, but a result, or even a by-product of (economic) processes that marked the past several years in Croatia and Europe. The economic crisis that hit the global economic market in 2008, from which most countries have yet to recover, has resulted in decreased production in some countries which in turn resulted in a reduction in greenhouse gas emissions. According to the participants, this was the case in Croatia where a combination of conditions resulted in a decrease in greenhouse gas emissions to the level specified by the Kyoto protocol. The reason for this, according to the better informed participants, are several years with hydrologically favourable conditions which resulted in a greater level of production from the hydroelectric power plants, a continuous decline in

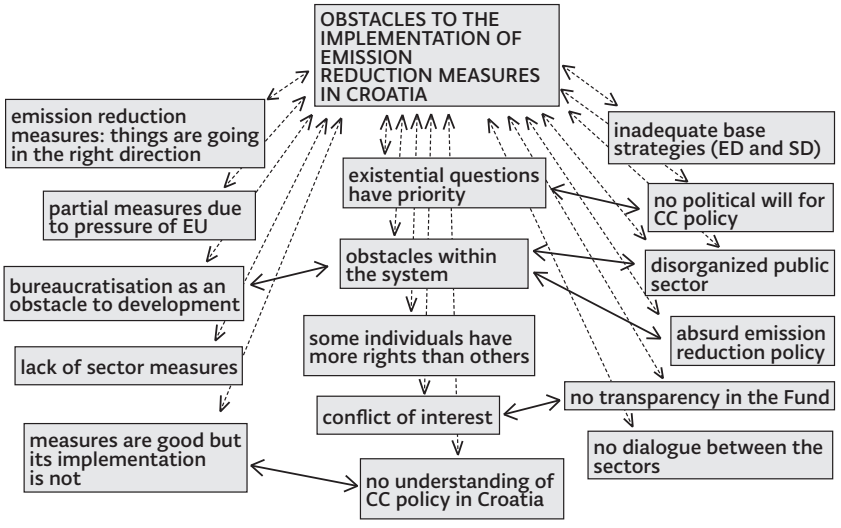
the number of cattle in the country and significantly decreased production in high emission industries, such as the cement and lime industry. Such an attitude is shared by all participants and is confirmed by participants from the public administration while the participants from the business sector chose not to comment on this topic.

THE TOPIC "OBSTACLES TO IMPLEMENTING EMISSION REDUCTION MEASURES"

After discussing the situation concerning climate policy in Croatia and after having expressed the opinion that Croatia does not have a comprehensive systematic climate change policy, we asked participants to explain some of the measures for implementing emission reduction. The topic "Obstacles to implementing emission reduction measures" consists of sixteen codes and one hundred and two quotes.

FIGURE 3

The topic "Obstacles to implementing emission reduction measures" and its respective codes



The topic includes some codes that are not grounded, that is, those that appear only once or twice in the transcripts. These will not be given much attention, as they do not represent the predominant perception of the problem, but we wanted to present them in the figure and the table in order to depict the diversity of attitudes.

TABLE 3 *Obstacles to implementing emission reduction measures in Croatia*

	Civil society	Politics	Public administration	Business	Science	TOTAL
Absurd emission reduction policy	3	0	0	1	0	4
Bureaucratisation as an obstacle to development	3	2	1	2	0	8
Existential questions have priority	0	3	2	0	0	5
Emission reduction measures: things are slowly going in the right direction	0	0	1	0	0	1
Measures are good but their implementation is not	8	0	2	6	5	21
Inadequate base strategies (ES and SD)	4	0	1	2	1	8
Lack of sector measures	1	0	0	0	2	3
Some individuals have more rights than others	0	0	1	0	0	1
No dialogue between the sectors	1	0	1	2	1	5
No political will for CC policy	7	0	0	2	3	12
No understanding of CC policy in Croatia	1	0	1	0	2	4
Unorganised public sector	2	0	0	4	0	6
Lack of transparency regarding the activities of the Fund	7	1	0	3	2	13
Partial measures due to pressure from the EU	2	0	1	1	1	5
Conflict of interest	0	0	0	0	4	4
Obstacles within the system	1	0	0	0	1	2
OBSTACLES TO IMPLEMENTATION OF EMISSION REDUCTION MEASURES	50	7	11	23	22	102

According to the claim most frequently heard in the interviews, certain measures for emission reduction are good but their implementation is not. This claim was present in many answers in which the participants elicited specific problems of the system not functioning, such as corruption, a lack of finance, procedural dilemmas etc. For the researcher this creates an impression of chaos for the researcher as concerns the implementation of measures where a set of measures is not created to contribute to the common goal of reducing the emissions. In other words, it leaves the impression that there is a large number of individual, unrelated measures of emission reduction that are not necessarily poorly devised but are simply not implemented, their effects being lost in other procedures, and no monitoring that would ensure their consistent implementation and the removal of obstacles. When asked "What are the obstacles to implementing emission reduction measures in Croatia?" the participants gave the following reasons:

> Civil-society2: "...from subsidies that formally exist but are hard to obtain, to the corrupt Fund which spent or stole every penny[26], to HEP's monopoly that does not allow anyone else to connect to the grid, and if they do connect, it takes a long time before they start paying and you need some 40 permits – this is insane!"

Lack of trust in government institutions refers to both the inspectorates and the Ministry itself. The participants report a complete absence of control. Administrative obstacles to the implementation of emission reduction measures are also often cited, as well as inefficient distribution of jurisdiction among the bodies. It is often reported that the problem is not the legislature but its implementation, not just by those in positions of responsibility but also from the bodies that prescribe these laws, that is, those who write subordinate legislature which creates the conditions for their implementation in the relevant context. The lack of coordination between institutions in creating legislature, a lack of converging policies, a lack of adaptation to the newly introduced laws (since the EU accession process commenced) to specific situations in Croatia, a lack of expertise and poor communication with other social sectors – these are the main obstacles for the implementation of measures that the participants report.

The lack of control is reflected in the lack of monitoring which makes the process of proving the effects of reduction measures impossible. The

26 This is not just a colloquial term and a case of the participant pointing out vague and unproven corruption in public institutions, but a concrete case that was proven in court.

participants also express doubts regarding the information that public administration institutions publish, as well as doubt regarding the number of parafiscal charges collected and invested, and the real situation as concerns greenhouse gas emissions. When asked about the situations relating to the monitoring system for the implementation of measures in Croatia, participants from public administration replied:

> Public-administrator4: "Well, the question is whether the data are correct. Because our policy and our general system are not bad. I think some should even look up to it, however, we have one thing on paper and another thing in practice, so the question is whether the data reflect the real state of things and whether those charges paid are really so..."

Despite constant reiteration that the legislature is not the problem but its implementation, comparative analysis shows that the participants often provide conflicting answers and use examples to illustrate the problems that occur in the aftermath of poorly constructed regulations, and those that are a consequence of implementation. This reflects the total organisational form of the regulations, their level of detail and their compatibility with regulations from other departments.

> Public-administrator1: "If the agency has its register of environmental pollution, you have the information that they [industry] will report into one base and you will report on them into another. This should not happen because you do not have a body that would control both databases. Then the law is sometimes vague, which means you are told that each county has to check the data on its own, and they do not have adequately trained staff..."

