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SUSTAINABLE CONSUMPTION
2009 Conference

Sustainable Consumption,
Production, and Communication

PROCEEDINGS

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Editors:
Sándor Kerekes
Mária Csutora
Mózes Székely

PREFACE

The idea of organizing the 2009 international conference on sustainable consumption is built upon the success of the previous "Sustainable Consumption" conferences organised in the past two years. Now it is jointly organized with the project "Sustainable Consumption, Production, and Communication" sponsored by the EEA Grants and Norway Grants. The aim of this project is to establish an efficient and reasonable economic-, social- and settlement-policy, which can lead to the steady improvement of lifestyle in such a way that it prioritises the conditions of ecological sustainability. The importance of the Norway Project is fundamental to the issue of sustainability. To be more specific, it is fundamental in the effort to reduce the rate of industrial pollution of human activities on the environment. On the other hand it is fundamental in understanding of and finding new perspectives for consumption, the central element of the social organisational methods which prepare the circumstances for production processes.

This year the objectives of the conference are to review and summarize completed and ongoing research activities on sustainable consumption, production and connected communication, to create an academic forum that can serve as the basis for professional communication and development in the field and to create an informal network of scientists who work and are interested in this field in order to share and promote knowledge about these subjects.

Many scholars and representatives from public interest groups have gathered here in this conference. We are sure that this meeting will provide good opportunity for all stakeholders to engage in dialogues on issues of sustainability.

To stress the multidisciplinary nature of the conference we have invited abstracts from different scientific fields, including, but not limited to, sociology, psychology, environmental sciences, marketing, economics, environmental policy, law, etc. Abstracts taking an interdisciplinary approach were especially welcome.

During the conference we are going to discuss the importance of and obstacles to collaborative research in plenary sessions, panel discussions, and intensive workshops. Our speakers from universities, research institutes and NGOs will surely provide us with valuable insights into their arenas and offer strategies for how to better engage others from their communities. The following abstracts raise important questions about communicating complex scientific and technological knowledge to the public, and about the role that scientists in collaboration with other spheres can contribute to the global debate on sustainable development.

We wish to thank all those who graciously share their wisdom with us at this conference.

Sándor Kerekes Mária Csutora Mózes Székely

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IS SUSTAINABILITY SUSTAINABLE?

András Lányi

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The Department of Human Ecology at the Eötvös Loránd University is conducting a research focused at the challenges, possibilities and obstacles of the building and evolution of a sustainable society and economy and the social, economic and legal environment influencing these processes in the rural areas of Hungary

Our research group organized by "Our Common Heritage Workshop" (Department of Human Ecology, Eötvös Loránd University of Budapest) has aimed to investigate the social preconditions that promote or prevent transition to sustainable agriculture in the rural areas of Hungary. One of our highlighted research sites is the Őrség (Western Hungary) where we have also wished to explore the attitudes, motives and social background of those engaged with the concept of ecology based farming and also of those who refuse it.

The first focus of our work is migration and immigration which had a decisive impact on the demographic, social and economic evolution of the region in the years of the party state system as well as in the transition years, and are again playing an interesting role worth examining it from a closer look. We research the reasons, motives and impacts of both the native people's commuting and the immigration of the intelligentsia to the Őrség villages.

Following the path beat by Ferenc Erdei in the 1930s we pay careful attention to the theory of twofold social structure which seems to be a social (and economic) phenomenon reappearing in various forms in the Hungarian society again and again. Understanding this symptom is essential in understanding the region and when trying to find ways of sustainable social and economic life.

Family farming has always played a very important role in the existence of the Őrség people. In our research we present the historical importance of family farming, look for the factors having ruined and still making this form of production nearly impossible, and in our action research we also try to find ways of overcoming these obstacles.

Finally, we have examined a field rarely given attention to in sustainability researches. We have tried to reveal and understand the history and reasons of non-cooperation which is very striking in this region, and the results take us back to the era of deportations, kolkhozes, secret observations and the various forms of persecution and exclusion.

The research is part of the "Sustainable Consumption, Production and Communication" Project financed by the Norwegian Fund.

I. IDENTIFYING OUR OBJECTS AND SELECTING LOCALITIES FOR THE FIELD RESEARCH

Our research group organized by "Our Common Heritage Workshop" (Department of Human Ecology, Eötvös Loránd University of Budapest) aimed to investigate the social preconditions that would promote or prevent transition to sustainable agriculture in the rural areas of Hungary. We intended to explore the attitudes, motives and social background of those engaged with the concept of ecology based farming and also of those who refuse it. Beyond the subjective components of the issue, it was clear for us from the very beginning that we must reveal the social, cultural and economic context, as well, because the chances of a shift to the new technologies of sustainability do not really depend on individual decisions but the capacity of the recipient community as a whole. Testing the human resources of ecology-based ways of development we preferred to attach our investigations to living experiments in practice, following their progression and analysing their successes and setbacks, even participating in the activities observed, and so applying the methods of action research in a later phase of our work.

This is an “optimistic” research: we do not want to reveal the general situation of the rural Hungary but the viewpoint and possibilities of those who try to give an authentic answer to the dramatic challenges of our time: an answer that fits the requirements of ecological and social sustainability. In the long run it would necessarily fit the needs of the stakeholders, too, we supposed. By analyzing and interpreting their efforts, we will be able to establish an operative model for the future sustainable rural development policies of our country.

To be able to control and compare our local experiences we decided to select different localities for the field research. Far beyond the financial possibilities of the present project we decided to start our explorations in four different regions of the country so that we could face various conditions.

The Őrség is a small Western region of the country next to the borders of Austria and Slovenia. This neighbourhood resulted in the most cruel isolation and control in the borderland during the communist era of the Iron Curtain, and an abrupt influx of new lifestyles, economic conditions and population after the fall of the dictatorship. Thus we expected to find here the consequences of the political and economic transition (experienced more or less by the whole of the country) in an enlarged, exaggerated form. The Őrség is now a very special location where the modernization-generated process of migration towards the cities and industrial areas goes on in parallel with its post-modern opposite: the migration of urban population to the countryside. The first tide of counter urbanization in Hungary brought here newcomers with bright new initiative and green ideas about farming and living that fitted the criteria of the present research work. Beside these social characteristics it is the richness of the region in natural resources including a famous and relatively intact landscape that made it especially interesting from our viewpoint.

Nagykörü in the valley of the river Tisza in the middle of the Great Hungarian Plain has been the headquarter of one of the most promising experiments in sustainable farming in this country: the Alliance for the Living Tisza Association. In this site we intended to study the process of this experiment, its impact and reception by the local community and will try to assess its future perspectives.

Some villages in the Bereg – next to the upper flow of the river Tisza, one of the poorest areas in Hungary – were chosen both for testing the ecologically sustainable alternatives as the means of development for regions in serious depression, and because the Living Tisza Association found new partners there, and intended to start new projects (concerning local food self-supply and the rehabilitation of traditional farming methods in the flood area of the river.) In that region we have met other experiments of community based local enterprises, as well.

Erdőkürt in the Southern part of the Nógrád County is the heritage of a previous field research of us. The small village aroused our curiosity with its fierce and successful fight for their local school not to be closed in compliance to the recent trends of concentration in the school system. Sad enough, a strong local community capable to assert its interests turned to be a rare phenomenon in our country. The rehabilitation of local communities is the sine qua non for sustainable development, thus we decided to include them in this new series of investigation.

The present report is based mostly on the materials of the field research going on in the Őrség, and its content is somewhere on half-way between the starting hypotheses of our

work and an attempt to supervise them in the light of the new experiences of the field research still in progress.

II. Preliminary remarks on the concept of sustainability

We cannot do other than reject the widespread definition of sustainability referring to the Bruntland report because it is based on heterogeneous concepts. Sustainability of a system has no regard to "the needs of the present generation" or the future ones and the concept of the so called social needs is obscure: it is mostly subjective and one could hardly argue that the sustainability of any social order in history depended on its capacity to satisfy needs. Whose needs and what kind of needs? Actually, a living system subsists when the existential resources of its development grow richer in the course of its development, and it declines when its functioning uses up those resources. Quite a different approach can be offered from the viewpoint of the late Chicago School of human ecology. A follower of them, O.D. Duncan identified four components of the social organization called an ecological complex: the population, the social institutions they establish to assure their survival, the technologies they use and last but not least the physical environment they live in. The sustainability of a given social order supposes a dynamic equilibrium in the interrelations between those four factors. When it fails, basic changes are required in one or more of the components: in the number and the distribution of the population, in the institutional order, new technologies may be introduced to ensure the means of subsistence or migration may start in order to find a more appropriate environment. "Needs" have no independent explanatory force, they are simply the consequences of the given institutions and available technologies that characterize a civilization. Now the equilibrium is lost and dramatic changes are about to happen. We are looking for the chances of a shift to environmentally friendly technologies in the Hungarian agriculture, the capacity of our institutions to receive them, and the strategies of the people to make their living under and beyond the given conditions of the ecological complex.

III. Migration processes in the Őrség region and their impact on the local society

The mainstream human ecology focuses at the nature – society relations and it is more sensitive concerning the future dimension of the issue than history. Mainstream rural development studies concentrate on the economic context at the cost of both the natural and the historical links. Mainstream sociology offers a reliable description of the present state of rural Hungary, but its prejudice favouring the dominant concept of modernization usually prevents it from taking marginal trends and alternative interpretations into account. Mainstream transitology has its fixed ideas about what should happen in the post-soviet countries of Eastern Europe so it sometimes fails to recognize what actually happens. We do not suppose to be able to add too much to their scientific achievements here but will try to bring together these four kinds of knowledge.

Concerning the poor state of the rural society and economy in Hungary, most of the interpretations are limited to the explanation of economic trends and are busy to blame or

defend the policy of the governments or the EU on one hand and the incapability of the village people to adapt to the changing conditions on the other. I argue here that we cannot understand their behaviour without noticing that it is a mangled society living there deprived from parts and organs indispensable for normal functioning. Political preconceptions, black holes in collective memory, and the culture of silence (of non-speaking) make most of us, both the scholars and the country people themselves neglect or misinterpret the violent history of devastation having burdened the Hungarian countryside.

In the middle of the last century our villages lost the whole of their middle and upper classes, all the property owners and the great majority of their intelligentsia within two or three decades. Nothing since the Ottoman occupation could be compared to the social devastation of that period. The landlords and the "political class" - the noblemen - living among the "exploited" folk managed the complete administration of the countryside, mediated cultural patterns, and it was their activity that maintained the social and political life. (So did for instance the Sigrays, a family of aristocrats, who played an important role in the Őrség before their being expelled. They built the church in their village, organized social care as well as the armed resistance against the Yugoslav occupation in 1920.) In a different way Jewish merchants played a similar role in the local society interconnecting it with the outside world. A colourful series of services and small ventures disappeared from the Hungarian villages together with them. Their persecution and exclusion in the 40s happened with the more or less active cooperation of the village people and still today the descendents of the latter refuse any questions about the fate of the Jews. In Őriszentpéter no one was willing to inform us about the original destination and owner of the buildings – the largest ones in the city - that proved to be Jewish property before the war. In the following decades the communist government attacked, robbed and partly deported the landowners, destroying the complete rural middle class. In the borderland it went on even more cruelly – as a preparation to the war against Yugoslavia and the imperialism. In 1951 hundreds of the best farmers – the class enemies – were exiled from the Őrség and suffered in the Hortobágy labour camps under the most inhuman conditions for years. Some of the survivors could return to their homelands in the sixties, but many of them moved to the cities.

Class struggles resulted in the complete destruction of the peasant society and the traditional agriculture together with the capacity of social self-organization. And that was the real target of the measures. After these preparations violent collectivization did the rest: the mobile part of the village society, especially the younger ones escaped and disappeared in the melting pots of socialist industrial centres. Those who stayed at home became subordinate workers of the agricultural co-operative and lost their deep knowledge of farming in the totalitarian labour organizations. The lack of farming and business skills is one of the components that can explain their insufficiency and drawbacks in family farming. We have found significant differences between the inhabitants' dispositions to conduct an agricultural enterprise in the villages that went under collectivization and in the exceptional ones where private estates have survived.

The biggest tide of migration in the Őrség, however, has begun only in the nineties and is still lasting: some half of the village population have found work in the cities and the industrial areas (and at the same time have lost their subsistence at home), actually without becoming urban citizens. They are the society of commuters sentenced to lead a double life: one in the cities where they have remained aliens, and another in their native villages

where they have turned to be aliens in some way, too. The inhabitants of the Őrség got to know the 'benefits' of commuters' lives only after 1989 when the strict limitations of free mobility in the borderland came to an end. At the same time, the collapse of agriculture (both of the markets and the organizations of production, the co-operatives) and the loss of their former jobs urged them to exploit the new possibilities (and themselves) the same cruel way as their parents were by the quota delivery obligations, collectivization and political terror.

Modernist preconceptions, however, make us believe that the move of the people from the villages to cities is necessarily progressive, and it is the normal way of improvement in a modern society. Be violent or not, mobility trends of the communist era led into the right direction and finally served the welfare of the masses. In fact, modernization means urbanization, but it can also take place by distributing the gifts of urban civilization between the smaller settlements instead of forcing their inhabitants to abandon their homes. In Eastern Europe a violent drive for industrialization and a despotic attempt to reorganize society made the governments prefer the forced concentration of the population. Urbanization proved to be a more consolidate means than camps to make inarticulate masses of the members of a local society. And the result of the forced mobilization was soon called social mobility by the sociologists, as well.

As far as the Őrség is concerned, after 1989 another trend of migration arose, too, but towards the opposite destination. Victims of forced urbanization started to leave the overpopulated and over-polluted sites of their lives and rediscovered the beauty, health and spiritual values of rural life. The Őrség was a popular location for them. Our investigations will give a more detailed picture of their attempts of integration into the local society and the special characteristics of their situation. I would stress now only two features. First, they seem to form another society, independent from that of the native people, thus the attempt of integration has failed. Second, we have found immigrants to be the pioneers of community building as well as ecologically sustainable ventures. However, these outsiders engaged with the revitalization of the Őrség and its local traditions have remained a bit suspicious in the eyes of the native people. And one cannot deny a sort of empathy concerning their distrust. During the last decades different kinds of urban people came here to solve their problems. They tried to convince them again and again that they knew better how to live, think and produce in these villages. They tried to make them accept new ideas and new practices and at last it was the local people who found themselves cheated and robbed.

The victims and the executioners of the late terrorist systems live together silently. They learned the culture of silent resistance. And at the same time they forgot the culture of cooperation, openness and solidarity. They do not trust each other. They do not trust themselves, either. And they definitely do not trust strangers anymore.

We seem to have arrived to the Őrség in the years of new and critical changes concerning both migration and depopulation.

- The last generation with agricultural expertise is about dropping out and it is dubious if they can pass their farming expertise together with the farms themselves to their descendants.
- A significant part of the estates – both lands and houses - have silently gone into the hands of foreigners, mainly from the Austrian neighbourhood.

- A great number of former commuters are now losing their jobs in the cities and must return to their villages but without any special competence in farming.

The consequences and interferences of these processes can hardly be assessed now, but their relevance concerning the future of the region is unquestionable.

IV. SOCIAL STRUCTURE – THE METAMORPHOSES OF THE TWOFOLD STRUCTURE

The totalitarian experiment to eliminate social differences lasted for forty years, it broke traditions, ruined the middle classes and mobilized the masses in various ways in the physical space forcefully. In the transition period, when a rehabilitation and restructuring of the Hungarian society took place or was at least anticipated, the new frameworks could hardly be recognized and the interpretation of structural changes primarily depended on the way of conceptualization.

In this paper I refer to the well-known approach of Ferenc Erdei and I will argue that the twofold social structure of the Hungarian society and especially that of the rural society recognized by Erdei in the thirties has survived in different forms and considering its re-consolidation is a key factor in understanding some of the latest developments in Hungarian society and its twofold economy. I am speaking about a twofold structure as Erdei himself did, and not a double one. The difference between the two is that there are no frontiers between the two segments of a twofold society: it is basically the same population that participates in both, and the situation of a given social group is determined by its relations to the two subsystems: the one organized by and around the state, and the one organized by and around a market-type competition of individual and independent entrepreneurs.

The relatively successful consolidation of the socialist regime was primarily based on the strong feudal and bureaucratic traditions of state absolutism. And they could very well survive after the transition. In the Őrség region the majority of the population belongs to this state-dominated and state-dependent segment of the society. The state, the public institutions and the municipalities maintain more jobs in the villages than private ventures do. Direct governmental (and an increasing European) redistribution of financial means from central budgets, and also of duties and privileges, is the dominant resource of family subsistence, and it is essential, for the survival of the so-called private enterprises, as well. Privatization was the last and also the greatest act of redistribution in this country and is spoken of by our informants as the source of the most serious social conflicts and ressentiment up to now. It has been often reproached that the land, workshops and the equipments of production nationalized some forty years ago in a terrorist way now, in the course of privatization, went into the hands of the members of the local elites, the leaders the of co-operatives and their business partners. In the Őrség it is a general opinion, that re-compensation was the source of the greatest injustices. The directors of the re-privatization process had gained the best lands, and later the compensated ones, in a total lack of money, machines and other means of production, sold their small estates practically for nothing. Finally, most of the new concentrated estates have been acquired by foreigners. The land now cultivated by a Dutch farmer is the property of an Austrian landlord.

It is not the deportations and the brutal violence of collectivization that the local people mention repeatedly but the destiny of the collective wealth in the course of its privatization

and the sophisticated ways of discrimination they suffer in the competitions and tenders for state supports. Indeed, state intervention is preferred to market competition by most of the actors in our economy. One can be easily mistaken by the "democratic", expertise-based and decentralized decision-making processes forgetting that this kind of redistribution of subsidies from the national or EU budget is now the most important channel of the central (planned or manipulated) redistribution system. Bargaining and even corrupting the process of decision-making is a central issue in politics at the local, the national and the continental level, as well. The new political and business elites have organized around the new "competitive" resources of redistribution: the tender calls. Surprisingly or not, the functioning of the system has proved to be very similar to the one described by Gábor Vági in his 1982 report titled "Competition for the development resources".

It is the competition for subsidies, supports and scholarships that determines the "market" successes and failures, as well. But a relative majority of the local workplaces in the Őrség, like in most of the under-developed rural areas in Hungary, is directly managed by the authorities: the municipalities, the national park, the social service system and so on. Their relative dominance is a consequence of the recent collapse of market economy and private enterprise. Below, at the bottom of the social pyramid, there are again beneficiaries of this state redistribution (gaining a small share): the pensioners – the majority of the population in many of the small villages -, the old, the disabled and those who have lost their jobs if they had ever had one at all. State economy is the last source of their subsistence.

And what about the market section of society, the private enterprises, their owners and their employees? A thorough examination of their management proves that the well performing farms and companies are the ones having been able to accumulate capital owing to their positions close to the local or national resources of redistribution during and after the time of the planned economy of socialism. The price of the peaceful transition in Hungary, which we were so proud of, was that positions owned in the hierarchy of the party-state era could be converted to positions in market competition at a nominal value. And skills developed in the late system proved to be useful in the new situation. They are not market skills at all.

The local industry primarily based on agriculture, local natural resources and traditional knowledge could not survive the transition. The former plants in the area, no matter if they produced shoes, bricks, cheese or coffins, gave up with one or two exceptions. Their termination meant the loss of an essential basis of sustainability: the capacity of the localities to offer jobs to their inhabitants and to keep them from moving away. Industrial workshops in the surrounding cities gave work to the commuters from the Őrség villages in the next decade. They were owned by foreigners or international companies. The late crisis made them, too, limit their activities and dismiss more and more of their workers. Low educated villagers became the first victims. Private enterprises in native hands with more than a dozen employees are very rare in this region, altogether four or five (!).

Concerning family farming, the situation will be detailed later as a special object of our interest from the viewpoint of sustainability. Tracing the ups and downs of its destiny served us with interesting conclusions concerning the nature of structural changes, too. While the so-called second economy of the late socialism in Hungary let legal and semi-legal freedom to individual enterprise and market relations, especially in agriculture, which could be utilized by both the individual farmers and the co-operatives, we had to face an

opposite trend after the years of political transition. Political freedom was not accompanied by an improvement of the business conditions for the inhabitants, at least not beyond the level of declarations. It's not a surprise, that Hungarian smallholders, possessing serious technological disadvantages and completely lacking productive capital which they had been deprived of a long time ago, could not answer the challenges of a free market full of strong and well-supported foreign competitors. The surprise is that the Hungarian governments – practically each of them – let them alone in their helpless situation. After the privatization of the co-operative estates individual farms ruined within a single decade. The Őrség, once a location of livestock-farming, dairy, forestry and fruit production proved to be incapable to give subsistence to its inhabitants. They had to give up their market positions enjoyed in the second economy of late socialism and retired to self-supply and the grey economy of local barters. What a defeat compared to the days of goulash-communism! And let me put it straight: they weren't defeated in a market competition, they could not even get the market dominated by multinational trade companies and agro-industry. The small village shops in the far Őrség are supplied with food from the same Bosnyák Square resources of centralized distribution as Budapest, and the local fruit-trees are cut and the cattle slaughtered, while the local smallholders have been kept away from local sale by sophisticated legal means. Small family farms have no future in the Őrség.

We have identified a special kind of small enterprises, mostly in urban immigrants' hands or managed by those who have returned to their place of birth after an urban career. They follow more or less ideological purposes when starting some sort of cultural or agricultural enterprise. They are engaged with the revitalization of the countryside, to green ideas, local traditions or a postmodern spirituality critical of mass culture, industrialization and consumerism. They are like followers of a religious movement. What is common in each is that the purpose of their enterprise is not economic in the narrow sense of the word. They are not especially interested in making more profit. Business success would only be the justification of the viability of their ideas and could serve (could have served) them in settling down and living their own lives. Sad to say, success mostly keeps away from them, and though they follow different strategies, they are not more successful than the native farmers.

Nevertheless, immigrants play an important role in the society of the Őrség and their presence could strengthen the sub-system of private enterprise and the horizontal cooperation between civic institutions independent of the state hierarchy. They are the initiators of cultural events and sustainable agriculture. The most beautiful old houses have been reconstructed by their new, urban owners. They operate the majority of the houses and farms open for visitors in the days of the summer festival “Hétrétország” organized, too, by an immigrant urban intellectual. When we speak about villagers, they must also be included. They are the same members of the local society – those who spend the greater part of the year in the Őrség or display most of their social or economic activity here - as the native people spending their workdays in distant cities and generally neglecting the public life of the local communities. Villagers are those who actually act in the villages, now this definition is a radical split from the dominant approach looking for an authentic rural society with traditional roots. The later does not exist anymore. It is part of our task to try to understand the ways and gaps of coexistence between the rest of the former rural society and the immigrant population, each of them dominated by part-time workers and part-time villagers. And it is not surprising that the immigrants play such an important role

in private enterprise, not only because they generally are higher educated or have more money but also because the majority of them are disappointed losers of free competition in the urban society they have come from. They are the victims of a violent and miserable urbanization and also the victims of illusory expectations about free initiative now moving into the countryside in search for an alternative field of activity.

V. FARMING CONDITIONS

The Őrség people were traditionally used to build their households on various resources. They found employment in the local industry, manufactured goods and sold them, worked for the border-guards, state forestry, national railways and other communal networks, or commuted to the next cities to find jobs. They worked in the cooperatives and beside all these they managed their private farms and cattle in their free time and sold their products. It is for the first time in their history that all these means of subsistence are running out at the same time. Still they do not seem to be lost. They rent their houses for tourists, produce food for home consumption and exchange it with their neighbours, have some income from woodcutting for (or in the ignorance of) state forestry or utilize their own forests, are looking for jobs in more distant cities or abroad and are busy to become pensioners as early as they can. They sustain themselves in some way or another, but their strategies of subsistence are far from the concept of social and ecological sustainability.

We use the term "sustainable economy" as it is generally taken. Its features are:

- a greater contribution of local knowledge and local natural resources to production that gives work to local people and allows a greater share of locally realized income,
- a limitation of distance between the place of production and that of consumption and an increasing capacity for food self-supply,
- an absence of environmentally harmful or devastating, unhealthy and cruel technologies,
- the preservation of biodiversity and the use of its resources to an extent that does not exceed their renewal capacities,
- economic activities that strengthen the cooperation and solidarity links between the people living together and serve local autonomy.

In an area rich in natural resources like the Őrség, the dominance of agriculture, including the local industry processing its raw products, would fit those demands. The technologies used by the small ventures are generally more environmentally friendly, they employ local knowledge and are more embedded in the local social context. The presence of workplaces and the increasing use of local resources limit transportation and strengthen the autonomy of the community. These are the presumptions of this research. They made us turn a special attention to family farming and food self-supply. I am going to give here a sketch line of the economic conditions in the Őrség area with a special regard to them. A more detailed report will be made later in the course of this research work.

(Land use, bigger ventures, livestock farming) There are 6000ha of uncultivated land in the Őrség. Most of them are former pastures and grass-lands having been given up since

the traditional livestock farming has lost its profitability. Obscure property conditions sometimes make it difficult to tell who the owner of a certain land is. A significant rate of the fields has been bought by foreigners, who do not necessarily cultivate them, while land is impossible to be bought in some of the villages. Austrian farmers owning an estate in Hungary can make use of the differences in prices and administration in many ways. They can prove the presence of the capital necessary to apply for Hungarian supports and subsidies, and are equipped with much higher level technologies. Most of them do not employ Hungarians. They despise the native people who sell their lands at low prices and spend the money soon.

The majority of the bigger estates grow grain crops. They do not fit the local conditions but are easier to grow, need less human work and meet the requirements of the EU supports, the main target of agricultural activity in Hungary. The biggest sales turnover in the area is performed by a floricultural farm. It is the best example of ecological unsustainability of the well performing agricultural enterprises in our days: its seeds, vessels, chemicals and even the soil is imported from abroad, together with the plastic layer that separates these hermetically from the land as a symbol of alienation from local environment. But the excellently managed enterprise gives work to 30 persons all year round and to much more occasionally. Greater livestock farms – only a very few of them have survived - function the same way but with much fewer employees or without any. They buy both the animals and their nutriment from their trading partners (the so-called integrators), then after having been fatted, the cattle will be taken away to be slaughtered and processed somewhere else. The locally added value of this business is minimal, hardly enough to keep up a family with no employees. The big milk farms resigned when the system of harvesting collapsed owing the impact of worsening market conditions as the processing industry and trading networks were acquired by foreigners enjoying a monopolistic position against the defenceless small producers. The latter could survive mostly in the villages where co-operatives were never organized and the traditions of private enterprise were preserved. But the prices dictated by their partners can hardly cover even the animal feeding costs. The farmers must spare the salary of the herdsmen, and the poor animals are kept in narrow stock-yards all their lives. While co-operatives once gave work to the whole village and supplied various sorts of services for the local society, today private ventures are unable to support the community under these poor conditions, on the contrary, they sometimes try to exploit the communal services without paying for them. They work extremely hard for a modest income and still they are not popular in the eyes of their neighbours at all.

An unlucky interference of the European and the national policies have made livestock farming collapse in this country, and the animals seem to have disappeared even from the Őrség where they gave the basis of the farmers' subsistence for centuries. Actually, they are present in a much limited number, mainly for family supply purposes and for trading in the grey economy, but most of them can see the sunshine first when they are taken to be slaughtered.

(Human resources) Urban life and industrial work was taken as the only way of progress for generations, and the farmers' children learnt to despise farming. Agriculture seems to have lost its respect in the eyes of countrymen. The young ones plan to escape from their birthplace if they can, and the last generation with a thorough expertise in farming is about dropping out now without any hope to be able to pass their knowledge to their

descendants. The poorest and least educated stratum of the village society spend their lives workless and are already even incapable of work, the “social benefit for labour” programmes have come just too late for them. The farmers cannot employ even those having lost their jobs in industry recently, because they know nothing about agriculture. So the lack of jobs and the lack of workforce walk hand in hand in our villages. Technical training schools are poor in number and quality, their profile does not always fit the characteristics of local farming, in fact, it is quite uncertain if they could attract the local youth even in case of a more adequate training supply. Only a small minority of the village youth plan their future in connection with agriculture. And the economic conditions prevent them from being able to realize their dreams.

(Demand and supply) Livestock farmers – and not only they – have given up animal keeping in the absence of market demand for their products at a reasonable price. The recently established milk processing plant in Szalafő will import milk from Slovenia owing to the lack of local milk supply. Cheap imported food of the worst quality with a massive promotion by multinational trade chains practically killed local production and it cannot be easily revitalized. There is no marketplace for the smallholders in the area. The leaders of the small city in the heart of the Őrség region refused to establish a local market referring to the lack of local products and also insisting that the villagers prefer the supply of the supermarkets. In the middle of this city there are two supermarkets and two greengrocers' stands selling fruit and vegetables bought from big wholesale networks. Their products travel hundreds or thousands of kilometres from their unknown location of production. While handicraft has a great tradition and some sorts of locally manufactured products are famous (pottery, brandies etc.), there are no sales stands for them. Tradesmen sell East-Asian mass products from their paper boxes at the roadsides.

(Trade regulations) EU decrees allowed family farmers to sell their products only locally and unprocessed. Our farmers are now prohibited to sell their home-made cheese, sausage, marmalade, brandy or wine even in their own houses. Owing to the permissions, certifications and official expert opinions demanded for marketplace sale it is not worth selling raw products. Milk from the local farms is banned to be used at the local canteens, and schoolchildren are made to drink the dubious products of chemical adjustment and food processing industry instead. To sell the meat of the cattle brought up and butchered in the family farms of the village is strictly prohibited. Native local species of fruit-trees are excluded from trade unless they are registered by the authorities. Biodiversity is not permitted without an official licence to exist. As a matter of fact, smallholders on the other side of the Austrian or Slovenian border suffer none of these kinds of limitations. It is the Hungarian government that missed to make additional regulations that specify the conditions of retail trade and could defend the traditional methods and products as it was suggested by the Cork Declaration. Village tourism, the country fairs and festivals have lost an attractive and popular kind of supply, and it is turning into a serious disadvantage in the international competition for guests, not to mention the advantages of healthy food in local supply. Most of the limitations are explained referring to the sanitary regulations, but their real motives are not so much connected to health care but the discrimination of family farming by mainstream agro-politics. However, the superiority of large estates and concentrated production is far from being evident in agriculture. None of a European comparison, the special Hungarian conditions, the market successes or the interests of

environmental sustainability can justify their being preferred. Anyway, it is not free market competition but official discriminations that are ruining family farming in Hungary.

(Competition for supports and the absence of capital) The absence of equal conditions is obvious in the allocation of governmental supports, as well. Bureaucratic requirements, over-complicated administration, the lack of the own resources demanded of the applicants and the post-financing system prevents smallholders from participating in the competition for supports. Agricultural ventures are excluded from the majority of the rural development tenders. The New Hungary Rural Development Plan contains an application for beginners in farming, but the amount of the available money has been far from being enough for the real beginners. As a result of the co-operative system most of the means of production are absent from family farms: stables, machines, animals, cash etc. Credits were as indispensable for the reconstruction as they had been in the time of István Széchenyi, but the banks had no intention to share the risk of a sector with such an unstable future. The interest rates are extremely high, and the loans are very difficult to be refunded in the agro-business sector. The supports available for the participants of environmental programs could fit the local conditions in the Őrség (grassland reconstruction, pasturing), but farmers are discouraged by the quantity of the requirements and the strict rules to be taken up.

VI. SOURCES OF NON-COOPERATION

Under the serious conditions described above smallholders should easily recognize the necessity of cooperating in a way or another. Traditional farming (and especially livestock farming) was supported and surrounded by the indispensable links of solidarity and cooperation in the village society. Family households as the basic economic organizations of a traditional society could count on the contribution of a lot of adult and adolescent members and they had their strict and hierarchic organization of labour distribution. Beyond that, families were interlinked by kinship and neighbourhood threads to the network of mutual aid. Forestry, pasturing, land-use, building their houses and celebrating their feasts were all comprised in this strong mutuality. Some elements of these traditions could survive until the last decades but the forced cooperation in the "kolkhoz" organizations had allowed no kind of real togetherness for generations.

In the Őrség this all was accompanied by the trauma of the deportations and the borderland situation: being continuously observed and burdened with the heavy obligation of informing the authorities on each other. Suspicion and distrust became the norm. There were so many things not to speak about: family descent, religion, politics, and finances. Distrust and suspicion dominated the everyday life, and this prevents these people from cooperation up to now. The privatization of the co-operatives divided communities again. Old and new injuries, conflicts and traumas made communication links weaken between the inhabitants of one and the same village. The situation did not become easier with the arrival of a new population. A relatively great number of immigrants moved to this region for the peace and beauty of its natural environment. They brought with them strange habits, alien to the inhabitants. And they soon became the owners of the nicest old houses, the former properties of the native families. They often appeared as the defenders of the "traditional" way of living as if they had wanted to teach the native people how to manage

their lives in their own villages. It is no surprise that the latter denied participation in those programmes and projects initiated by the newcomers.

However, the Őrség people may well have had a special intrinsic individualism, too, reflected by the traditional structure of their settlements. Actually, their villages have no middle. Separate groups of houses were built on the neighbouring hills, and this arrangement let less communication between the inhabitants than elsewhere.

There are many possible explanations but the fact is that a series of bad experiences and abrupt changes in their local history make the inhabitants of this area distrust each other, and they especially are precautious when they face new challenges from outside. These developments may be harmful in the present situation, when the ways of providing independent family subsistence seem to be closed. Even the intergeneration contacts make it difficult to maintain them. The younger ones do not intend to take the heritage of their ascendants over, neither the (agri)cultural traditions, nor the farms themselves.

Be it a consequence of market conditions or legal regulations, the present economic situation gives no chance for small-scale family ventures to survive in Hungary. And a radical change in mainstream agro-politics is rather unlikely. In Hungary, the big landowners' oppressive dominance and the peasants' misery has been a tradition unbroken for some five hundred years – it is perhaps the only sort of continuity in our history. It has proved to be sustainable for centuries owing to the strong support by the legislative power, it was as unjust in the time of István Werbőczy and his Tripartium as it is in our days when big businesses can easily assert their interests all over the world and especially in the countries where public opinion has no real influence on the government's decisions.

At he same time, most of the attempts of institutional cooperation and common ventures have failed in the observed region. (Actually, we could register only one exception: a sales cooperative of the bigger milk producers from two or three villages has been functioning continuously since the days of privatization.) The attitudes for and against cooperation will be revealed in our interviews. It seems that the discouraging factors are of many different kinds, and both the lack of finances and the lack of trust in the partners play an important role in their approaches.

THE REGIONAL AND SOCIAL DETERMINING SUSTAINABLE CONSUMPTION MODELS

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The paper presents the theoretical background, the concept, the first results, and some conclusions of the sub-research titled "The social mechanisms and interests determining consumption models. The model of sustainable consumption." The research is developed by the Institute of Sociology of the Hungarian Academy of Sciences.

The importance of the research is that the territorial consumer patterns radically changed in Hungary due to the globalisation and internationalisation. Based on the theoretical background the territorial consumer habits of the different social groups depend not only on the social-structural positions (qualification, occupation, financial situation, family background), but also on the residential consumer patterns. The new territorial consumer habits also represent the contemporary regional mechanisms (urbanization, suburbanisation, gentrification, social exclusion, regional, social inequalities, transition processes, the effects of the market economy).

The aim of the research is to reveal the different social-spatial groups' consumer features, and territorial consumer patterns, to explain the main determining factors (social, demographic aspects, economic, cultural processes, environmental circumstances, social attitudes and preferences) through several scientific methods (document and literature analysis, empirical tools: survey and deep interviews). The impact of the main (economic, political, civil, governmental and social) actors' interests, territorial consumer conflicts and ecological and social sustainable and unsustainable issues are also being surveyed. Finally based on the empirical results new sustainable territorial consumer models and some propositions will be developed.