When talking about unorganised reduction measures, the participants put into question the issue of political priorities. By this logic, if emission reduction is one of the government's priorities, actions from above should make sure this goal is achieved. This reflects the need for a strong state and its responsibility for reducing greenhouse gases.

One can conclude that despite taking over the EU regulation measures, climate policy in Croatia does not contain all the necessary elements and cannot be conducted. Such policy can ultimately have a strategy (in this case, for the reduction of greenhouse gas emissions) that is supported by various laws but cannot be implemented.

We may find a good example in the code regarding the lack of trust in one of the main instruments for greenhouse gas emission reduction – the Environmental Protection and Energy Efficiency Fund. Just before this

study commenced, the Fund's chairman was prosecuted and convicted for embezzlement and corruption, which only reaffirmed the opinion of the study participants regarding the responsibility of the public sector for unsuccessful climate policy in Croatia. The participants emphasise the disproportion between the money accumulated by the Fund and the projects it accomplished, expressing their doubts regarding the criteria that were used to decide on co-financing for various energetic efficiency or renewable energy projects. The participants think that the Fund defeats its purpose and creates an image of having a lack of transparency as the criteria used to distribute the money are unclear and not available to business subjects as interested parties. Some participants see this as deliberate creation of conditions that would allow money to be embezzled. In addition, the results of the Fund's activities are unclear, and they are not visible in measures or efficiency studies, if they even exist. When asked to express their attitude concerning their (mis-)trust in the state system for emission reduction and the system for monitoring the efficiency of emission reduction measures, one participant from the civil society sector reported:

> Civil-society1: "...in the situation we have been living in with Kyoto for the past six years, aware of the regulations and formulas used to show emissions, and which measures are permitted to decrease the emissions – comes a Fund chairman who starts yelling about how they reduced five hundred thousand tons of CO_2 using their own measures...Alright, where do you see it in our national plan? If you created some subsidies, then you should be able to see it in Croatia's balance."

We are drawn to the conclusion that there is a notable systematic error in the Fund's creation when you take all information and attitudes into consideration; much like with the implementation of climate policy, except this is a case of conflict of interest in the way that an institution acts. In this particular case, the Fund is the body which collects the money and decides on its distribution. Therefore, there is no triangle of organisations – one which creates the legislative framework (the ministry), one that determines the criteria for choice of projects (separate agency), and one that would distribute the financial assets according to the legislative framework and external decision (the Fund). Since the Fund collects the money and decides how the money is spent, this creates an opportunity for a lack of transparency concerning the handling of money, that is, embezzlement, which is the reason the chairman of the Fund ended up in jail.

The lack of political will is also reflected in the lack of instruments and legislature for greenhouse gas emission reduction27, in the lack of interest from the governing structures to deal with climate change as they have not been recognised as a priority, and within the prevailing interests that are not in accordance with measures for reducing greenhouse gas emissions, as some participants stated:

> Scientist2: To have efficient measures, you have to carefully plan them. And people making the plans have different interests, especially in energetics. This means the obstacles are that those who are supposed to change things or do things differently are not planning anything. That is the main obstacle, and they will continue planning."

> Civil-society2: "Some people see the problem as being in corrupted public administration. I think the inefficiency was not there on its own but was a result of scheming, either in the Fund or at the level of blocking certain investments at HEP or them maintaining their monopoly."

The next most commonly mentioned codes refer to a gigantic bureaucratic system and the inadequacy of basic strategies that should support the climate policy of the state. The size of the bureaucracy affects the speed at which emission reduction projects are conducted and the motivation of private persons or potential investors. An inefficient bureaucratic system is shown to reflect the inefficiency and disorganisation of the public sector, essentially having reasons related to conflicted interests.

In addition to conflicting interests, many participants from the civil sector think that energy development strategies and sustainable development strategies lack vision. This lack of vision is reflected in their orientation towards minimal goals for emission reduction in energetics and an incomplete sustainable development strategy. Even though these strategies are a few years old, their results are still not visible to relevant actors. Another issue that is emphasized is the lack of connection between the strategies, as the sustainable development strategy should be the main document that is used to orient all the other development strategies. In addition, certain projections and projects in the energy development strategy are considered inadequate in the context of greenhouse gas emission reduction and are perceived as projects that will keep the economy tied down to fossils fuels for the next twenty years.

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27 The laws relating to the emission reduction of greenhouse gases are currently available in the form of several articles, found in the Air Protection Act: http://www.zakon.hr/z/269/Zakon-o-za%C5%A1titi-zraka.

The relevant actors also think that the strategies are not developed enough. This results in them being declarative strategies that are not implemented as there are no short-term plans for action in certain sectors. When asked "How do you rate the Sustainable Development Strategy and the Energy Strategy with regard to the reduction of greenhouse gas emissions?" a participant from the business sector answered:

> Businessman4: "The strategy is not developed into a strategy which should be public, business, and academic. It doesn't have that "drill down" effect (...) that is well known in these circles that deal with sustainable development, socially responsible business and so on; you just can't monitor all sides – state, public, academic, and business at the same level and I think we don't have much chance for success."

This again emphasizes the dissatisfaction of participants with the communication between certain sectors of society. The dialogue between the scientists, NGOs, entrepreneurs, and public administration is necessary in order to reach agreement and for the legislature to be implemented effectively. Dialogue and compromise are emphasised here. One can see that the participants think that each sector is "selfish" when lobbying for their own measures of greenhouse gas emission reduction and if some of them do not sacrifice their own interests, a compromise which would ensure implementation will not be possible to achieve. While some participants talk about connecting the sectors, others describe a "culture" of dialogues which would enable them to recognise a common goal for all sectors. When asked about their view on the role of other groups of actors included in this study with regard to participation in the creation of measures for emission reduction, the participant from the public administration expressed the following attitude:

> Public-administrator3: "It is necessary for all sectors to have a dialogue as it can be used to reach a certain compromise which would be structured in such a way that it allows this framework to be implemented...because if we don't have that, then we have laws, which might be phenomenal, but are not being implemented."

Some participants are still focussed on the lack of organisation of the public sector in terms of the absence of a main agenda according to which all members of various departments should act, and then the lack of public administration employees in the sector of climate change and in terms of the inefficient distribution of jobs and task prioritisation. Thus, some participants have the impression that the existing measures for greenhouse gas

emission reduction are partly a result of pressure by the European Union and that these measures were taken over as partial, unrelated, unadjusted and therefore inefficient. This leads to many absurdities in climate policy, such as conflicting regulations, counter-effective subsidies etc., and many participants from the civil and business sector express their concern over this.

The participants see the motive for such a formal approach to climate policy as lying in the fact that the government finds this problem relatively unimportant. Due to the economic recession, a large number of unemployed people, poor industrial production, and a large number of people below the poverty line, some of our participants emphasise that existential issues take priority. That is, every segment of the public administration, or every ministry is trying to solve immediate social problems, thus contributing to short-term economic progress, which is sometimes opposed to long-term climate policies. When asked "Do you think the emission reduction is a priority for the government?" a participant from the field of politics answered:

> Politician4: "I am aware of what should be done and how the ministry of agriculture and regional development and the ministry of finance should join in, but I think, considering the situation in the country, that they do not think this as a priority...unfortunately."

Conclusion

The participants were almost unanimous in their stance that the policy for the reduction of greenhouse gas emissions created by the government and implemented by the public administration is neither comprehensive nor efficient.

The participants see Croatia's climate policy more as a set of unrelated and incomplete measures that aim to reduce the emission of greenhouse gases, than a systematic policy which has a clearly defined goal and straightforward instruments that are connected in all sectors and which include political convergence. The most commonly mentioned causes for the non-existence of comprehensive policy are a lack of interest or knowledge from persons responsible for drafting climate policy. This is compounded by the lack of cooperation between ministries, lack of coordination between sector measures and the lack of long-term planning crucial for climate policy. However, some participants have a positive opinion concerning the development of climate change policy in the near future, partly due to the European Union and partly due to a new Minister (who, in the meantime, has resigned from her position).

Special attention was given to the causes of the inefficient implementation of measures for greenhouse gas emission reduction. The participants' opinions regarding the obstacles for implementing the emission reduction measures are characterised by dissatisfaction with relevant actors involved in the implementation. By stating the whole array of reasons, that is, the obstacles to carrying out the emission reduction measures, the participants often contradict themselves but concrete problems illustrate the extent of problems and the grounds for their dissatisfaction with the implementation of measures. The total number of codes on this topic contributes to the impression of "chaos" among the measures for greenhouse gas emission reduction as they were not created so as to lead towards a common goal. Even though there are a large number of individual measures to reduce the emissions, their efficiency is lost in procedural vagueness and the lack of coordination with other measures, and there is no quality system of monitoring that would direct attention to specific problems.

An opinion often voiced is that Croatia joining the European Union should result in positive effects the adopted legal framework and through the international emission trading system. However, this does not take into account the fact that changing some settings as concerns the political context does not change the governing and administrative structure in the state, which will be reflected in the further (in)efficiency of climate policy. Special attention should be paid to the absence of international, legally binding agreements that would bind the countries to fulfil the goals by written sanctions. Taking this into consideration in the context of climate policy, the attitude towards the defining effect of the European Union on Croatian climate policy is in contrast with the opinion that the inefficient climate policy in Croatia is a result of a negative attitude of the government towards the problem of climate change.

One can conclude from the opinions of the participants that some of the basic elements such a policy should have are lacking: a legal framework, instruments for implementation, monitoring and sanctions. Even though the country created the legal framework, it did not take care of the system of implementing the emission reduction measures – and this primarily refers to the lack of organisation, the incompatibility of certain measures from various departments, legal paradoxes, a gigantic bureaucracy, a lack of staff etc. – and it completely ignored the system for monitoring which resulted in an inability to assess what has been done and the inability to correct one's mistakes.

The problems of climate policy such as the lack of relations between institutions, a lack of coordination of sector policies, and the general inefficiency of climate policy are often perceived as the result of the government's attitude towards the problem of climate change. If we leave out the

conflicts of interest groups and lobbying and corruption, which appeared as one of the topics in the interviews, the poor state of climate policy is, according to everything stated above, an indicator of the inability to recognise and understand the importance of climate change, consequently located so low on the list of priorities. In the context of the overall quality of life in the country, we should also add that solving immediate existential issues such as the high unemployment rate and the large number of people below the poverty line is more important and is a higher priority for this government. In all this, the development potential of comprehensive climate policy remains unrecognised and the primary problems are solved through projects which are, despite being economically justified in the short-term, in conflict with the long-term efforts of the greenhouse gas emission reduction policy.

Given all that is stated above, the answer to the question put forward in the title of this article is obvious. Croatia is not yet ready for a coherent climate policy, not only due to deficiencies in legislature, but also due to basic structure of interrelations amongst actors from different social sectors, and due to reluctance of crucial actors in state structures for creating such a policy.

In this respect, the contribution of this research lies in the answers to basic questions regarding the relation of relevant actors to climate change policy in Croatia and in the creation of a new background for more detailed studies of all individual phenomena that have been shown to be relevant in this study. ●

Annex

INTERVIEW PROTOCOL

Climate change as a problem

1. What is your attitude towards global warming and climate change as an ecological problem?
2. How well are you informed about causes and consequences of global warming and climate change in your opinion?/where do you get information about causes and consequences of global warming and climate change?
3. In your opinion, what are the most threatening consequences of climate change?
4. Who are in your opinion relevant actors for dealing with / solving climate change threats in Croatia?
5. What actions they should be conducting?

Global climate change politics

6. How well are you informed about global climate change politics in your opinion? / where do you get information about climate change politics?
7. How would you assess (un)efficiency of global CC politics (Kyoto protocol and the following negotiations)?
8. Do you consider implementation of 'radical' measures for reducing GHG emissions possible (zero carbon economy etc.)? / Do you know some examples of implementation of that kind of measures?

Domestic climate change politics

9. In your opinion how well are you familiar with domestic laws and regulations on cutting GHG emissions?
10. Do this regulations in your opinion constitute coherent and full climate change politics?
11. Do you consider justified Croatia's repeated request on rising emission quotas for the base year of the Kyoto protocol?

Context and implementation of measures for reducing GHG emissions in Croatia

12. How effectively are regulation for emission cutting implemented in Croatia?
13. Are there any obstacles? If yes, which are they?
14. Your perception of your own role in dealing with / participate in implementation of climate change policy in Croatia?
15. Your perception of role of other actors in society in dealing with / participate in implementation of climate change policy in Croatia?
16. Do you see current economic crisis as obstacle or as opportunity for creating and development of efficient climate change policy in Croatia?

12 Environmental sustainability and education: The case of Croatia and Slovenia

Mladen Domazet / Branko Ančić

> Never before have the stakes been so high for the role of [education] in shaping how people interact with the environment. Human activities such as the generation of greenhouse gases, the accumulation of waste, the fragmentation or destruction of ecosystems, and the depletion of resources are having a substantial impact on the global environment. As a result, threats to the environment are prominently discussed in the media and citizens of every nation are increasingly faced with the need to understand complex environmental issues (OECD 2009, 3).

Calling for global change in society and education

Though we can safely say that ever since humanity developed an ability to record its fears and wishes we have been fascinated and tormented by the fate of the human race, contemporary science warns humanity that we are facing an unprecedented transitional period[1]. Humanity has indeed experienced great transitions before, such as the beginning of the Stone Age, the Agricultural Age or the Industrial Revolution (GLASSER 2007), but we have never before been in the position to causally link the fate of most of contemporary biosphere to ours (BECK 2010; CHAKRABARTY 2009). Faced with such a warning, numerous authors argue that this global problem cannot

01 We would like to express our gratitude to Danijela Dolenec for a thorough reading and insightful comments on earlier drafts of this text. We are also grateful to the colleagues and participants in the *ESD-Relevant Content in Transitional Countries' Compulsory Education: a Comparative Perspective* symposium at the European Conference on Educational Research 2012, in Cádiz, Spain for comments and suggestions on some of the preliminary findings.

be resolved using the current modes of environmental interaction within the current lifestyles (MILBRATH 1996; ECKERSELY 1998; DOPPELT 2003; EHRLICH and EHRLICH 2013; CIFRIĆ, THIS VOLUME; ŠIMLEŠA, THIS VOLUME). To achieve the desired material transformation of environmental impact we need a transformation of economic and political governance, knowledge and values such that "basic organising concepts of modernity have to be rethought" (DAVIDSON 2004, 169).