I. INTRODUCTION

This paper is based on the sub-research titled "The social mechanisms and interests determining consumption models. The model of sustainable consumption" which is the main task of the Institute of Sociology of the Hungarian Academy of Sciences in the project „Sustainable Consumption, Production and Communication" organised by the Corvinus University.

The main goal of the research is to reveal the territorial consumption models formed and followed by the Hungarian urban social groups, and the determinations of the regional social-economic mechanisms and their interests. The research wants to analyse the consequences of the socially different territorial consumption models, and the unsustainable ecological and social issues. Another goal is to establish different sustainable territorial consumption models according to the real territorial consumption issues of the social groups.[1] The realisation of the research is actually only in the first phase, that is why

[1] To reach the goals, four methodological elements are being used. The first one was the elaboration and differential analysis of national and international academic literature related to the sustainable consumption to create the theoretical background. The second one will be the statistical data and related document analysis. Finally the main methodological element is the empirical research: questionnaire survey in the Budapest region and deep-interviews with the affected stakeholders. There is plan to carry out one control research in another

the aims of the paper are to introduce the research, to present the theoretical background, the concept and the first results and to draw some conclusions.

II. THEORETICAL BACKGROUND

The international and the European integration, the globalisation, the transition and the modernization processes reconstructed the Hungarian social and regional structure [1], the economy and the system of infrastructure which are influencing the territorial consumption [2].

Followed by the European trends the social-economic regional concentration and the correspondence between the social and the regional hierarchies were strengthening. The new developed global effects, the transformation of the social system, the regional-social concentration and these effects institutionalised, in addition to the transformation in the communication and press modified the historically developed consumer's behaviour, especially the territorial consumer's behaviour as well, the traceable and the exemplary models [3]-[5].

The territorial consumer habits and models of the social groups are generated by both the social-structural position (qualification, occupation, financial situation, family background), and the consumer patterns of the habitats (which are generated by the global urban consumption requirements and opportunities) [6]. Besides the above-mentioned processes the urbanization, the regional and social inequalities, the historical background, production and the distribution of the economic and commercial system, the influence of the market economy and the intervention of the state resulted in new type of territorial consumer models.

Due to the globalisation and internationalisation the territorial consumer patterns radically changed in Hungary and the analysis of this change will be the most important task of this research.

To establish the theoretical background it is necessary to make the concept of territorial consumption clear. In the international literature the concept of the sustainable consumption has been discussed for a long time. In this debate either the normative or the realistic conception, but the empirical approach is more characteristic. But in the creation of the concept of this research the normative model has to depend on the real empirical approach. It means that we have to analyse firstly the real territorial consuming processes. Due to these processes we will be able to create the different normative models based on the real regional, social and economic conditions, requirements and consumer habits.

III. THE NEW TYPE OF TERRITORIAL CONSUMER MODELS

Based on the theoretical background the empirical research focuses on the following issues:

1) The location of the different social groups in the metropolitan area, more exactly what kind of urban space do they consume by their place of residence? How did the territorial

urban region, where the economic and social situation is different from Budapest region. There are several experts (sociologist and geographers) participating in the realisation.

consumption change during the transition processes compared to the socialist period according to the globalisation and the urbanisation? And what are the ecological and social unsustainable consequences of the territorial consumption?

The segregation of the different social groups is clear, the centres of Hungarian urban areas are concentrating high social classes, high-educated and qualified professionals earning high salaries, while low social classes generally live in the peripheral parts and in suburbs of low social prestige. However some groups of handicapped classes do live in the city centre as well and the percentage of high social classes is also significant in suburbs [7].

There is a core-periphery model of dual social structure where the traditional model of socially high-ranked centre with low-ranked periphery has been extended by another scheme of low-ranked centre and high-ranked periphery. All these processes have created a new type of socio-spatial unit.

This regional, urban model resulted and manifested at the same time the creation of the new territorial consumer habits as well. In the socialist regime there were very remarkable differences between the social structure, and the habitat requirements of the different social groups. The social structure of Hungarian population was more structured than the spatial social structure (due to the historical cultural heritage, and educational level differences and due to the income differences in 1960's after the socialist reform processes). More exactly, the social differences were not able to appear in the territorial structure. On the other hand the different habitat requirements of the social groups were not able to be manifested in the territorial system. In this period the Hungarian territorial system was more homogenous compared to the Western societies, the segregation was not too much characteristic. This phenomenon was determined by several mechanisms, such as the ideological effects of political regime and the allocation consequences of the redistributive housing system, which aimed at managing the social inequalities.

During the transition the social structure inequalities developed and manifested in the territorial system due to new housing market effects and the possibilities to realise of the old and the new habitat requirement of consumption: These periods created new habitat gated communities, not only in the suburbs in the large cities but in the city centres as well. Suddenly the long time hidden habitat requirements and the new habitat preferences emerged, especially among the middle class groups who wanted to live in the most protected and gated areas of Western style. This period was the suburbanisation as a new territorial consumption trend, which realised several unsustainable (ecological) issues. The habitat requirements of lower social groups created different phenomena, they were forced to change their residence because of income or unemployment problems, or the increase of the urban property prices. These also mobilised the growth of suburbanisation and unsustainable issues, the increase of traffic and pollution.

In the Hungarian urban regions besides the suburbanisation the gentrification also emerged, due to the renewal of the historical city centres, the rehabilitation processes. These phenomena resulted in the improvement of green areas, but unfortunately an unsustainable issue was caused as well, the growth of social exclusion.

2) What were the consequences of the new regional social structure, and the reorganisation of the territorial consumption habits on the everyday life consumption in the place of residence of the different social groups? Where are the everyday life

consumptions of the different social residential groups localised and are these consumptions more global or more local?

Due to the modernisation, and the global urbanisation, and the spatial position of the economy and the work places the local everyday life consumptions no longer exist, but probably there are certain differences in the everyday life consumptions based on the characteristics of the social situations and the local facilities of the residences. A possible hypothesis is that the everyday life consumptions of higher social groups are more global than that of the lower social groups.

The localisation of the everyday life consumption generate a lot of unsustainable issues in the urban areas, the increase of heavy traffic and its consequence the pollution. The inequalities in the localisation of urban facilities intensify also the social inequalities. In addition to the disadvantageous social and regional position, the large distances cause difficulties for people to organise their everyday life consumption.

3) In connection with the everyday life consumption it is an especially significant issue to analyse the consumer habits of the public service of the different social resident groups. The question is: what do groups consume considerably from the various urban public spaces, the public institutions, the social infrastructure constraints in the different type of residents? What are the determining factors of the public consumer habits?

The public service consumer habits produce a lot of social unsustainable issues. The differences which appeared in the use of public services (public institutions, the social infrastructure) strengthen the social inequalities. The social conflicts take place for example among the middle class groups and the disadvantageous people in connection with the use of public green areas or the public place, and public transport. These issues are examples for the territorial occupational conflicts.

4) The final step is the creation of the different territorial and social consumer models. The models will include three important elements: the presentation of the location of the different social groups in the metropolitan area, the observation of the territorial consumption habits of the everyday life consumption, the analysis of the public service consumer habits. During the creation of these models the researched elements will be connected with their sustainable or unsustainable consequences, their ecological and social issues, and conflicts. Finally the propositions: how can we change the models and where do we have to change them based on the social and regional circumstances and possibilities and on unsustainable issues?

IV. THE CONCLUSIONS

It is clear that the current processes of modernization, regional transformation, the new trends of global urbanization, the bourgeois development, the transformation of natural environment, which suffered from the consequences of the recent global economic crisis, and all their territorial ***consequences*** convert the social conditions and interests of the urban societies.

Characteristically these processes transformed the territorial consumption models and the social requirements of the territorial consumption of the different social groups as well. These transformations strengthened not only the regional, urban inequalities, and

mobilised the territorial expansion but they also created the new territorial consumption conflicts and unsustainable ecological issues.

The problem of sustainable consumption certainly receive a new interpretation, the values of sustainability will certainly increase, because the number of groups who are unsatisfied with the contemporary territorial consumption models increase.

Based on historical overview sustainability, sustainable development, sustainable consumption and sustainable territorial consumption show that the concept of sustainable development has given a new approach to development itself. On one hand the new approach synchronizes the social, economic and ecological points of view, and interprets the economic, social and environmental circumstances as complex phenomena. On the other hand, the development is not quantitative, but rather qualitative.

The needs play key role in the basic concept of sustainable development, namely, that these needs have to be accessible for everyone at the same level of consumption. This classic approach is also acceptable for the research, but this concept is too normative, so the real question is rather connected to the possibility of the implementation of these social needs. How can needs be provided for everyone? The question is used not only because of today's financial and market crisis, not only because of the welfare states' problems, and not only because of the left-over welfare system of socialist states. But also because we do not recognize these needs. There are too many demand models, which are normative and remote from reality without empirical experiences. But these needs (either on local or national level) and their potential satisfaction possibilities are socially and geographically very different. That's why it becomes a very important scientific mission.

There are other important scientific questions such as: who decides about the interventions to change consumer habits? Who benefits from this and who will be the victims? And what do the victims think about it?

The sociological question is the clarification of the social background, and the discussion of necessary social conditions. These social interests and determinations are largely unclear, due to the lack of empirical researches in this field. The limits of social participation make social interests unclear as well. In Hungary, after the transition in the 1990's, the Western consumption patterns influenced the Hungarian middle class consumption habits but broad social strata were excluded not just from the consumer models, but also from the decision-making mechanisms.

In Western Europe already in the 1970's, the necessity of responsible and sustainable consumption became evident. During the 1980's the unsustainable development issues, the symptoms which were seen by Hungarian and Eastern-Central European experts became increasingly evident. The European integration created the possibility of sustainable development and the programs and strategies of environmental protection in the Central and Eastern European countries, including Hungary.

The Western European and North American literature generally examined the consumption of individuals and households, such as food consumption, household energy, travel and transport. These fields are very important but this research chooses one specific approach, from the individual level this research moves to the community level, and particularly to the (urban) residential areas. It analyses the territorial consumer processes, the determining social and regional conditions, and the ecological and social sustainable issues to create different territorial and social consumer models.

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MAPS FOR STORMY AND SUNNY DAYS
A COMPREHENSIVE MODEL OF GDP, THE ECOLOGICAL FOOTPRINT, AND SUBJECTIVE WELL-BEING

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In this paper the environmental loads and well-being of countries are investigated. We sketch two maps through the practical regrouping of the classical IPAT formula. These maps help strategic decision-making in a world with limited resources. Data are gained from gross domestic product (GDP), ecological footprint (EF), and subjective well-being (SWB) databases. This may be helpful for elaborating strategic portfolios for different countries and country-groups. Our model of economic activity, environmental limits and human happiness suggest that both our economic activity and our happiness need to be somewhat dematerialized.

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I. INTRODUCTION

Kenneth Boulding's view of spaceship earth gave us a new view regarding the connections of economy and environment [1]. The cowboy-economy did not face environmental limits, and while locally some resource shortages might have arisen, people could move to a new, undeveloped area. Mankind lived in a situation like this for thousands of years, a time when *population* times *consumption per capita* had insignificant effects on the whole world biosphere. Mainly small, geographically restricted areas could have experienced something different, like islands, where no escape from ecosystem collapse was possible (see, e.g. the collapse of the Easter Islands civilization [2]).

Now, in the 20th and 21st century, cowboy economies have come to their natural end − there is no possibility to move on after using up our environmental resources. Our whole Earth is like an island: we everywhere face the limited capacity of the ecosystem to sustain human activities. Boulding used the metaphor of a spaceship for this situation (see the detailed story of this metaphor in [3]), but here we rather use the metaphor of a sailing ship to depict the situation of mankind.

To steer this global ship correctly requires solving two important problems: we should (1) decide where to go, and; (2) bypass dangers, such as running aground or into an iceberg. To sail well requires a good map to identify our position, and a compass for analyzing the best way of reaching our destination. Additionally, we need emergency plans for stormy days (which pay attention to natural limits, namely to sustainability). However, dealing with possible catastrophes is insufficient in itself: this only results in aimless wandering around reefs and icebergs. So dealing with ultimate ends − salvation and the happiness of mankind − will be referenced here as working with good weather (sunny side strategies); while avoiding the danger of stormy days or on dangerous road sections, which we will call dark side strategies. Actually, both kinds of activities are essential: preparing ourselves for dangers and always keeping one eye to our final destination are important tasks, to be performed simultaneously.

II. METHODOLOGY

At the macro level, for a danger warning signal, one of the best possible analytical tools is the IPAT formula developed by Ehrlich, Holdren and Commoner ([4], [5], [6]; for more details on this topic see [7]).

$$I_{environment} = P * A * T_{environment} \quad (1)$$

Here, mankind's load on the environment (I − Impact) is viewed as three factors acting together: population (P), affluence (A), and technology (T). This model has been developed in many different ways since the 1970s, we will not go into details regarding these attempts.

Measurement of these factors is crucial. P will be dealt in its natural dimension (capita). A is usually be measured by GDP/capita; we also use this method (GDP is measured in US$, in purchasing power parity). One of the most comprehensive measurements of I uses the ecological footprint conception [8]. It is measured in global hectares; later in this article, for the sake of simplicity, we omit the word 'global'. Thus for T, the most obscure factor in IPAT, we get Ha/$, which is a measure of *material intensity*. So our equation, written in units of measurement will look like this:

$$Ha = capita * \$/capita * Ha/\$ \quad (2)$$

Developing an analytic macro-level destination indicator system has been given less attention till now. The question "*for what purpose* is the human transformation of nature?" is strongly related to the question "what is the use and aim of human life?" This age-old question can be answered in many ways; we, on pragmatic grounds, must commit ourselves to using the subjective well-being (SWB) conception using data from the most comprehensive worldwide database [9]. It is usually measured by a ten (1−10) or by an eleven (0−10) grade scale, wherein the highest value refers to the highest subjective well being or happiness[1]. To gather this data, the responder should consider a question similar to this: "*Taking all things together, how satisfied are you with the life you lead?*" [10]

This measurement helps us to view not just the dark side of human activities but its positive side too. Now we are able to reformulate the classical IPAT formula with a modified focus:

$$I_{happiness} = P * A * T_{happiness} \quad (3)$$

Now, it is clear, that human activity ($P * A$) − as a starting point − contributes not just to environmental load but to human well-being as well, because increasing human well-being is usually the main motive for transforming and exploiting our natural environment. Of course, subjective well-being has not an exact origin from human activity: there are lots of other subjective factors combined together (psychological, cultural, behavioural); these can be summed up in the factor $T_{happiness}$. Using units of measurement our equation can now be written as:

$$aggregate\ happiness = capita * \$/capita * aggregate\ happiness/\$ \quad (4)$$

So our T values ($T_{environment}$ and $T_{happiness}$) are practically-chosen efficiency ratios. Analysing environmental effects it is important that a given economic activity ($P * A$) accompany to the minimum extent environmental effects; that is a dollar of useful human

[1] We refer to *subjective well-being* and *happiness* as synonyms.

activity should be gained through a minimal ecological footprint. This is a well-known result of dematerializing − or angelizing − GDP. However, the direction of this effort turns back at the realm of happiness: maximizing the effect of human activity on human happiness is a suitable effort. Thus, raising $T_{happiness}$ means dematerializing human happiness.

It is possible to connect the sunny, happiness-related; and the dark, limited resource side of human activity by combining and regrouping equations (1) and (3). Dividing both equations by $T_{environment}$ and $T_{happiness}$ respectively, we gain:

$$(I_{environment} / T_{environment}) = (I_{happiness} / T_{happiness}) = (P * A) \quad (5)$$

Because $I_{happiness}$ has a declared subjective character, its content as a per capita value is more understandable. It is valid for $I_{environment}$ hectare values too. Then it is worth dividing (5) by P, and we gain:

$$([I_{environment}/P] / T_{environment}) = ([I_{happiness}/P] / T_{happiness}) = A \quad (6)$$

This double relationship makes it possible to draw our maps to aid strategic orientation. Both maps use coordinate systems, which have on their x axis the corresponding GDP/capita values, while their y axis shows the corresponding T values ($T_{happiness}$ for our sunny-side map and $T_{environment}$ for our dark side map). These kinds of maps have hyperbolic iso-quant curves: they always show a fixed average happiness ($I_{happiness}/P$) or a fixed environmental load per capita ($I_{environment}/P$), respectively. Every data point on these curves represents the same average subjective well-being or ecological footprint per capita.

III. A STATIC ANALYSIS

The above explanations help us to clarify the strategic position of every country in the world. Our chosen period is 2005, the latest year for global widespread and comparable ecological footprint data. We use data from 143 countries, covering 99% of the world population [11]. GDP data for 2005 are from World Bank *World Development Indicators 2007*, while the data for ecological footprints are mostly from the WWF *Living Planet Report 2008* [12]. Because our starting database is completely the same as was used by the Happy Planet Index 2.0, it is worth studying their additional remarks regarding country data [11].

Figure 1. helps to identify dangers regarding sustainability (based on 2005 data), and reveals possible danger-averting strategies too. Regarding limited environmental capacity, it is important to examine how many hectares of ecological footprint was used up to produce 10 000 dollars of GDP (Ha / 10 000$ on Fig. 1). Diminishing $T_{environment}$ refers to more efficient technology and less material intensity. Fig. 1. shows two iso-EF curves: the lower of which shows an ecological footprint of 2.1 hectares per capita, which was sustainable in 2005 according to calculations. The higher iso-EF curve has all the points of 5 hectares per capita, which shows us in serious environmental deficit. The data points of our maps represent countries of the world; their formulation refers to sunny times; that is to average SWB values in the country.[2]

[2] Less than 5 average SWB in a country means ‘nonhappy’ in Fig. 1, between 5 and 7 it is ‘happy’ while over 7 it is ‘very happy’.

The upper parts of Fig 1. show countries with low environmental technological efficiency (more than 5 hectares / $10000), while they also have low GDP per capita values (less than $5000). So despite their low environmental efficiency they are still sustainable (at least according to the concept of EF) as they are usually positioned under the 2.1 hectare iso-EF curve. They mostly are unhappy countries; only some have higher than SWB=5 value, which value divides happiness and unhappiness on a 1−10 scale.

On the other end of the map (bottom right) we see the world's most wealthy nations. They have far more than $10000 GDP per capita but they have serious environmental deficits: there are plenty of countries which have a far greater EF than 5 hectare per capita, which is completely unsustainable. Ecological efficiency poorly improves in these cases when GDP per capita increases; only 5 countries display a lower ratio than 1.5 hectares / $10000 (Singapore, Germany, Netherlands, Austria and Switzerland). Unfortunately, they are still quite unsustainable. It seems that higher environmental efficiency accompanies a higher environmental deficit, which can be seen as a paradox of technical development with environmental implications.

Our map for sunny days has $T_{happiness}$ on its vertical axis (higher values are more efficient) and contains iso-happiness curves (Figure 2, mostly based on 2005 data). All the points of the lowest running curve represent an average SWB=5, which means a country on average is neither happy nor unhappy. This curve can be seen as the happiness/unhappiness border (crossing this border is important in human terms, just as not crossing the 2.1 Ha per capita iso-EF curve is in environmental terms). We have iso-happiness 7 in the middle − above this a country can be considered very happy. We show the SWB=10 iso-happiness too. It is the theoretical maximum: reaching this level for a country would represent a wordly utopia, but striving for this may yet be an acceptable political agenda. Data points on our map represent countries of the world and their formulation refers to the dark side of the story; that is, to EF per capita values in the country[3].

The most happiness efficient countries are unhappy, so it is worth excluding them from our analysis. In the 1−3 happiness unit per $1000 section we usually find happy countries, which are still environmentally sustainable (Fig. 2.). In those countries, however, where $T_{happiness}$ is not even 1 happiness unit per $1000, higher levels of unsustainability can be observed. Less than one third (0.33) of happiness efficiency is usually accompanied by more than a 7 average happiness factor in a country, but the costs of this high happiness may be enormous: they usually have huge GDP per capita values which are usually accompanied by huge EF per capita values. The best values of environmentally sustainable happiness can be observed in Latin American countries.

IV. Conclusion

Our analytical tool simultaneously uses a more narrow, more mechanistic and technical view of our concern (dark side maps), and a broader, holistic approach to focus attention on the human person, to human happiness. Thus we analyse two questions simultaneously:

[3] Less than 2.1 EF per capita in a country means 'sust' in Fig. 2, between 2.1 and 4 it is 'nonsust' while over 4 it is 'nonnonsust'.

the question of *how* is important on the dark side for human beings, while the question of *what for* is gaining higher relevance on the sunny side of human being.

Our maps help to determine a country's position from both sides of a strategic analysis and using these it is easy to see which direction is preferable for future movement. For a relatively developed country, like Hungary, it is preferable to lower EF in order to contribute to global environmental sustainability; while there may be huge reserves which raise happiness levels through to a higher happiness efficiency.

"*Navigare necesse est, vivere non est necesse*" (We have to sail, we do not have to live) − once said Pompeius Magnus, Roman general and politician, to sailors when they did not want to go out to the stormy sea. Yes, in our global planet-boat we always need to navigate in such a way that we should not endanger human and nonhuman life − the whole living system of our planet and its capacity to sustain human activities. A reasonably thoughtful system, completed with healthy moral and ethical principles, may help us to avoid ending up getting shipwrecked while moving us closer to our desired end; to our subjective (thus diverse) happiness.

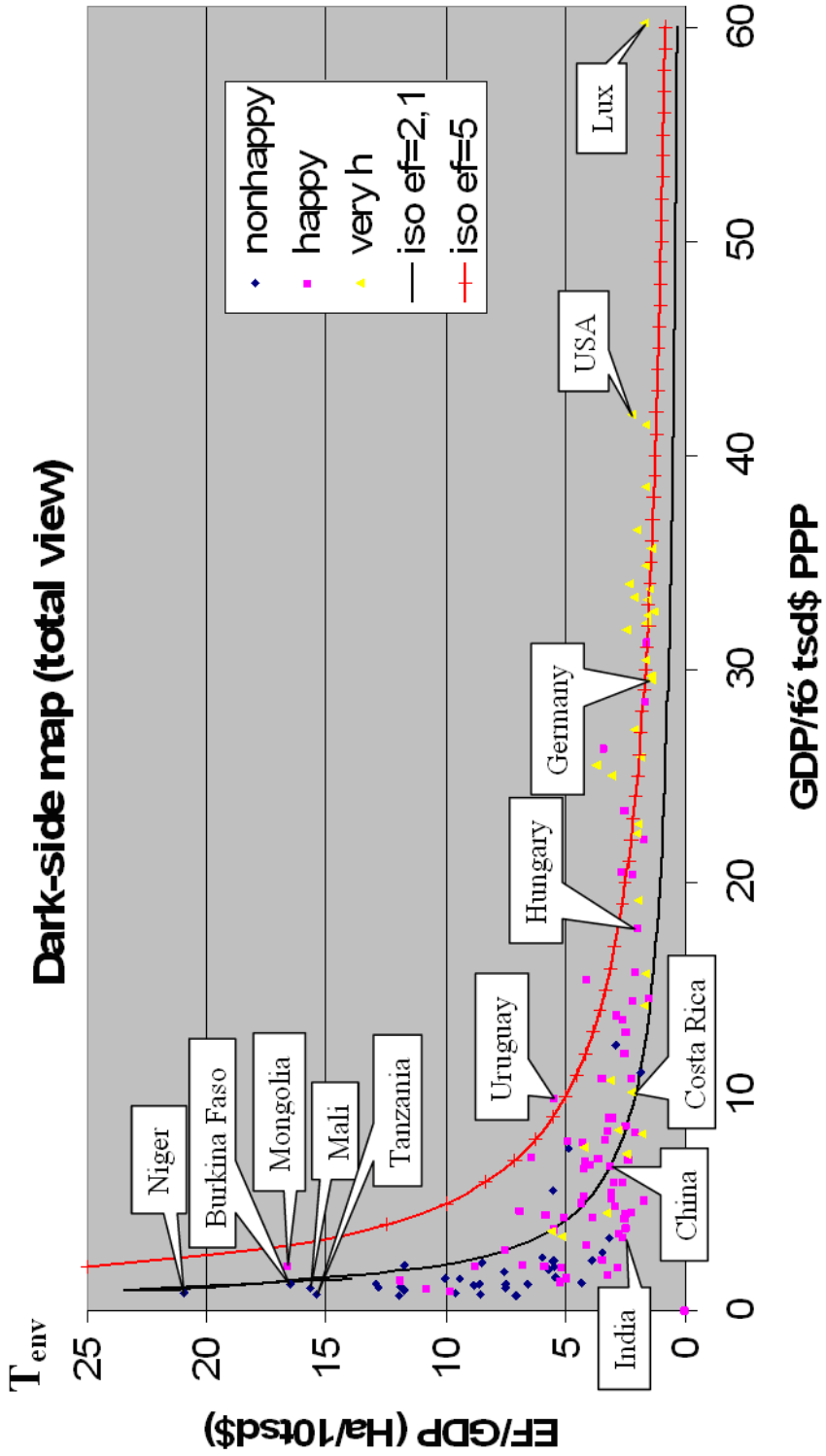

FIGURE 1: AFFLUENCE AND $T_{ENVIRONMENT}$ WITH ISO-EF CURVES (2005 DATA)

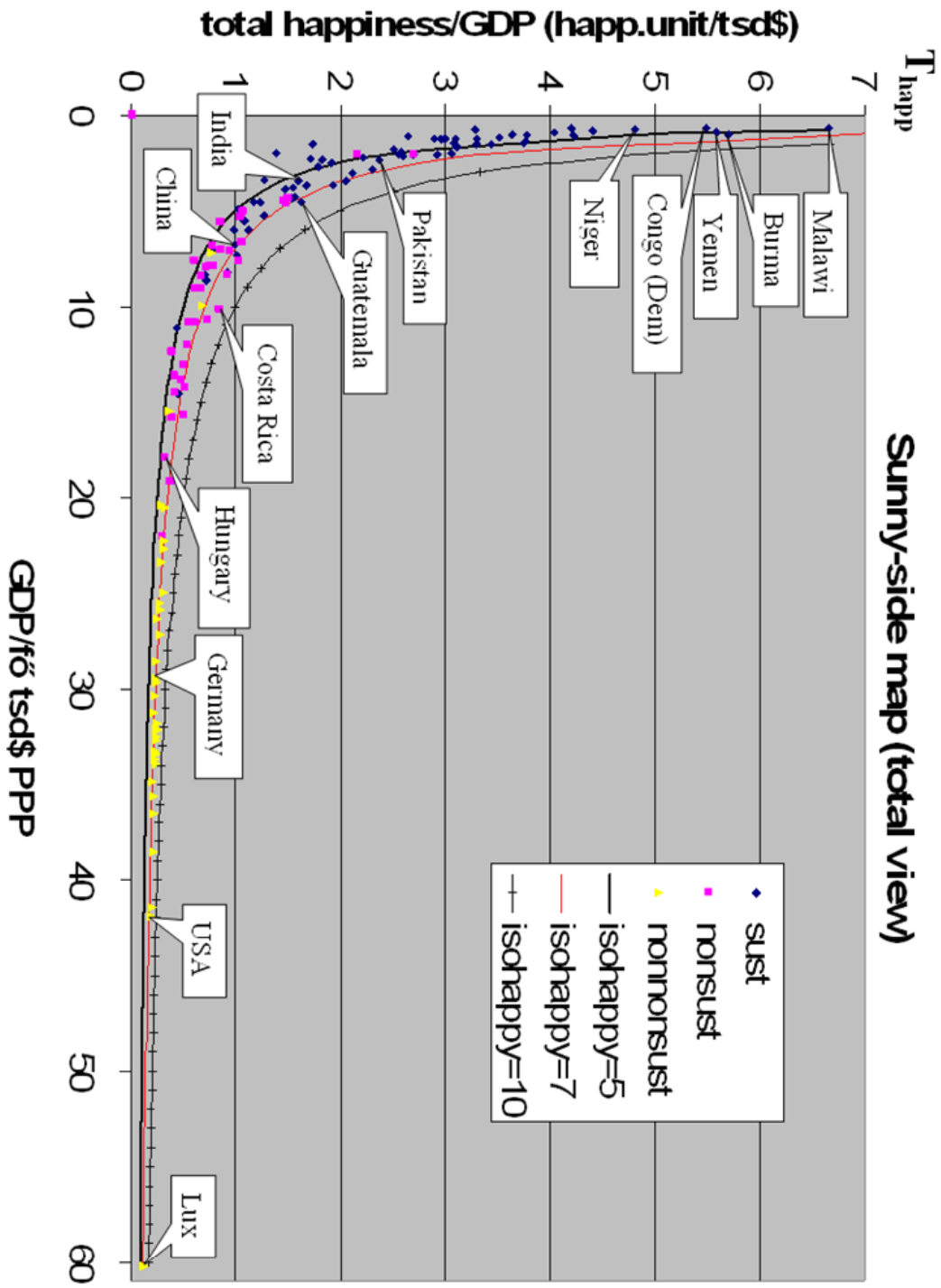

FIGURE 2: AFFLUENCE AND $T_{HAPPINESS}$ WITH ISO-HAPPINESS CURVES (2005 DATA)

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DELIBERISATION OF SUSTAINABLE CONSUMPTION AND PRODUCTION MAKING AN IMPACT – COLLECTIVE ACTIONS

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Abstract:

Development of policy background and proposals, sustainable consumption in economic and policy documents, European and Hungarian policy analysis.

The goal of this paper is to discusses the first learning of an ongoing EU FP7 project called 'Civil Society Platform on Sustainable Consumption and Production' (DelibProcessSCP, 2008-2009). The SCP dialogue platforms provide space and partnerships for civil society organisations to influence political decisions, inform about funding opportunities, explore creative tools and identify research needs. The project invites European civil society organisations to discuss three main impact areas (housing, food and drink, mobility) as the main domains for SCP and recommend options for policies and actions, which respond to the needs of civil society in cooperation with other stakeholders (researchers, governments and businesses).

For promoting sustainable consumption and the sustainable lifestyle, such as sustainable food, housing and mobility, civil society organisations (CSOs) have an important role to play. They are needed for urging governments and business to take action and encourage individual consumers towards more sustainable consumption and production patterns. However, they need support to become more active in different policy levels.

Several events invite the CSOs to enter in the DelibSCP process. The first was the opening conference in Szentendre, Hungary in October 2008 focused on the identification and elaboration of the main focus areas and trends within the SCP arena. The second conference in Wuppertal, Germany in March 2009 looked at concrete discussions on cross-cutting issues related to SCP in the three demand areas, as well as the formulations of specific research needs and of more effective civil society actions. The final conference in Brussels in December 2009 aims to link CSO dialogue and actions to SCP policies, giving space to develop collective actions for change. This article can serve as a background paper for the final conference by identifying the gaps for efficient CSO participation in SCP policy processes and offer solutions on how to fill these gaps effectively.

The first part of the paper describes several reasons for CSOs limited participation to SCP policy processes on European level, based on the learning of the DelibSCP conferences. More information and dialogue between policy makers and CSOs (platform) is clearly needed to see the connections between top-down and bottom-up processes. CSOs should be involved in the policy processes already in the very beginning to give them ownership. More knowledge and capacity on funding opportunities is also needed to ensure better participation.

The second part of the paper concentrates on finding solutions for filling these gaps.

It will highlight the deliberative processes that EC and other European players might take towards supporting SCP policy and development in relation to overcome limiting factors, to stimulate enabling factors and identify linkages to international and national policy development.

SUSTAINABLE PARTNERSHIP WITHIN UNIVERSITIS AND INDUSTRIAL PARTNERS, RESPONSIBLE PARTNERING

Dr. Péter A. Csíkos, Alexandra Horváth and Tamás Polgár

Abstract:

Within the international project „Sustainable comsuption, production and communication" our team is working on the analysis of the sustainable partnership between partners of different sectors in the economy (universities, industrial partners, companies etc.), especially in the field of research and development (R&D). The objective of the realising project is the completion of economic researches of sustainable innovation, partnership between participants from different sectors and responsible partnering, and also to mapping the future of these trends, recommendations.

During the research we examine the short and long term results of foreign (German, English, French) examples different from ours on partnership between R&D enterprises and public R&D institutions. The main questions of our research is that if it worth, needed to keep on with the present system or if it is rather worth to launch a totally new system.

The basis of our research hypothesis was that the present partnering system may not adequate, so it is worth to examine whether such system exists which reach the aim than the present one: develop the level of R&D effectiveness, the relationship between research groups and enterprises, and move to the 3 % GDP proportional R&D expenditure. Another important basis of our hypothesis was that there are more than one solutions, the combination of different systems can be also viable.

In the first phase of the research our group makes an international benchmark on this theme, we search for international best practices, good examples and useable methods. After this analysis we will have a look at the international solutions and we are going to know how responsible partnering abroad works.

After making the international benchmark we analyse the daily routine of these partnerships, the problems, best practices and the role of the state (support methods, changes required through different support methods and policies of the government). The primary research applies during the examinations is divided to 3 main parts, for receiving not only direct answers based on a representative sample, but also opinions which are difficult to insert into the objective categories of a focused research, but have important content of information for the decision makers. The 3 main parts are: questionnaires, experts' roundtable and workshops.

The methodological base of the primary research is set up of questionnaires, which contains segment-specific, self-fill-in half structured, open and close questions in adequate perception, which proven opportunity with valuing question groups for measuring the acceptance of factors relating to sustainable partnership and responsible partnering. The answers could be filled in on a 5 rate scale.

The questionnaires provide opportunity to make the experts' opinions measurable –in the case of representative sample – and receive quantitative results for the finance of the innovation.

During the experts' roundtable meetings such actors will be involved into the active opinion exchange who can be important and definite actors of the more effective management of the present system, participants of the partly conversion of the innovation- subsidising system and preparers the whole reorganisation of the structure.

The objectives of the organising regional workshops is to give the opportunity to build in opinions of such actors in the analysis, who can shade the view, and call the attention to special characteristics (i.e. agro – innovation problems), which need particular treatment. Therefore during the selection of the participants we will not focus on involving special organisations, but we organise open workshops for regional organisations involved in the wider innovation, where the participants can freely comment the examined questions, and introduce their own problems and specifications.

After these analysis our group will formulate recommendations on how to build up a more effective system and how to utilise best practices.

ENVIRONMENTAL AND COLLECTIVE SENSE OF RESPONSIBILITY IN CONSUMPTION

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Abstract:

The target of our research was to know the human values, cultural activity, environmental consciousness, consumer attitude, awareness, habits and opinion, propensity of participating in local decisions, and the motivation factors of the Hungarian adult population.

A lot of international examinations deal with the continuous change of attitudes, human values and life-style concerning the environment (i.e. Inglehart 1997). According to the newest researches a new way of thinking was born in Western European and Northern American countries in the last decades. The followers of this ideology have a greater responsibility for the ecological sustainability, social and political activities, and civil rights (Ray-Anderson 2000).

According to the results of a new Hungarian research (Székely – Gyene – Pörzse, K. – Takács, Sz., 2008) we can also find a group in the Hungarian population which is more sensitive to the social and environmental problems and the traditional and postmodern values. This research identified three clusters: about forty percent of the sample demonstrated materialistic orientations; another forty percent was more inclined towards humanistic values, while the remaining twenty percent scored low on both value sets.

This Hungarian research was our first base. In our project we focused the group with humanistic values system. Examining this group with qualitative method (focus groups) we deduced the differences between verbal commitments and action responds. We compared the relation to sustainability of some highlighted target-groups, as decision-makers, and opinion leaders by way of deep-interviews. At this conference we are presenting the results of our qualitative survey and the explanation of second part of our project, a representative survey which will be based on the results of focus groups and deep-interviews.