We need, they say, a shift away from the contemporary common sense conceptualisation of nature and its role in the socio-economic processes within and between societies. Even the reluctant (at best) advocates of the seriousness of the challenge and the need for change, such as Žižek (2008), state that the scientific warnings and the everyday worldview have come to a point of 'reinforcing each other's blindness', and a possible action strategy requires a shift from the current common-sense interpretation of Nature and Environment.

To put long term sustainable socio-economic patterns into practice we require wide-reaching formal and social learning, including fostering a broad understanding of the problems and consequences of the daily practices of material production and their social impact, but also of the procedures and mechanisms available within a society for their eventual alteration in line with sustainability-oriented strategies. To gain the said understanding is not only to be horrified by the scale of the problems, but also to have a familiarity with the wholesome natural processes which the human survival and development materially depends on. We need educational content that can help individuals use their understanding of natural and social processes so as to go beyond the paralyzing fear of the impeding crash of civilisation and the material foundation on which contemporary societies are developed (NEWELL and PITMAN 2010). However, understanding the root causes of the current predicament also needs to be agreed upon.

This is not a standard task for educational transmission as on one hand there is the urgency to enable contemporary youth to respond to the rapidly changing environmental circumstances now, with no pan-culturally uniform and delineated body of knowledge and skills to be simply transmitted and trained in. Tillbury (2007) explicates that a comprehensive approach to the problem in the education sector requires questioning the existing mental models and societally engineered expectations that have lead contemporary societies to unsustainability. Glasser (2007) warns that it is dangerous, given the urgent need for action, to miss an opportunity to act based on what we know – even though much remains unknown. So as to make the required change all-encompassing and avoid the rushed botched responses to externally enforced crises, it should be based on learning which is largely rooted in public education. The required learning has

to be all-encompassing and planned in that it has to be more than a push against the boundaries of ignorance and adoption of inert facts. That learning does indeed have an effect is confirmed by OECD (2009), according to which the school remains the main source of information on key environmental issues. In the United Kingdom awareness of sustainable development concept was greatest among fresh school-leavers (SDC 2001) out of the whole adult population.

Of course, awareness of human-environment interaction and its connection to some aspects of individual and societal wellbeing is not a revolutionary new requirement for global educational systems (SATO 2006), or in the cases of Croatia and Slovenia. Even though it was introduced into educational theory over 40 years ago, initially environmental education (EE) did not present the environment-development interaction as one of interconnected feedbacks. It focused largely on conservation of nature, primarily delivered through environmental science. Such an approach is still present today in the PISA[2] 2009 reports, as well as in much of environment-related curricular content justification in Croatia and Slovenia (BAJKUŠA et al. 2011; GOBBO 2011). Management of natural resources appears to form the conceptual core in justifying the inclusion of environmental science factual content into compulsory education.

A few decades later, development was brought into sharper focus bringing a shift from EE to education for sustainable development (ESD) (SATO 2006). The UN's sustainable development agenda named explicit tasks for education through Agenda 21, stating that education is of critical importance in promoting sustainable development and improving the capacities of people to address both environment and development. By the end of the 20th century, international education policy initiatives increasingly saw environmental protection issues as a global, rather than parochial path-dependent problems, linking them ever more closely with the developmental sustainability narrative. Notwithstanding that, international educational initiatives can be decades away from implementation in national educational systems. Though some aspects, such as inclusion of global agenda scripts can be rapidly spread under 'world culture' pressures (MEYER et al. 1997), according to Pizmony-Levi (2011) actual implementation can be slow and extensively modified under exigencies of 'local culture' (ANDERSON–LEVITT 2003). In other words, both a time-lag and significant contextuali-

02 PISA is an international student assessment programme run by the Organisation for Economic Cooperation and Development (OECD) launched in 1997. Through standardised testing it pertains to evaluate education systems wordlwide every three years by assessing 15-year-olds' competencies in the domains of reading, matheamtics and science. Croatia and Slovenia have participated since 2006.

sation affect the translation of global educational initiatives into national compulsory education narratives. What is more, there is also a tendency to relegate tasks to education if they are to be postponed for the time being.

Beck (2010) blames the present mismatch between scientific factual presentation of the global environmental problem and the lack of adequate societal response on the fallacious separation of the sociological aspects of development from natural sciences and the economies based on them. Some analyses show that this is precisely what has emerged from the good intentions of original EE in developed countries of the global North: it has turned from instilling conservation values to propagating technical knowledge for managing the environment as a resource for sustained economic growth (SAUVÉ, BRUNELLE and BERRYMAN 2005). The narratives of historical development of science developed after World War II have separated the interaction within 'nature' and within 'society', only to be forced to bring them back together today through the consequences of the actions resulting from science and technology on the global climate, and the consequences of climate change on society. Beck takes climate change as a literal ridicule of the premise that society and 'nature'/environment are separate and mutually exclusive (2010).

POLITICAL ECOLOGY IN EDUCATION: TEACHING FOR TRANSFORMATIVE POTENTIAL

Given this advanced understanding of the relationship between environment and society, educational narratives are today expected to present global environmental change as a challenge that can be addressed through social struggles that form an integral component of human interaction with the natural environment. This emerging political ecology perspective advances both traditional environmental education and the curricular content of education for sustainability. The political ecology approach sees environmental education practices as not only scientific, but political, framed by different locally contextualised perspectives on specific trajectories of political-economic change through development. It provides the critique of traditional environmental education that warned of the dangers of environmental pollution in industrialized societies (PEET and WATTS 1996) and extends education for sustainable development into a concern for future generations' potential to continue along modern developmental paths.

This novel perspective exposes human struggles embedded in traditional environmental issues without reducing factual understanding of the biophysical processes and social agents and institutions involved in them. Educational presentation upon such views fuses the factual, material, value-laden, discursive and change-efficacious readings of the nature-society complex and its implications for publicly proclaimed outcomes

of compulsory education. Of course, in educational theory we often find well-argued calls for conceptually complex presentation of the material and social worlds (MARTIN 1993; KOHLI 1995; BENNETT 1995; ADLER 2003), but it is much harder to find them operationalized into clear curricular instructions. In the case of political ecology framing this can also be seen as a reflection of the broader polarisation and its subsequent transcendence within the intellectual sphere following different readings of the Marxian modes of production as combining the material and the social (WOLF 1982; PAULSON, GEZON and WATTS 2003). It is thus far from easy to find guidelines on how to apply criticism of EE and ESD content exposition in political ecology to existing national curricula. We should aim, at first instance, to find in them factual content organised into a holistic construction of the nature-society complex, whilst the phenomenon of environmental change manifests processes of social conflict and domination. The guiding question here is how environmental issues reflect relationships within society, that is – those between individuals and broader socio-environmental systems (PRAKASH 1995; ROBBINS 2004).