The research is part of the "Sustainable Consumption, Production and Communication" Project financed by the Norwegian Fund.

VIRTUAL WATER AND SUSTAINABLE CONSUMPTION

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The concept of virtual water could support sustainable consumption. This paper aims to show how. The work is based on the master's thesis of Flora Ijjas ("Hungary at the virtual water trade market") and on László Valkó's books and studies.

The master thesis aimed to find out whether virtual water conceptions – like virtual water trade – can help to act responsibly in the face of growing demand for water and energy caused by population growth and rising living standards and in the face of the global environmental problems of climate change and diminishing water resources.

Three main challenges: the rising consumption driven by population growth, the effects of climate change and the rising consumption of biofuels were discussed, focusing on the relations between them and on the possible solutions for those provided by virtual water trade.

By analysing Hungary's water resources, virtual water indexes and the connections between agriculture, foreign trade and biofuel production – the study wanted to find out how we should answer to those challenges.

A Fuzzy model has been provided to simulate the effects of some expected changes at two virtual water indicators of Hungary: the impact of higher temperatures and rising maize production on the water footprint and water scarcity. It can help to decide what plants and how shall be grown or how high possible water footprint/water scarcity quotas shall be set.

The thesis discussed the advantages, opportunities and risks of virtual water trade. It's aim was to support integrated water resources management in a way that provides society's development by a more sustainable (water) consumption. According to this, some aspects of ecopsychology are mentioned to find out how virtual water concepts could be applied in practice in order to raise consumer consciousness.

Keywords: sustainable consumption, virtual water, virtual water trade, water footprint, consumer consciousness, ecopsychology, global environmental challenges

I. VIRTUAL WATER

According to some important authors' definitions [1]-[4] virtual water means the water content of a product[1] - the volume of freshwater used to produce it. The trade[2] of virtual water content (of the product) means the water flow that is being transferred from one place to another.

The question is again, how can it be useful to look at the trade flows of virtual water?

The main point is at „looking". The process of getting aware of how much water we are really using is necessary to clearly see the consequences of it. The point is at making the water flows inside the consumption chain transparent. As a result more consciousness could be achieved as well by individual consumers as well by large corporations and states.

[1] ***Virtual water content/water footprint***: The water footprint of a product/service is the volume of freshwater used to produce the product, measured at the place where the product was actually produced. It refers to the sum of the water use in the various steps of the production chain (www.waterfootprint.org).

[2] ***Virtual water flow/trade***: The virtual-water flow between two nations or regions is the volume of virtual water that is being transferred from one place to another as a result of product trade (www.waterfootprint.org).

Of course there are several other positive outcomes that virtual water concepts can provide society with but the last one brings the most. In business: making the decisions consciously and in life: acting consciously – this is the way we can make changes possible and make sustainable consumption reality. The nature of consciousness will be analysed, ecopsychology [5] also coming in picture and trough consciousness it is connected to the processes of virtual water flows.

May the predicted dark visions of „war over water" be right or not the fact that water is our most important life force is a fact. Acting like responsible and reasonable beings - individuals and even corporations shall be aware of how much water they are using, what quality it has, where does it go after using it.

The concept of virtual water can help even the consumerist - by seeing more clearly - if his decisions are sustainable or not. But it can also support companies on making (although maybe only on the long term) more profitable, more socially responsible and more sustainable decisions. The same stands for states, governments or regions.

Today society is facing global environmental problems also caused by climate change. A symptom of this may be for instance the diminishing accessible water resources. As there is also a growing demand for water and energy - caused by population growth and rising living standards - the situation could get even worse.

In this study three main challenges - rising consumption driven by population growth, the effects of climate change and the rising consumption of biofuels - are analysed with the help of virtual water concepts [14].

The idea of looking at these problems from a virtual water concept of view gets more and more supported. The European Regional Document [6] for the 5th World Water Forum shows that several politicians and scientists have got interested lately in virtual water. According to this it may be useful to see how and if these concepts and indexes can provide society and its sustainable consumption.

II. FOOD CRISES, CLIMATE CHANGE, BIOMASS

According to a study [2] of IWMI (International Water Management Institute) by the year 2050 there will be an additional 3 billion people to feed and „food production may need to increase by 70-90 percent from levels in 2000 to meet this global food demand. Without improvements in the efficiency and productivity of agricultural water use, crop water consumption would have to grow by the same order of magnitude."

Population growth will further increase industrial and household water consumption. A fact is for instance, that a diet without meat requires a lot less water per day to produce than a diet high in grainfed beef [7]. If the whole world ate the average american diet, than 75 % more water would be required to produce it (for 1 kg of wheat 500-4000 l of water is needed while for the same amount of beef 16 000 l of water needs to be used). For a vegetarian diet 2600 l, while for the average american diet 5400 l of water is used.

Looking at the data it is clear, that we also have to give attention to the consumption trends and the psychological issues behind them [5]. Consumption choices can have a significant effect on the environment just as heavy meat consumption accuses our planet's freshwater resources.

The report [7] of the German Development Institute concluded that between 1980 and 2000 the world water consumption has been risen by 30 %. For the next 30 years it predicts the global demand for water to grow 3 times more than what it is at present. It means that 40 % of the population would suffer from acute water scarcity.

As western society gets richer and as it slowly overuses all of its natural resources - the economists, business people and politicians are looking for new ways to sustain the level of consumption we are used to possess. That is the reason, why biofuels and biomass are getting more and more attention last years. But as it has positive effects (like less CO2 emissions) it has negative effects as well. One of them is strongly connected to water. Based on a study [8] the average per capita energy use in western societies (100 GJ/capita/year) - a mix from coal, crude oil, natural gas and uranium - requires about 35m3/capita/year. „If the same amount of energy is generated through the growth of biomass in a high productive agricultural system, as applied in the Netherlands, the water footprint[3] is 2420 m3. The water footprint of biomass is 70 to 400 times larger than the water footprint of the other primary energy carriers (excluding hydropower)." The trend towards larger energy use in combination with an increasing contribution of energy from biomass will enlarge our need for fresh water. This may cause competition with other claims, such as water for food [14].

All the symptoms and changes written above may get even worse and are also partly caused by climate change. Increasing consumption needs – mainly caused by population growth - will increase the world's food and water demand, while climate change may decrease their supply. Of course there will be nations, that will gain from these changes. Hungary for instance could become a winner, in case it can adapt fast and use its capacities (for instance by planting more mediterranean crops). But for the larger part of the world (and maybe also for us) climate change will have dramatic effects and one of them may be growing water scarcity. As losing balance for too long is dangerous, we should look at all the possible ways we can find it again. It is worth to take a look what solutions virtual water can offer for us.

III. VIRTUAL WATER TRADE

One way to save one countries domestic water resources is by importing water-intensive products and exporting commodities that are less water intensive. But not only one countries water resources can be saved. According to several scientists working on virtual water issues – it is possible to save water at a global level. This happens if by virtual water trade the flow is from sites with relatively high water productivity (i.e. commodities with a low virtual water content) to sites with low water productivity (commodities with a high virtual water content). This means that international trade could save water globally.

A study [9] shows that the total amount of water that would have been required in the importing countries if all imported agricultural products would have been produced

[3] The **water footprint** of a product is the volume of freshwater used to produce the product, measured at the place where the product was actually produced. It refers to the sum of the water use in the various steps of the production chain. The water footprint of a product is the same as its virtual water content) (www.waterfootprint.org).

domestically is 1605 km3/year. These products are however being produced with only 1253 km3/year in the exporting countries, saving global water resources by 352 km3/year.

Summarizing the researches on global water trade we find, that it is possible to save water this way. Although it is in most cases only an accident - as countries and corporations are not consciously organizing their trade in a way that water can be saved. There are also cases, when more water is used, then without trade and there are water scarce countries that are virtual water net exporters [14].

This shows that most trade occurs for reasons unrelated to water. One such reason is for instance when a country has labor rather then water shortages. Another reason can be the lack of financial resources, so the country can not import enough to meet satisfying consumption levels [2].

Another question is if it's possible at all to "save" water globally. Then water is in a way constant on earth, as it is part of the world's water cycle. How is it possible to save some of it then?

"Under the prevailing political and economic climate, it is unlikely that food trade" – here virtual water trade – "alone will solve problems of water scarcity in the near term." [2] An optional way to look at it is by searching for solutions as sustainable and "healthy" as possible.

According to virtual water trade and other concepts - the main questions are:

- How can products be produced using as little water as possible and doing it in a sustainable way by applying water saving and cost effective technologies and using green water[4] mostly?
- How can water scarcity concerns and the goal of global water savings be significant enough compared to political interests and economic costs by developing one country's trading strategy?

IV. HUNGARY

Basically Hungary has enough water of rather good quality. Thanks to the incoming water from abroad we are well situated compared to world's average. However it is important to notice, that the water resources are unevenly distributed within the country and that the amount and quality of the incoming water is strongly dependent on the activities of the upstream countries [14].

Thanks to the EU Water Framework Directive and the integrated water resources management - a good water status may hopefully be achieved in future, also in Hungary. But we also have to be aware of the main challenges coming to us. Population growth, climate change and energy crises will also have an effect. That's why it is important to have a strategic system thinking according to our water resources and agriculture. Virtual water concepts can help this process and further it can provide sustainable consumption.

[4] The **green virtual-water** content of a product is the volume of rainwater that evaporated during the production process. This is mainly relevant for agricultural products, where it refers to the total rainwater evaporation from the field during the growing period of the crop (including both transpiration by the plants and other forms of evaporation) (www.waterfootprint.org).

In order to see how virtual water conceptions can help Hungary to adopt to the coming changes - by also providing sustainable consumption in meanwhile – it is worth to take a look what capacities we have.

Some scientists and politicians say we have enough water and there is no need to worry - we only have to get the best out of it. Others on the other hand are more carefully and they do worry about the uneven distribution of the water resources. The Danube is probably going to carry enough water, but not to the regions that may become strongly affected by climate change. Such a region is for instance the *Alföld*, that is far from the Danube river and that is one of the most important agricultural lands of Hungary [14].

Hungary's agriculture gets less political, economical and public attention today then it would deserve. Without water and food the strategic industry sectors (like automobile industry, informatics, machine industry) wouldn't survive neither. A country should use what it has and Hungary definitely does have agricultural land. As food and water will have more strategic importance, so will society feel its real value. The decision-makers should decide now, if we want to adopt fast, if we want to concentrate on what we really have and if we want to use it carefully in a sustainable way. Otherwise the country may fail, because of the incoming effects of the major environmental problems (like climate refugees or food crises in neighboring countries).

The virtual water indexes of Hungary are relatively good. According to the water footprint concept, we have a very low water scarcity[5] and water dependency[6] but we have high water self-sufficiency[7]. The water footprint of Hungary[8] is 7,99 km3/year. Of course it only says something, if we compare it to other nations WF.

It also needs to be considered that drought is a different term for having inefficient water resources available. Drought represents a temporary decrease of the average water availability and it is and will be of a big problem as well in Hungary as in other EU countries.

At the time Hungary is net virtual water exporter but in the future it would be reasonable to analyse, if this is sustainable, or we should sell less water [14]. There is an example what processes Hungary should be aware of and what should be considered by deciding to sell or to consume our own products.

V. CASE STUDY QATAR, OMAN AND HUNGARY - SUSTAINABLE WATER CONSUMPTION AND WIN-WIN DEALS

There are some countries where the consumption of water and food may become more difficult then it is right now. Climate change, population growth, growing energy demand

[5] ***Water scarcity*** is defined as the ratio of the total water footprint of a country or region to the total renewable water resources (www.waterfootprint.org).

[6] Countries with import of virtual water depend on the water resources available in other parts of the world. The ***virtual-water import dependency*** of a country or region is defined as the ratio of the external water footprint of the country or region to its total water footprint (www.waterfootprint.org).

[7] The ***water self-sufficiency*** of a nation is defined as the ratio of the internal water footprint to the total water footprint of a country or region. It denotes the national capability of supplying the water needed for the production of the domestic demand for goods and services (www.waterfootprint.org).

[8] ***Water footprint of a nation*** is defined as the total amount of water that is used to produce the goods and services consumed by the inhabitants of the nation (www.waterfootprint.org).

may be the causes. And there are some countries that are already aware of the coming challenges and that have already began to prepare for this. The question is: how relevant is international trade in alleviating water scarcity in these nations? But just as important is the following question: how relevant is this international trade in magnifying water scarcity in others and to which extent does international trade contributes to national water dependency?

From this point of view discussions of the politicians of Hungary, Qatar and Oman in January 2009 on renting land from us - get a different look [14]. The politicians tried to make a deal. Qatar and Oman would rent some land, grow cereals and bring them home, while Hungary would get liquefied natural gas from them. In a way it means: we give away a part of our water resources and land for some gas. The question is, that if water will be in fact such an important and rare good in 10-20 years, than is it really a good deal for us?

It is obvious, that in the face of the coming changes and their effects, countries with rare conditions (like high water scarcity, little agricultural land) will give more attention to Hungary's capacities. The question is: how can we get the best out of it, and not just for ourselves but for all? How to make win-win deals?

Let's hope we could do this. But the problem is, that the Hungarian negotiators didn't seem to look at the motivations of the other side. According to this they also didn't seem like they knew, what it is really about and maybe that's why there are no news what is going on right now.

Fact is that while the available water/capita/year in Hungary [10] is about 10541 m3, it is in Qatar 70 m3/capita/year and in 2025 it will only make a 50 (!) m3 [11]. The same trends are to be seen in the case of Oman: the available water/capita/year will rise from 800 to 220 m3 [11] and to top this, its water scarcity is 389 % (!) [12].

VI. FUZZY MODEL FOR SUSTAINABLE WATER CONSUMPTION

As land and water will probably become strategic goods – like oil – lot of questions need to be answered:

- How to use our water resources carefully, in cost-effective and sustainable way?
- How to use „extra" resources in order to help water scarce nations and to make win-win deals?
- In what industries shall we rather use foreign water resources (like importing certain plants rather than grow them) in order to save water and to save costs?

To answer these questions a lot of information is needed and their interconnectedness shall be analyzed. The Fuzzy model below has been developed [14] to show a little part from the relatedness of the processes between Hungary's capacities (like its water resources and climate) and the predicted changes it is facing the next 30 years.

Two input variables and two output variables were added:

- Rising temperatures (°C)
- The volume of extra maize production (%)
- Water footprint of Hungary (million m3/year)
- Water scarcity of Hungary (%)

Results

The developed model can help by answering following questions:

- If the volume of growing certain plant (here maize) gets risen – how high will the water footprint and water scarcity of Hungary get (presuming one of the added climate scenarios)?
- If Hungary wants to keep its water scarcity below a certain level, then how much more plants of certain kind can be grown (presuming one of the added climate scenarios)?

The model can also be of a big relevance for countries of high water scarcity, as it could help by the decision: which plants shall be grown by using as little water as possible.

VII. CONCLUSION

In order to provide a sustainable consumption of water resources following information need to be collected:

- Where, when, in what volume and of what quality are the available water resources?
- For what are these resources used?
- What happens to the waste water?
- How much virtual water is used to produce export products, what is their virtual water content and how much water has left the country in total?
- How much virtual water comes in with import products?

With these information the virtual water balance[9] of a country will get available, as well as it's water footprint (from the total amount of water that is used to produce all the goods and services consumed by the inhabitants). These indicators provide further information for decision-makers to see, if a country's water consumption will be sustainable or not. With models - like the Fuzzy model shown above – it can be predicted how sustainable water consumption will be, by facing the coming changes implied by climate change, energy and food crises.

Virtual water concepts can provide consumers (also individuals) with information – by making certain processes transparent – how to consume from the water resources in a sustainable way [14]:

- Water footprint for instance can show the consumer how much water gets consumed by consuming certain product.
- By comparing the products' virtual water content - a more sustainable decision can be made about which product to chose.
- By presenting the amount of water used for certain products – strong feelings can get risen by consumers in order to make them more aware [5] about how

[9] The **virtual water balance** of a country over a certain time period is defined as the net import of virtual water over this period, which is equal to the gross import of virtual water minus the gross export. A positive virtual water balance implies net inflow of virtual water to the country from other countries. A negative balance means net outflow of virtual water (www.waterfootprint.org).

sustainable they are really living. (An example for that: for one cap of coffee a bath-tube of water – 140 l - is needed.)

- In order to support consumers in consuming sustainable - a kind of a water label (similar to eco label [13]) may be used.

One of today's and coming years' main issues are the protection and sustainable usage of available water resources. In order to provide at least enough drinking water for all (also for the 1 billion people who do not have it at the time) all the researches connected to water issues will have a great significance. Yet one needs to be aware of the real value these scientific theories and technological solutions are providing us with. All the new, innovative and visionary concepts need to be analyzed in order to see their advantages and consequences more clearly as some of them may harm more, then if they weren't exist at all.

For instance for poor countries struggling with issues of food security, depending on imports from trade (in this logic from virtual water trade) to meet basic food needs - is risky. It is viewed as one that increases their vulnerability to global fluctuations in market prices and to geopolitics. For many countries the development of their water productivity can be a more secure option than to import more [2].

The sustainability of the systems we have got used to – the monetary system, consumption, energy market, system of law, the social institutions – become more and more questionable at the time. We are coming to a point where we have to decide if we will further hang on all of our customs and preferences (even if humanity can not much longer sustain on planet Earth in this case) or we work on our addictions [5] and have the courage to change.

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COALITION, CLIQUES AND CONSUMPTION BEHAVIOUR OF THE RICH IN A POOR COUNTRY

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Sociological perspectives on consumption, with an embedded notion of economy, view demand for goods is a by product of social forces. Theorist within this discipline direct attention to the social structure and culture, which shape and determine the amount, content and patterns of consumption. New economic sociology explicitly puts emphasis on interpersonal effects on consumer demand. Granovetter and Soong argue that what one buys is shaped by his interaction that takes place within and between networks. This paper sheds more lights on consumption as interaction process by including network obligations, participation in social life and power as consumption goals. This study of the rich in Dhaka, in Bangladesh, based on observation and interviews, is used to advance the argument that consumption is important for the exercise of power and competition for resources and power through alliances or coalitions. Members of various elite networks, political-bureaucratic- and business, direct their consumption and investments at forming coalitions, cliques, or ties with significant others, as wide as possible. Luxury consumption provides them connections with dispersed social networks. Conversely, they compete for resources and power, which may take pervasive forms and have negative impacts on social and natural environment.

Key words: Cliques; Consumption; Embeddedness; Power network;

I. INTRODUCTION

The subject matter of this paper is network influences consumption and investment behaviour. It is a brief analysis of individuals' interaction with others that shape the amount, content and patterns of consumption. It has two major objectives. Firstly, by including individuals' efforts to satisfy obligations to networks and their struggle for power as consumption goals it sheds more lights on consumption as an interaction process. Secondly, identifying some damaging effects of consumption as struggle for power it addresses the issue of sustainability in poor developing societies. In those countries more than a billion people lack the opportunity to consume in ways that would allow them to meet their basic needs (Human Development Report 1998). Yet, there are consumers of luxuries. They are consuming in ways that cannot be long sustained environmentally and socially.

The focus of this paper is on consumption and investment behaviour of the rich in a poor country, Bangladesh. There, a handful rich people (political, bureaucratic, military and business elites) spend heavily on luxury consumer durables, gifts, grandiose wedding ceremonies, cars, housing etc. They constitute a fraction of the total population (less than 2% of a total population of 140 million) who again are concentrated in the capital city, Dhaka. Despite their small number, they with their ownership and control over economic resources command a disproportionate influence on the rest of the society. This is a common feature in most south Asian countries. "The dominance of a narrow band of elite-consisting mainly of land lords, bureaucrats, big industrialists, and military officers-reflects the concentrated nature of political power in South Asia".(Human Development in

South Asia 1999, p. 4). Among them there is a tendency of competition of display of wealth and wastefulness as a part of their life styles that are inimical to sustainable development.

In an earlier paper I developed an analytical framework in order to address the question: How do network structures compel people to maintain a high rate of luxury consumption"? (Rahman 2008). Analysis of data, derived from observation and interviews, was based on two sociological arguments on embedded nature consumption; that consumption is human beings' interaction that takes place within and between networks and people take others' consumption behaviour and possession of goods into consideration when they make preferences (Granovetter 1978, 1991; Granovetter and Soong 1986; Bourdieu1984; Coleman 1994; Frenzen, Hirsch and Zerillo 1994; Veblen 1899). The analysis shows two major patterns of interaction: 1. Consumptions are efforts to satisfy social demands and participate in social life, and 2. Exclusive social networks are decisive for access to resources and for channelling investments, therefore people invest in networks.

In this paper I take the issue one step further and ask the question: How are networks used for exercise of power and competition for resources and power. To address this question I will make an analysis of how various elite sub-groups in Dhaka direct their consumption and investments to form coalitions. The coalitions can be described as power networks. What I mean by power network is that power has a net-like structure. The section to come is a brief account of structure of power networks. I then describe and discuss how structures of coalitions and cliques influence consumption of various elite sub-groups in Dhaka. This is followed by a brief discussion on implications of luxury consumption for the rest of the society. Finally I conclude with some theoretical comments on the mentioned theories.

II. THE STRUCTURE OF POWER NETWORKS

The structure of a power network is a combination of its form and contents. The form refers to density, durability, patterns of connections etc. Patterns may be horizontal or vertical relations among the members of a network. Contents are obligations, sentiments, and instrumental relations, which includes power. Power has to do with decisions people make about social arrangements under which they live. In Bangladesh, the power to make decisions is seated in political and bureaucratic institutions. The business institutions are linked with those decision makers. Political leaders, top bureaucrats and rich business families have always been in alliances. These elites have always tended to come together to form power triangles through creation of mutual and reciprocal dependence that necessitated close working, horizontal, relationships among them.

Power networks can be vertical. There are hierarchies or layers in the internal structure of any coalition. Members of various coalitions hold different positions; some have core positions and some intermediary positions, within a coalition, within a political party, within a business association etc. One's position in the network structure is crucial for his power, and for what influence he has on others. The position defines one's obligations to others in the coalition has significant influence on where he spends and invests. At the top level of the hierarchy are core party leaders, business elite and bureaucratic elite. They have *centralised power*. They participate together in exclusive clubs, association meetings

and maintain horizontal relationships among themselves, based upon mutual ties and cooperation.

There may be temporary coalitions of relatively small groups of two or more persons, within a political party or within a bigger coalition. These groups usually emerge when one wants to strengthen his or a group's position and influence within a party or within a coalition. Such groupings often take the shape of cliques. This type of tie is dense but the durability depends on return from such ties. Returns may be economic gains or political power, or both.

Major political parties have their student front, labour front, youth front etc. Political leaders maintain ties with the leaders of these fronts. They have intermediary positions. These intermediaries are at the next level of hierarchy. They participate with core members on some occasions. They have *nominal power*. There are dependencies between them and core members. Those also take the form of vertical patron-client relationships.

There are groups of those who lack resources and communication channels to the core of any coalition. They have *fragmented power*, which implies their limited capacity to form coalitions and to participate in decision making. They may contact the core members through intermediaries.

These levels of hierarchy are crucial for the relative strength of coalition members and for their access to resources and information. These also explain what social obligations are relevant for them and what they consume, where they invest and why.

III. THE STRUCTURE OF RELATIONS AND CONSUMPTION

Coalitions are instrumental relations. Members of various coalitions come into alliances when they want to share power. However, coalitions contain some aspects of reciprocal obligatory practices. The notion of reciprocity for coalition members implies not a balance in give and take between who provides with supports and who receives. A core member shows his consideration of helping other members of the alliance, whenever they in need. They maintain direct contact in distinguished clubs, in exclusive hotels, dinner parties etc.

"Dhaka has a very active social life with a large number of official and unofficial parties. Receptions are held almost every night by donors, United Nations agencies, embassies, local and foreign businessmen and non-government organisations, quiet dinners at the Dhaka Club, and numerous meetings at the city's two five star hotels- providing the informal social setting for direct contact between high level political, bureaucratic, military elite and businessmen".(Kochanek 1993:258).

Social gatherings and gala parties are to promote repeated interactions among the political leaders, top bureaucrats and rich businessmen. Other mechanisms include exchange of gifts on various social occasions like religious festivities, birthday parties, wedding ceremonies etc. Failure to do so may result in isolation. All the elite sub-groups make efforts to avoid isolation. Businessmen finance election campaigns, arrange party meetings. They make donations to various political parties, cultural and charity organisations etc. A political leader is under certain social pressure to include more benevolent activities like establishing a school, constructing a hospital in the village etc. A core member of a political party visits districts, and makes donations to the local party fund. A local leader arranges feasts for the visiting leader. Hundreds of party workers are

invited. If the Prime Minister is visiting the area, the local party members arrange motorcade and public meetings. Roads are decorated by colourful festoons, lightings, gates etc. Schoolgirls and boys are gathered on both sides of the roads. People are transported from different parts of the district.

Charity is grounded partly in religious values of solidarity for the poor. People arrange *iftar* (breaking fast during Ramadan) and they sacrifice cattle on the occasion of eid-ul-azha. I found altruistic consideration regarding charity or sacrifice is few among the elites. Ramadan is a month of austerity. But, the elites arrange grand *iftar* parties and invite other members of the social elite. They use the *iftar* party to create and extend personalised connections. They discuss different measures of how to cope with the challenges from other political parties, as well as how to tackle the rival groups within the party. Influential leaders from the rival political parties are also invited. It happens that the day after the local daily newspapers announce that Mr. X from the A party has joined the B Party. An *iftar* party may be used as venue for networking, for lobbying, and for intimidation. There is competition among the rich as regards who are invited, how many items being served in the party, how much one paid for a cow etc. What looks like obligatory practices, seemingly appear to be parts of a performative process through wastage.

The performative process exerts further pressure to consume. People follow the trends in the life styles of effluents in the society through extravagant ceremonies. In varying degree, the eiltes maintain personal elegance and a special mode of address. They are glad to see their sons and daughters intermarry.

The marriages of their sons and daughters are marred by wasteful ceremonies. Expensive gold ornaments, a fridge, a stereo-set, an air conditioner, even a car are given as gifts. They are commuting between Dhaka, Bangkok, Singapore, Dubai and even London making purchases in connection with the forthcoming wedding ceremony. Wedding ceremonies are marked by ugly display of material affluence.

People desire status and prestige attributed to the higher echelons in the society. Consumption of luxuries, investments in housing, car etc., are strategies to make up differences between them and those with higher status. Those strategies further show linkages between consumption practices and growth of identity. Attaining these goals require dignity recognized by others. Various elite sub-groups in Dhaka make efforts to take their place in the society with status, and thereafter they are able to build it up to create their own distinctive positions. Be that investments in a luxury house or in a luxury car. “If it is not one of the most luxurious and expensive house in Dhaka, its meaning is lost to me” boasted the 50 year old contractor, when he was showing me his villa in Baridhara, Dhaka. He also owns one BMW X3 and a Mercedes.

A well decorated luxury house in a posh area, an office in a centrally located commercial area and membership of an exclusive club are sources of status and ways of maintaining connections. They earn reputation. Reputation is important for establishing links with the power brokers who are capable of doing favours. Favours may be granting loans, foreign exchange, allowing the import of desired consumer durables, cars, allocation of a plot in the posh residential areas etc. One respondent described:

“A person, what he does, where he lives and how good is his office, make up important criteria in gaining popularity in a social circle. Again the clublife, and aspects like this, and if you are not a member of a good club, you are not considered to be one of the richest people in the society. So staying in certain areas, visiting a certain club, dining at certain restaurants, adds value to your

value in the society. And in return, you get benefits when you do business. A businessman needs a lot of things, his experience, and the right product. But contacts are more important. Personal contact in this part of the world is a price of a wider roll in business. And to gain that, you have to live your life where you are, in contact with the elite, and with the decision-makers of the country".

The statement especially refers to the political elite. A leader must maintain a distinctive life style and his financial strength. The amount of money an ambitious leader can spend in election campaign is crucial for his possibility of being elected. A candidate competing for parliamentary election spends more than one million taka (U.S.D 20,000).

During election all the political parties arrange meetings all over the country. The political leaders become very benign. They contribute to schools, hospitals etc. using the state funds. The leader of the party in power travels throughout the country using state owned planes and helicopters. Resources and services provided by the state institutions are scarce. Therefore, there are competitions among them regarding control over the state institutions and state power. Various cliques often emerge as the elite make efforts to maximise economic returns and secure political power. Collectively, through business associations, political affiliation, and through personal connections within cliques, all the elite sub-groups enjoy a variety of direct formal and informal channels of access to government decision-makers.

In short, networks are significant not only because of obligatory practices. Those are significant because those work as mechanisms of achieving reputation, recognition, economic resources and power. People invest in networks for social closure, inclusion and exclusion in their struggle for resources and power. All these activities further help them to obtain a higher position within a network or an alliance as well as in the society. Exclusive networks are used as resources in acquiring even more resources and power. They also compete for power.

Having described the centralised nature of power distribution through various coalitions I now discuss implications of luxury consumption and investment behaviour of various elite sub-groups in Dhaka.

IV. Discussion

The coalitions and cliques analysed in this paper shows a duality of relationship. Clique ties may be intense, yet weak. Clique ties are short-term and non-durable. The economic returns from such ties are crucial for their durability. If the control pressures between identities are less or more than the pressures inside a clique, durability of clique connections can be anticipated. These contexts involve detangling overall relations into types of tie. The examples are favouritism, nepotism and venality.

Thus the multiplex tie contributes, as a cause and mechanism of exchange, to allocation and to distribution more generally. This is at the root of clientilism. In this regard, the consumption and investments of the elite cliques are aimed at competition for resources, which depends on centralised power within the clique. Clique connections both influence and are influenced by consumption. Clique connections maintain inequality, corruption etc.

Members of a coalition or a clique know that consumption pays, consumption benefits them. However, the beneficial effects of consumption are not available for those who are outside any coalition or who do not have the capacity to consume or invest in coalitions. The elite's consumption patterns have social impacts that deepen inequalities and inimical to sustainability. Their consumption patterns are indicators of consumption as damaging.

The highly centralised style of decision-making power and the predominantly reciprocal network structure of coalitions and clique ties perpetuated consumption expenditures of the elites that have expanded at an unprecedented pace, the impacts of which, unfortunately, are negative for the society as a whole. Dhaka is now characterised by the stark contrast it offers between the rich and the poor. The contrast is brought about vividly by the architect designed modern luxury villas in posh residential areas, latest model imported cars on the one hand, and an increasing number of slums full of beggars and vagrants, on the other. The oases like Dhanmondi, Gulshan, Banani and Baridhara with fashionable buildings and high lifestyle involving vulgar display of wealth and decadent culture provide a sharp contrast to the generally depressing picture of poverty in the slum areas. One meets the houseless and the 'bastee'(slums) dwellers just within a minute's walk. The people living the 'bastee', neither have proper accommodation nor do they have access to drinking water, health services etc. I am not going to analyse the poor peoples' livelihood. My only comment on this vulnerable people is that they are forced to live in the limited open space.

The desire of owning a house of an average Bengali middle-class family remains a dream since the price of land in Dhaka has increased by 1000 times in the last twenty years. In posh residential areas and the central business district present, land prices are higher than most Western metropolises. In one of the poorest countries in the world factors such as population pressure, demand for land for housing or for commercial purposes exceeds the amount of land which is available. What stands out as unique is the growing trend among the elites of all kinds towards concentration of land ownership in the city of Dhaka. The elites constitute about 10% of Dhaka's population and they own 80% of land in Dhaka. They demand more land. Since no more land is available they started grabbing empty government plots, encroachment of canals, rivers, ponds, lakes etc. They also manage the allocation of state owned property at a nominal price. A Dhaka daily reports that an organisation headed by the wife of the Communication Minister, in 2004, has been allocated a bigha (hundred decimal) of land of his ministry adjacent a green park close to the ministry at the heart of the city, for a token price of Tk 5,000 (USD 80). The market price is more than Tk 300 million (USD 5 million). There was competition among the members of the alliance government to grab as much land of the government, in this case the property of the railway. Similarly a son of the President during the same period got allocation of another piece of land close to the airport for the purpose of supplying gasoline to the Civil Aviation Authority(Bangladesh Observer 22nd September 2004). The list is long. The point is that people with power give minimum consideration to what social consequences this may create. Dhaka city, used to be a city of lakes and canals, and green parks, now turned to be jungle of concrete buildings. Its sewerage system and traffic system have collapsed. Households lack drinking water. Rich people use deep tube wells and created pressure on ground water. Due to huge number of private cars, old buses and use of air conditioner the level of pollution became alarming.

Power supply in Bangladesh is inadequate. The shortage is compounded by excessive use of air conditioners, fridges, t.v etc. To address the country's energy shortage the

government of Bangladesh recently introduced day light saving time. The wealthy people however have installed their own generators, which require additional gasoline. That means more import of petroleum from abroad. There came a new instruction from the government to government employees to stop wearing suits, jackets and ties to save electricity. The objective is to minimise the use of air-conditioners, and hence saving energy. Officials and ministers have also been told not to turn their air conditioners below 24 C.

V. Concluding remarks

Implicit in the above discussion are theoretical issues of embeddedness implying consumption as interaction process, rationality of consumption, social inequality, sustainable development etc. It is beyond the scope of this paper to go into detail on these issues. I rather present some reflections on the theories I mentioned in the introduction.

People feel the urge to consume certain items or invest in something they are consumer as a product of the social and cultural milieu in which they are embedded. Through repeated interactions, within and between networks, the objective structures of elite culture developed among the rich under investigation. The socially ascribed means people adopt to achieve economic goals that explain rationality (Weber's notion of substantive rationality). The rationality of economic action including consumption and investment behaviour must be understood in terms of the existing form of interaction. In many developing societies, it is the reciprocity form of interaction that shapes the base of types of institutions and networks enabling the creation of a framework for the economy.

Rationality, utility and goals of consumption practices depend further on what other transactions are involved in the whole network relationship of which obligation is only one part. Name, fame, power, recognition etc. are also important goals of consumption. The case in hand indicates that those who achieve recognition and consume luxuries appear to be people who can maintain networks and know how to get things done. People direct their consumption at forming network ties with significant others, as wide as possible. This supports Granovetters' notion of strength of weak ties or structural embeddedness. Consumption provides people connections with dispersed social networks.

Elites of all kind want to ensure a clear spread of ranking in order to increase the number of networks and distances of identities. A set of ties may embed into a team, or into an identity. Thereby, coalitions and the cliques grow by the process of 'folding-in' as is explained by Coleman and Burt (Coleman 1957, 1961; Burt 1982). Folding-in process works across the different networks and tends to yield clique membership across several contacts of the elite sub-groups. Such connections grow both within a network and between networks. If one or more clique members had connections outside the network, the other members of the same networks tend to assimilate him. He thereby secures a concrete (though fragile) place in a network. In case such concrete ties are disrupted, new ties of equivalent sort could be acknowledged and achieved by means of consumption.

Elites desired status and prestige through consumption. Claims for prestige are expressed in the ways of consumption that make up the styles of life, characterising the elites at

various status levels. Members of a clique with centralised power, eat at certain places with certain people. They maintain personal elegance and a special mode of address. The elite society in Dhaka often regiments status activities to upper circles (contagion hypothesis), where exclusiveness, distance and condescending benevolence toward outsiders are the characteristics.

The elites imitate the life styles of other elites. They also struggle for recognition and prestige, and compete for resources and power. This accords Bourdieu's claim consumption and investment that serve both to maintain equilibrium and create differentiation as regards access to economic resources and political power (Bourdieu1989). Coalitions may take the form of cliques.