As we elaborate here, in existing Croatian and Slovenian curricula we find only interpretational reflection of content that trains for the analysis of "the nexus of production and consumption, in its modern capitalist guise, [as an] indispensable starting point for understanding the basic causes of the destruction of the global environment" (PEET, ROBBINS and WATTS 2011, 15). These documents, originating from mid-2000s, were not constructed based on the requirements of the emerging field of political ecology in education. However, this does not mean that we should give up on seeking a comparative presentation altogether. Pursuing a political ecology perspective in education means to explore ways in which meanings of the wider nature-system are culturally mediated and geopolitically situated. Given this approach, we can start by mapping environmental sustainability content in relevant subject-programmes in the search for transformative potential through appropriate presentation of the content, agents as meaning creators and different relations between them. In this way we open up the possibility for environmental challenges to be presented as a socio-political issue at least as much as an economic and technical challenge.

In line with that, but aware that it by no means presents a complete political ecology critique of existing educational narratives in Croatia and Slovenia, we present a preliminary reading of the selected subjects' curricular content in line with educational paradigm of Cross-boundary Transformative Sustainability Education (SCHWARZIN 2010), as given by Domazet (2012B). Though this is not the only educational strategy inspired by critical pedagogy (FREIRE 2000; 2007) and in line with political ecology,

this transformative paradigm is explicitly rooted in an attempt to respond to standardised sustainability projects perpetuating the exploitation and inequality whilst striving to protect the environment (SCHWARZIN 2010).

Croatia and Slovenia: shared history and contemporary differences

Croatia and Slovenia share much of their developmental history over the last 200 years, as well as much of the educational tradition over that period. As members of the Central European empire of Austria-Hungary the two states shared a starting position for industrial modernization, despite recorded differences in political and strategic positions within larger empires and federations (MIRKOVIĆ 1958; ŠTIH and SIMONITI 2004; BUDAK 2007). This shared position was carried over into the Yugoslavian kingdoms and federated republics in the second half of the 20th century. Regarding educational history, both states inherited the overarching educational tradition from the Austro-Hungarian Empire and Yugoslavian iterations, despite the fact that the federal republics were in charge of their own educational policy in socialist Yugoslavia. Unfortunately we are not aware of comparative analyses of the processes of curricular reforms in these two countries over the last 20 years, which would undoubtedly improve the interpretation of the comparison of existing respective curricular content, but exceeds the scope of this text.

As other texts in this volume amply illustrate, the two states share similar levels of GDP and HDI (cf. DOMAZET and MARINOVIĆ JEROLIMOV, THIS VOLUME; DOMAZET, ANČIĆ and BRAJDIĆ-VUKOVIĆ, THIS VOLUME; DOLENEC, DOMAZET and ANČIĆ, THIS VOLUME; UNDP 2013), but differ with respect to the ecological footprint (EF), inequality-adjusted human development index (IHDI) and inequality adjusted income index enough to occupy opposing positions among the 18 European countries analysed (cf. DOMAZET, ANČIĆ and BRAJDIĆ-VUKOVIĆ, THIS VOLUME). Whilst Croatia's overall HDI places it in the same global development group of countries as Slovenia, its GDP per capita and inequality-adjusted HDI (IHDI) exhibit a stark difference from Slovenian averages. Given that inequality presents the most immediate obstacle to Croatian population's greater support for sustainability measures (DOMAZET, DOLENEC and ANČIĆ 2012), it is not surprising that the difference in average inequality-adjusted income also shows up in the difference in mean values of indicators of willingness for material sacrifice (cf. DOMAZET, ANČIĆ and BRAJDIĆ-VUKOVIĆ, THIS VOLUME), suggesting that the Slovenian population is more committed to willing material sacrifice. On the other hand, as can be seen from Table 1, whilst enjoying the same level of biocapacity potential per capita, the Slovenian Ecological Footprint (EF) of in-country production (EF production) and consumption (EF consumption), as well

as the overall 2008 average is greater than Croatia's. That makes Slovenia's population's debt to environment and future generations much greater than Croatia's, and in line with that of most developed European countries.

TABLE 1 *Development, income and environmental cost indices for Croatia and Slovenia*

Country	GDP pc 2011 as percentage of EU27 average	HDI 2012	IHDI 2012	EF production 2008	EF consumption 2008	EF overall 2008	Biocapacity 2008
Croatia	61%	0.805	0.683	3.3	4.2	3.9	2.6
Slovenia	84%	0.892	0.840	3.8	5.2	5.2	2.6

Previous analyses also show that higher educational attainment is related to greater environmental concern (HAANPÄÄ 2006; DOMAZET, DOLENEC and ANČIĆ 2012; KUFRIN, THIS VOLUME; BIERI and STOILOVA, THIS VOLUME). Although similar proportions of youngest generations in Croatia and Slovenia hold tertiary education qualifications, Croatia is lagging behind Slovenia in all other generation groups under 55 years of age, as is shown in Table 2.

TABLE 2 **Percentage of the population with tertiary education qualifications in the population aged 24-64, by age group, 2010**

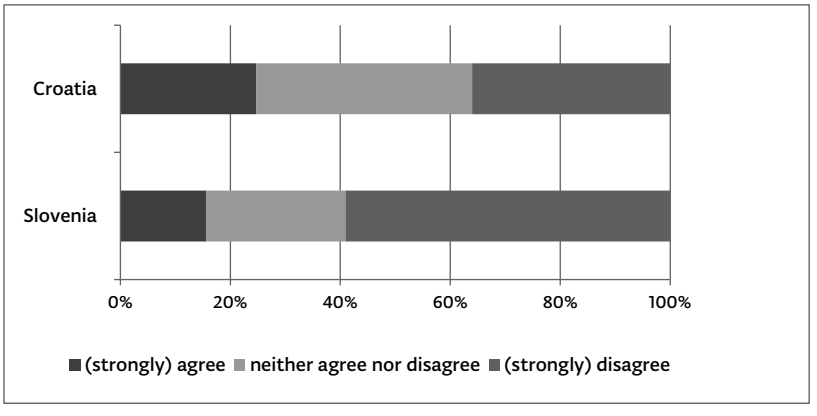
Years	Croatia	Slovenia
24-29	25.2	25.4
30-34	22.6	34.8
35-39	17.7	29.7
40-44	16.1	23.7
45-49	17.6	21.4
50-54	14.7	18.5
55-64	17.4	16.3

SOURCE: *EACEA 2012*

Although the two countries share the same starting point in 1990, over the 20 year period the expected years of schooling have grown from 12 to 14 years in Croatia, compared to almost 17 in Slovenia (UNDP 2013). According to OECD's (2009) recent international assessment programme of 15-year olds which analysed knowledge of environmental science and geosciences, Croatian students' results were generally close to the OECD average, whilst the Slovenian were generally above it. In both countries awareness of the basic environmental issues and a sense of responsibility are higher than the OECD average (2009). On the other hand, optimism regarding improvement in the next 20 years is slightly lower than the OECD average in both countries. In the case of Croatia the results show a statistically significant relationship between higher optimism expressed and lower performance on the assessment, whilst among Slovenian 15-year olds no such link was established.