Showing-off and wastage not only allowed but necessary. Therefore, wastefulness, as well as investments in clique connections, all involving state funds, dominates consumption patterns of the elites. This supports Veblen's theory of conspicuous consumption. Veblen rejecting the economists' notion of rational homo economicus provided evidence on conspicuousness, show-off, wastefulness as important aspects of the life-styles of the leisure class.

Conspicuousness in consumption patterns erode renewable resources, pollute environment and undermine the prospect of sustainable human development. My final remark is on the connections between conspicuous consumption, influencing and influenced by coalitions and cliques, and ingrained inequality in many developing societies. Development studies have mostly focused on problems of industrialisation, macro-economic factors, gross national product and incomes, and macro-institutions. The level of consumption as indicated by consumption indexes has also been used as an indicator for development. Yet, development studies have not paid attention to the complex chain of links between consumption and (under)development. It is interesting to see that the Human Development Report 1998 recognised the connections between competitive spending and conspicuous consumption, which turn the affluence of some into the social exclusion of many. The report rightly observed

> "When there is a heavy social pressure to maintain high consumption standards and society encourages competitive spending for conspicuous display of wealth, inequalities in consumption deepen poverty and social exclusion" (Human Development Report 1998: 6.)

Still, the report's exclusive focus is on the global dimension i.e. consumption in the global village. It compares the rich countries with the poor countries characterised by uneven growth and increasing inequalities in terms of consumption. My emphasis is on the internal consumption patterns of the elites, and impacts of conspicuous consumption on society. Within a society consumption serves as a means, not only of identity and communication, but also defines economic activities. In this regard, the symbolic power of consumption turns destructive as expressed in its power to exclude people. One major outcome of this is inequality, both in terms of consumption and the distribution of wealth. Thus the symbolic power of consumption does not allow the common goals of society to be realised.

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ATTEMPTING TO MEASURE THE SUSTAINABILITY EFFECTS OF LARGE RETAIL CHAINS[1]

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Large retail chains have become the dominant purchasing places for Hungarian consumers. At the same time when the first large scale retail unit was opened in Hungary the first critical voices were heard on the environmental effects of hypermarkets. In the new century economic critiques have overtaken the environmental ones. In countries with longer history of retail chains and market economics the most intensive discussion is about the social effects of big box retailing. Nonetheless these social debates have had almost no effect on the regulation of large retail chains. This is probably due to the difficulty of quantifying social effects and accounting for other variables impact on social effects. This paper gives an overview of the critical academic literature and proposes a set of indicators for measuring the sustainability of large retail chains that may serve as a starting point for exact measurements.

The research is part of the "Sustainable Consumption, Production and Communication" Project financed by the Norwegian Fund.

I. INTRODUCTION

Consumption patterns are determined by infrastructures to a large extent. The sustainability of consumption depends on whether infrastructures provide access to sustainable products and services (e.g. are certified green products easily accessible to consumers?) but also on the sustainability of the infrastructure itself. Our research focuses on the latter criteria and attempts to propose a set of indicators for measuring the sustainability of retail chains.

Over the past decades there has been a growing concern about the environmental, economic and social sustainability effects of large retail networks. Social movements in Hungary and throughout the world have claimed that retail chains have harmful environmental effects because they: generate extra traffic, increase logistical needs, and have negative effects on long term employment. Others are worried about the decreasing vitality and viability of central urban areas and also accuse retail chains of making the food processing industry bankrupt and destroying the traditional local agriculture.

Although these are serious claims, they are rarely supported by statistical data and trend analysis. This paper first maps the main critical concerns about the effects of large retail chains through the analysis of the relevant international and Hungarian academic literature and publications by various civil society organisations. Secondly, it proposes an indicator set for the measurement and monitoring of the sustainability effects of retail chains, more precisely of hypermarkets. Indicators are based on the triple-bottom-line approach to sustainability measurement, examining the effects of retail chains on society at large, on the environment, and on the local economy.

[1] The author is grateful for the research assistance to Kristopher Greek.

II. THE MARKET SIGNIFICANCE OF LARGE RETAIL CHAINS

It is significant that the market share of retail chains has been increasing and that the retail of fast moving consumer goods is becoming increasingly more centralised within these institutions. The focus of this paper is on self-service retail establishments, which offer a wide assortment of food and non-food goods, whose territory is at least 3000 square meter, and that usually have parking lots. This is the definition used by the Hungarian Central Statistical Office to define hypermarkets [1]. In the following document hypermarkets will mean large retail chains according to this definition.

While hypermarkets often operate independently they may also operate inside shopping malls. In Hungary the major hypermarket chains are: Interspar, Tesco, Auchan, Cora and CBA [2]. The first hypermarket (Interspar in Győr) opened in 1995, six years after the regime change, and since then their numbers have been increasing exponentially. 2006 was the peak of development when seventeen new establishments were opened [2], [3]. In 2008 125 hypermarkets operated in the country, the majority of them owned by Tesco [2], [4], [5].

The increasing number of hypermarkets indicates a general concentration in retail trade. While the number of retail units decreased by 1.3 percent throughout the country, the number of units operating as hypermarkets grew by 61 percent between 2002 and 2007. Accordingly, the share of units operating in shopping malls or hypermarkets from the retail doubled to 4.9 percent [2]. There is a continuous fluctuation of retailers within hypermarkets: in 2007 one in five retail units had a different owner than in the previous year. Hypermarkets also represent a concentration in retail ownership. In an average hypermarket one business entity owns 1.9 retail units while the corresponding country average is 1.5. This is a nine percent increase from 2002 in hypermarkets and a 1.7 percent in the country average [2].

Concentration is also evident from market figures: the so called modern chains (hypermarkets, cash and carry, supermarkets, discount chains) together make up about two thirds of the share of the fast moving consumer goods retail market; hypermarkets alone have about a quarter share [6]. The monetary amount spent per one shopping trip is smaller in the case of small, independent shops; about 1000 HUF was spent in them per occasion. The corresponding figure for hypermarkets was 4200 HUF and 2200 HUF for discount chains [7]. Hypermarkets are also the dominant places for big household purchases: four in five consumers doing big household shopping choose hypermarkets (not exclusively) [8].

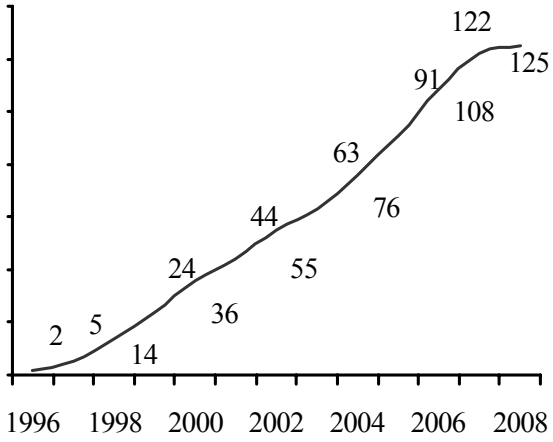

FIGURE 1: NUMBER OF HYPERMARKETS IN HUNGARY (SOURCE: [2], [3])

III. PROBLEMATIZING THE SUSTAINABILITY OF LARGE RETAIL CHAINS IN HUNGARY

In the recent decades various critiques emerged from various actors against hypermarkets. The most significant debates centred on the environmental concerns in the nineties and later at the beginning the 21st century about the economic dominance of big box companies. Contrary to the international experiences, the public discourse lacks the debate on the social effects of the increasing expansion of large retail units, e.g. its effect on employment or on unionization. On the other hand while the discussion of the environmental effects remained in the background on the international scene it was raised by the civil sector in Hungary and received media coverage.

Not long after the first hypermarket opened the social critique of such retail units also arrived to Hungary. In 1997 the Magyar Közlekedési Klub (Hungarian Transport Club, HTC) published material on their negative environmental effects. The 66 page booklet entitled "Shopping traffic – Shall we improve local trade or build new shopping malls?" was a translation of a material first published by the Verkehrsclub Österreich (Austrian Transport Club, VCÖ). The publication focused on the environmental effects of the increased traffic caused by large retail units built in the suburbs and it also promoted local trade, nevertheless data and cases represented the Austrian case. In the same year one of the most well known environmentalist groups Levegő Munkacsoport (Clean Air Action Group - National Environmental Protection Federation, CAA) in alliance with a couple of local residents launched a strategic lawsuits against the first retail unit of Auchan and against the Pest County Administrative Authority, which issued the building permit. The CAA and the residents claimed that the environment would be ruined and they would suffer from increased air and noise pollution. Additionally, they claimed that the procedure for issuing the building permission had been done incorrectly [9], [10]. Finally the CAA and the residents lost the case and the retail unit was built in spite of the confrontation with other civil organisations and researchers. However, the CAA and green organisations remain s powerful opposition to large retail units.

In 2009 the Association of Conscious Consumers published the ranking of large retail chains under the flagship of their unique ethical ranking project, entitled Cégmérce (Corporate Score). Hypermarkets performed poorly due to several environmental, employment and consumer protection failures [11].

About ten years after the appearance of the first critical voices from civil society, organisations, ministries and governmental authorities started to pay attention to the anomalies involved in the operation of the large retail units; unfair business practices, economic inequalities and the harmful effects on local enterprises were main concerns.

More than a decade after the first hypermarket had opened the economic and social effects of large retail chains became a hot topic in governmental communication. From 2006 new trade law ordered retailers with significant buying powers to maintain fair business relations with suppliers. The Ministry of Agriculture and Rural Development was one of the leaders of these new waves of critiques. In 2006 it initiated a code of ethics for the retail chains with the declared goal of promoting products with Hungarian origin. However, after few months of negotiation the draft was withdrawn. At the same time a parallel initiative by the Hungarian Trade Association was successful. Besides having fair business practices as a central issue it took a progressive approach and also promoted environmental perspectives (after primary business interests). The code states that retailers should prefer energy saving and environmentally friendly products, introduce selective waste management programs, and should seek to use environmentally friendly packaging. The code was endorsed by the major chains and also approved by the Hungarian Competition Authority. The code is still in force.

In 2006 the government also established a committee for examining competition practices and the state of consumer protection in large retail chains and through their supply chains. The report emphasised the significance of big box chains by pointing out that while units above 400 square meters only represent a two thousandth of existing retail units more than 40 per cent of retail takes place through them. At the same time retail units under 200 square meters responsible for the one third of trade. Experts also concluded that the number of large retail chains is high even by international comparison therefore the competition is strong among them [12].

The economic dominance of retail chains remained in the centre of public and political discourse. In 2007 and 2008 the Hungarian Competition Authority funded research on the topic. The research was conducted by the Research Institute of Economics and Enterprises of the Hungarian Chamber of Commerce and Industry. The first research (both qualitative and quantitative) was aimed at discovering the realities of trade practices that were referred to in the new trade regulation in force since 2006 and at measuring how informed big box suppliers were about the act. When asking about the potential harmful effects, in the qualitative phase, the representatives of suppliers mentioned that due to intensive price competition fewer resources are left for innovation. Furthermore, the high fees paid for being in the assortment of the hypermarkets lead to the disappearance of certain products and of many SMEs which in turn results in the destruction of local production and the loss of jobs. Environmental effects of import related transport were also mentioned and many said that intensive competition between retail chains has lead to declining product quality, which does not serve the interest of consumers [13].

In 2009 the Ministry of Agriculture and Rural Development again initiated a code of conduct for retailers, entitled “Food Supply Chain Code”, for promoting fair business

practices in order to provide fair living for all members of the chain and for promoting the sales of Hungarian origin products [14]. The proposal was rejected by trade associations and the Hungarian Competition Authority had been planning an investigation with the reasoning that the code would limit fair competition [15]. Finally the proposal was withdrawn.

IV. Environmental, social and community aspects in the light of statistics

While the first critiques of large retail chains were raised by environmentalist groups in Hungary this aspect of sustainability is barely discussed in the international academic literature. The most similar cases are climate change and land use.

Beauvais made calculations on the contribution of hyper- and supermarkets to climate change. The results of the study are based on a survey among hyper- and supermarket consumers and on assumptions. Beauvais first concluded that both the size and the distance of the shopping area from town centres significantly contribute to increased car use, which was higher in low density area shopping comparing to high density zones and higher for hypermarkets than for supermarkets. Beauvais set up an indicator for measuring the environmental efficiency of purchasing from different retail units in different urban areas. His claims that a 100 EUR value purchase from a supermarket in high density zone contributes to 5 kilometres driving while 20 kilometres in case of hypermarkets in low density areas. His final conclusion is that carbon dioxide emission is four times more intensive in case of suburban hypermarket shopping than in case of local supermarket shopping [16].

These figures may be multiplied by exponentially growing “motorized” shopping as is the case in Hungary. Few years ago already one fifth of shopping was done with cars, however this ratio is significantly higher in the case of cash and carry (93 percent) and of hypermarkets (76 percent) and of discount chain shopping (47 percent) [17].

Hypermarket construction on green fields also contributes to urbanisation that leads to increased imperviousness and therefore to decreasing water quality. The study ”The Importance of Imperviousness”, prepared for local water preservation policies, states that ”imperviousness is a powerful and important indicator of future stream quality” as such surfaces ”collect and accumulate pollutants deposited from the atmosphere, leaked from vehicles… In some cases, impervious surfaces themselves become a significant source of pollutants (e.g. zinc desorbing from roof surfaces). ” Utilization of already existing urban infrastructure for commercial purposes has the benefit of not increasing imperviousness. On the other hand the large footprint of hypermarkets means that their creation, along with urbanization in general, increases imperviousness and therefore pollution [18].

There are dozens of academic studies on the social sustainability of large retail chains especially on that of Wal-Mart in the United States. According the CNN’s Fortune 500 ranking Wal-Mart is the second largest US firm, with the 405 607 million dollars annual revenue [19]. According to the 2009 Annual Report from Wal-Mart their average discount store size is 108,000 square feet while their average supercenter size is approximately 186 000 square feet [20]. the supercenters then are similar to Hungarian hypermarkets such as the Auchan in Budaörs which is about 170 000 square feet.

In 1999 Boarnet and Crane analysed the effects of Wal-Mart on labour market for the Orange County Business Council (United States) and on the basis of various statistical evidence they claimed that grocery stores offer better wages and benefits compared to Wal-Mart or other low cost retailers [21].

Later Basker's paper (2005) demonstrates the importance of longitudinal analysis. According to the statistically significant results Wal-Mart contributed to the net creation of about 40 jobs in the first year of entry and 20 in the subsequent year per county. This is less than the company originally promised and less than the average employment of a Wal-Mart retail unit (150-350 workers). This discrepancy is due to fact that the entrance of Wal-Mart into the market generated lay offs and forced existing competitors to downsize. In the following years all together about 90 jobs are lost in the retail and in the wholesale sectors. However, Basker notes, the overall balance at the five year horizon is still slightly positive. All together the study estimates about 10-30 newly created jobs – far less than the original estimation. Contrary to the small contribution to employment in the retail sector, a small negative effect of Wal-Mart entry was shown on wholesale employment. This is most probably explained by special vertical structure of Wal-Mart that organises wholesale for itself. This study also shows that other sectors, such as automobile sales and services, restaurants or manufacturing businesses were not affected by new Wal-Mart stores [22].

Dube and Wertheim focused on the effects Wal-Mart has on wage level. They used labour statistical models and found that average earnings fall when Wal-Mart enters a market. Authors claim that Wal-Mart does not create additional jobs and additionally reduces total income for retail workers [23]. Neumark et al. not only state that Wal-Mart does not created additional jobs, but they claim that each Wal-Mart worker replaces approximately 1.4 retail workers, which represents a 2.7 percent reduction in average retail employment. Their analysis also shows that big box store openings contribute to a 1.3 percent decline in retail earnings. Nevertheless, authors note that this phenomenon is observed in a generally rising retail employment environment [24]. Similar results were also confirmed by Dube et al. who examined the wages of hypermarket workers in the United States using the data of the US Bureau of Labor Statistics, and found that wages were indeed lowered; workers at Wal-Mart make about a quarter less than those workers in competing stores. Statistical evidence was found that Wal-Mart entry reduced both average and total retail earnings (wages other benefits) in urban areas. Authors measured a 0.5 percent drop in retail earnings on the county level per opening of Wal-Mart. On the state level the opening of ten Wal-Marts resulted in a 0.5 to 2 per cent decrease in average earnings. Drops mostly affected employees at Wal-Mart competitors [25].

Large retail chains mainly affect the local economy through their taxes and by their spending power. Basker who researched the employment implications of Wal-Mart on the county level also concluded that while Wal-Mart entries may contribute to a slight increase in retail employment in the midterm, they reduce the number of small retail establishments in the county [22]. Such results may be particularly interesting for evaluating the tax incomes of local communities. Boarnet and Crane pointed out that the municipal benefits are lower than they are purported to be since the increased tax income is offset by tax losses from existing businesses [21].

A study prepared by the Civic Economics (2002), a Chicago based consulting firm, analysed local data and of using economic models concluded that local merchants have a greater local economic impact. This is because much of their money is spent in the local

community. The authors also claim that stores competing with chains will decline, causing a decline in local economic activity even if total sales increase. Finally, small changes in consumer spending habits have a strong impact on the local economy [26].

A US based think-tank Institute for Local Self-Reliance (ILSR) compared detailed financial information obtained from eight locally owned businesses and from big box retailers. ILSR concluded that while local businesses spend more than half of their money in the local and state economy, big box stores spend only around one sixth in state. Charitable giving was also examined, evidence was found that local businesses give far more relative to their revenues than big box stores [27].

V. Discussion

The further expansion of large scale retail should be evaluated against the sustainability effects noted on this form. Besides some environmental indicators already set up for general purposes by the Hungarian Central Statistical Office, social and economic aspects should be evaluated more carefully. A longitudinal analysis should be applied so that local decision making can be well founded based on actual costs and benefits.

Large retail chains evidently affect the levels of employment. To what extent and to what direction – it is still debated. Offsetting effects should be measured in the Hungarian context as well. Thus the widespread and high level use of illegal or semi-legal employment patterns in Hungary should be taken into consideration when examining employment. Offsetting the assumed high level of illegal or semi-legal employment in the small-scale retail sector (competitors) probably will provide more positive social effects for hypermarkets in the case of Hungary.

Based on the discussed references, we propose the following set of indicators to measure the sustainability effects of large retail chains and their alternatives.

Society	**Environment**	**Economy**

▪ Employment
  ○ In general
  ○ In the retail sector
▪ Wage levels
▪ Illegal or semi illegal employment
▪ Level of social security registration
	▪ Traffic
	▪ Land use (urbanisation)
	▪ Energy use
	▪ Water use
		▪ Taxes paid
		▪ Spending power

There are other indicators of sustainability that are less discussed but also worth measuring: time balance of consumers and of workers, public costs of maintaining surrounding infrastructures (roads, public transport, lighting etc.).

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SUSTAINABLE CONSUMPTION: FROM ESCAPE STRATEGIES TOWARDS REAL ALTERNATIVES

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Better sustainability policy is supposed to lead to better sustainability performance. Nonetheless, recent research predicts further growth of the ecological footprint and stable ecological deficit in Europe and North America despite their impressive policy efforts (Lenzen et al. 2007) [1]. Similarly, individual strategies result in somewhat reduced load for committed consumers, but this reduction cannot offset the total impact of the socio-economic configuration: consumers in higher income countries tend to pollute more. Committed consumers „offset" a part of their environmental load by carrying out green purchases. A radical change assumes a change in lifestyles (Shove, 2004) [2].The conference paper is the first step of the study that aims at measuring the significance of attitude elements as compared to the significance of the socio-economic system on different elements of consumption and environmental aspects. This paper focuses on measuring the ecological footprint impacts of consumption in different product groups as well as in different income groups of the society.

The research is part of the "Sustainable Consumption, Production and Communication" Project financed by the Norwegian Fund.

I. INTRODUCTION

Countries with the best sustainability policies and highest ESI rankings 'boast' the largest ecological footprint. Better sustainability policy is supposed to lead to better sustainability performance. Nonetheless, recent research predicts further growth of the ecological footprint and stable ecological deficit in Europe and North America despite their impressive policy efforts (Lenzen et al. 2007) [1]. Similarly, individual strategies result in somewhat reduced load for committed consumers, but this reduction cannot offset the total impact of the socio-economic configuration: consumers in higher income countries tend to pollute more. A radical change assumes a change in lifestyles (Shove, 2004) [2]. Committed consumers „offset" a part of their environmental load by carrying out green purchases. The study aims at measuring the significance of attitude elements as compared to the significance of the socio-economic system on different elements of consumption and environmental aspects. (See Figure 1)

The environmental impacts of different social segments of Hungarian consumers are compared to each other and this way we hope to separate the impact of environmental factors (e.g. climate in defining heating requirements), income, and lifestyle elements.

At the first stage of our research we have calculated the ecological footprint of consumption by income deciles, as income is perhaps the most important factor of the socio-economic configuration. Thus we will such how much is the difference in ecological footprint between rich and poor that should be compensated by higher environmental consciousness of high income groups. Our hypothesis is that individual attitude is able to somewhat modify, but not able to offset the difference in income-defined ecological footprint totally.

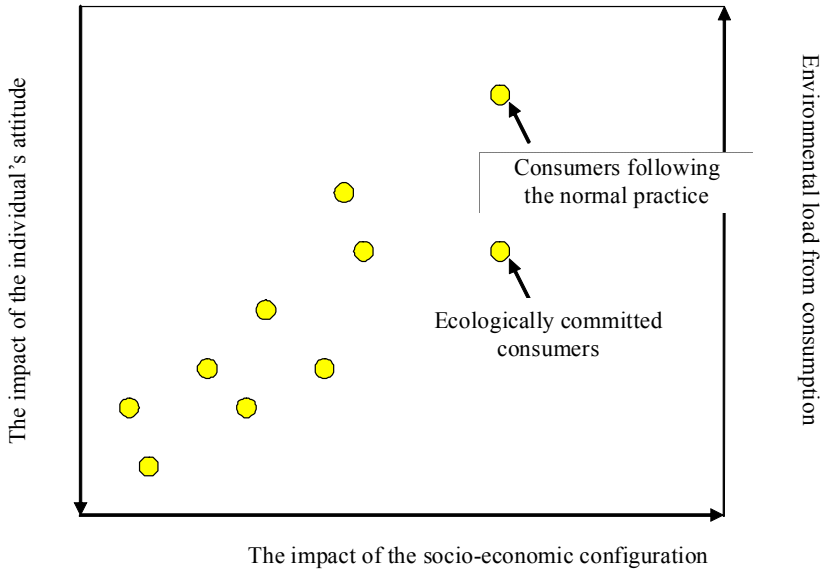

FIGURE 1: THE IMPACT OF THE INDIVIDUAL'S ATTITUDE ON THE ENVIRONMENTAL LOAD

II. MEASURING THE ECOLOGICAL FOOTPRINT OF CONSUMPTION

In order to measure the sustainability, the human impact on the natural capital, a proper indicator is needed. Finding and developing such indicator has been the research subject of many scientists, so this issue has a rich literature from the last two decades.

The very early researches focused on the calculation of the number of population, which can be sustained by a defined area. The question of how much nature people use to sustain themselves, was first raised by Wackernagel and Rees (1996) [3], and the breakthrough came with their study, where they introduced a new method and measure – the Ecological Footprint.

The definition of the Ecological Footprint is the following: 'the Ecological Footprint is a resource accounting tool that measures how much biologically productive land and sea is used by a given population or activity, and compares this to how much land and sea is available, using prevailing technology and resource management schemes' (Wackernagel et al., 1996) [3]. It measures human demand on nature, by assessing how much biologically productive land and sea area is necessary to maintain a given consumption pattern. As a result the physical areas are expressed in so-called global hectares, making the comparison between regions, nations easier.

In this analysis the unsustainable populations have a larger ecological footprint than the land available for them. The method also calculates with the waste flows of human production and activity, distinguishing between biological waste, toxic materials and wastes of materials which are directly sent to landfills. Treating the water usage in the calculations is a critical issue as well.

It is important not to mix up the Ecological Footprint method and result with the carbon-footprint calculations. They are not the same, the Ecological Footprint calculations use the data on carbon dioxide emissions. The importance of the carbon dioxide data and the

calculated carbon footprint lies in the fact that it contributes to the easier understanding and use of Ecological Footprint. The area based carbon-footprint becomes comparable to the demands of the productive land, and thus making the so-called spill-over effects more visible.

As for the ecological footprinting method, today there exist two different approaches. The so-called 'compound' footprinting introduced by Wackernagel et al.; and the so-called 'component-based' footprinting of Simmons et al. (2000) [4]. The 'component-based' method reflects a bottom-up analytical approach, thus it focuses on the measurement of smaller groups, sub-regions, organisations.

The consumption of goods and services results in the direct and indirect degradation of the environment. The indirect environmental impact is an impact that occurs during the production process or waste treatment of the product, thus not during the use of the product by a consumer. We consider that the examination of the indirect effects should be brought into prominence; the reason is that there have been only a few studies which have comprised the indirect consequences in their analyses.

Bicknell et al. (1998) [5] were the first to introduce generalised input– output analysis, incorporating it into the method of the ecological footprint calculations. Lenzen and Murray (2001) [6] revised the method of Ecological Footprint (in the following EF). They have made modifications on the original concept in order to make it suitable for input−output analysis. Thus a regional, disturbance- based approach is taken in their study, including actual Australian land use and emissions data.

Wackernagel et al. (2006) [7] have also shown a combination of Ecological Footprint accounting with monetary input–output analysis.

Tukker and Jansen (2006) [8] were those who have worked out a review on the studies focusing on extended environmental impacts, using the methodology of the input-output analyses. They concluded that the major part of environmental impacts is associated with the following consumption categories, namely the housing, transport and food. These categories seem to have the major influential force.

Kerkhof et al. (2008) [9] came up with a novelty in their analysis on the household expenditures of the Netherlands, because they were the first to make a consistent analysis of the expenditure elasticities of the four impact categories. This analysis allows the examination of the elasticities by regression analyses and a comparison regarding the product level. The study deals with exclusively household expenditures as household characteristics are the major drivers and explanatory variables in energy requirements and environmental impact (Lenzen et al. 2004 [10], Pachauri, 2004[11]).

Using the top-down technique of the input-output analyses, the first step of Kerkhof et al. was the quantification of the impact intensities of household goods and services. After it the results came from the combination of household consumption data. The indirect impact intensities were calculated by means of environmentally extended input-output analysis. The study analysed the annual expenditures on six aggregate product groups by equivalent expenditure deciles, showing that high-expenditure households spend more money on 'development, leisure and traffic' and on 'house', but with the growing expenditure volume, the demand on food relatively decreases, thus it is important to examine the consumption patterns changing by the expenditure level.

In a recent study of Druckman and Jackson (2009) [12], the authors have put up the research question that how much CO2 is attributable to the different kinds of needs and

desires and to what extent decoupling is occurring between household expenditures and CO2 emissions. They aimed at defining the carbon footprint of different segments of the UK's society compared to each other. Taking the direct and indirect consumption (embedded in trade) into account as Kerkhof et al. (2008) [9] did, they have worked out a quasi-multi-regional input–output (QMRIO) model. It is a modification of the multi-regional model, already used before in other studies, but it allows bigger accuracy, transparency and a bigger scale of sectors being taken into the model. Because of the rebound effect, it was vital to take into account the overall expenditure on good and services beyond the country borders as well.

The authors give a deep insight into the methodology of calculating embedded CO2 emissions. It is based on a two-region model (Proops et al, 1993) [13] and Jackson et al. (2007) [14] with modifying the CO2 intensity of imported goods, by calculating it for each importing partners in 12 world regions.

The results have shown that though the proportion of embedded goods have risen slightly, the embedded CO2 emission through imports have significantly increased from 1990. The great proportion of embedded goods highlights the importance of examining the cross-sector and cross-country impacts of consumption. It is worthy of note, that the quarter of the emission of an average household stems from the recreation and leisure (including personal aviation), the most well-off Supergroup having the greatest carbon footprint.

Quite a few criticisms have been raised in the literature concerning the method of the Ecological Footprint. The major objections are related to the measurement and the calculation of the ecological footprint. Though all these criticisms, in many studies and analyses it has already been shown that the Ecological Footprint concept is an appropriate indicator for capturing the relation between consumption patterns and environmental impact.

III. THE CALCULATION METHOD USED IN THE HUNGARIAN CASE STUDY

In this study we have calculated the ecological footprint of Hungarian households' consumption as well as the ecological footprint intensities by using the method of input-output analysis as suggested by Bicknell et al. and Wiedmann et. al. This method quantifies the direct and indirect ecological footprint of different consumption categories. By following their approach we are able to compute the total effects of each product or service groups on the ecological footprint. Thus, we can move forward from holding industries responsible for all ecological impacts they cause, and will be able to face the reality that industries use the environment in order to produce products for us. Final consumers must hold responsibilities for the impacts their consumption induce.

Direct impacts refer to using of a product by the consumer and it is characterised by direct intensity vector. Indirect impact is defined as the impact that occurs during the production process or waste treatment of a product (Moll et al., 2008).

The total intensity vector expresses the direct and indirect impacts of industrial activities (total ecological footprint per expenditure). Basically, it represents the entire industrial supply chain of deliveries from industry to industry up to the final demand, where the households purchase the product (Wiedmann et al., 2005). E.g. ecological impacts of

tourism industry include not only the direct impacts, which are sometimes minimal, but also the ecological footprint of travelling or the laundry services.

Calculation follows the following steps:

1. Production of the environmentally extended input-output table that complements the industry transaction matrix ***A*** with industry aggregate ecological footprint data. It requires assigning all ecological footprint data to industrial sectors using data provided by the Ecological Footprint Network as well as cross coding tables. At this step we used the CORINE database to assign built-environment footprint to industries and households. We also used OECD, Eurostat and COICOP cross-coding tables to allocate products to industries.
2. Calculation of the physical coefficient vector.
3. Calculation of the Leontief inverse matrix, $(\boldsymbol{I}-\boldsymbol{A})^{-1}$, using the industry by industry symmetric input-output matrix from the EUROSTAT database. We used 2005 data as it was the latest available year for input-output as well as Ecological Footprint data.
4. Calculation of the total intensity vector capturing both direct and indirect impacts
5. Calculation of total requirements by households by multiplying the diagonalised intensity vector and the final demand by household vector.
6. Reallocation of final demand into consumption categories using KSH statistics, COICOP tables and TEAOR.
7. Adding direct ecological impacts of household to the table. Those impacts are not present at the market, so they are not captured by the transaction matrix. They include direct greenhouse gas emission from fuel burning and built up land.
8. Calculation of the EF/expenditure vector for different product groups.
9. Calculation of total requirement by income deciles. At this step we combined KSH consumption by income deciles statistics with the EF/expenditure vector.

IV. RESULTS

Fig.2. shows the ecological footprint of households by product groups. Total household consumption includes the direct consumption of built land and fuels for housing, built land and fuels for private transport and all other consumption of households. The demand categories with the highest ecological footprint are:

- food which is gives almost half of the total ecological footprint of Hungary,
- direct energy use by households (9% utilities and 9 % direct CO2 emission by individual fuel use or travelling)
- and services, which includes hotels, restaurants and public services.

The ecological footprint of food is dominant in the EF of each country, but it is still very high in Hungary as compared to other countries. This phenomenon requires further research, particularly because the consumption of animal products, a potential major driver in high EF, stays bellow the Western European average.

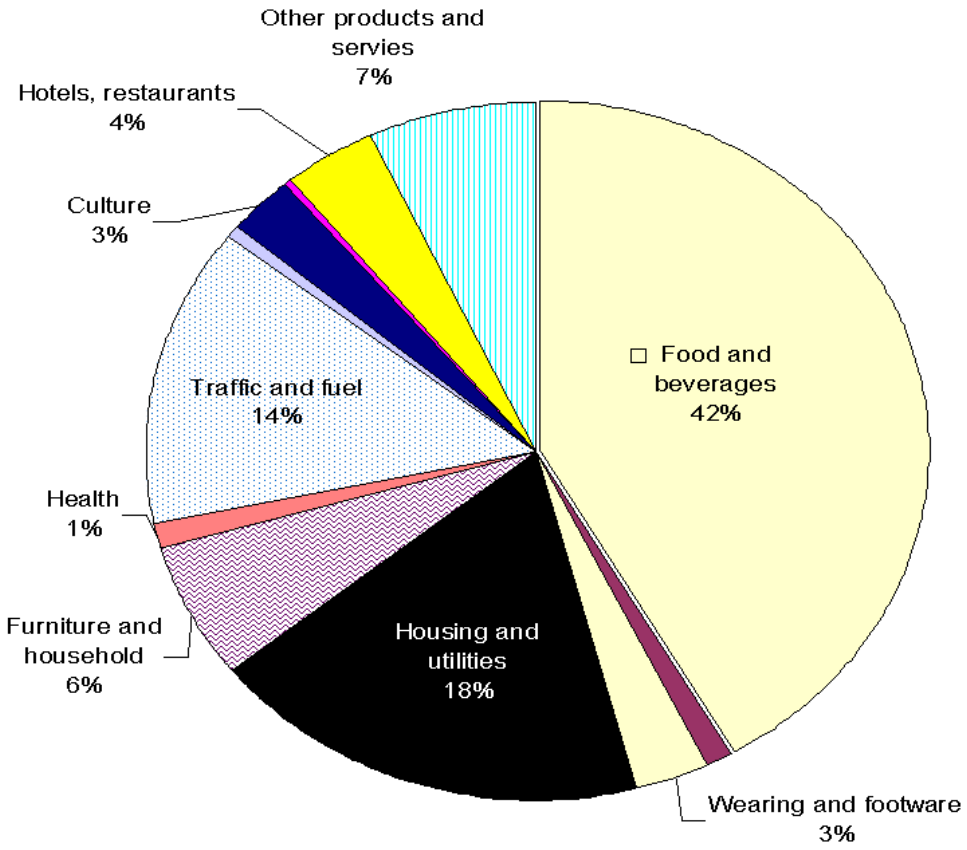

FIG 1: ECOLOGICAL FOOTPRINT OF CONSUMPTION

Comparison of direct and total intensities

Total intensity vector expresses the ratio of the spending of one unit of national currency on a product and the ecological footprint .

Consumption activities with the highest total footprint are agriculture, forestry and paper products, utilities and services. The cause of the high ecological footprint of forestry and wood products can be explained with the extensive nature of forestry due to the large lifecycle of trees. That is we need very large areas in order to produce 1 m3 wood annually. It does not equal saying forestry is polluting, though. Actually we must be happy if we have a high percent of forested land in the country. Using wood products is acceptable as soon as those are produced by sustainable forestry practices. So we have to be very careful with interpreting direct and total intensity vectors.

The difference between direct and total impacts shows the environmental impacts that happen in the value added chain. This is especially high in the hotels and restaurants sector and in the services sector. These sectors are traditionally regarded as environmentally friendly ones, but we should rethink this interpretation. Basically, service industries are at the end of the value-added chain, hence we tend to think of these industries as ones less harmful for the environment, but detailed analysis shows the opposite. The total ecological

footprint of the hotel and restaurant industry, for example, is 26 times higher than their direct footprint and this number does not capture the impact of individual travelling to these institutions. The ecological footprint per expenditure is the 3rd highest here of all industries.

Product groups	*Direct intensity vector*	*Total intensity vector*
Agriculture, hunting and related service activities	10.826	14.472
Forestry, logging and related service activities	66.625	77.597
Manufacture of pulp, paper and paper products	2.760	11.411
Electricity, gas, steam and hot water supply	3.251	5.681
Wholesale trade and commission trade, except of motor vehicles and motorcycles	0.096	1.400
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	0.088	1.037
Hotels and restaurants	0.103	2.655

TABLE 1: DIRECT VERSUS TOTAL IMPACTS OF INDUSTRIES

	HU
	Ecological footprint/expenditure Gha/HUF 10^{-6}
Food and non-alcoholic beverages	8.6
Alcoholic beverages	1.7
Clothing and footware	3.4
Housing and utilities	4.2
Furniture and household	7.3
Healthcare	1.3
Transport	5.3
Telecommunication	0.4
Recreational and cultural services	1.7
Education	1.4
Catering and accommodation services	5.6
Other products and services	4.4

TABLE 2: ECOLOGICAL FOOTPRINT PER EXPENDITURE

Household expenditures by income deciles

The aim of this paper is to explore the variation in ecological footprint among different segments of society. Therefore we use income deciles.

Table 1 shows the ecological footprint on 12 aggregate product groups by equivalent income deciles. We can observe how the consumption pattern changes with the increasing total income. The Hungarian households spend mostly on food and beverages their incomes. and its share of income decreases from 52.69% to 33.69%. In contrast. the share of expenditures on transport increases from 9.88% to 17.10%. Households with higher

income level generally spend more money on holidays and leisure activities at weekends than poor families.

The share of expenditures on wearing and footwear. alcohol. tobacco. education. communication and other products to total income nearly remains constant. The categories ‘other products and services’. ‘health care’. ‘culture’. ‘hotels and restaurants’ increase proportionally.

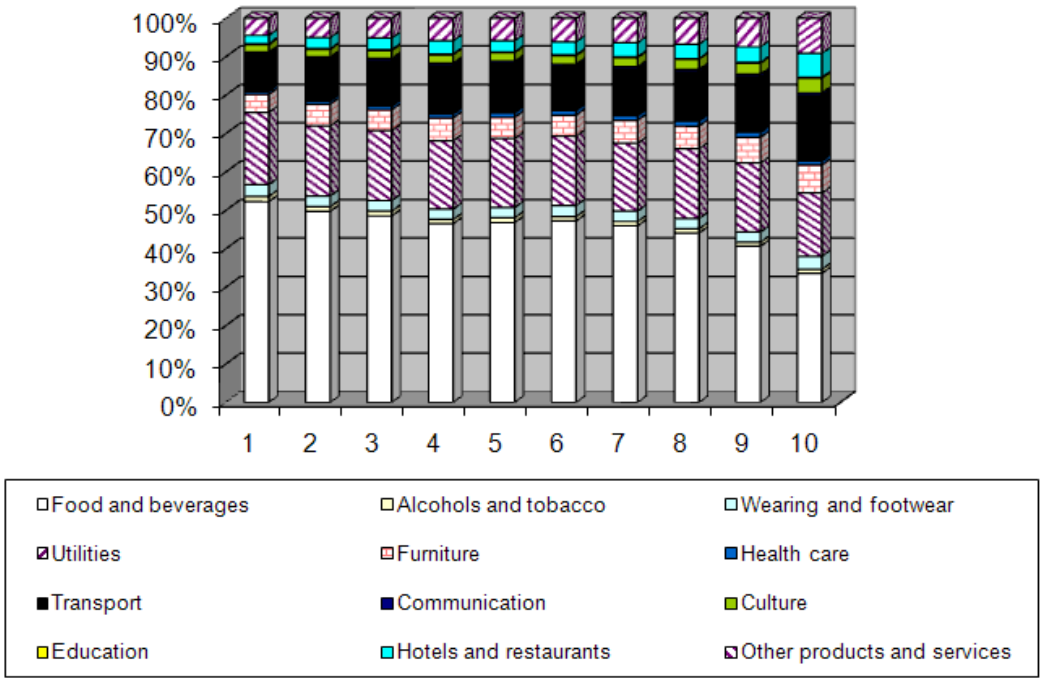

Fig.2. shows the composition of ecological footprint in increasing income deciles. The annual ecological footprint of households of the first income group 1.9 gha per capita and of the last deciles is 6.4 gha per capita. When the volume of the consumer basket increases. the demand for food levels off. while the demand or expenditures on transport. recreation or services increases more than proportionally. This observation indicates a consumption pattern common to other countries. too.

The results can be easily misinterpreted in a way that suggests a less harmful consumption structure for the wealthy. For example. food. as major driver of the ecological footprint has a lower proportion in their spending. We must note. however. that high income groups do not reduce their expenditure on any of the product groups either in HUF or in natural dimension. They just add luxury items to the top of their shopping list. Thus. increasing income. although apparently improves the structure of ecological impacts. will still go ahead with enlarged ecological footprint.

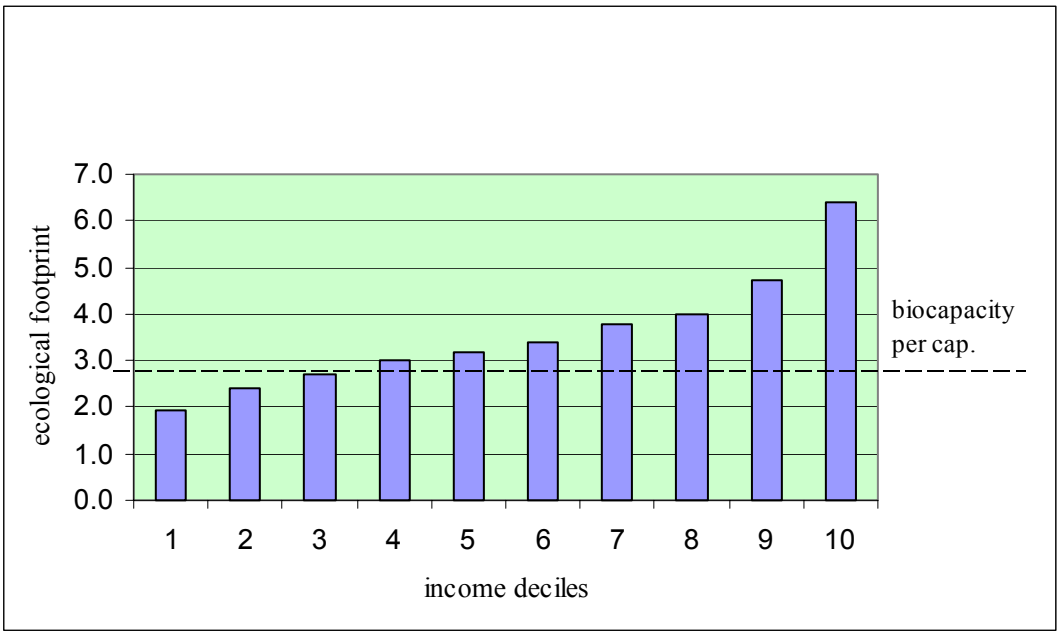

FIGURE 3: ECOLOGICAL FOOTPRINT PER CAPITA BY INCOME DECILES IN HUNGARY

The biocapacity of Hungary is 2.82 global ha per capita meaning that about 30% of our population lives within the biological limits of the country. Deciles 4. 5 and 6 are close to the margin: environmental conscientious individuals within these income groups might live in a sustainable ways. The highest income group is characterized by about 2.5 times higher environmental impact than the biocapacity. It is unlikely that such big difference could be offset by proper purchasing behavior.

More radical changes in the infrastructure. technology and lifestyle are necessary. Further research is needed though to measure the impact of environmental attitude.

Table 3 and Table 4 show the bias often prevalent when comparing wealthy countries with less well-off. United Kingdom seems more efficient in ecological footprint/GDP or ecological footprint/expenditure terms than Hungary. The root of this apparent "efficiency" can be found in higher prices as well as in buying more expensive products by the wealthy consumers. The ecological footprint per capita by product groups shows some variation across product groups. but the total per capita footprint without direct impacts of households is actually about the same in the two countries. (UK has a total of 5.3 gha per capita and Hungary has a 3.5 gha per capita when also taking direct ecological impacts of private transport. fuel burning and built up land into account.) The bias is very similar to that of comparing the highest income deciles to the lower ones. Thus. we cannot expect reduced ecological impact as a result of increasing income.

	Hungary	UK	
	EF/expenditure	EF/expenditure	Ratio
	gha/HUF*10-6	gha/HUF*10-6	
Food and non-alcoholic beverages	9.321	3.237	2.9
Alcoholic beverages	1.726	1.549	1.1
Clothing and footware	3.366	0.278	12.1
Housing and utilities	4.247	0.795	5.3
Furniture and household	7.326	0.567	12.9
Healthcare	1.273	0.371	3.4
Transport	5.323	0.726	7.3
Telecommunication	0.427	0.248	1.7
Recreational and cultural services	1.670	0.794	2.10
Education	1.410	0.326	4.3
Catering and accommodation services	5.654	0.935	6.0
Other products and services	4.365	0.394	11.08

TABLE 3: ECOLOGICAL FOOTPRINT INTENSITY OF EXPENDITURE IN HUNGARY AND IN THE UK (WITHOUT DIRECT IMPACTS BY HOUSEHOLDS)

	HU	UK
	EF/cap	
Food and non-alcoholic beverages	1.42	0.72
Alcoholic beverages	0.04	0.09
Clothing and footware	0.10	0.03
Housing and utilities	0.50	0.58
Furniture and household	0.22	0.20
Healthcare	0.04	0.02
Transport	0.18	0.37
Telecommunication	0.02	0.02
Recreational and cultural services	0.09	0.32
Education	0.01	0.02
Catering and accommodation services	0.14	0.41
Other products and services	0.24	0.25
Summa	3.0	3.0

TABLE 4: ECOLOGICAL FOOTPRINT PER CAPITA BY PRODUCT CATEGORIES (WITHOUT DIRECT IMPACTS OF HOUSEHOLDS)

V. CONCLUSION AND FUTURE RESEARCH

Our analysis revealed that end-of-supply chain industries has much higher environmental impact than what is usually supposed. It also showed that consumption of food. utilities and fuel are dominant within the ecological footprint. We must interpret these results with caution. The high EF of food production is due to the high area requirements of the sector. rather than to its polluting nature. Ecological agriculture might even have higher EF than intensive agriculture. characterized by high input of pesticides and artificial fertilizers. as its crop yield is lower. The same analysis will be carried out for environmental indicators other than EF in order to complete the picture.

We also found that highest income deciles consumers boast more than three times higher EF than the lowest income deciles. although the relationship between income and EF is regressive. A part of that might be compensated by environmental conscientious behaviour. but the difference seems to be too high for a complete offset.

In our future research we intend to refine the methodology of measuring the environmental impact of consumption and will also measure the potentials in voluntary changes in the lifestyle. We will also link ecological footprint to the measuring of happiness and life satisfaction in order to check how much ecologically sustainable lifestyle is associated with reduced life satisfaction. Identification of social groups with sustainable lifestyle and high level of life satisfaction will be targeted in order to reveal the "miracle" of living happily and sustainably.

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CHANGES IN CONSUMER BEHAVIOR PATTERNS IN THE LIGHT OF SUSTAINABILITY

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Below article provides a comprehensive review of literature on the theoretical aspects of sustainable consumption and on changes in household purchasing patterns as a factor of sustainable consumption, both in Europe and worldwide. The conditions to consumers' social responsibility and to the formation of environmentally conscious behavior patterns, and the methods for fostering and motivating behavioral changes essential for green consumption will also be dealt with. The authors complete a primary research study with the purpose of surveying changes in Hungarian consumption behavior patterns, with special emphasis on analyzing how appropriate information encourages sustainable consumption. The findings of the qualitative study, along with the methodology of the succeeding quantitative study are presented, as well.

The research is part of the "Sustainable Consumption, Production and Communication" Project financed by the Norwegian Fund.

I. INTRODUCTION

Our consumption behavior is formed, developed by a number of various impacts along the social learning path. In order for sustainability criteria to have a strong influence on consumption habits, we need to identify the factors which affect related consumer decisions most.

The first step towards sustainable consumption is the environmentally conscious individual [Zsóka, 2007]. The existence and the depth of this consciousness was characterized by Zsóka [2007] on the basis of ecological knowledge, environmental values, environmental attitudes, willingness to act and actual deeds. She also underlines that tracking the individual's consumption habits and their becoming aware of those habits greatly contributes to developing sustainable behavior patterns.

Within this process, the introduction and the internalization of proper consumption patterns is a key objective. The basis for this is a thorough understanding of consumption tendencies and the reasons behind them.

II. MAJOR CONSUMPTION TRENDS IN THE LIGHT OF SUSTAINABILITY

International organizations have been continuously calling our attention to current consumption patterns being unsustainable. The prevalence of unfavorable processes is also supported by the 2002 OECD report [Towards sustainable household consumption?, 2002] , which forecasts a continuous growth in per capita private consumption until 2020, along with a growing GDP. Below follows a summary of effects by industry:

Energy consumption trends: in spite of improvements in efficiency, a 35 percent growth in energy consumption was forecasted, 2020 vs. 2002. Households' energy consumption is

expected to grow, for the following reasons: more extensive use of electronic devices, larger flats, more demand for heating and cooling capacities. In households, the highest proportion of energy is used for heating, then water heating, and in smaller proportions for lighting and cooking.

Transportation trends: Considering households, it is transportation habits that cause the most severe environmental burden. The number of tourist trips, especially long-distance flights, is expected to grow. Railway usage shows a decreasing tendency. Holiday habits will change, too, more and more families undertake shorter but more frequent trips.

Trends in household waste production: the amount of urban waste is forecasted to grow by 43 percent between 1995 and 2020, which is approximately 700 million tons per year and some 640 kilograms per capita. Thanks to recycling, the process of waste production has slowed down, yet the total amount of waste production has not dropped.

Water consumption trends: according to expectations, fresh water consumption will rise by 12 percent in the OECD area by 2020. Households typically consume relatively low amounts of water, they account for only 8 percent of total consumption.

Food consumption trends: Due to consumers' desire for diversity, demand for special, exotic products might grow, while their pursuit for a healthy lifestyle will result in an increased interest for organic food and functional food items. Non-household consumption is also becoming more and more significant.

III. CONSUMER ATTITUDES TOWARDS THE ENVIRONMENT

Today, consumers feel capable of acting in behalf of nature, and they want to change their consumption patterns, indeed. Residents of developing countries feel more responsible than those of developed countries. Also, they are more willing to act and they tend to believe that this really makes a difference [Greendex, 2008].

European consumers are becoming more and more sensitive to environmental problems, as well. The Eurobarometer survey [2008] showed that the protection of the environment is considered a personal matter by 96 percent of all Europeans. Some two thirds reported that environmental problems are very important to them. Reactions to these problems are expected to be global. They support EU participation in environmental policies.

The majority of Europeans has a positive attitude towards environmental protection, and they pay attention to their individual roles, as well. Respondents reported their quality of life being almost as strongly influenced by the state of the environment (80%) as by economic factors (84%). Environmental regulations are considered to be drivers of innovation (63%) instead of hindrances to economic performance (16%). They said, environmental protection should be first priority instead of economic competitiveness. Some 86 percent meant that people as individuals do have an important role in protecting their country's environment.

Studies showed that even though Europeans feel the necessity of environmental protection, this attitude is not always reflected in their behaviors and actual deeds. It was 59 percent of respondents who reported having done at least one thing for the sake of environmental protection during the month when the survey was conducted (this usually meant waste recycling). A mere 3 percent of respondents can really be considered environmentally conscious. Europeans are not very willing to act in ways which would

directly influence their lifestyle and their purchasing habits. They do not use their cars less frequently, they do not buy green products. They do not seem to be aware that their consumption patterns cause environmental problems.

People's knowledge about environmental problems, harmful substances and consequences is very poor worldwide. The level of informedness varies country-by-country within the EU, as well. All in all, 42 percent felt they are not properly informed, yet 50 percent meant that their own level of preparedness is appropriate. Citizens of the Western and Northern countries meant they are rather well-informed, while people from the South and the new EU-countries were less positive about this.

IV. RESPONSIBILITY OF THE INDIVIDUAL

Responsibility, as an ethical concept, is necessarily present in any decision situation which has long-term, significant consequences and the outcome of which does not only affect the decision maker, but others, as well [Zsolnai,1998].

The consequences of consumption-based growth call our attention to the need of analyzing the topic of responsible decision making not only on the corporate level, but on the individual level, too. Whatever the individual does and whatever they decide for – they prefer some goods or services to others based on their individual considerations -, it does have an effect both on the environment and on their own individual wellbeing.

The socially conscious consumer

It was the seventies when focus began to shift to the social responsibility of the individual. In 1972, Anderson and Cunningham already distinguished a group of consumers with a high level of social consciousness, with the basis of the distinction originating in some demographic and socio-psychological characteristics.

A socially conscious consumer, according to Webster [1975], is: a consumer who takes into account the public consequences of his or her private consumption or who attempts to use his or her purchasing power to bring about social change.

Considering the model, a socially conscious consumer is a person who has all necessary resources in terms of income, education and social position needed to support the community, and the need for active participation is also an element of what they expect from themselves. The individual acts consistently in line with these attitudes, both on an organizational level and in their individual purchasing decisions [Webster,1975].

The definition of Meffert and Kirchgeorg [1993, In: Piskóti-Nagy, 1998] deals specifically with environmentally conscious consumers. They suggested that environmentally conscious consumers be defined as natural persons and legal entities who are characterized by a certain ecological consistency in their purchase decisions. Consumers realize that the development, production, distribution, consumption, use and even the disposal of any product places a heavy burden on the environment and causes additional costs. They strive to minimize these negative effects and additional costs.

V. MODELS OF CONSUMER BEHAVIOR

Several comprehensive approaches to forecasting consumer behavior and to handle the problem of individual will vs. environmental determination have already been developed.

Stern's [In: Jackson, 2005] *Attitude - Behavior – Context* [ABC] *model* attempted to describe and predict pro-environment behaviors. An important element was that behavior was considered as a function of the organization and its context. The key dimension of the model was the structural dynamism between attitudes' impacts and environmental factors. Considering recycling, for example, if recycling opportunities are very easily available or if they are hardly available at all, it does not make too much of a difference whether people's attitudes support or refuse recycling.

In the *theory of reasoned action* [TORA], Ajzen and Fishbein [1980] emphasized that attitudes have no direct effect on behavior, they only influence one's behavioral intentions. Behavioral intention, however, is a function of several factors – for example attitudes, subjective norms and their relative importance.

An improved version of the TORA model is the theory of planned behavior [TPB] [Ajzen, 1985, 1991]. New elements in this model are control beliefs and perceived behavioral control as a consequence of the former one. In the model, Ajzen puts significant emphasis on perceived behavioral control, which influences behavior not only through behavioral intention but directly, as well. It was the introduction of the element of actual behavioral control which made it a dynamic model [Ajzen, 2002]. Actual behavioral control refers to the extent to which the individual is able to achieve the desired outcome through their behavior.

Furthermore, a well-known integrative model is the *Motivation – Opportunity – Abilities* [MOA] *model* of Ölander and Thøgersen [In: Jackson, 2005]. They asserted that a relationship between attitude and behavior only exists if one has personal control over their behavior. To improve its predictive power, they suggested the incorporation of the factors 'ability' and 'opportunity' (as a concept of facilitating conditions) into the model. The 'opportunity' concept is related to Stern's notion of external conditions and also demonstrates some similarities to Ajzen's perceived behavioral control model.

From amongst the remaining models, the theory of Kollmuss and Agyeman [2002] on environmentally conscious behavior should certainly be mentioned. They identified three groups of factors which might influence the individual's behavior: demographic, external and internal factors. External factors are economic factors, institutional conditions, social, cultural and political factors. The group of internal factors includes motivation, ecological knowledge (not necessarily accompanied by environmentally conscious behavior), values, attitudes, environmental consciousness, emotional attachment, perceived behavioral control, responsibility and priorities and habits.

In the above models, the factors of conscious behavior not only include individual aspects but some factors related to interpersonal relationships, as well. These two groups of factors are equally important to assessing a society's level of consciousness.

Factors influencing, controlling conscious consumption

The OECD report employs the *Needs, Opportunities and Abilities (NOA) model* when presenting influencing factors by industry. An advantage of the model is that it deals both with micro and macro-level motivational factors. The main point is that consumers purchase goods and services in order to satisfy certain needs. Opportunities and abilities

determine consumers' behavioral control. Opportunities represent external facilitating conditions, while abilities are internal factors enabling the purchase of any given product.

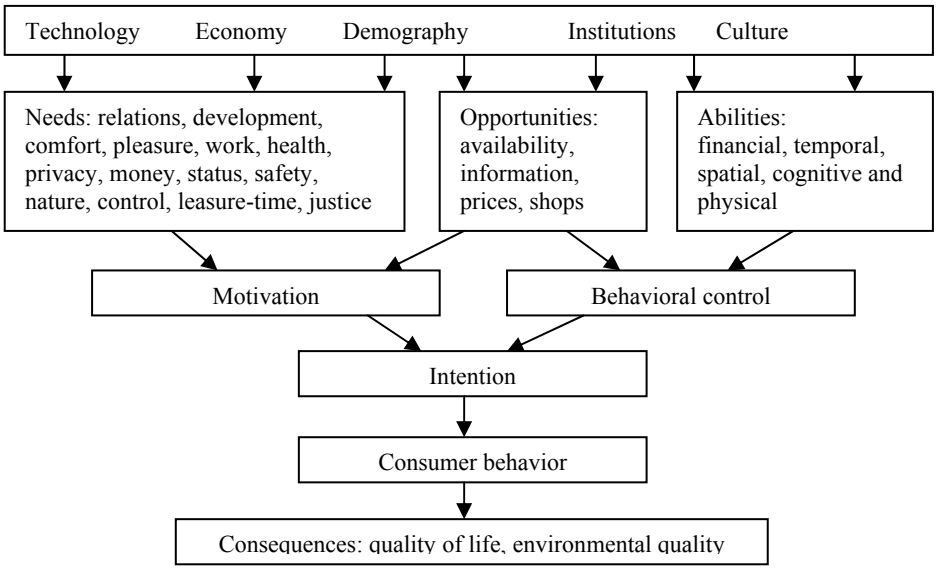

FIGURE 1: NEEDS- OPPORTUNITY- ABILITY MODEL SOURCE: GATERSLEBEN AND VIEK, IN NOORMAN AND UITERKAMP,IN OECD TOWARD SUSTAINABLE CONSUMPTION?, 2002

This model is the basis upon which the primary research is built, the findings of which will be used to adapt the model to the domestic context in order to finally test the adjusted model in the quantitative phase.

VI. THE COMPLEXITY OF ENVIRONMENTALLY CONSCIOUS BEHAVIOR

As also illustrated by the NOA model, the actual realization of environmentally conscious or ethical or green consumption – which term one might ever use – depends on a number of various factors. A consumer might be strongly motivated towards conscious consumption, yet still, if they lack the opportunities (infrastructural, financial, etc.), they will not be able to reflect this attitude in their behavior.

Environmentally conscious consumption means too much responsibility for the individual consumer. Pro-environment governmental policies, therefore, need to raise social activities to the community level instead of targeting the individual consumer [Moisander, 2007]. There are no properly defined criteria to ecologically sound consumption strategies, and the set of safe goods and services has not yet been defined, either. In making the abovementioned decisions, it is hard to decide which environmental criteria are relevant and which elements of the quality of the environment are most important.

Moreover, there are several ways to be an environmentally conscious consumer. The majority only considers a couple of factors, instead of taking advantage of all the

opportunities. Meffert and Kirchgeorg [1994, In: Piskóti-Nagy, 1998] identified five types of behavior which an environmentally conscious consumer might choose:

(1) reducing the consumption of traditional goods, (2) adjusting demand – purchasing environment-friendly products instead of traditional ones, (3) consuming environmentally efficient goods, (4) participation in recycling, in selective waste collection (5) environmentally conscious complaints or protests.

VII. CONDITIONS OF THE QUALITATIVE STUDY

In order to get to know consumers' consumption behavior as related to the environment, we conducted a qualitative study. In-depth interviews were conducted with selected respondents to develop a deeper understanding of the supporting and hindering factors of sustainable consumption as perceived by the individual. The method was suitable for revealing underlying reasons and some deeper motivations. Subsequently, selected respondents were asked to log their consumption behavior for one entire month. Finally, focus group meetings were organized with the purpose of sharing experiences, understanding hindrances and the common discussion of personal impressions, feelings and opinions. At these meetings, we also looked into how respondents' consumption behavior had changed and whether these changes could be maintained in the future. In present paper, we provide an analysis of the in-depth interviews.

In-depth interviews were conducted in three regions, with 20 respondents altogether: in Budapest (5 respondents), in Miskolc (5 respondents) and in Győr (10 respondents). The number of respondents was suitable for revealing all aspects which might help us understand the research topic. The interviewee could be anyone above 18 years of age, with at least secondary education and with a positive-to-neutral attitude towards the topic. In-depth interviews were moderated by the researchers participating in the project, who also contributed to the processing of qualitative data.

The objective of this small-sample, non-representative survey was to deliver information on the basis of which the questionnaire of the quantitative study can be developed, that is statements suitable for measuring relevant characteristics can be formulated.

VIII. FINDINGS OF THE QUALITATIVE STUDY

The growing significance of consumption and the reasons thereof

As a starting point, we wanted to know which factors determine the level of people's consumption. In line with earlier findings [Hofmeister, 2008], our respondents thought that there were no socially acceptable limits to consumption. The only limits are the individual's financial assets and their own values and attitudes. Social norms being absent, market-generated effects tend to prevail which necessarily leads to overconsumption.

„This is something everyone should decide for themselves. In a democracy, it would be strange to tell people how much they can buy, wouldn't it? They should feel it themselves. Everyone should know where their own limit is." (Male, Győr)

„Everyone can do whatever they can afford and whatever psychical needs they have, we should let them do it without limitations." (Female, Budapest)

Generated consumption

Respondents partly explained overconsumption with some kind of external urge. Many types of products and services are developing so rapidly that consumers desiring to keep up the pace simply have to buy newer and newer products. Examples mentioned by respondents include compatibility issues of some electronic devices and some services' being only available on some specific devices.

„There are ways they can make us buy it. Mostly, I see this in electronics. Mobile phones. In markets where newer and newer products are continuously introduced to the market. They are continuously developing them, modernizing them and forcing people to replace the old ones." (Female, Győr)

Another aspect of overconsumption is the expansion of supply, the increased level of wellbeing and prosperity and purchases made as a result of promotions. Respondents primarily mentioned advertisements, quantity discounts and limited offers.

„If you see that you can get three for the price of two, and you like the product, you buy it. It might go bad, but you buy it." (Female, Budapest)

In relation to the above effects, people's willingness to reward themselves also generates consumption. Our fast-paced everydays, fragmented relationships and the ever-growing level of individualism all drive the individual towards easily available sources of enjoyment – consumption, for example.

„Provides a feeling of joy. A feeling of happiness." (Female, Győr)

Major perceived environmental problems

In all three regions, interviewees primarily mentioned air pollution and litter as major areas on environmental concern.

Considering waste management, aesthetic aspects prevailed over environmental considerations in people's responses.

„…you can see it in your own surroundings that people throw litter all around. They don't care for their own environment. They just throw all garbage and litter all around." (Male, Miskolc)

Besides urban litter, the irresponsible handling of dangerous waste materials and illegal dumping, the method of waste collection was also brought up. Several respondents mentioned selective waste containers being not used at all, or not used in the proper way, and they also criticized the transportation of waste.

Air pollution as an everyday problem also received particular attention in all three regions.

„Practically, there is no clean air any more. This is something to worry about. My child seems to get asthma, as well. This is a consequence of air pollution, as well, most probably." (Male, Miskolc)

Smog, the impact of gas emissions caused by the excessive use of cars, climate change, global warming and deforestation were also mentioned. Respondents meant, moreover, that water pollution and its wasteful usage, the effects of chemicals both in agricultural production and in households and inappropriate energy consumption are very problematic areas, as well.

All in all, respondents typically mentioned problems affecting their own immediate environment or expressly influencing their health status.

Responsibility

What regards the solution of the above problems, interviewees agreed that the individual does indeed have a prominent role, besides the need for international and governmental participation and for responsible corporate operation practices.

„…each and every one of us, in their own immediate surroundings, what they can do, they should do, as if they don't, then its totally indifferent what decisions are made on a higher level." (Female, Budapest)

Looking at individual responsibility as related to interviewees everyday life, they mentioned a number of hindrances which could actually be explained by financial possibilities, comfort, lack of knowledge or the refusal of responsibility. They suggested that these be solved through legislation (penalties or positive discrimination) and by appropriately informing the individual.

„I think there should be one or more organizations overseeing these matters, and governing us, everyday people, by directives or laws, how we can act in a pro-environment way." (Male, Győr)

Knowledge, information

The lack of information and the sensation of less-than-optimal informedness was basically characteristic for all three regions. Respondents had often been deterred from making environmentally conscious decisions exactly because of mistrust, because they questioned the credibility of available information. In such situations, motivations like comfort or financial considerations took precedence.

„Yes, we have actually bought bio products a couple of times, and now it was such a surprise, that those might be infected, as well, and so on. So, I think we have no idea what really happened to them."(Female, Győr)

Significance of nurture

Participants agreed that education and nurture have a particularly important role here. Those who did have some pre-existing knowledge due to their nurture, did actually make much more conscious decisions and did consciously spread their values and knowledge amongst the people around them.

Everyone meant that the basics of environmentally conscious behavior must be conveyed to people at an early age, as this is the only way it can become part of people's everyday routine on a society-wide level.

„We should begin here, within the country, by educating our children to live a more environmentally conscious life. Then, as a adults, they will be able to strive for much more significant achievements." (Male, Miskolc)

Power of the community

Primary factors hindering environmentally conscious consumption, as named by our respondents, were related to the low level of perceived behavioral control and the difficulties in accessing necessary information. Accordingly, they were ready to support any initiative which aimed at raising these problems to the community level and at providing guidance.

„There will always be some exceptions, but still, you have to reach the majority, and then the individual will follow the masses." (Male, Győr)

Most frequent environmentally conscious consumer behavior patterns

To the question what they personally do in order to protect the environment, respondents provided us with only one or two typical answers. Once again, we saw that interviewees did not know what kind of actions might belong into this category. Spontaneous answers of participants were usually related to littering.

Selective waste collection

Our respondents from Győr most frequently mentioned selective waste collection. Practically all of the interviewees collect their waste selectively, even if the selective containers are a bit further away.

„This has been the case for years now. It close, so we don't have to take it very far…, but earlier, when it was far, I still took it, I just put it in the car, then my daughter said you take it but the exhaust is still polluting the air. I told her, you are right, but I had to go that direction anyways." (Female, Győr)

We made the observation that in Győr, where selective waste collection had been introduced earlier than in the remaining two regions, people were more concerned about proper waste management than littering.

Selective waste collection was not characteristic of respondents from Miskolc and Budapest. The distance to selective waste containers was perceived as a much more significant hindrance by them. The selective collection and transportation of waster directly from their house seemed more feasible to them.

We shall underline here that signs of mistrust with regard to the transportation of wastes were detected in all three regions, people were concerned that even though they collect paper and plastic selectively, these might still end up in the very same garbage truck.

Homegrown crops

The topic was primarily mentioned when taking about consumption habits concerning bio food items or eco-labeled products. The conscious consumption of bio food products was only characteristic for a very few respondents. The most frequently mentioned hindrances were excessively high prices (as compared to average food products) and the lack of trust in bio labels.

Those who had the opportunity, rather voted for the vegetables and fruits grown in their parents' garden. Those might have been sprayed, too, yet respondents still considered them bio food, and more tasteful than those bought in the shops.

Purchasing domestic products

Pro-environment factors (transported to shorter distances – lower emissions) were not mentioned at all by respondents in relation to buying domestic products. Discussions rather dealt with the competitiveness of Hungarian products, protectionism and sometimes skepticism about the EU. The fact that respondents ignored these important aspects of sustainability is also a symptom of the lack of information, and currently, economy-related political communication is much more about saving jobs and economic advantages rather than environmental protection, too.

A major hindering factor in buying domestic food products was, just like in the case of bio food items, their relatively high price. Still, all but a few respondents demonstrated a positive attitude towards these, and they said they liked buying domestic products.

„I am trying to buy Hungarian products. The question is whether the cheaper one is the Hungarian one. I would, maybe, have a look at it, but I'm not sure I would buy there." (Female, Budapest)

Energy and water consumption

These two areas of sustainable consumption were only mentioned after interviewers had asked a related question. In compliance with earlier research findings, the reason for our subjects' consciousness was not some pro-environment motivation but rather the need to economize for financial reasons.

„I don't really care too much, I pay the same amount for water. No matter, how much I use, I pay the very same sum, so I don't care about this particular thing. But I don't think…" (Female, Budapest)

The potential positive effects of nurture might once again be brought up: turning off the tap, switching off the lights and other electric devices might well become a habit, a routine this way.

Sustainable consumption

An interesting finding was that the majority of respondents explained the concept of sustainable consumption in terms of economic conditions. There were only one or two interviewees in each region who mentioned environmental consciousness.

„There is a certain level of consumption which, based on certain considerations, I am able to sustain for many-many months and years. This is what came to my mind." (Male, Győr)

IX. CONCLUSION

Our findings are in line with the conclusions of Eurobarometer and earlier research projects. Based on the NOA model, the subjective, perceived factors of our respondents were the following: Considering macro-level factors, interviewees emphasized improved quality of life, cultural control, nurture and the need for governmental and international regulations. Micro-level factors include, in the category of needs, comfort, health protection and the demand for freshness, quality and cleanliness. Respondents underlined prices, physical distance and information as factors related to opportunities. What regards the abilities possibly influencing environmentally conscious consumption, our subjects mentioned financial status, lack of time, the taking or the refusal of responsibility, trust and economization. Above factors are going to be tested in the quantitative phase.

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ENVIRONMENTAL EDUCATION AND SUSTAINABLE LIFESTYLE OF STUDENTS – INTERNATIONAL RESEARCH

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The aim of the paper is to describe the first efforts of an international research project being currently carried out by the Department of Environmental Economics and Technology at Corvinus University of Budapest (CUB). The survey focuses on the environmental awareness of university students in several countries, like Austria, the Netherlands, Slovakia, Lithuania and the USA. The main objective of the research is to analyse the relationship between environmental education and lifestyle features, as well as consumer behaviour of students.

The paper includes a literature review about sustainable consumption patterns and about surveys with similar focus, the main assumptions of the research with a detailed justification and methodology, as well as main parts of the questionnaire. Main assumptions are:

(1) Environmental education influences the awareness of environmental problems significantly. (2) Impacts of environmental education reflect in the lifestyle of students. (3) Environmental attitudes of students are more positive than society average; their consumer behaviour is expected to be less unsustainable. (4) Reported environmental behaviour and actual environmental awareness of respondents are usually not consistent.

Assumptions will be tested by statistical methods like frequencies, crosstabs, factor and cluster analyses, discriminant analysis, correlation tests etc.; using the SPSS program.

The research is part of the "Sustainable Consumption, Production and Communication" Project financed by the Norwegian Fund.

I. INTRODUCTION

The aim of the paper is to describe the first efforts of an international research project being currently carried out by the Department of Environmental Economics and Technology at Corvinus University of Budapest (CUB), supported by the EEA and the Norwegian Financial Mechanism. The survey focuses on the environmental awareness of university students in several countries. The main objective of the research is to analyse the relationship between environmental education and lifestyle features, including consumer behaviour of students.

Main assumptions of the research are the following:

(1) *Environmental education influence the awareness of environmental problems significantly*: students specialised in environmental issues are expected to have higher level of environmental knowledge and higher awareness of environmental problems.

(2) *Impacts of environmental education reflect in the lifestyle of students*: those studying environmental subjects more intensively are supposed to be more environmentally conscious in their everyday actions.

(3) *Environmental attitudes of students are more positive than society average; their consumer behaviour is expected to be less unsustainable.* In order to control the validity of these assumptions via a comparative analysis between the behaviour of students an adult

population, several questions of the Eurobarometer 2007 research have been included into the questionnaire.