In the context of the data from the environmental module of the ISSP survey (2011), results from OECD (2009) show an interesting congruence between optimism related to cognitive performance in environmental science and geoscience among 15-year olds (OECD) and agreement with levels of techno-scientific optimism in the general populations of these two countries (ISSP), which is shown in Figure 1.

FIGURE 1
ISSP: agreement with statement "Modern science will solve our environmental problems with little change to our way of life" in Croatia and Slovenia – general population



As can be seen from Figure 1, a general belief in science as the solution to environmental problems is higher among Croatia's population than among Slovenia's. Taken together, these findings suggest that better educated

populations show less faith in technocratic solutions to environmental problems. Regarding the general level of concern for the environment and readiness to do something about its protection, there is a marked difference among Slovenia's and Croatia's populations (DOMAZET, ANČIĆ and BRAJDIĆ VUKOVIĆ, THIS VOLUME). Apart from that, no marked differences show up between the two populations on most other attitude indices and single indicators charting modernisation, growth and economy-environment tradeoffs . However, for our analysis of educational content it seems significant that the two countries differ regarding the level of agreement on whether economic growth always harms the environment. While Croatia's contains one of the largest proportions expressing agreement with such statements (slightly above United Kingdom, Sweden and Norway), Slovenia's proportion in agreement is much lower similar to populations of Switzerland, Finland, Austria and – interestingly – Bulgaria.

Methodological choices in analysing curricula

The social and behavioural changes required for an organised response to global environmental change require a universal education in competences for sustainability. In order to accomplish this universal character of educational curricula, it is necessary to develop governmental requirements for the public education sector (DI GIULIO et al. 2011), such as the layout of educational standards, definition of general learning objectives, and national curricula for universal compulsory education. Whilst all forms of education should contain appropriate sustainability oriented content, compulsory education has the most universal reach prior to ability and interest differentiation of the student body.

The precise choice and nature of presentation of topics is ideally based on the scientific models of how incremental competences develop, as well as on public dialogues about competences required to address the complexity of development issues in this century. Therefore, the compulsory schooling curriculum necessitates making choices and allocating preferences between different topics which are justifiably seen as related to sustainability. Through the choice and representation of topics, as well as through their framing in curricular texts, national curricula influence classroom practices, as well as how teaching time is divided among different topics (DI GIULIO et al. 2011). This is taken as an indication of the relative importance assigned to different topics, as well as skills and values development. Even where the teaching time for particular unit is not explicitly declared in the national framework curriculum (NFC), the relative representation of a particular topic within the overall topic selection indicates the relative importance assigned to it by the educational authorities.

The data presented here for Croatia and Slovenia are from a study covering nine countries, which mapped curricular topics, skills and values deemed relevant for education for sustainable development in national curricula, as well as in a selection of subjects and textbooks (DOMAZET et al. 2012).[3] Though the study did not analyse the relative representation of ESD-relevant content within the overall curricular content, it enables a clear comparison regarding relative representation of different ESD-relevant topics, skills and values for Croatia and Slovenia. A detailed presentation of the methodology behind the research design can be found in Domazet et al. (2012). For our purposes here it is important to stress that the selection of topics, skills and values recorded in the NFCs[4] draws on the UNESCO Decade of ESD mid-term report (WALS 2009). They were contextualised by the research team having in mind the specificities of the analysed national educational systems. Overall we recorded 26 cognitive content topics and 21 skills or values whose representation in NFCs. The cognitive content eventually recorded consisted of topics covered in the factual knowledge content of the NFCs, while skills and values recorded were those explicitly mentioned as developed through implementation of different content units of the said curricula. The cognitive content was further divided into environmental, economic and socio-cultural topic lists. Individual curricula entries, meaningful wholes of sentences, bullet recommendations or entire paragraphs were marked as belonging to multiple topics if they for example combine content in both poverty and agriculture. For the purpose of analytical clarity, the list of skills and values was shortened into 5 skill

03 The data used in the publication has been obtained within Network of Education Policy Centers (NEPC) project *Education for sustainable development partnership initiative*. The content of this publication is the sole responsibility of the authors and can in no way be taken to reflect the views of NEPC.

04 In Slovenia there is no equivalent document to a national framework curriculum, but individual subjects' syllabi chart the overall aims of the subject and its connections to other subjects in compulsory education in their introduction sections. These introductory sections were used in lieu of NFC in the case of Slovenia in DOMAZET et al. 2012. In Croatia, at the time of data collection there was a national framework curriculum for compulsory education providing an overview of educational goals and content coherence for overall compulsory education, but detailed classroom instruction still followed individual subject syllabi from 2006 (collected in MILANOVIĆ-LITRE and VICAN 2006). Slovenian documents can be found online at http://www.mizs.gov.si/si/delovna_podrocja/direktorat_za_predsolsko_vzgojo_in_osnovno_solstvo/osnovno_solstvo/ucni_nacrti/posodobljeni_ucni_nacrti_za_obvezne_predmete/#c17865; whilst Croatian document is available online in English translation at: http://public.mzos.hr/Default.aspx?sec=2499.

or value groups, which were shown to be generally consistent with grouping of selected skills and values in different countries' curricular content (DOMAZET et al. 2012). Finally, further shortening was made to enable visual representation in cloud graphics, which we use in the empirical analysis that follows. Detailed specification of the topics and their broader description is given in Annex 1 of Domazet et al. (2012).

In the following analysis we firstly focus on the relative representation of the Economic, Environmental and Socio-cultural topic groups in the cognitive content of the Slovenian and Croatian NFCs, followed by the relative representation of environmental topics within each country's NFC document. After that we discuss the importance of the relative representation of different skills and value groups in each of the countries' NFCs. We review differences in performance and related findings of international assessment framing of curricular content that combines the most frequent skills and values groups with environmental topics. Before making concluding remarks regarding attitudes among Croatia's and Slovenia's populations, we discuss the framing of the curricular content which is required to adequately address global environmental change. The qualitative review of framing of educational content is drawn from Domazet (2012B), Gobbo (2011) and Bajkuša et al. (2011). In Domazet (2012B) we used the selection of content from Environment, Technology and Geography subject curricula in the two countries. Using the same coding matrix as in Domazet et al (2012), the content was selected and coded in accordance with Schwarzin's 2010 transformative education model. We assess the selected subject content groups against Schwarzin descriptions of model's requirements. We focus on subject curricula because they are more readily used in classroom practice, while the framing of content given in them is more readily transmitted through teaching than is the case with the national curriculum framework. The national curriculum framework on the other hand gives a more coherent picture of the overall compulsory educational content irrespective of academic disciplines behind it.