(4) *Reported environmental behaviour and actual environmental awareness of respondents are usually not consistent*. The survey contains several control questions to test the consistency of respondents' answers and reduce self-reporting bias.

(5) *The lifestyle of the participants is definitely influenced by several factors*, where the strength and interrelationships of these factors – like environmental knowledge base, attitudes, value system, social and individual norms, cultural features, system characteristics, situational factors, PCE (perceived consumer effectiveness), perceived sacrifice needed for the behaviour etc. – will be important issues of the analysis.

II. THE LITERATURE OF SUSTAINABLE CONSUMPTION

Relating to the topic of the paper, three issues of environmental literature are relevant which will be shortly presented in the following: approaches and problems of sustainable consumption, environmental awareness and behaviour of students specifically, as well as environmental education for sustainability.

The definitions of sustainable consumption include consuming „not unsustainably" (JACKSON, T. 2006), changing lifestyles, consideration of constraints by environmental limits (OFSTAD, S. 1994), consuming less (see the movement of voluntary simplicity, e.g. ELGIN, D. 1993), producing more sustainable products more efficiently, and consuming more efficiently. The dominant institutional consensus has moved from the „change lifestyles" approach to the „consume efficiently" approach. According to a widely accepted definition „sustainable consumption is not about consuming less, it is about consuming differently, consuming efficiently, and having an improved quality of life" (UNEP 1999). **C**riticizers of the lifestyle change approach argue that it is "too subjective, too ideological, too value laden, and too intractable to be amendable to policy intervention" (JACKSON, T. 2006, p.6). In their opinion, intervening in consumer behavior would jeopardize „sovereignty" of consumer choice, and reducing consumption may threaten a lot of material interests, and undermine the key structural role of consumption in economic growth as well as to undermine legitimate efforts by poorer countries to improve their quality of life (JACKSON, T. 2006, p.6). Furthermore, campaigns based merely on motivating individuals to change their lifestyles seem to be quite unsuccessful and isolated; community-based initiatives are more promising. (ROBINS, N. - ROBERTS, S. 2006) On the other hand, stressing only the efficiency of consumption also has its drawbacks. It tends to obscure the scale of resource consumption patterns (see „rebound effect"), it does not eliminate the tension of what should be or should not be consumed and it does not solve the problem of difference between material resource consumption and economic consumption (ROBINS, N. - ROBERTS, S. 2006). The representatives of this opinion argue that lifestyle change is essential not only desirable.

The roles of consumer goods and services beyond satisfaction of functional needs are various (construction of identity, pursuit of status and social distinction, maintenance of social cohesion, social selection, pursuit of personal and collective meaning, etc.) which creates complexity and makes decisions towards sustainable consumption quite difficult. Consumption options are affected by several factors like income, availability and

infrastructure of essential goods and services (water, sanitation, education, health care etc.), time use (between work and leisure), information, social barriers (missing access to opportunities), decision-making and upbringing in the family, etc. (UNDP 2006). This variety also ends up in a number of answers how sustainable consumption should be addressed. Furthermore, consumption is linked with human development is a fairly ambiguous way. It directly exerts positive impacts on the consumer through reduced hunger, improved health, reduced morbidity and mortality, increased mobility, opportunities for employment and interaction; and negative ones through pollution, accidents, unhealthy food, dangerous medicines, addiction, etc. Consumption also results is positive externalities (see vaccination, or a beautiful garden) and negative ones (via environmental pollution, social inequality and exclusion). The relationship between consumption and human well-being, as well as happiness is also arguable. Conventional economics assumes an obviously positive relationship between the GDP and well-being, while the so-called "life satisfaction paradox" (see EASTERLIN, R.A. 1974, INGLEHART, R. – KLINGEMANN, H-D. 2000) states that relative income has higher impact on life satisfaction than absolute levels of income and experienced happiness depends mainly on personality and on the hedonic value of the activities to which people allocate their time. Life circumstances influence the allocation of time, and the hedonic outcome is often mixed. Conditions that make people satisfied with their life do not necessarily make them happy.

As a result of the Marrakech process and the initiatives of the Collaborating Centre on Sustainable Consumption and Production several reports have been published on marketing sustainable consumption and sustainable lifestyles (UNEP 2005a, b, and c). Creative campaigning seems necessary as people do not react positively on restrictive way of communication (ROBINS, N. - ROBERTS, S. 2006). Of course, there are some obstacles to practical progress like poor systems for waste separation, collection and recycling of materials; inadequate environmental information on products; low priority given durable products; low cost of waste disposal, failure to include the costs of waste management in disposable products; increased advertising; and consumer society culture with all its driving forces behind modern lifestyles.

Regarding environmental awareness of students recent research works have mainly been focusing on how students perceive sustainability as a concept and how they try to realise it in their everyday life. KAGAWA , F. (2007) found in her survey of 5729 respondents that students have positive attitude towards sustainability regardless of their knowledge about it. However, they predominantly associate the concept of sustainability with environmental aspects and actions. Social and economic (as well as political and cultural) dimensions were only very rarely mentioned. When talking about lifestyle change, most students think of "light green" actions, such as changing purchasing habits by choosing products which are organic, fair trade, healthy, or stem from socially responsible companies; recycling; saving energy and/or water; as well as using public transportation. Reducing consumption was only mentioned by 1% of respondents as an option that students would be ready to do for a more sustainable personal life. Kagawa detected some dissonance between students' perceptions of sustainability and their reported behaviour patterns. Respondents tend to agree with radical statements but they refuse radical changes in their personal life as well as at community or societal levels. The maintenance of economic growth is a goal which is not questioned by the respondents.

Based on this experience, how should then effective environmental education or education for sustainability look like? As known from the literature, increasing knowledge does not necessarily results in behavioural change, although the knowledge of environmental problems raises concern in people (see KOLLMUSS, A. – AGYEMAN, J. 2002). ARBUTHNOTT (2009) argues that even change of attitudes and values is insufficient in altering behaviour (although this change is necessary for action). In addition to attitudes, several factors influence behaviour: socio-cultural factors like social norms (AJZEN, I. 1985; WIDEGREN, O. 1998), group identity (BONAIUTO, M. – BREAKWELL, G.M. – CANO, I. 1996), and interpersonal relationships (JAEGER, C. – DÜRRENBERGER, G. – KASTENHOLZ, H. – TRUFFER, B. 1993); contextual support (STERN, P.C. 2000; ARBUTHNOTT, K.D. 2009); habitual behaviour (KOLLMUSS, A. – AGYEMAN, J. 2002; ARBUTHNOTT, K.D. 2009). The impact of situational factors like economic constraints, social pressure, opportunity to select between various actions, established old traditions, the sacrifice required by the behaviour, lack of infrastructure (HINES, J.M. – HUNGERFORD, H.M. – TOMERA, A.N. 1986) is also significant: FLIEGENSCHNEE and SCHELAKOWSKY (1998) claim that 80% of motives influencing environmental awareness or the opposite can be traced back to situational or other internal factors. In the research of MAJLÁTH M. (2009) the most important features of the environmentally conscious group of respondents were their ecocentric ecological view, higher level of ecological knowledge, strong motivation by social norms, higher perceived consumer effectiveness (PCE; they perceive a significant, positive impact of their pro-environmental behaviour), as well as lower perceived action difficulty regarding pro-environmental behaviour (they feel that pro-environmental activities not demand too much sacrifice from them).

The value system of the individual is most strongly shaped by the stimuli coming from the immediate environment (family, friends, neighbours, teachers, etc.) It means that education provides a lot of "input" to individual behaviour through knowledge, values, attitudes, emotional involvement, lifestyle examples etc. KAGAWA, F. (2007) states that the development of empowering pedagogies should be able to educate students to become "*change agents*". She believes that in our "rapidly changing and uncertain world faced by sustainability-oriented challenges higher education needs to play an increasingly significant role in helping students become active responsible citizens" (KAGAWA, F. 2007, p. 335).

Learning outcomes for sustainability are discussed by Svanström et al. (2008), stressing the importance of systemic and holistic thinking, integration of different perspectives, skills like problem-solving, critical thinking, creative thinking, self-learning, communication, teamwork, and becoming an effective change agent. So-called "transformative learning" is essential (see WALS, A.E.J. - BLAZE CORCORAN, P. 2006) to make students able to integrate, connect, confront and reconcile multiple ways of thinking and handle uncertainty. Providing all necessary skills of change agents for students are fairly challenging for environmental (sustainability) education programs and curricula nowadays, reality shows partial success throughout the whole world. In order to achieve learning outcomes for sustainable development, SVANSTRÖM, M. et al. (2008) emphasise the importance of active learning, teaching methodologies focusing on practical activities and first-hand experience, engaging in sustainability solutions.

STEPHENS, J.C. et al. (2008) even go further stating that higher education itself should be change agent for sustainability. Via modelling sustainable practices for society, teaching students to be change agents, as well as promotion and enhancement of engagement between individuals and institutions, higher education can actively take part in this "transition management" toward a sustainable society (a more detailed description of transition management framework is given by KEMP, R. – LOORBACH, D. – ROTMANS, J. 2007).

In order to be successful in education for sustainability several barriers have to be overcome, including diversified understanding of the concept of sustainability, limitations of technological solutions, limitations of traditional regulatory and economic approaches, limitations of a consumer based approach, lack of accessibility and limits to reliability of information for decision-making, limits to human information processing capabilities, and balancing individual vs. universal rights (see SIBBEL, A. 2009). Higher education faces the challenges of promoting diversity, understanding and disseminating the concept of sustainability, redesigning curricula towards a more solution-oriented training, handling new and complex sustainability problems. "The curriculum should include experiences which lead to a greater awareness of social and moral responsibilities. In particular, greater self-awareness of personal value systems and a willingness to revise them is required to prepare graduates for works towards sustainability." (SIBBEL, A. 2009, p. 79)

It seems an essential question how to encourage „sustainable living" and discourage unsustainable living within society and how environmental education could provide applicable answers to this issue and effective tools for students to change the attitudes and behavior of the society. Our empirical research addresses these topics specifically in an international milieu.

III. EMPIRICAL RESEARCH

In the first phase of the research, an online questionnaire-based survey will be conducted among university students from the old and new member states of the EU – like Austria, the Netherlands, Slovakia and Lithuania –, as well as from the United States. Naturally, Hungarian students will also be included in the sample. Earlier a basic study was prepared with participation of 436 students from the Corvinus University of Budapest, with a slightly different focus, putting the emphasis on the effectiveness of environmental education (for the results, see MARJAINÉ SZERÉNYI Zs. - ZSÓKA Á. - SZÉCHY A. 2009). We believe that an international outlook is important since - to our knowledge - no such study has been prepared to date and therefore there is no information as to if and how differences in the cultural, economic and social situation affect students' consumer behaviour. In our research we also use hypotheses based on results from previous studies which have been discussed in the introduction.

The survey is based on the following blocks in the questionnaire:

Knowledge, consideration and assessment of the most important environmental problems.

Consumer behaviour in general, factors influencing consumption habits, appearance and strengths of environmental aspects in consumption habits.

Lifestyle patterns: realisation of pro-environmental behaviour features in individual life of respondents.

Transport habits.

Conditions and factors which students perceive as necessary to be willing to change their lifestyles towards a more sustainable direction.

The role of environmental education in the evolving and shaping of attitudes and consumption patterns.

The introductory part of the questionnaire comprises questions on the scientific field of students, the reason behind their choice of specialisation and also whether or not they have taken any environment-related subjects during their university studies. It can be assumed that students choosing environment-related fields are those with strong environmental commitment, therefore the causal link between environmental education and pro-environmental consumer behaviour may have a different direction or be less pronounced in their case. These students chose environmental specialisations precisely because of their already strong commitment, so environmental education will no longer fundamentally affect their environmental attitudes. For the rest of students, teaching environment-related subjects may have a far greater influence, but it is also among them that we can expect to find those who are completely indifferent to the topic.

It may seem natural that students whose initial interest in environmental issues is higher also know much more about the problems existent in this area. We pose several open-ended questions in order to avoid influencing students by listing possible problems in a closed format, as this could result in a larger number of issues being chosen. The aim is precisely to find out what type and number of problems students are able name on their own. Knowledge is measured in two ways: on a self-reporting basis as well as objectively. The inconsistency between answers and actual behaviour appears also here. Our research includes attitudes, values, as well as the effect of socio-cultural factors on individual behaviour (the opinion and example of reference persons and groups). Even emotional factors appear in some places. The important issue is to be able to translate the results of the survey into educational practices, that is, to identify what pedagogic methods are necessary to significantly increase the number and proportion of consistently environmentally conscious students and to ensure that young university graduates become catalysts of pro-environmental change.

It may be interesting to observe students' opinions on their own consumption level, whether they consider it excessive or normal. From the point of view of sustainability, the factors influencing shopping decisions are also important, for example to what extent fashion trends or the environmental burden caused by unnecessary consumption are taken into account, and what kind of environmental considerations the students may have when buying something. The shopping venue may also be significant: experience shows that the vastness of choice found in shopping centres and malls induces people to spend more, often buying things they would not buy in the smaller shops close to their home.

Environmental protection can be realised through a wide variety of actions. As previously mentioned, the existence or lack of opportunity can have a great effect on individual habits, but these are most influenced by sensitivity towards the environment. Today's university students are aware of a number of environmentally friendly solutions and forms of behaviour, but they do not practice all of these regularly. This is where social and economic differences between students from the United States, the EU15 and the new

member states can appear more pronounced. In the review of the theoretical literature we saw how much the following factors can influence environmental consciousness not just on the level of principles, but also in actual behaviour: the feeling of one's individual irrelevance ("one swallow does not make a summer") which decreases motivation and results in passivity – and its opposite, PCE which is the conviction that one's actions can bring about change. This can be measured both positively and negatively. The other factor is the inconvenience, the level of sacrifice associated to environmentally friendly behaviour. This can be measured by asking about the preferences of respondents regarding various activities and the reasons behind them.

Transportation habits have a considerable effect on the environment. Here, the differences between smaller and larger settlements are usually quite large due to the different conditions; however, increasing the share of public transportation and other environmentally friendly modes of transport (cycling, walking) is very important for our future. The questions are also aimed at finding out what factors would result in a change of transportation habits, providing valuable insights for transport policy.

We also included some questions from the Eurobarometer survey on environmental attitudes (EUROBAROMETER 2008) in order to find out if there is any difference between the behaviour of European adult populations and university students (whom we believe to be more environmentally conscious).

The aim of the research is not only to find out about the present situation, but also to offer suggestions for the promotion of a more sustainable lifestyle. Therefore we also enquired about the willingness to adopt more environmentally friendly behaviour patterns, the barriers in the way of such changes and the importance attributed to increased environmental knowledge (through environmental education).

The questionnaire concludes with a section on socio-economic characteristics. A very important factor for consumer behaviour and environmental consciousness is the amount of money that students dispose of in a month to cover the expenses associated with their lifestyle. Previous experience suggests that environmentally conscious students spend a lot less and are more modest in their material desires.

Family background, the number of siblings, the parents' education level and external factors such as the neighbourhood's shopping and selective waste disposal infrastructure can also be relevant for environmentally friendly behaviour.

In the second phase, the research will be supplemented by a survey in secondary schools in Hungary, with the help of interviewers. Secondary school pupils are expected be more strongly influenced by family-related lifestyle models in their consumer behaviour than university students.

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PROMOTING HEALTH AND ENVIRONMENTAL AWARENESS OF THE HUNAGRIAN CONSUMERS - GREENING THE RETAILERS

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The main topic of the presentation

The topic of this paper is a review of the Hungarian consumption habits related to the FMCG (Fast Moving Consumer Goods) and assess the sustainability aspects.

The objectives of the paper are the followings: (1) to present the current consumption patterns in Hungary (2) to investigate and evaluate the environmental and health awareness of the Hungarian consumers, (3) to investigate the accessibility to the healthy and bio products. (4) to investigate the consumer's familiarity with the eco labels, (4) to present the consumers' satisfaction on the consumer's information about the products.

The methodology

The research based on the literature review of the sustainable consumption and analysis of the statistical database. We made a survey on the consumption patters in three Hungarian regions in relation to three hypermarkets in August 2009. This paper presents the research findings of a KEOP project, called "Campaign for making the Hungarian consumption patterns more sustainable, greening the retailers" coordinated by the Regional Environmental Center for Central and Eastern Europe, Country Office Hungary.

Key words: Hungarian consumption patterns- Sustainable consumption- environmental and health awareness-information about healthy and bio products

THE RELEVANCE OF BARRIERS TO ENERGY BEHAVIOUR CHANGES AMONG END CONSUMERS AND HOUSEHOLDS

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Abstract:

The paper and presentation is based on a EU FP7 research project – BARENERGY. The project aims to identify the relevance and strengths of various barriers for energy behavior changes among end consumers and households and to discuss how activities from political authorities, energy producers and NGOs can overcome these barriers. The project analyses barriers in the fields of domestic energy use, household appliances and private mobility.

The project addresses changes in consumer behaviour along two dimensions. The first is energy saving and improvement of energy efficiency within households, the second is changes toward more sustainable and renewable energy technologies. The research is also concerned about the relationship between these three strategies; turn down and switch off, the purchase of energyefficient appliances, and shift to (more) sustainable energy carriers.

The research combines an individual and institutional approach. For this reason, countries with a substantial variation in institutional structure, such as variations in energy providers were chosen and a methodological triangulation with three main empirical approaches were developed:

Qualitative interviews with strategic stakeholders in the involved countries: Norway, UK, The Netherlands, Switzerland, Hungary and France. We want to address different opinions among stakeholders about the relevance and strengths of these barriers, and strategies to overcome the barriers. We will also use this opportunity to map knowledge gaps among various stakeholders, as a vital input to the consumer questionnaire.

Representative quantitative surveys among consumers in the countries involved in the project. This survey will both function as a collection of necessary data for the project, but will also constitute a benchmark and a model for measuring consumer values, attitude, norms, habits, acceptance and behaviour in the future, - in countries not involved in the project.

Qualitative strategic focus groups among targeted consumer groups in the same countries. With strategic groups we understand people with different windows of opportunities and people with different social background.

Based on the results of the project the potential for change in relation to the windows of opportunities (Svane 2002) will be discussed.

First results of the project are based on qualitative stakeholder interviews and a representative consumer survey carried out in six countries (Norway, UK, The Netherlands, Switzerland, Hungary and France) that will be followed by focus group discussions.

In the field of mobility the following areas were analyzed: Public transportation, short distance trips, car sharing, purchase of hybrid cars, purchase of fuel efficient cars

Field of household appliances: cooking and baking, purchase of appliances.

Field of green energy: installation of photovoltaic panels, buying green power, construction of low energy houses, energy efficient refurbishment, energy efficient heating behavior.

BUILDING ALTERNATIVE AGRO-FOOD SYSTEMS IN HUNGARY

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Abstract:

Contemporary alternative agro-food networks (AAFNs) are frequently described by analysts, researchers and rural development professionals as fragile and ambiguous retail venues representing a wide variety of agro-food products and services while presenting sustainable, face-to-face, spatially proximate relations between farmers and consumers. In the alternative food movement discourse AAFNs usually gain meaning and value as a point of resistance against the universal logic of capitalism and a way out of the crisis of conventional agriculture. This paper will explore and compare agro-food initiatives from Hungary ranging from an open air market in downtown Budapest, through an urban buying group and a complex rural development hub, to organic public procurement schemes in their ambition and potential to represent meaningful alternative solution in the food system. Various strategies will be interpreted within the regulatory context of AAFN-s in Hungary looking at how different policies and regulatory frameworks on the national level shape AAFN-s' development.

The analysis extended to different stakeholders' perspectives, representative statements on alternative production processes linked to quality, territorial origins and ecological advantages of food. While successfully retains as much funds as possible for the country, the national-level application of the CAP basically marginalises environmental concerns, alternative agriculture and regional development strategies. Rather than accommodate smallholder agriculture, hygiene regulations aim to ensure a maximum level of food safety, whereas trading laws impose a requirement to provide invoices for any sale.

The underlying political, cultural processes and historical trajectories of each initiative are analysed with special regard on producers' marketing modes, consumption practices and consumer involvement, power relationships and modes of interactions between these groups. Preliminary results based on qualitative interview data analysis point to the contradictory characteristics of AAFNs in contemporary Hungary enhancing self-organisation, democratization, autonomy, and at the same time shaping new inequalities, creating spaces for commodification of agricultural knowledge.

The research data come from an FP7 project "Facilitating Alternative Agro-food Networks: Stakeholder Perspectives on Research Needs".

Keywords: agro-food networks, power, sustainable agriculture, knowledge, quality

PARTICIPATORY ACTION RESEARCH FOR ENCOURAGING THE PRODUCTION AND CONSUMPTION OF LOCAL FOOD: THE CASE OF THE MEZŐCSÁT MICRO-REGION

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Abstract:

This paper presents an ongoing participatory action research (PAR) project that aimed at facilitating bottom-up, sustainability planning and development in one of the most socio-economically disadvantageous micro-region of Hungary. As a part of the PAR process, production and consumption of local food products is facilitated and awareness is being raised around the issues of multifunctional agriculture, locality and sustainability through the financial help of the Norway Grants.

Local food products potentially account for various environmental (less packaging and transport), social (the money circulates in the local community) and employment (creates livelihood at a local level) benefits.

As a first step, a qualitative, participatory research is conducted for defining the current state of the art illustrating the very specific local context: insight is gained into the factors (at all levels) which facilitate or hinder the production and consumption of local products; the current state of local food initiatives, and identification of relevant actors and institutions.

Then concrete actions are being planned and carried out to facilitate the production and consumption of local products.

The Mezőcsát Micro-Region (MMR) is situated in North-East-Hungary, along the Tisza River and in the Borsodi Mezőség Protected Landscape Area.

Some of the most important local products are: dairy products (milk, cheese), eggs, fruit schnapps, honey, fruits and vegetables. These are available either on farm or in local markets, and only on a very small scale.

The research methods applied include:

- ***informal in-depth interviews and***
- ***questionnaires to understand the patterns of the production and consumption of local food products***

Action steps include:

- ***workshops and trainings built around identifying and learning about the legal conditions of producing and consuming local products***
- ***compiling a local products inventory and making it available in both an offline (information boards in the centre of each of the villages, brochures) and online form***
- ***installation of local food shelves in local shops***
- ***extending the scope of the annual Local Products Festival of the Micro-Region: the festival brings together producers of local products to celebrate themselves, their settlements and the micro-region and contributes a lot to include local products, cooperation, cultural and identity issues in local rural development.***

Some of the facilitating factors identified are:

- ***national policy space for small quantities of local products: 14/2006 smallholders decree***
- ***Hungary's access to the European Union LEADER programme***
- ***set up of the rural development office in the micro-region***
- ***national and international food scandals***
- ***economic relations still surviving beyond the local market economy: barter, reciprocity, informal economy etc.***
- ***loss of livelihood opportunities on one hand, rise of multifunctional agriculture on the other hand***

- ***renewed search by consumers for 'authenticity' and for products and services associated with tradition, heritage and culture***

Some of the hindering factors are:

- ***collapse of the Hungarian food-process industry and traditional markets for local food***
- ***weak webs of social relations: low level of trust and solidarity among local people, less proximate local relations, weakening place attachment, non-active citizenship***
- ***small-scale farmers decide to remain illegal so as to avoid taxing and hygienic regulations***
- ***lack of willingness to cooperation and partnerships among producers and consumers (partly due to the historical heritage of the previous socio-economic regime)***
- ***strong price sensitivity of consumers***
- ***no local actors taking the lead and responsibility for acting as an intermediary***

The research is part of the "Sustainable Consumption, Production and Communication" Project financed by the Norwegian Fund.

LIVING LAB: A DESIGN STUDY FOR A EUROPEAN RESEARCH INFRASTRUCTURE THAT RESEARCHES HUMAN INTERACTION WITH, AND STIMULATS THE ADOPTION OF, SUSTAINABLE, SMART AND HEALTHY INNOVATIONS

Martin Krekeler

Abstract:

LIVING LAB ist the name of a project within the 7th Framework programme for research and technological development of the European Union. Its aim is to develop a design study of a European research infrastructure that researches human interaction with, and stimulates the adoption of sustainable, smart and healthy innovations around the home.

Living Labs address some of the difficulties that occur in the course of an innovation process. Worldwide, 85% of development efforts are spent on products and services that never reach the market. At the same time, the experts often totally underestimate the market potential of many products and services. Living Labs are an approach to stimulate user-driven innovation, which can lead to a better understanding of customer needs and thus to more successful innovations.

The LIVING LAB project uses this approach for the development of more sustainable products, services and consumption systems. Sustainable products, or ecoinnovations become more and more important in the face of the challenges Europe is confronted with: climate change and energy use, overuse and depletion of natural resources, ageing populations etc. The trends in all these fields are developing in unsustainable ways, leaving a need for innovative technologies, products and services that contribute to energy conservation, sustainable consumption and a high quality of life. Many of such innovations were developed in the past, but the social acceptance and market uptake of these has not been very successful. Home domotics, PV systems and water re-use systems are a few examples of promising domestic technologies that are still waiting to happen.

Existing Living Labs often focus on the user-acceptance of single products or have a strong bias towards ICT-related developments. The LIVING LAB project is supposed to get a holistic view on user behaviour. Therefore longitudinal research throughout the innovation process is necessary as well as cross-cutting research, exploring the effects of changes in different (functional) areas of the home on each other. This user-centred approach, taking user experiences and real-life settings as point of departure is needed to better predict the sustainable impact of future products and services.

The LIVING LAB infrastructure will be designed as a 1-stop-shop for research on adoption of sustainable innovations. A network of stakeholders from academia, business and government pools its expertise to offer a three-step-portfolio to its partners and clients:

• Insight generation in existing homes, monitoring living behaviour over an extended period of time and getting real-life observation results.

• Alpha-testing of prototypes of sustainable innovations, taking place in lab houses. Those modular, highly flexible dwellings enable testing of buildingintegrated systems as well as products of daily use, both installation and user experiences are considered.

• Evaluating fully functional prototypes in the field, i.e. in existing or newly built homes. Again, this testing will take place over a prolonged period of time.

LIVING LAB should enable us to come to systemic innovations, leading to the massive cutback in resource use that is necessary to make production-consumptions systems more sustainable.

As the LIVING LAB research infrastructure will be made up of several LIVING LAB centres and affiliated research institutes and corporate labs, networked across Europe, parallel research in several facilities can be done, as well as studies into cultural diversity of European consumers. At the moment, a Strategic Research Agenda is elaborated and potential public and private stakeholders are interviewed in order to get feedback on the conceptual design draft.

The current phase of the project is dedicated to the development of a Design Study for the future Living Lab infrastructure. This phase will be finished in the end of 2009. The project is planned to continue with the establishment of an International Coorsination Office and the erection of the first lab houses in 2010/11. The Wuppertal Institute for Climate, Environment and Energy is one of seven partners in the project.

INTEGRATION OF PUBLIC ART PROJECTS IN THE COURSE OF URBAN REGENERATION

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Abstract:

The presented methodology reflects on the theme of sustainable urban regeneration. The theoretical background of the strategy deals with the changes taking place in the field of public art and urban rehabilitation methodoligies. The parallel drawn between the evolvement of the two fields leads to a method that interweaves pubilc art projects into the process of rehabilitation, to create platforms which enable people to take active part in forming of their future.

Changes concerning the role of public artworks can be clearly defined since the 1980-s, when a new form of art, the socially engaged art, starts to arise. The role of these artworks shift from self expressive acts to actions and models of communal spirit. The social context of these works can be summed up in their aim to enhance social communication, to open discussion and dialogue. Opposed to object making the projects are more performative and process based in approach. Today's art is creating perceptive, experimental, critical and participatory models, modelling possible universes. Such changes can be also seen in the evolvement of the rehabilitation methodologies. Starting as early as in the 19th century, the question of modern city altering people's relations is still an actual one. This thought lead to new alternative theories in the past decade that create the foundation of new urban strategies uprising since the 1990-s, emphasising that sustainable development cannot be managed without the participation and knowledge of local citizens.

This is the area where the fields of public art and rehabilitational processes meet: both sharing the idea to generate better quality life in the open spaces of cities, through participatory modells. With the appropriate content, systematic build-up, and with the detailed phasing of public artworks, they can serve as complementary projects in the course of rehabilitation, acting as surfaces that enhance communication, and social activity.

In the cooperation of Révs Zrt. and Újirany Group the method is now put into practice in the case of the integrated rehabilitation of Palotanegyed, Budapest. Public research shows that people are open to community activities, if the adequate platforms are created. In order to activate people in the rehabilitation process playful communicational platforms are created (eg. The award winning Interacive Mapping Project[1]) that enhance communication between local people to share local knowledge, in order to create a stabil network of citizens taking active part to give rise to the image of the citypart. The public art projects/events focus on both the privately owned public spaces, like the inner courts of houses, transforming them into community places (micro projects), and the public spaces owned by the city: streets, squares (macro projects). The macro projects consist of a chain of public art projects and events that aim to focus attention on local values and economical/cultural potentials. Local shopkeepers and dwellers are involved in the process, which in the next years will turn the streets of Palotanegyed into an ever evolving interactive gallery, enhancing local economy and culture, garanteeing sustainable development. The projects realized (eg. the Inner Court Project, the Asphalt Painting Project – patterns and qoatations marking out the rehabilitation site and local values, the Mirror Project – making local values more visible) are also to be presented in detail as the first results of the strategy, with the introduction of the ongoing (The Gallery and Orthophoto Project) and upcoming (eg. Open Mall project) projects, as one connecting system.

[1] On the large surface of the orthophoto (placed in Nyugati station undrerpass) people were able to mark their homes, most liked places and places to be developed, with the help of stickers. It became a place where social, ethnic, and economic boundaries were erased and people came together to share stories and ideas about the city in which they live. (http://www.asla.org/2009awards/502.html)

SEGREGATION, MIGRATION AND LOCAL POLICY

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The vast majority of the literature on sustainable urban regeneration is dealing with the physical, biological and economic aspects of urban developments. However, in most cases the key of the success to the otherwise logical solutions is in the social dimensions of the process.

In this paper we will outline certain market and policy factors which define the patterns of segregation and the level of outward mobility in the most vulnerable parts of the city. These phenomena are important in the description of the conditions for successful urban regenerations. We will use the past-dependency theory to understand the post-socialist model of urban structures. This way the paper is based partly on empirical studies, and is a preliminary framework for an ongoing research.

The research is part of the "Sustainable Consumption, Production and Communication" Project financed by the Norwegian Fund.

I. INTRODUCTION

The analysis of the spatial and social structure of modern cities and patterns of changes represent one of the basic research directions of urban sociology. In literature, two main directions prevail, "ecological" and "historical". According to the first one, changes take place in accordance with practically the same model in various parts of the world. The driving force of urban development is economic development (social-political factors only have a modifying role), and therefore in the case of all cities the same phases follow each other, with a slight delay only. However, according to the other theoretical direction, there are different development paths even with similar levels of economic development. In other words, major historical social factors, leading to different types of urban development, occur with economic development, and often even stronger [1].

Comparative urban sociology researches of the 70s and 80s focused on a specific case of the above problem, i.e., comparison of development in capitalist and socialist countries. Those following the "ecological" direction did not see any significant differences between urban development in socialist and capitalist countries, only a time delay, providing that the economy of the former countries was weaker than that of the latter. This also explains differences between their cities. For example, according to György Enyedi, Hungarian regional development is nothing else but one of the sub-categories of general European development, very similar to the one observed in the West [2]. However, according to sociologists of the "historical" trend, the development of cities of Central and Eastern Europe is significantly different from that of West European and American cities, although there are still some similarities. Cities of socialist countries went through different development paths, because compared to capitalist countries at a similar level of development they had a different spatial and social structure. Development was fundamentally influenced by the lack of market conditions and state re-distribution. Due to

reproduction of the structure of social differences, power structure and method of operation, even phenomena which seem similar for the first sight had a different social meaning. [3][4][5]

The systemic change in the former socialist countries has created a very interesting situation for the above dispute, which can also be considered an experiment. After the change of the political and social system it became possible to study whether social processes of cities have also changed as a result of changes in power and social conditions. Other impacts of differences observed in the historical conditions of the systemic change in certain countries also became available for analysis. A lot of signs indicate that different models of the socialist "heritage", and transformation, and of course different "load-bearing" capacity of the economy of individual countries, and typical ways of their development have such a strong influence on urban development that new models need to be created which differ from West European or American ones. Therefore, while we cannot talk about a universal urban development model at all, within which cities of various countries are only in different phases of development, another open issue is how to explain similar phenomena of cities developing on the basis of different models. Similarly to West European and North American cities, for example, internal parts of cities have started to turn into slums and suburbanisation began too in former socialist cities. However, the moving out of the population of the capital city cannot simply be identified as suburbanisation in a Western context. In Hungary's case, not only the middle classes move out from the capital city into villages surrounding it, but families in lower statuses also move to villages with more underdeveloped infrastructure. This trend involves people who obtained good housing conditions in socialism as a result of their second jobs undertaken in the economy, but after the systemic change they got into a trap and hoped to break out by moving out from the city. [4]

This study intends to highlight an aspect of the dispute mentioned above using the example of Budapest and its agglomeration. We try to describe those factors that determined the relationship between Budapest and its surrounding area in the 1990s. We shall argue that typical social processes fundamentally defined spatial mobility processes and their characteristic features too. At the same time, this study can also be considered the continuation of former studies too. While changes in the spatial and social structure of Budapest were analysed in previous research studies by ignoring the relationship between Budapest and its agglomeration [6], after the systemic change a joint analysis of the two seems to be more adequate. During the last few years, a much closer relationship and mutual effects have developed between the two areas. All these changes call for the extension of former research activities in this aspect too, and an analysis of spatial dimensions of an urban society even if the problem is not only limited to the administrative borders of the capital city only, but Budapest and its whole agglomeration forms the subject of analysis together. The reason for this is that it is more difficult to understand the spatial and social processes taking place within the boundaries of the city without taking into account also the tendencies prevailing in a wider environment.

II. HOUSING POLICY AND ITS EFFECTS

Housing policy in Hungary the last fifteen years can be divided into three, firmly distinctive periods.

After the transition in 1989, housing constructions by the state ceased, since one of the important ingredients of non-sustainability of the socialist economic system was precisely that the redistributing system, due to its squandering nature, could no longer be financed. Besides the change in the power structure, we may regard the transformation of the economic structure as a principal characteristic of the epoch. This process went in hand with familiar crisis phenomena. In our case, it was that housing factories and organisations in building industry at once closed down that had produced the prefab housing estates, making up approximately one third of all housing constructions in the 1980s. The rest of the building industry was not able to compensate for the shortfall. One of the reasons is the length of time necessary for adaptation. Nonetheless, it was equally important that income of the population decreased, therefore the demand shrank. Because housing policy did not encourage housing construction, the annual number of new dwellings fell to two thirds compared the number in previous epoch. After the three-four years of dramatic decline, we witnessed stagnation till the end of the decade; the state housing policy was inactive.

During this period, neither the incentives that may regulate the housing market in market economy conditions nor the institutional structure that would effectively fulfil this role were formed. Typically, the regulation of the field was carried out by multiple ministries, even in varying set-up.

Passivity of the central housing policy cannot be considered an accident. Two major aspects of structural critiques of socialist economic and social regulation targeted the methods of state-party-state power practice and the related ownership structure. Exactly that made the privatisation and decentralisation seen unavoidable in housing policy as well. We may have perceived two consequences:

First, in the transforming municipal system, the competences – including the housing policy in question – were transferred to the municipalities, the role of larger territorial aggregations were minimised. In Budapest, it implied the introduction of a special, two-tier system. Large majority of municipal jurisdiction was shifted to the districts; the capital authority works as a 24th local authority, besides the 23 districts. As a consequence, we find rather dissimilar housing policies within the capital.

Second consequence of the political transformation was the mass privatisation of previously state-owned dwellings as virtually the sole visible means of housing policy. In 1990, about the half of the dwellings of the capital was in municipal ownership; by the mid-1990s, this ratio fell to about one tenth. During the socialist epoch, the housing sector was a good example of how the state was a bad proprietor. This part of the housing stock was in much worse state than that in private ownership. Throughout the privatisation, it was hoped that ‘real’ owners would be better possessors of the flats and buildings than the state used to be. Being their own interest, they will maintain and renew their dwellings. In privatisation, actual tenants could become proprietors for a fraction of the market value of the flat, with very advantageous loans. The optimistic scenario, however, prevailed only partly, in higher status areas of the city. The former tenants in worse areas of the city faced increasing costs of housing maintenance; it gradually reached a hardly bearable level compared to their low income. As a consequence, possibility of buying their tenement was

not a ‘national gift’ for them – as for more fortunate people – but a trap was increasingly difficult to break out of.

This situation basically confined the housing policy of municipalities. A huge pressure was put on them by middle and higher status portion of the potential tenants – that represent the ‘visible’ part of the electorate – to privatise as quickly as possible the tenement flats and the municipalities tried to do all to the utmost to meet the demand. Besides the obvious political gains, they hoped rather that they would get rid of the burdens of maintaining the flats than they feared for losing the bulk of their possessions as a consequence of this process. In the end, about eighty per cent of the tenement flats went into the possession of the ex-tenants, the municipalities kept only the part that could not have been transferred.

In consequence, housing stock in the worst state, which could not be sold to tenants, concentrated in certain areas of the city; thus it remained in the possession of the municipality with all its troubles and impoverished dwellers. Basically, similar spatial distribution is characteristic of the housing stock, which is in slightly better state, and therefore privatised by the ex-tenants who on the other hand do not have enough financial resources to maintain and renovate their new possessions.

This situation culminated in that the bigger housing stock a municipality possessed the heavier burdens it had to bear in fields of maintaining the flats and attending to their impoverished tenants. As a consequence, in the housing (and in social) policies of the municipalities the tendency strengthened to force out the poorer population groups through various methods. One of the most important means to do so is the urban rehabilitation and reconstruction that goes with large-scale demolitions. In its course, the cost of reallocating the tenants of decayed buildings – often in very bad state thanks to omitted renovation – may be paid by potential investors. So much the more, since the tenants who can hardly even fight for their interest may relatively easily be persuaded to accept comparatively cheap flats – although better than the previous one – or its monetary equivalent. Thus the municipality can easily remark that it serves the interest of the poor with its procedure since they will get in better position compared to the unaltered situation. Moreover, it considered the interest of the middle-class dwellers of the territory because the district turned tidied and respectful. In addition, for the newcomers are of higher social status that the leavers, municipalities may judge they fulfil their social goals as well. In return, the municipality no doubt becomes increasingly defenceless against the demands of investors. They are partners in realising the above goals only if they make sufficient profit. For this purpose, the municipalities are often willing to make sacrifices such as giving up the traditional urban image and loosening the building regulations, since they fear they may discourage otherwise the investors, possessing immense capital, necessary for developments. Furthermore, it is a risk worth taking that they might hardly parry the suspicion of blackmail when deciding less transparently with reference to efficiency. By all means, it seems this risk is worth taking for the districts in order to get rid of the burdens brought about by the poor, parallel to the backing of demolition forms of urban rehabilitation by the middle class residents and to the gain coming from deepening good relations with investor groups, interested in developments.

III. HOUSING POLICY AND SPATIAL MOBILITY

The privatisation of council flats was a significant motivation factor in the extensive mobility after the systemic change. Since the council flats owned by local governments were not only concentrated in internal districts, it can be concluded that the privatisation impact might have resulted in the decline of population not only in internal districts, but external districts too. Housing privatisation had several impacts on different groups of interested individuals. For example, it significantly increased opportunities for moving, as well as constraints. As a model, we can say that as a result of housing privatisation those who purchased a home in good conditions, in a favourable ecological position, and had sufficient equity or family capital themselves, moved to parts of Budapest agglomeration with a high status. Families who bought their former flats in areas of Budapest with less favourable conditions, and therefore their additional capital was relatively moderate, typically moved towards the Eastern-South-Eastern agglomeration zone, or villages which were slightly further away from Budapest, but still belonged to the agglomeration.

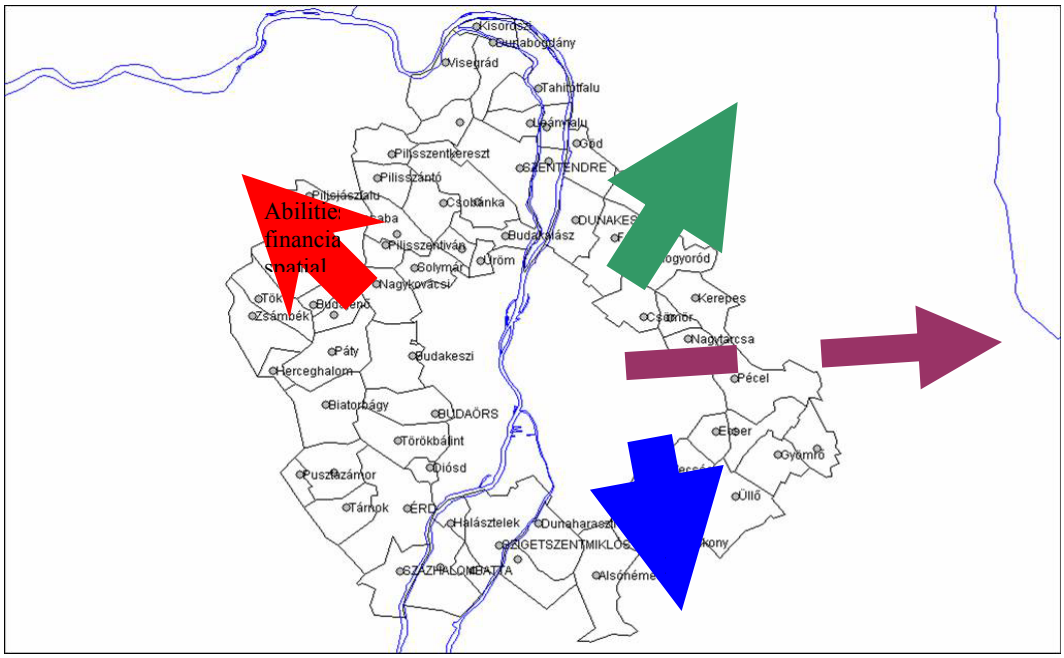

FIGURE 1: THE DIRECTIONS OF SUBURBANIZATION

Groups for whom the consequences of housing privatisation increased financial liabilities moved to settlements far away from Budapest (not belonging to the agglomeration). In their case, the main motive of the move was not to improve the housing conditions or symbolic social position, but an escape from an increasingly risky trap involving arrears in expenses, and large debts. In their case, family ties had a very important role in selecting the target place. Usually they moved back to the same place from where they came to Budapest or its agglomeration in the 1950s and 1960s. The majority of such families moved to Budapest while some relative in the larger family retained the house in the countryside (especially in East Hungary), and consequently those who returned to their former homes, still had some properties, including even partially

vacant flats, the refurbishment of which was relatively cheap. Therefore, the moderate amount received for their flats in Budapest in bad conditions was suitable for such families to escape from the trap created by housing privatisation. Of course, this solution is rather risky, and its durability depends on whether people found jobs in such settlements, and to what extent the traditional family network helped them to re-integrated into a world which they left behind a long time ago.

TABLE 1: DISTRIBUTION OF FINANTIAL POSITION OF INDIVIDUALS MOVING WITHIN BUDAPEST, OR FROM BUDAPEST TO THE AGGLOMERATION OR EVEN FURTHER BETWEEN 1990 AND 1997, (%)[1]

	Within Budapest	To the agglomeration	To other areas	All out-migrants
poor	10,3	5,0	20,7	13,4
middle	75,7	87,0	74,1	80,1
Well-to-do	14,0	8,1	5,2	6,5
all:100,0 %N=	N=1896	N=221	N=256	N=477

According to their wealth status, the composition of those involved in movements within Budapest and towards the agglomeration was more or less identical with the average figures prevailing in Budapest, i.e., the ratio of affluent people was nearly 150% of poor people. However, there was a significant different between the two groups, namely, that among those moving out to agglomeration the proportion of both extreme groups was lower, i.e., this moving option seems to prevail more as an interest enforcing strategy for those with a medium status. On the other hand, among those who moved to remote points of the country, there were more than twice as many poor people as the average figures in Budapest, and the ratio of affluent people was only approximately 50% of the figure prevailing in Budapest. Therefore it seems that a significant proportion of population moving to agglomeration belong to the middle class, among those moving to remote settlements the proportion of people belonging to lower middle and other lower classes is very high.

[1] This indicator contains three elements. On the one hand, we took into account whether the individuals asked had other properties and assets apart from their homes or not. It indicated a high status too if individuals had certain status symbols in the category of consumer goods. On the other side, if only an out-of-date version of a consumer goods, listed in the questionnaire, was possessed by an individual, it indicated risks of a low status (for example, only black and white TV, traditional washing machine). Apart from that, an individual was only considered one in a low status if he did not possess assets or consumer goods indicating a high status, listed above, and sometimes the family did not have enough money for food, heating or rent. Therefore, while forming a group in favourable financial conditions, we considered those affluent who had assets, possessed at least one of the consumer goods indicating a high status, and did not have any financial crisis in their in their family for the last 12 months.

TABLE 2: DISTRIBUTION OF MOTIVES FOR MOVING AMONG SPATIALLY MOBILE BETWEEN 1990 AND 1997(%)

	Within Budapest	To the agglomeration	To other areas
Life was too expensive	7,7	12,0	28,7
No jobs	3,6	2,6	10,6
Housing was too expensive	11,8	17,0	26,0
Improve hosing conditions	54,4	55,0	34,5
Move near to relatives	16,0	23,2	43,5
Privatisation gain	6,6	14,8	12,9

The low status of those moving out of the agglomeration and the probability of the related constraint moves was significantly higher among them than among those who moved within Budapest or to the agglomeration in the 1990s. It is indicated by the fact that among the motives for the move the relatively conventional and suburban motive of "demand for a more spacious and better home" occurred only in 34.5 per cent, while in the other two moving types the ratio was more than 50 per cent. Most probably, it is even more revealing that more than one quarter of the individuals moving to remote places (28.7%) had to move towards cheaper areas, and nearly one quarter (26%) found that they were unable to maintain their former home in Budapest. This is an extremely high proportion comparing it to the other two spatial mobility routes—7.7 and 12.0%, and 11.8 and 17.0%, respectively.

The issue of Budapest and its agglomeration is a good example for the impacts of changes in a political and power structure on social conditions. As a result of our analyses, perhaps the most important conclusion is that the development of a city and its environment simultaneously shows the consequences of spontaneous processes and power planning interventions. Among spontaneous processes, we can use the example of Western lifestyle examples, which are becoming more realistic and desirable as a typical consequence of general globalisation impacts. Naturally, it is a real challenge for a group of the society, which is better informed on the matter, and can have access to financial and other capital too, with which it can implement the changes. The suburban life, turning into a lifestyle through mechanisms not listed here, i.e., the ordinary lifestyle of a well-defined Western middle class, is therefore a desirable and potential lifestyle for those groups which are the relative winners from the systemic change in Central and Eastern Europe. However, attempts for this lifestyle do not only represent spontaneous processes, including increasing demand for adequate land, a family house type lifestyle is becoming more and more a definition for a human place of residence. The middle classes, and in general those in power, typically reflect their own requirements and norms as universal requirements and norms, applicable to everyone equally. All kinds of ideological arguments are adopted and increased in order to justify attempts for suburbanisation. These arguments proved to be efficient for them despite the fact that in other aspects a lot of reasonable counter arguments (for example travel time) could strongly doubt the practicality of spatial mobility for these groups. The processes show well that basically the place of residence is selected according to the social status, compared to which the specific advantages and disadvantages of the selected area are secondary. (Naturally, as we are talking about the selection of places of residence and moves of groups with a higher status, such groups

usually move to places which are more advantageous in physical and environmental conditions. The conclusion that the primary motive for the change is the preservation or increase of status naturally does not mean that physical conditions are not more favourable than in the case of residential places for groups with a lower status.) Naturally, these spontaneous processes and their impacts are closely related to the opportunities offered in the changed power structure and economy of the 1990s, and the objectives it outlined for the winners. However, looking at the process more closely, it does not only consist of spontaneous efforts and forced answers, but it takes place in a well defined power and planning environment, pointing to the same direction. It is enough to refer only to the disputes between the political management of Budapest and the central government, as a result of which the economic and social problems of Budapest and its surrounding area has always been more or less impossible synthetically to date. Similarly, the decisions which identify the finances of local governments have straight consequences on the extent to which such local governments encourage and the extent to which they resist newcomers, and how and to what extent they try to sell part of their territory for industrial, commercial and service purposes, etc. In addition, these physical development and planning decisions take place in the framework of well-defined planning processes. These processes give a role to new players in the decision-making system, the designers themselves, with their own more or less separate interests and interest representation efforts. Thus, therefore, in addition to the spontaneous efforts of interested parties, the complicated system of expert and political decisions also determine the conditions and directions within which spontaneous efforts can be implemented. Most probably, one of the most important issues in Central and Eastern Europe in the 1990s was to what extent, in through what mechanisms various social groups were capable of enforcing their interests among the changing power conditions, and to what extent we could observe processes similar to West European models in this complicated system, and to what extent we can consider the observed processes as special mechanisms of Central and Eastern Europe. Thus, therefore, the suburbanisation processes described in relation to Budapest and its agglomeration represent social conflicts and risks, the observation of which can be used as an example of the characteristic features appearing in the first 10-15 years of the systemic change.

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DEVELOPING A "GREEN-POINT" ENVIRONMENT VALUATION SYSTEM ON A LANDSCAPE-FARMING PILOT AREA

Molnár Géza and Podmaniczky László

Abstract:

The principle of farming is the environmental adaptation, which means that the land is used for its best purpose with an intensity it can bear without any harm. Experiences show that systems are capable of living in the long run if they easily adapt to the changing conditions in space and time. Local adaptation, reliance on local resources are a rational intention not only from socio-regional but also from economic point of view.

The aim of our research is to create a "Green-point" valuation system which on the basis of ecological (land-use) capabilities of the investigated area (Bereg) is able to qualify the ecological and economic efficiency of the farms in the framework of concrete, farm-levele calculations. With the help of it farmers can get an idea about the opportunities of the land-use-change and at the same time they get a definite, numerical answer about the probable ecological results on the level of their own farms. The greatest advantage of the "Green-point " is its flexibility, as it inspires the realisation of the farm-specific methods of adaptation.

The research is completed with reviewing the attitudes of farmers, too. We examine some hypotheses indicating the insustainability of the present system. We explore if farmers are aware of these phenomena and their effects, implications. Are they prepared to be able to farm in other circumstances, too? Do they know what they should do in order to move land-use towards sustainability? With this research we can analyse the actual feasibility of the sustainable systems in the long run, too, their social, economic and environmental effects.

As a result of the research among the farms of the area a landscape-farming model and several farm plans are made which are sustainable on the one hand and can be realised even in the present circumstances on the other hand. We also try to define the crucial points that inevitably must be changed in order to converge farming and sustainability

The research is part of the "Sustainable Consumption, Production and Communication" Project financed by the Norwegian Fund.

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ON THE WAY TO HOLISM
AN ECO-AGRICULTURAL MODEL FOR SUSTAINABILITY

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Abstract: ***Groups of international and domestic scholars generally agree that local production and consumption should be the foundation of sustainable development. Organic farming and renewable energy sources should be used in order to achieve our goals. Our everyday life should be simplified through economizing in all dimensions of life from the satisfaction of basic needs to the luxury consumption of wealthy societies.***

There are several experiments in which ecologists and sociologists have tried to establish self-supporting settlements. These alternative models are designed to operate on different principles to those of the global economy that is overruling our societies today. Their aim is to work out a social model as an alternative; a model which places importance on environmental and ecological consideration and focuses on country, villages, farms, and households.

This paper describes practical examples of where an eco-holistic approach has helped to create a model of a sustainable solution. Ecoflex is a firm representing a type of eco-agricultural model. The Ecoflex model's originality is how it integrates rape oil pressing manufacture with the ambient agricultural structure. The model shows how Ecoflex oil manufacture in Szedres is integrating the triple bottom line of sustainability: economy, society and environment in a holistic way. The big advantage of this model is that the rape oil can be used for bio diesel production and for use in the food industry as a vegetable oil substitute. Pellets suitable for animal fodder or heating in the energy sector are valuable by-products. This flexibility provides a unique contribution towards both sustainable production and consumption at the same time.

The research is part of the "Sustainable Consumption, Production and Communication" Project financed by the Norwegian Fund.

Keywords: renewable energy, regionalism, local production, sustainable production and consumption.

I. INTRODUCTION

Holism's main thesis is that the world is one integrated unit, in which everything is coherent and inter-related. This is just the opposite of reductionism, which is the paradigm of separability, which has recently prevailed. Whatever connection and coherence we seek to focus on, our holistic view will help us to gain a successful critique.

Contemporary philosophers of the green movement have developed a new ideology based on five fundamentals: (1) The notion of Gaia: "The planet can be healed successfully if we do not only concentrate on the disparate environmental problems, but we rather examine and treat the Earth as one unit." (James Lovelock); (2) Deep Ecology: "The main idea here is that it is not the person who should be protected from himself, but that nature has to be defended from people." (Arne Naess); Perma culture: "We have to plan each of our activities so that the plan of our subsistence contains the conception of continuity. The American Indians for example believed that whatever we do, we have to think about the consequences and effects of our steps on the seventh generation." (Bill Mollison); Bioregionalism: "It is a decentralized, locally-based economy. We primarily use things that are made locally. We should learn to respect the spirit of certain places."(Gary Snyder) and; (5) the Spirit of Creation: "The world cannot be sustained only with practical

images, the spirit is also needed. The Spirit of Creation helps us to see the nature and also ourselves in another way. Everything is sacred: the Earth, the trees, the rivers and the mountains." (Matthew Fox). These are the constituents of an integrated approach to nature.

II. ECO-HOLISM

Eco-holism is a new approach which combines traditional holism with an eco-centric approach. It examines global economic policy from both an environmental and social dimension. While holism traditionally studied social, political and economical dimensions, the eco-centric approach dealt with ecological-environmental issues, while social connections were just lightly analyzed. Gabriella Kütting combines the interactions of global economy and natural environment in her book in terms of eco-holism.

The concept of eco-holistic analysis is put forward as being how environmental issues are incorporated into the analysis rather than as being structural and systemic forces and constraints within which actors operate. The concept of an eco-holistic analysis is based on three pillars (the historical dimension of environment-society relations, the concept of consumption and equity) which offer new dimensions of analysis which can serve to highlight why traditional institutionalist approaches to the study of international environmental politics lack suggestions for effective environmental improvement.

III. ECO-HOLISTIC EVALUATION OF BIOMASS AS ENERGY RESOURCE

In the last decade there has been great euphoria about bio fuels. The EU set a target of reaching a 20 % share of bio fuel in fuel consumption.

The well-known problems of the EU agricultural policy and the permanent overproduction of cereals made it obvious that the transfer of food biomass into energy is a rational alternative. Scientific studies estimated that there was about 11 000 TWh potential in biomass which is totally unexploited. The same study estimated only 5000 TWh available from wind and 4000 TWh from solar energy. Based on this analysis, EU willingness to stimulate the broader use of biomass for energetic reasons was fully understandable. Besides the huge energy potential in biomass, its utilization may provide several non-energy benefits to society:

Biomass not only renewable energy, but helps:

- solve the problem of overproduction of agricultural products (such as cereals which are produced using financing from EU intervention funds).
- support farmers experienced in the field of corn and grain production.
- utilize spare tillage area.
- create favourable natural circumstances (i.e. improved landscape).

Additional advantages for the promotion of biomass as an energy source:

- biomass is a carbon-neutral energy source
- it is more sustainable, because it is renewable
- it helps maintain the countryside and settlement systems
- bio-fuel is needed because of the potential oil deficit and crude oil dependency

- it can be produced on the spot, is safer to produce and reduces import dependence
- it helps in solving local employment problems

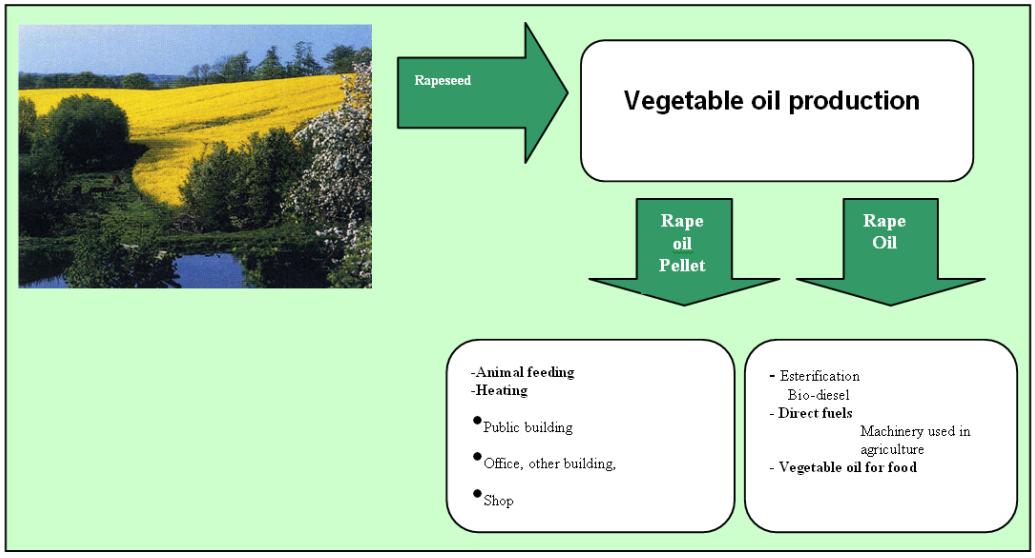
Despite so many advantages the question must arise of whether production of bio-fuels is environmentally friendly. As always: it depends! We must consider the following factors:

- the oil industry is still growing, the crude oil prices fluctuate between 40-120 USD/barrel in a year time frame
- over the short term only, biomass industrial production systems are more economic (the domestic support system favors and supports only the bigger economies of scale (i.e. 500 HA). This is just the opposite of what environmentalists would prefer.
- industrial inputs are high, energy gain is small, chemical exertion is significant and agro-biodiversity is decreasing
- potential use of genetically manipulated seed-corns

Energy plant cultivation reduces biodiversity and leads to monoculture and there is a threat that farmers will be forced to use genetically manipulated seed-corn in the name of "sustainable development".

IV. AN ALTERNATIVE APPROACH: THE ECO-AGRICULTURAL MODEL

Ecoflex is a type of eco-agricultural model. The model's originality is that it integrates rape oil pressing manufacture into the ambient agricultural structure.



1. FIGURE: THE ENERGETIC EXPLOITATION OF RAPESEED

Before commencing activity, through choosing appropriate territory, sustainability aspects were taken into consideration. The primary aim is to locate the production

machinery in a place that is within a 50-60km zone of growth of the crops. Minimizing transport distances reduces the environmental burden and also reduces transport costs. This concept enables reforming the structure of agriculture, developing grass crop rotation, and at the same time suits plant cultivation for the food industry.

The works commenced at a place that had previously functioned as a farmers' co-operative. Six people now work in the formerly ruined buildings. If we think about the 5000 tones of rape that is yearly produced and the logistical activities and work related to this, we can say that the small number of workplaces is notable. The rape is bought from the farms and farmers from the neighborhood. The works is now capable of producing 430 MT rape per month which means the production of 150 MT (170000 liters) of rape oil and 280 MT of rape pellets.

There is a plan to raise the amount of workers to ten and capacity to 15000 tones of rape. Rape oil is currently sold to produce Biodiesel exclusively on the Hungarian market. If the Hungarian laws permitted, by virtue of its quality it could be locally used as fuel for agricultural machines. Additionally, it is planned to provide for the settlement's electricity using rape oil (using a diesel generator fueled by rape oil). The settlement's heat energy is provided through a pellet boiler, fueled on locally produced rape pellets. Pellets are primarily sold for feeding purposes to local ranchers and fodder producers.

This project is worth further examination as a comprehensive overall model. By means of the project, local food security and energy security can both be increased while more sustainably supporting the countryside population.

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LOW-CARBON COMMUNITIES AS A CONTEXT FOR MORE SUSTAINABLE ENERGY CONSUMPTION

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With the increasing importance of climate change on the policy agenda as well as its ever more visible impacts, sustainable energy use has become an important area of sustainable consumption. Reducing energy use and increasing energy efficiency are among top priorities, and as households consume about 26% of the energy used by final consumers, it is of great importance that they are supported in their effort to reduce overall energy use.

However, so far, the majority of initiatives concentrated on individual consumers or households, and not on their wider context, communities. Recent literature has suggested that more focus should be placed on the community level and that energy users should be engaged in the role of citizens, and not only that of consumers. This paper analyses different types of emerging low-carbon communities as a context for individual behavioural change.

First, through a review of the relevant literature, the paper takes a closer look at the obstacles to behaviour change that communities can help, and have been shown to help, overcome. These problems include social dilemmas, social conventions, socio-technical infrastructures and the helplessness of individuals.

Then, it introduces and analyzes different types of communities to show how they have been helping individuals and households change their behaviour and lower consumption. Not only geographically centred communities, but also sector-based, interest-based and smart mob communities are introduced, and the strengths and weaknesses of the various community solutions are analyzed from the point of view of their success in promoting and enabling behaviour change.

Finally, conclusions for research as well as policy and decision-making are drawn for the design and support of low-carbon communities.

Keywords: low-carbon communities, energy conservation, behaviour change

I. INTRODUCTION

For decades, attempts to change energy-related behaviour were targeted at individuals as consumers of energy. Recently, many European localities have started to transform themselves into sustainable energy communities or low-carbon communities. Here, individuals take the role of citizens rather than consumers, and gain the capacity to work together to transform their energy infrastructure on the local level [1].

Low-carbon communities provide a new context for energy end-user behaviour change [2]. Thus, they present potential solutions to key problems in early energy demand-side management programmes [3]. According to Gardner and Stern [4], there are basically four types of instruments to change behaviour in relation to environmental problems: regulations and incentives; education and awareness raising; community management of environmental resources; and reference to moral, religious or ethical principles. In

European societies, the first two types are used almost exclusively, and in the case of energy consumption, with little success.

Energy conservation programmes have suffered from an overly individualistic focus, assuming that individuals fully control their behaviour and make decisions in isolation [5] [3]. Research has shown that this is not the case. Individual decisions to save energy in order to conserve common natural resources are framed by social dilemmas [6]: individual efforts are useless unless others participate. Moreover, energy-related behaviour is shaped by conventions and socio-technical infrastructures that are largely beyond individual control [7], [8]. Finally, these problems, together with the invisibility of the consequences of our action, lead to a sense of disempowerment that is a major obstacle to low-carbon lifestyles [9]. Low-carbon communities present at least a partial solution to these problems of individual behaviour change.

Most of the discussion on low-carbon communities centres on geographically local communities (e.g. [10] - [13]). This is indeed one of the primary forms of community with a place-based identity, shared history, shared infrastructure, and political and administrative power. We introduce into the discussion some other forms of community: sector-based communities, interest communities and virtual communities. We thus define low-carbon communities as forms of co-operation and collaboration that aim to reduce the carbon-intensity of their members' lifestyles by providing amenable contexts and mechanisms that encourage behaviour change [2]. By analysing various low-carbon communities, we examine which problems of individual behaviour change they solve best, and in which ways.

This article is structured as follows. We first present low-carbon communities as a potential solution for four persistent problems in sustainable energy consumption: social dilemmas, social conventions, shared infrastructures and the helplessness of individuals when faced with the enormity of climate change. We then examine how these issues are addressed in low-carbon communities, drawing on a dataset from an ongoing project called CHANGING BEHAVIOUR[1]. We analyse the strengths and weaknesses of various community types, and conclude by suggesting avenues for further research and development.

II. Changing Behaviour: The Fallacy of Targeting Individuals

Most of the behavioural change programmes to reduce energy consumption, and more recently to reduce the carbon-intensity of our lifestyles, have focused on individual behaviour. They have tried to influence behaviour via economic instruments like grants and rebates, or via education and persuasion, e.g. information campaigns [14]. While some programmes have been quite successful [14], many have faltered, leading to scepticism about the possibilities to change current high-energy, high-carbon behaviour patterns. Considering the remaining cost-effective potential to reduce CO_2 emissions (e.g. [15]), especially through energy efficiency and energy conservation [16], [17], the current results of behavioural change programmes appear modest.

[1] Changing Behaviour is funded by the European Commission's 7th Framework Programme. More information can be found at http://www.energychange.info

Many of the behavioural change programmes suffer from a conceptual problem: methodological individualism. By drawing on purely economic or psychological representations of behaviour, they fail to recognize the socially grounded nature of human behaviour [3], [18]. In the following, we elaborate on four issues in adopting low-carbon behaviours that are disregarded when focusing merely on individual behaviour. To conclude, we suggest some features of communities that can influence their capability to address these problems.

Social dilemmas

The notion of social dilemmas in natural resource use is grounded in the problem of public goods (e.g. [19]). Public goods are goods for which property rights are not defined, and which can be freely used by anyone (e.g. shared natural resources like the atmosphere). Thus, there is no mechanism to limit overuse and depletion of the resource. Even when individual users perceive the problem of overuse; their unilateral actions to limit use are ineffective if others continue the unlimited use of the resource. While economists originally suggested the allocation of property rights as a solution to this problem, this is not often feasible or desirable [20].

When we try to solve collective problems like climate change by focusing solely on changing individual behaviour, social dilemmas arise [6]. Unless people can assure themselves that others are contributing, their efforts to reduce the carbon footprint of their personal behaviour may appear pointless. This dilemma is reflected, for example, in a recent survey in which 57% of the respondents stated that they 'do what they can for the environment', but it does not make a difference because 'other citizens' or 'large polluters' do not do so [21]. Recent guidelines for behavioural change campaigns have acknowledged this problem and stressed the importance of making sure that everyone is participating and that people see that others are also 'doing their bit' [22], [23]. More fundamentally, community management (i.e. management of resources by the entire community rather than by individuals) could be a solution for the dilemmas of sustainable consumption [4], [24].

While community management presents a promising approach to social dilemmas, mere close interaction with others within a community is not sufficient (e.g. [25]). Ostrom [20] has identified features of traditional communities that have successfully managed shared resources sustainably, including clearly defined governance *boundaries*, *rules* concerning the utilisation of resources, collective choice *agreements*, *monitoring*, *graduated sanctions*, *conflict-resolution mechanisms*, and the ability to *self-organise*. Such features are notably lacking in today's world of energy use and carbon emissions. Yet, at various levels, groups of individuals can create new institutions and schemes for resolving social dilemmas. For example, Kollock [6] has argued that *transformation* is a promising avenue to resolve social dilemmas: collective action can be reframed by providing assurance that others will co-operate, signalled through pledges and common symbols.

Social conventions

Social dilemmas are not the only obstacle to converting to a low-carbon lifestyle. Individually-oriented behaviour change programmes have been shown to disregard the social nature of behaviour [3]. It is implicitly assumed that each consumer makes decisions about consumption in isolation, and is free to choose products and services on the basis of personal preferences.

Research on the evolution of consumption patterns has shown that individual choice has a limited role in many types of environmentally relevant behaviours [3]. For example, Shove [7] has examined the development of washing and bathing, showing how commonly shared conventions of cleanliness and 'freshness' have increased the frequency of both activities over the past decades. Similarly, the demand for 'convenience' products has grown as the temporal organization of family life has disintegrated: families rarely go to work at the same time, eat at the same time, and spend their leisure time in the same place. Such conventions relate to the mutual ordering of everyday life across individuals. They are not primarily individual choices: consumption patterns are shaped by shared conventions that evolve historically, creating common understandings of decency and appropriate behaviour [26].

Conventions are learned and maintained through social interaction. They are reinforced by a vast commercial system of technologies, marketing and media that contribute to a convergence of conventions of "comfort, cleanliness and convenience" [7]. It is thus difficult for individuals to step outside conventional systems of consumption. It is even difficult to perceive the 'conventional' nature of self-evident and 'normal' customs. Even if they are called into question, the renouncement of 'conventional consumption' (such as frequent showering or laundering) is easily perceived of by others as anti-social. As conventions are by definition socially shared, one solution is to support new social groups that collectively develop alternative conventions [27]. Moreover, if we want to question existing conventions, a deliberative and inclusive process of problematising current lifestyles is needed [28].

Lack of infrastructure

The evolution of consumption patterns, conventions and customs is closely linked to the development of technologies of everyday life [7], [29], [30]. For example, Shove [7] has shown how air conditioning systems have evolved through mutually reinforcing developments in scientific specifications of 'comfortable' living and working temperatures, building design and workplace practices. While air conditioning standards have converged around the world, alternative schemes for 'making oneself comfortable' have been marginalized [31], [32]. Even though conventions and socio-technical systems are two sides of the same coin [7], it is worth addressing infrastructures separately as their materiality requires specific resources for change.

The above is only one example of the socio-technical systems that shape the carbon-intensity of our lifestyles. Such systems only become visible when the problems created by them are acknowledged in society. Even then, the unavailability of alternative systems creates barriers to change. And even when technologies like low-energy housing constructions become available, they are difficult to adopt because of the lack of supporting competencies, services, and social structures. High-carbon technologies are linked to broader systems of supporting knowledge structures, supply chains, commercial interests and conventions [31] – what many scholars of technological change call 'regimes' [33]. Such regimes are embodied in urban infrastructures of electricity, water, waste and other utilities [34] as well as in the available routines, knowledge and skills of how to conduct one's daily life.

Thus, shifting to low-carbon lifestyles often requires a questioning and search for alternatives, not only for existing conventions, but also for existing infrastructures of

consumption and work. It is obvious that changes in entire infrastructures are beyond the purvey of most individuals; they are collective endeavours. While socio-technical systems and infrastructures are national or even global, they are also partly amenable to local modification and experimentation. Sustainable housing areas and alternative utility systems are some examples of current experiments in creating new infrastructures of consumption [34], [35].

Because infrastructures are central in defining the carbon-intensity of modern lifestyles, they are also central in supporting and maintaining change. Even though individuals can be induced by information or incentives to 'go against the grain' and learn to curtail energy consumption, such changes are often short-term and rarely survive once the change interventions are discontinued [36], [37]. For lasting change, individual learning needs to be supported by new routines, infrastructures, institutions and networks [38], [39].

Helplessness

The previous paragraphs show that individuals are locked-in to existing consumption patterns through many social and socio-technical ties [40]. Thus, exhortations to individuals to 'take responsibility' may be frustrating and create a feeling of helplessness [41]. The small things that are easy for individuals to do may be relatively useless in the face of the enormity of climate change. Psychological theories of individual-level change have discussed empowerment as a key factor supporting behavioural change; a feeling of helplessness is the greatest obstacle to change. People are most motivated to change when they feel they are becoming more competent and more able to take charge of their lives [42], [43].

Helplessness and disempowerment can be countered by providing individuals with feedback on the collective impact they are making in reducing carbon emissions [28]. Feedback is an important aspect of empowerment because the problem itself is invisible, and people have no way of knowing whether they are making a difference. Moreover, they have no way of knowing whether others are participating, and hence collectively making a *significant* difference.