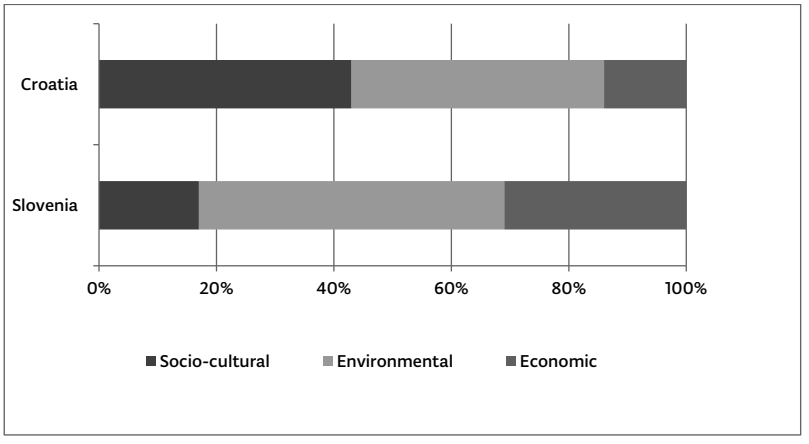
Compulsory education curricular content – quantitative distributions and qualitative framings

In their national framework curricula Croatia and Slovenia do not show great differences in relative representation of environmental cognitive content (Figure 2). In Slovenia it is the most represented segment of cognitive content in the curriculum, whilst in Croatia it is the second most-represented by a narrow margin. In that respect, and at the level of national framework curricula, we can expect that the instruction time and effort dedicated to these topics is roughly the same in both countries. In the methodology

used to record these findings there was no way of measuring the overall representation of the ESD-relevant content versus the content that is not relevant to ESD, as the latter was never recorded and numbered. However, given that the definition of content relevant to ESD was quite broad, there is no reason to suspect that the ESD-relevant content enjoys a miniscule or insignificant representation in the national framework curricula overall.

FIGURE 2

Relative representation of different groups of Cognitive Content in the national framework curricula (NFC) Croatia and Slovenia. Reprinted from Domazet et al. 2012, 73.



However, Figure 2 also shows a stark difference in the balance of the other two components of the ESD-relevant content. Croatia has a much greater representation of socio-cultural than economic content, whilst in Slovenia the situation is almost reversed. This suggests that the instructional time and effort dedicated to the two types of curricular content is substantially different between the two countries. Adherence to Croatian framework curriculum requires greater emphasis on the topics of peace, human rights and intercultural understanding, than to poverty, economic principles, sustainable development principles and the presentation of the production-consumption nexus. The situation in Slovenia is reversed. Overall however, there is a need for greater coverage of the social and economic aspects of sustainability in school curricula of both countries, especially the relationship between economic growth and the environment (SDC 2011; DOMAZET et al. 2012).

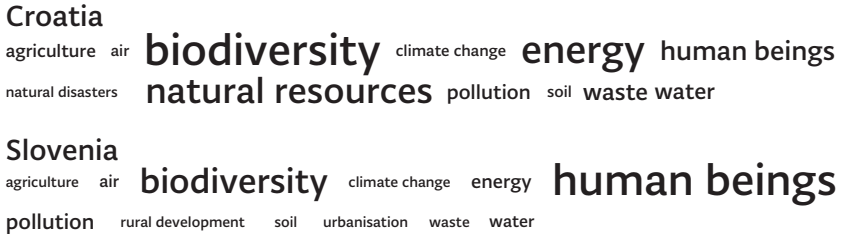
Adopting a political ecology critique of ESD, we expect a twofold impact of these differences. On the one hand, differences in the internal distribu-

tion of topics within the environmental segment of the curricular content are related to instructional time and effort. On the other, the political nature of discussions should become more accentuated in topics within socio-cultural and economic segments. However, our analysis here cannot capture this level of detail, so we focus on the presentation environmental topics that are in line with the focus of the analysed texts. The analysis of framing of subject syllabi content in Croatia and Slovenia presented below provides some idea as to how the environment and its relation to humans is constructed in selected subject-syllabi of the compulsory educational systems of the two countries.

ENVIRONMENTAL CONTENT – QUANTITATIVE CURRICULAR TOPIC ALLOCATION

In the following analysis we employ cloud graphics as a visual tool that facilitates analysis of the relative importance given to topics within environmental curricula in Croatia and Slovenia. Larger renderings of concepts represent more frequent appearance of the given concept in the national curricular texts. Figure 3 shows clouds of environmental topics in the national framework curricula of Slovenia and Croatia.

FIGURE 3[5]
Clouds of relative proportions of environmental elements in national framework curricula (NFC) in Croatia and Slovenia. The figure includes only those elements that are represented in the curricula in respective countries. Reprinted from Domazet et al. 2012, 75.



Overall, Figure 3 suggests that there is a greater emphasis on resource-driven construction of the environment in Croatia, compared to a more complexity-oriented construct in Slovenia. Whilst in both countries 'bio-

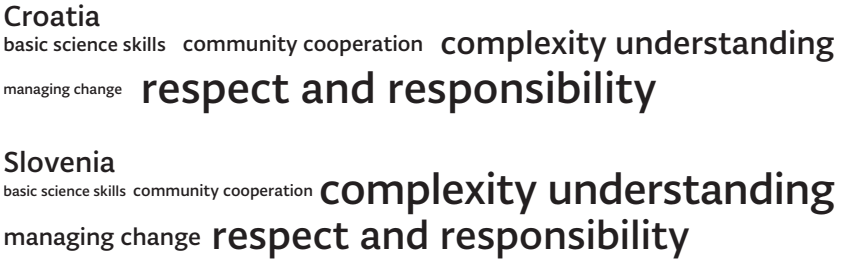
05 Some graphic representations are shorter versions of coding matrix terms ("human beings" = "human beings (as living organisms)").

diversity' and 'natural resources' are dominant topics of environmental ESD, different emphasis is placed on 'energy' and 'human beings as living organisms'. Croatia places greater emphasis on 'energy' suggesting more time dedicated to the role of the environment in energy generation. Slovenia, on the other hand, places about as much emphasis on 'human beings as living organisms', parts of the overall complexity of global and regional ecological systems, as it does on the presentation of 'natural resources' to be extracted from the environment for human benefit. But Slovenia also includes topics of 'rural development' and 'urbanisation' which are altogether absent from Croatian framework curriculum. These topics, in turn, could be associated with more politicised aspects of learning about the environment, both from the perspective of utilisation of environment in economic development, and in presenting human incursions in other ecologies as intrusive and potentially destructive.

An analysis of the relative representation of skills and values groups relevant to ESD in the two countries' curricula confirm this line of assessment, as shown in Figure 4.

FIGURE 4[6]

Clouds of relative proportions of skills and value groups of elements in national framework curricula (NFC) in Croatia and Slovenia. The figure includes only those groups that are represented in curricula in respective countries. Reprinted from Domazet et al. 2012, 102.



In Croatia the accent is again on 'respect and responsibility' values, and less on 'complexity understanding'. Such an arrangement suggests the representation of nature as a distant other, to be treated with respect, rather than a space of debate through which to implement changes and

06 Some graphic representations are shorter version of names of groups of skills and values constructed from coding matrix terms ("complexity understanding" = "reflexivity and complexity understanding"; "managing change" = "managing change and uncertainty"; "respect and responsibility" = "values of respect and responsibility").

'improvements'. The situation in Slovenia is reversed, with 'complexity understanding' taking centre stage, whilst 'respect and responsibility' comes second. Combined with greater representation of 'managing change' skills and values, this suggests that Slovenian educational discourse takes a more active approach to management of global environmental change, perhaps one of direct involvement, whilst Croatian one prefers a more passive approach. In addition to that, a sizeable relative representation of 'respect and responsibility' values in Slovenia suggests that the approach to ESD skills and values is not entirely techno-managerial.

QUALITATIVE FRAMING OF ENVIRONMENT IN SUBJECT SYLLABI FROM TRANSFORMATIVE PERSPECTIVE

From an engaged political ecology perspective, it is important to equip students with critical tools required to understand root causes of contemporary global environmental challenges and their connection to human development and wellbeing. Given this objective, a quantitative comparison of topic representation cannot tell us whether their framing leads to understanding rather than rote-learning, and to exploration of causes rather than appropriation of notional platitudes. Sauve, Brunelle and Berryman (2005) analysed environmental education texts since the 1970s in order to establish the influence of neoliberal globalization, and they concluded that environmental education was presented as a tool for material development and economic growth. The environment was presented as resource characterised by technological problems of management and not a part of human experience with its own intrinsic value. Given that education is also a tool to express societies' choices and aspirations, they concluded that a lack of critical inquiry into the root causes of contemporary environmental challenges is a sign of societies' choice to prioritize neoliberal economic policies. This can be seen as locking future generations into existing practices that are clearly problematic from the perspective of environmental sustainability. Individual societies, even small and peripheral European ones like Croatia and Slovenia should resist such globalizing tendencies through educational documents that embody transformative notions of describing and integrating environmental content into national compulsory education.

In subject syllabi that cover the Environment, Geography and Technology[7] in Croatia's compulsory education overall there is almost no overlap between conceptual domains of complex objective systems, human society

07 As stated above, due to the process of educational reform this refers to a different document (MILANOVIĆ-LITRE and VICAN 2006) predating the more comprehensive, but as yet very general national curriculum framework (NFC) whose quantitative relationships are reported on.

and individual agency (see example in the box below). In addition to that, a transdisciplinary perspective on the contemporary global environmental challenges is also missing. The presentation of content is such that it does not allow students to tackle root causes of environmental degradation and their connection to individual behaviour and wellbeing, as well as power relations in society. The environment and ecosystems contained therein are presented as a resource to be economically managed so that the negative side-effects are avoided (DOMAZET 2012B). Besides being valued as a resource, biosphere is only valued for aesthetic reasons.

> "Students should develop an attitude towards life as a value, and familiarize themselves with capacities to conserve and protect nature. They should familiarize themselves with beauty of their surroundings and the importance of protection of natural beauty and resources for purposes of human health and wellbeing." (Authors' translation from 7th/8th grade *Biology* subject syllabus, MILANOVIĆ LITRE and VICAN 2006).

In Slovenia, there is a greater overlap between the conceptual domains of complex objective systems, human society and individual agency, though it is still far from making the permanent connection that Schwarzin's (2010) transformative educational paradigm envisions. There are some explicit calls for transdisciplinary approach to factual content, but no great wealth of examples and inclusion of non-scientific forms of knowledge and environmental world-views (DOMAZET 2012B). Two examples of framing are given in the box below.

> "Students should, at science and technology lessons, experience nature empirically, learn about it, change it through work and assess interference with it from different value-points. [...]
>
> Knowledge and experience about themselves, about nature and technology is used by pupils in order to engage with the environment and make informed and responsible change to it." (Authors' translation from 5th grade *Nature and Technology* subject, VODOPIVEC et al. 2011).

Slovenian selected subject syllabi present the students's potential as human individuals, giving them a more prominent role in tackling environmental challenges than is the case in Croatia. In addition to that, it places greater emphasis on the holistic humanity-environment-economy complex. Though explicit exploration of root causes of global environmental change in its material and social aspects is still absent, in Slovenia there is

a greater emphasis on critical thinking in different disciplinary domains related to sustainability and development.

Concluding remarks: education for switch to sustainability or business as usual?

Although scientific literary practice prefers a clear conclusion mandating unanimous action, the rethinking of basic organising concepts of modernity, limited transformation potential of the semi-periphery, span of social and formal learning practice and only partial contribution of curricular content to eventual learning outcomes; we shy away in this instance from suggesting simple curricular replacements of the existing content recorded. Nonetheless, the above analyses should have informed the reader of the curricular areas and structural connections where such alterations might be found in each of the two semi-peripheral European formal educational systems. Their historic rootedness in the processes of 'europeisation' of education in each country and possible 'modernisation' convergence remains an issue for further explorations. Overall, the observed differences among qualitative framings in two countries align with our insights from quantitative comparisons in the preceding section.

Our findings mostly confirm the rigid distinction between culture and nature which has been a central feature of modern Western traditions (LATOUR 1993), and which still shapes much of sustainability thinking in developed societies. A reorientation to sustainability requires the integration of technology, humanity and ecology into a whole, while all of these elements are subject to political negotiations of choices (DAVIDSON 2004). In contrast to that, representations of humanity, ecology and technology as separate forms of reality still stand behind much of current sustainability thinking, which is reflected in our analysis of curricular content in Croatia and Slovenia.

Compulsory education still insufficiently nurtures connections between techno-scientific developmental progress and processes that lead to it. A somewhat greater awareness of technology as not only a product of existing but a creator of new human-environment complexes (LATOUR 2002) may be related to the observed greater disassociation from techno-scientific optimism in Slovenia. This realisation of the limited scope of technology to address the problem demands a new kind of democratic citizen to be fostered through educational process. To avoid simply shifting the burden to the curricular content of "citizenship" or "civic education", a wholesale change of educational framing of development model and ideology is needed, away from straightforward ideological reproduction of the *status quo*.

The social change invoked in texts of this volume places before education a staunch task of quickly redefining the answer to the question 'How should we live?' (DAVIDSON 2000) – suggesting that something like a global citizen is called for. This would be an individual that is conceptually 'plugged' into the interconnectedness of societies around the planet, as well as humans, the rest of biosphere and the planetary physical base. That individual must take much greater responsibility and show far reaching respect for distant consequences of her actions (DAVIDSON 2004). Essentially, this requires educational practices of governance and participation, as well as normative respect for the non-human biosphere and responsibility for the human disproportionate impact on the whole.

Given the necessity of accentuating the environmental change in the public sphere of the European semi-periphery , we call for an education that discusses root causes of the dissatisfaction with the current predicament and encourages exploration of possible alternatives. In devising a global environmental reorientation, our societies must discuss the global direction of civilization, while our education systems should equip citizens with tools for such a discussion, abandoning reliance on simple practical fixes for existing socio-economic institutions. In some respects, Slovenia's population currently seems better prepared to embark on such a transformative path, not only because of greater individual income of its members, but also because of societal aspirations encoded in educational narratives that present the environment as a more integral component of individuals' wellbeing. At the same time, a relatively high concern for environmental protection, coupled with respect for biodiversity and natural resources indicates that Croatia could embark on a transformative path as well, if it challenges its blank reliance on economic growth and better negotiates long-term human wellbeing within the confines of a geographically and climatically limited space. ●

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To think through the potential of developmental sustainability, whilst bearing in mind the relationships between environment, economy and society is in itself in this day and age an important discipline. A group of authors here, whilst thinking through the concepts of 'degrowth' and 'prosperity without growth', seek out solutions and point to possible ideational 'sustainable pathways' towards sustainability. In that sense this volume is a good, even exceptional, contribution to science of sustainability within the discourse of social sciences and humanities.

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