A further solution suggested to empower individuals is to align intrinsic and extrinsic motivations [43], [44], referring to intrinsic motivations that relate to resource conservation as an end in itself, and extrinsic, i.e. ulterior motivations like cost savings and personal benefits [45]. People need to feel their efforts are making a difference, and require government support for this. However, if the support is too directive, it can undermine the intrinsic motivation [9]. Thus, empowerment cannot be accomplished top-down – 'being told what to do' can engender even more helplessness [43]. Individuals need to be invited to participate in devising their own solutions. Moreover, incentives should be aligned to support individuals' voluntary efforts [9].

These observations suggest that low-carbon communities can support individual empowerment in different ways. From the individuals' perspective, collaboration in a community may counter helplessness and help to empower individuals by providing a feeling of competence, feedback on the impacts of their and others' actions, and a 'voice' in devising solutions.

Features of communities that may influence their capacity to facilitate low-carbon lifestyles

Above, we have suggested a number of ways in which low-carbon communities might be more or less effective in solving the problems faced by individuals when attempting to reduce the carbon intensity of their lifestyles. On the basis of the literature, we assume that the rules and characteristics mentioned by Ostrom [20] and the ways of solving social dilemmas suggested by Kollock [6] may be relevant for low-carbon communities, but we also expect that there may be additional relevant features not mentioned in these sources.

We can also consider, following Jackson [24], the influence of more structural features of communities on their capacity to facilitate change at the individual level. This notion draws on a set of concepts from Cultural Theory, the grid-group matrix [47], closely corresponding to the classical forms of social structure "Gemeinschaft" and "Gesellschaft" as defined by Tönnies and Durkheim. "High grid" refers to a social structure in which the rules governing social relations are clearly defined, and there is a clear division of labour within the community. "High group" refers to a structure in which the boundary between the community and the outside is distinct and group members share strong personal and emotional ties. We expect that the structure of low-carbon communities can have an impact on their effectiveness in solving the four different kinds of problems mentioned above. In particular, we expect that the structure of communities can influence their capacity to shape infrastructures, on the one hand, and empower individuals, on the other.

III. Five Types of Low-Carbon Communities

Above we have discussed four barriers to behavioural change that call for solutions at the community rather than the individual level. Low-carbon communities may help to solve some of these problems. However, the problems transverse geographical community boundaries – they occur on multiple scales, and the most appropriate scale and format for their solution is still an open question [24].

Most of the discussion on low-carbon communities focuses on place-based communities like cities, municipalities or neighbourhoods [48]. Sectoral networks are another type of community addressing climate change. NGOs, especially ones that combine a campaigning mission with an aim to provide services for members are another form of community that can be termed 'interest-based'. Today, virtual communities like 'smart mobs' (action groups organizing via social media technologies, see [49]) are also emerging. In the following, we present examples of each type of community.

Urban community: Manchester is My Planet

Manchester is my Planet (MiMP) is a city-regional partnership programme aimed at transforming the level of action on climate change by local authorities, universities, businesses and citizens. Co-ordinated by Manchester: Knowledge Capital (M:KC), the programme includes a behavioural change work stream spearheaded by a Climate Change Pledge Campaign encouraging citizens across Greater Manchester to reduce their CO_2 emissions by 20% by 2010 [50], [51].

The main thrust of the campaign was to encourage a wide spectrum of citizens to make a personal commitment to reduce their own CO_2 emissions and feel part of wider 'movement' of personal, social and organizational change. In this way the programme sought to challenge the social convention that action on climate change was purely the

responsibility of government or traditional environmental activists. The aim was to address three key motives to mobilise participation:

- *Alignment with a mainstream, 'cool and fun' campaign:* This was done by using upbeat, independent branding. All the messages employed aimed to be positive, inclusive and empowering. The events targeted to gain new pledges were either festivals, sporting events or other leisure activities. The use of celebrities from sport and television was central to this 'fun and cool' image. Political endorsement was sought from both national and local figures to provide gravitas to the campaign.
- *Saving money:* The personal financial benefits of reducing energy use were employed as a campaign message demonstrating the personal benefits of taking action.
- *Empowerment to reduce the impacts of climate change:* This was done by showing how personal actions can reduce CO_2 emissions and demonstrating that residents could take positive local action in tackling climate change.

After the initial two-month period of intensive public relations and marketing, which yielded over 10,000 pledges, a communications programme was established with the pledgees. This took the form of newsletters, e-bulletins, on-line resources and local authority-led events. Promotion of the energy saving advice services of partner organisations formed a key part of the message, giving pledgees the information to take action themselves. Progress on the wider MiMP programme and pilot projects was communicated to pledgees and wider stakeholders to demonstrate that their efforts were being matched by politicians and partner organisations. As communications funding drew to a close, viral communication methods [52] were developed with low-cost methods such as a Facebook (social media) application, film introductions and climate change speaker training courses.

The primary metric for judging success of the campaign remains the number of pledgees which currently stands at over 20,500. This makes it the most successful sub-national pledge scheme in the UK. While communicating the message that citizens have a part to play in tackling climate change, the fact that there are more than 20,000 confirmed pledges demonstrates to politicians that a significant constituency support ambitious city-regional leadership on climate action.

Sector community: Green Office

Green Office is a programme run by WWF Finland to promote low-carbon workplaces and lifestyles [53]. It is not primarily a community, but a certification and training programme, yet it employs community-building among the participating organizations. The networking and communal aspects of the programme are one of its central success factors.

Green Office offers a simplified environmental management and certification system, with a special focus on CO_2 emissions. The ultimate goal of the programme is to combat climate change through energy efficiency and renewables, reduce natural resource use and promote sustainable lifestyles through enhanced employee awareness. Currently, 200 offices with a total of 20,200 employees have gained the Green Office certificate. Certification requires that offices appoint staff responsible for the Green Office programme, set up an environmental programme, provide training, sort and recycle waste, reduce CO_2 emissions, make a commitment to continual improvement, monitor achievement of objectives, and report annually to WWF Finland. Studies are published on best practices and WWF representatives make regular inspections of certified offices.

Reasons for offices to adopt the scheme include environmental benefits, cost savings, staff motivation, enhanced reputation and legitimacy of the certified organizations.

While Green Office is not primarily a community but a certification scheme, it makes extensive use of some community management principles:

- *Networking among the participants* is a core element of the programme. WWF Finland organises four network meetings annually, hosted on a rotating basis by the participating offices.
- *Commitment* is an integral element of the scheme. It is ensured by the contract signed between the participating offices, through annual inspections and via the required reporting. Companies not meeting these criteria are excluded from the programme.
- The programme makes use of *social pressure* and *social recognition*. Often the initiative to join the scheme comes from one of the employees or from a mid-level manager. There are also diffuse pressure from customers and prospective employees who want to work with a 'responsible company'.

The programme has been successful in reducing CO_2 emissions. For example, in 2007, the Green Office participants reduced their CO_2 emissions by 12%. Most of this reduction, however, is achieved via reduced paper use and a shift to green electricity. Reductions in energy consumption have been more modest. Many offices have achieved energy savings through simple measures like turning off computers and lights, but this is not always sufficient to offset the growing demand for energy for new office equipment, especially increasingly powerful servers. Going beyond 'the low-hanging fruit' requires fundamental changes in the infrastructures of office work provided by global suppliers and based on global standards.

On the other hand, the programme has been successful in creating new networks and a sense of community. The Green Office companies interact with each other regularly and share experiences. Being part of this 'club' seems to be an important motivator for the participants. As the participating offices join forces to question existing practices, they also work to reshape the conventions governing office work.

Green Office serves to align some of the intrinsic and extrinsic motives of the organizations participating in the scheme, as it offers a win-win proposition. The scheme also goes some way toward empowering individual employees. However, the extent to which Green Office really serves the individual employees' interests depends on the management style of each participating organization – Green Office itself does not deal with employee empowerment.

Smart mob community: Carrotmob

Carrotmob is a virtual community that aims to reduce CO_2 emissions by harnessing consumer power in a particular fashion. The idea is to get a large number of consumers to show up and buy commodities as a special event, on the same day at the same place. This coordinated consumer power functions as the metaphorical and real currency of the event organisers, who seek businesses that agree to make socially responsible choices[2].

In a bidding contest, different service providers are asked to give offers on how large a share of the earnings from the event they will use for investments in energy efficiency. Carrotmob makes a deal with the service provider that promises the highest percentage.

[2] For more details, see Carrotmob in Online database of European Demand-Side Programmes, available online at: http://www.energychange.ceu.hu

The purpose is to create a win-win situation, where neither consumers nor store owners spend extra money, while energy reductions are still achieved. In this form of consumer activism, consumers can make a difference by simply coordinating their purchases of products or services that they would buy anyway.

The Carrotmob phenomenon started in San Francisco in early 2008, where a few local activists gathered their friends and arranged a bidding contest for local liquor and grocery stores. To spread the word, a movie of the event was made and shared online. The grocery store invested 22 percent of the day's sales, thousands of dollars, into energy efficiency improvements.

In Finland, the idea was similar, but it was more difficult to implement due to the structure of liquor and grocery stores. Because almost all grocery stores are chain stores, the bidding contest was modified for local conditions. Thus, the Helsinki organisers chose to approach restaurants, and the event was organised on a Saturday evening in a restaurant. The second event was arranged soon after in another town, and at the time of writing there are nine regional Carrotmob groups planning more events.

Carrotmob explicitly reverses the conventional notion of 'sustainable consumption' as a sacrifice for the common good. Rather, consumers are mobilized to make use of the profit motive of companies by favouring the company willing to make the largest 'sacrifice' (which in the case of energy efficiency investments, is not actually a sacrifice but a reallocation of resources). Moreover, by coordinating the actions of individual consumers, it enables consumers to accomplish a change in the way the company behaves and to see the results of their action.

Carrotmob's coordinating function alleviates the feeling of helplessness that individual consumers might feel. Making responsible consumer choices together is enjoyable and creates a feeling of togetherness, as well as the possibility to make a visible difference in a selected target. Coordinating purchases challenges the social conventions of shopping for one household and makes shopping a social event. The coordinated event targets the socio-technical infrastructures that need to change in order to reduce energy consumption. However, the extent to which the 'targets' (i.e. liquor stores, restaurants) can change their own infrastructures depends on the competencies and supply chains that they and the Carrotmob team can mobilize to save energy. Until now, the funds raised in Carrotmob events have been used for established technologies like energy-saving lighting, and the total amount of energy saved is still small.

Carrotmob also utilizes new technologies to create a new infrastructure of 'coordinated consumption'. Social media applications play a particular role in the Carrotmob phenomenon. The viral forms of communication [52] are central in opinion sharing, recruitment, event coordination, experience reports, and keeping up momentum between the events.

Interest community: Carbonarium

Carbonarium is both the name and programme of a not-for-profit and non-governmental association in Hungary established in early 2005 with the overall aim of decreasing its members' CO_2 emissions and also increasing climate change awareness of the general population. The members of the association keep track of their own CO_2 emissions, compare them with one another, implement mitigation measures, and pay membership fees based on their calculated CO_2 emissions [54].

The programme is rather ambitious as it builds on its members' sense of responsibility and voluntary initiative in cutting consumption and related emissions. They do this in a country where there is no supporting infrastructure or any funding easily available for such initiatives.

At the moment, Carbonarium has 13 members, all individuals, who agreed to record their monthly energy consumption (household electricity, heating, car mileage, etc.), send it to the administrator of the programme, and pay membership fee based on their calculated CO_2 emissions. Carbonarium prepares statistics on its members' consumption and emission data, makes comparison between members, and also publishes some of the statistics on its website, accessible to the general public.

Carbonarium developed its own methodology for calculating emissions. Members of the association (and the interested public studying their website) learnt a great deal about their CO_2 emissions and the most important factors contributing to the emissions. The calculations and the statistics revealed, for example, that more than half of the members' combined emissions (56%) are caused by personal mobility. Thus, members learnt about where they need to place the most emphasis on in a low-carbon lifestyle. In addition, the association also organised low-carbon activities (e.g. bicycle tours) to provide space for their members to meet, socialize and support one another in their attempt to live a lower-carbon life.

The format of the association is useful for implementing voluntary programmes: it is fully democratic and gives each of the members space for expressing opinion and influencing the activities of the organisation. At the same time, because of its voluntary nature, it does not always provide the necessary structure for effective action. In the specific case of Carbonarium, none of the members had the time and capacity to design and implement a communication programme and to establish links with other organisations working in the field. For this reason, the initiative remained isolated and little known.

The initiative operates in a context that is not yet supportive and appreciative of such programmes. Generally, the population of Hungary is not yet ready to take responsibility for individual emissions on a voluntary basis. Furthermore, although some funding is available to support individuals in their attempt for low-carbon lifestyles, it is not widely accessible. Nonetheless, with a more effective communication programme, Carbonarium might target the early-adopter individuals (and organisations), convince them to join the association and offer them tools to monitor and reduce emissions. Similar initiatives to Carbonarium can also be found in the UK, most of them operating as carbon rationing action groups[3]. There, due perhaps to a more supportive environment, they appear to be growing in numbers.

Semi-facilitated interest community: EcoTeams

EcoTeams are groups comprising of the representatives of 6-8 households. The idea for EcoTeams comes from the NGO Global Action Plan (GAP) who first organised such groups in the 1990s in the Netherlands and then in the UK [55]. More recently, in the US, the EcoTeams idea was used specifically to encourage low-carbon living [56].

An EcoTeam is organised when a concerned individual contacts GAP with the wish to become active in his/her community and is then assisted by GAP in convincing and

[3] See for example: http://www.carbonrationing.org.uk

recruiting households in the community to join an EcoTeam and start working on improving their environmental performance and lowering their footprint together. After measuring their consumption (i.e. reading their meters and weighing their garbage), the recruited households gather in one the members` home once a month for about 6 months and discuss, with a facilitator from GAP and using materials provided by GAP, a specific area of consumption such as energy use in the home, transport, waste or food. During the monthly sessions they also map out practical actions that they can take to improve each household`s performance, share experience and local knowledge as well as give tips to one another. At the end of the 6 months, using the regular measurement data, each household receives personalized feedback on its performance and progress. To conclude the project, a celebratory meeting is held to provide positive feedback and reward the effort taken. At this meeting, possible future steps are also discussed: what could each household do to improve further and what actions they could initiate in their community.

EcoTeams have proven to be very successful in lowering consumption as well as helping households to sustain the behaviour changes achieved during the project. Studies [55], [57]-[59] indicate that the behaviour changes created while households were still meeting have been kept in the longer run (2 years), moreover, quite a few of the participating households improved their environmental performance even further. What is it, though, that makes EcoTeams successful? Researchers evaluating them [57] as well as GAP [55] found that most importantly, EcoTeams

- Create a sense of community that provides both support and social pressure for participants to change behaviour and then keep up the environmentally friendly behaviour;
- Through regular metering, measuring, monitoring and feedback at the household level reinforce participants, and help prove that they are indeed able to change;
- Help incorporate small but significant changes into everyday routines, and turn them into habits; and finally
- Help participants see that green behaviour is normal.

IV. Strengths and Weaknesses of Various Forms of Low-Carbon Communities

The communities described above operate on different scales, ranging Greater Manchester Area (with 2.5 million inhabitants) to the 13 members of the Carbonarium group. They also have different levels of ambition vis-à-vis low-carbon lifestyles: Green Office focuses on simple solutions that save money and reduce carbon emissions. Carrotmob at present focuses on demonstrating consumer power by promoting energy efficiency investments in individual businesses. Carbonarium and EcoTeams, on the other hand, strive at fundamental change in consumers' carbon footprints, whereas the Manchester area aims to the forefront of climate change action in the UK. Even though these communities operate on different scales, they share the aim to reduce carbon emissions, and they work towards this aim by changing the conditions for individual behaviour.

In the following, we first examine what approaches the different communities use to deal with the constraints on individual behaviour change: social dilemmas, social conventions,

lack of infrastructure and helplessness. We then suggest some structural features of these communities that condition their ability to solve common problems of their members.

All of the examined communities serve to reframe the *social dilemmas* of low-carbon lifestyles, to a greater or lesser extent (Table 1). In this, they make use of two distinct approaches, even though some of the communities employ both strategies. One is to focus on win-win solutions that are outside the conventional 'win-lose' game of common resource management (e.g. [60]), i.e. by stressing the financial and social rewards for climate actions (see also [2]). This approach is dominant in the Green Office example, but the link to win-win solutions is also present in the MiMP case, where private benefits and the benefits for urban regeneration are stressed. Carrotmob also reframes the social dilemma from sacrifice to pleasure by enabling consumers to 'painlessly' encourage companies to invest in energy efficiency.

But some of the communities also strive for reframing the social dilemma on a more fundamental level by turning the individual's win-lose dilemma into an 'assurance game' [6], where members can be assured that others will participate. The MiMP Pledge Campaign and the EcoTeams initiative involve an important element of assurance, as residents can see that others have signed up to the pledge, or are participating in EcoTeams. On a smaller scale, a similar effect is created in the case of Carbonarium through membership and common monitoring, and in the case of Carrotmob, by the mobilization of consumers to be visibly present to each other at the events.

There are also two distinct ways in which the communities tackle the *social conventions* that constrain individuals in shifting to a low-carbon lifestyle. One is to deal with the conventions 'head on' by challenging existing routines and 'standard procedures' (cf. [2]). This is the approach taken by Green Office, Carbonarium and EcoTeams. Green Office deals with conventions by actively reshaping 'appropriate' procedures and patterns (e.g. paper use) in office work. Carbonarium and EcoTeams strive for a more fundamental type of challenging by debating and challenging the taken-for-granted beliefs about modern life of its members and audiences. Another approach is to try to create new conventions. This can be accomplished, for example, by shaping the public image of climate action by making it more mainstream and entertaining, as the MiMP programme is doing. Fun is a crucial element also in Carrotmob, but it also attempts to actually create a new convention by turning (some kinds of) consumption from individual into collective activities.

The communities in our examples deal with the *lack of appropriate infrastructures* in various ways. Mostly, they have created new knowledge networks and communication infrastructures to support new consumption patterns. None of the communities in our examples have yet managed to significantly change the 'hard infrastructure' conditioning the carbon intensity of our lifestyles. MiMP is perhaps the best positioned to actually reshape and create urban infrastructures, but as it has a legacy of existing infrastructure, change in a large urban area is a slow process. Thus, most of the infrastructure created until now is still on the drawing board. Green Office, EcoTeams and Carbonarium, as well, have mainly focused on knowledge infrastructures, and still lack the 'reach' and power to reshape global supply chains. Interestingly, Carrotmob has created new infrastructure to coordinate consumer action via Internet and mobile communications.

While the communities have experienced varying success in dealing with the above-mentioned constrains on individual behaviour change, they all appear to be making progress in dealing with *helplessness*. They do so by providing advice, encouragement and

new competencies, as well as a legitimate context for action (cf. [2]). The communities also empower by demonstrating in various ways that there are others who share the same concern (as in Carbonarium and EcoTeams), and are taking the same actions. This can include members of the same community, but also others within the region, as in the case of Manchester is My Planet.

It was previously also suggested, following Jackson [24], that the structure of communities can make a difference for their ability to create conditions for sustainable consumption. In `high grid` communities, the rules governing social relations are clearly defined, and there is a clear division of labour within the community. On the other hand, `high group` refers to a structure in which the boundary between the community and the outside is distinct and group members share strong personal and emotional ties. We examine how these different features of our four communities influence their ability to support individuals in the adoption of low-carbon lifestyles.

Considering the four different community types, we find that the urban community (MiMP) and sector-based community (Green Office) correspond roughly to a "high grid" structure: relations between members are governed by distinct rules and there is a clear division of labour. These are strengths enabling the enforcement of common principles and the distribution of rewards. But they may also be relative weaknesses in terms of empowerment and participation. People expect extrinsic rewards and sanctions in high-grid communities, and it is more difficult to create intrinsic value of group membership in this type of context. We thus characterize MiMP as 'medium' on the group dimension, also due to its sheer size, in spite of its active work in social mobilization. Green Office can be characterized as 'low-to-medium' on the 'group' dimension because of the fundamentally transactional nature of relations within the network, in spite of the friendly personal relations that have evolved.

NGOs and informal groups are characteristically high on the 'group' dimension [47]. Carbonarium and Carrotmob are stronger on the 'group' than on the 'grid' axis. There is relatively little division of labour or formal structure employed to ensure appropriate forms of behaviour. In the case of Carbonarium, for example, the 'low grid' characteristic created problems: people lacked the time to work in the association to ensure that goals are met, and there were few clearly defined roles. It is likely that in this case, working towards medium in 'grid' might help achieve aims while still preserving spontaneity and egalitarianism.

EcoTeams are interesting from this point of view as their organisation and work is facilitated. Furthermore, all members know that their EcoTeam is formed with specific aims in mind and that they will be together for a well-defined period of time (although they are obviously free to continue meeting after the facilitated period comes to close). Because of these features, EcoTeams are medium on the 'grid' axis and `medium-to-high` on the group dimension.

	Social dilemmas	Social conventions	Lack of infrastructure	Helplessness
MiMP	- Win-win solutions and assurance - Identification of climate change as a common problem with tangible benefits for those taking action - Links between climate action and urban regeneration	- Creating new conventions - Taking action on climate change is simple, cool and sexy - Conventions of urban life yet to be challenged	- Communication infrastructure - 'Hard' infrastructure development underway	- Demonstration of progress on wider MIMP programme - Demonstration that other pledgees are taking action
Green Office	- Win-win solutions - Focus on simple solutions that save money - Social rewards and stakeholder loyalty for 'good' workplaces	- Challenging existing conventions - Challenging and changing taken-for-granted practices at the workplace	- Creation of new supply & knowledge networks - Limited impact on 'hard' infrastructure	- Advice, support, new competencies - Alignment of individual and organizational motives
Carrotmob	- Win-win solutions and assurance - Turning climate action from sacrifice to fun - Visible presence of others at events	- Challenging existing conventions and creating new ones - Challenging the conventional way of consuming by making it a collective event	- Creates a new infrastructure for coordinating consumption - Limited impact on 'hard' infrastructures of energy use	- Participation and togetherness at Carrotmob events - Small but visible results
Carbonarium	- Assurance - Creating a community of individuals prepared to change their lifestyle and promote these changes to others	- Challenging existing conventions - Creating a supportive environment - Changing taken-for-granted beliefs about modern life	- Creating knowledge network on the carbon intensity of lifestyles - No impact on 'hard' infrastructure	- Advice and encouragement - Members can see that "others are doing their bit"
EcoTeams	- Creating a community that provides both assurance and group pressure to act and change - Monitoring of and feedback on performance	- Reflecting on and challenging existing household routines (with the help of knowledgeable facilitator) - Assurance that being `green` is normal	- Creating a local knowledge network and awareness of existing infrastructure - No impact on changing of 'hard' infrastructure	- Advice, feedback and support - Assurance that being `green` is normal - Feeling and knowledge of being part of a global movement

TABLE 1: APPROACHES USED BY THE COMMUNITIES TO DEAL WITH CONSTRAINTS ON INDIVIDUAL ACTION

'Smart mobs' are a form of community in which organized social action is based on technology-mediated, emergent behaviour [49]. Being (partly) virtual communities, they embody some of the characteristics of such communities: while levels of mutual support are lower than in face-to-face communities, such communities are also more egalitarian because the lack of frequent face-to-face interaction prevents the emergence of social

stratification [25]. This is the case for Carrotmob, where activities are organized on an ad hoc basis, with different people taking the lead at different times.

Effective action to combat climate change requires both structure and social mobilization. The two high-grid communities have more power to effect changes due to their more structured character. Yet on the other hand, as they build on existing structures, the have a large task in transforming those structures, which have considerable inertia embodied in existing institutions, social relations and technological systems. The three 'low-grid' communities have little existing structure to slow their pace, yet lack of concentrated power can make it more difficult for them to exert an influence outside the sphere of their membership. Moreover, like all voluntary communities, they are at the risk of 'core burnout' [61] and loss of momentum. This is especially the case for EcoTeams since they are planned to be together for 4-6 months, after which it is up to the members to carry on with their activities. Interestingly, though, longer-term studies [57], [58] indicate that the majority of people involved in EcoTeams keep up their actions and even improve their environmental performance further.

All of the community types discussed here have their own strengths and weaknesses. Yet each of the examples we examined serves in its own fashion to overcome obstacles to individual action. As the communities evolve and become more self-reflective, they will likely benefit from an examination of their inimical 'virtues' and 'vices' (see [25]). This may enable the communities to work toward an optimal balance between structure and individual empowerment. Moreover, these and other communities can likely benefit from creating some sort of hybrid, nested forms of community management (see [20]), as is to some extent the case already in the MiMP community.

V. Conclusion

Without working together, individuals stand little chance of seriously reducing their carbon emissions. We have presented five ways in which people can form low-carbon communities. Our research suggests that low-carbon communities can centre around various shared interests, practices and structures. At present, our data on different types of communities are limited. However, through one exemplary case of each type, we can suggest some particular advantages and problems in different community types. Further research is needed to establish the generalisability of these observations.

It is clear that place-based communities have inimitable advantages in providing infrastructure for more sustainable consumption patterns, yet they also bear the burden of existing infrastructures that are slow to change (see [46]). Nonetheless, urban authorities are uniquely positioned to influence utilities, business and consumers within the region, and the MiMP programme indicates that new modes of communication and co-operation can be incorporated into an existing urban governance structure.

It is perhaps less self-evident that sector-based communities have opportunities to challenge existing conventions of work. The Green Office programme, however, shows that some conventions are fairly easy to change, once critical mass and supportive institutions are in place. Even greater strategic competencies and power are, however, required to change the 'hard infrastructure' of office work, which is often shaped by global enterprises and standards.

The conventions governing private consumption are more difficult to challenge than those at the workplace; consumption is usually a private affair and the conventions shaping consumption are more 'invisible' due to entrenched beliefs in consumer sovereignty [40]. Carbonarium and EcoTeams, our interest-based communities, and Carrotmob, a smart mob community, show that even such conventions can be challenged on a small scale; in the case of Carbonarium and EcoTeams, through debate and problematisation, and in the case of Carrotmob, by creating a new forum for coordinated consumption. The work of these communities suggests as their potential strength their ability to alleviate the helplessness that individuals feel when faced with the enormity of the climate challenge.

The different types of communities are not mutually exclusive, but overlap and complement one another. This is most visible in MiMP, which though it is a place-based community, also hosts sub-communities centring on shared interests and practices. Our analysis thus suggests that existing and emerging low-carbon communities can evolve by hybridizing and adopting elements from other types of communities.

We also highlight the challenges that communities encounter when trying to build an amendable context for low-carbon behaviour patterns. As carbon emissions are global, the boundaries of these communities cannot be tightly limited if they wish to reach their goals. In the case of Carbonarium, the initiative remained isolated, and thus had limited impact beyond its membership. Carrotmob is growing globally, but its ability to sustain momentum depends on continual recruitment of dedicated activists. Green Office is establishing in new countries, bringing new management challenges for an originally local certification scheme. MiMP is active in national climate policy and co-operates with other cities. These developments show that present-day communities for the management of global problems through local solutions need to devise new rules and principles to complement traditional common-pool resource management institutions (cf. [20]).

We cannot suggest the best possible format and structure for low-carbon communities – this depends on the context, history and resources of each community. However, our analysis indicates some dimensions on which low-carbon communities can be evaluated, improved or supported, and which may be helpful for researchers, practitioners and policy makers in the future. We also suggest that present-day communities may need to create new principles and hybrid solutions for co-operation to complement the time-tried principles of community resource management.

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THE HYBRID-ELECTRIC VEHICLES (HEV) – HISTORY, POSSIBLE FUTURE, PROS AND CONS

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One of the main obstacles to faster progress in environmental protection is the transitional cost, as the expected short-term negative economic implications scare away the general public. Far from many among the consumers are ready to pay a price premium for an already expensive product just because it is „greener", unless they can have reasonably quick returns on the „investment". The financial advantage is often non-existent for the individual users and henceforth is either substituted by emotional and other non-material benefits, or is created by governmental incentives.

Another general negative implication of modern technology is the rebound effect, which is probably best illustrated by the fuel efficiency improvement – the more environmentally friendly engines consume less fuel, therefore they are cheaper to use, therefore we use them more, therefore the idea of using less fuel takes the consumer to using more fuel.

In this regard it shall be no surprise, that the highly praised introduction of the Hybrid-Electric Vehicles is raising concerns, whether that really is a good solution.

When governments, enterprises, NGO's and private individuals embark on an environmentally friendly initiative they do not always arrive to an environmentally friendly outcome. When we finally overcome the resistance, after a period of slight improvement (if any) we can have an even worse ecological impact, and even more severe negative economic effects in the long run. Ecologically speaking, we need to support only those recommendations, that not only sound „green" and are politically correct, but also have a high probability of long-term validity.

This paper summarizes the experience of different countries, presents different opinions and attempts at introducing a new dimension in the debate of Pros and Cons Hybrid-Electric Vehicles.

I. THE VEHICLES WE DRIVE

The road vehicles at the moment can be generally classified in three groups depending on their power trains:

1. Internal Combustion Engines (ICE) Vehicles
2. Electric Vehicles (EV) – having an electric drive train
3. Hybrid-Electric Vehicles (HEV) – having both

The ICE vehicles represent the overwhelming majority – these are the commonly available cars with gasoline or diesel power trains well known to the wide public. Less widely spread are the different converted versions of ICE that can run on Liquefied Petroleum Gas (LPG), Liquefied Natural Gas (LNG) and Compressed Natural Gas (CNG). We all know that using fossil fuels is not a solution in the long run due to their limited resources. So if we look for opportunities how to replace traditional fuels derived from petroleum with alternative products, then we can have different solutions right here – e.g. we can use ICE with bio-hydrogen or bio-fuel.

Hydrogen

Though not yet commercially available, hydrogen has been in the center of renewed public attention. Few know that, ironically, the very first operational Internal Combustion Engine in history, which was build in Switzerland by François Isaac de Rivaz between

1805 [1] and 1807 [2], was running on hydrogen. Now, two centuries later, hydrogen (still) has great chances to become the fuel of the future. Its main advantages as ICE fuel are: relatively easy to adapt present ICE technology, the almost zero direct emissions and its renewability. In a technical review of the modern development of the Hydrogen-fuelled Internal Combustion Engine (H_2ICE) White et al (2006) conclude that "Undoubtedly aided by the technological advancements of the ICE, simple H_2ICE options are convenient and economically viable in the near-term [3]". Nevertheless, the authors of the above review cautiously add, that "the long-term future of the H_2ICE is less certain and hard to predict". Presently 40% H_2 is produced from natural gas, 30% from heavy oils and naphtha, 18% from coal, and 4% from water and about 1% is produced from biomass [4]. If we would decide to replace transportation fuel with hydrogen by taking it from fossil fuels, then according to Shinnar that, "would require more fossil fuel than currently used for the same purpose and would significantly increase our energy imports and global warming. If the hydrogen were to be released by electrolysis using solar- or nuclear-derived electricity, the cost would be higher. The direct use of the electricity would cost half as much as via the hydrogen route [5]".

Vergragt cites a 2002 study, which concludes that for the next 30 years there will not be enough renewable energy to produce hydrogen sustainably in any country, "except or Iceland, with its abundance of geothermal and hydroelectrical power [6]". Which shall not be interpreted as a dismissal of the idea for hydrogen fuel, but rather as a call for further research in hydrogen production, especially via biological processes. The above citation also carries a warning on using hydrogen as fuel in Fuel Cell Electric Vehicles (FCEV), which we describe later. In other words, we shall be better off by using EVs.

Bio-fuel

The renewable liquid fuels such as bioethanol, biodiesel, green diesel, and green gasoline are generally considered to contribute to sustainability, reduction of greenhouse gas emissions, as well as regional development and security of supply.

The most widely used transportation bio-fuel at the moment is bio-ethanol. Using ethanol as a fuel additive to unleaded gasoline causes an improvement in engine performance and exhaust emissions [7]. "When produced under proper conditions from sugar cane, it is essentially a clean fuel and has several clear advantages over petroleum-derived gasoline in reducing greenhouse gas emissions and improving air quality in metropolitan areas [8]". According to the cited remark it is difficult to achieve the desired effect in countries other than Brazil, having different climate, size and agriculture. Other scholars have voiced a similar opinion: "On an energy basis, ethanol is currently more expensive to produce than gasoline in all regions considered. Only ethanol produced in Brazil comes close to competing with gasoline. Ethanol produced from corn in the US is considerably more expensive than from sugar cane in Brazil, and ethanol from grain and sugar beet in Europe is even more expensive [9]." Other disadvantages include "lower energy density than gasoline (bio-ethanol has 66% of the energy that gasoline has), corrosiveness, low flame luminosity, lower vapor pressure (making cold starts difficult), miscibility with water, toxicity to ecosystems, increase in exhaust emissions of acetaldehyde, and increase in vapor pressure (and evaporative emissions) when blending with gasoline [8]". The EU biofuel policy has its outspoken critics too: "Knowing the current situation of the prices for raw materials, forcing European countries to produce and

consume biofuel is not profitable either for the European countries or for individual users [10]". Instead the author would encourage the use of existing technologies in the market to reduce fuel consumption, including the HEV [10].

It is worth mentioning that bio-ethanol is another example of a revived initiative. Henry Ford's Model T back in 1908 was the first commercially available vehicle already built to run on biofuel. Henry Ford was not the only one who promoted ethanol. Still it was gasoline that grew to be the fuel of choice on the market, and the automotive industry became addicted to petroleum. Luckily for Ford his Model T was also the first Flex-Fuel Vehicle (FFV), capable of using gasoline as well, hence the mass adoption of gasoline fuel did not affect the business strategy of Ford Motor Company.

Electricity

Which cannot be said about many carmakers that betted exclusively on electric power trains. They soon went out of business, despite the fact that "from 1895 to 1910, electric automobiles were more common in most areas of the United States and Europe than gasoline internal combustion vehicles [11]". Among the numerous reasons blamed for the decline of the EVs we shall mention their much shorter range compared to ICE, the lack of acceptable infrastructure (for example, "By 1917, just seven million American homes – roughly one-third – were connected to an electrical grid, most of these were in large cities"), poor management and faint marketing on behalf of the electric car manufacturers, as well as the successful lobbying of the petroleum companies [11].

Nonetheless, environmental and economic worries of modern time have revived the interest towards the EVs. Despite their need for time-consuming recharging and high battery costs, the Battery Electric Vehicles (BEV) have stayed with us in more or less inconspicuous forms even after the indisputable triumph of the "ICE age". They are noiseless, have no direct emissions, at the same time their disadvantages have remained generally the same, not to mention the relatively new concerns about the polluting dangers of end-of-life batteries. Apart from BEV, another type of EVs has emerged – the high-tech FCEV, using hydrogen or ethanol to produce its own electricity. Their commercial application is still under development.

The third type of road vehicles – the HEV – shall be the main target of this paper.

II. On HEV and MEN

The HEV represents a combination of ICE and an electric motor in an attempt to bring together their benefits. The hybrids use the worldwide infrastructure created for ICE over the last one and a half century, and at the same time partly enjoy the advantages of the BEV. As a result we achieve improved fuel economy and reduced emissions.

The idea of the hybrid is not new – the luxury sports car producer Porsche proudly states that the first HEV was built in 1900 by their founder at the age of 25 [12], although nobody claims that Ferdinand Porsche might have been inspired by environmental concerns. After many attempts over the decades by different inventors and carmakers the modern HEV equipped with a gasoline engine and an electric motor finally came back on a commercial scale in 1997, when Toyota successfully launched its Prius model in Japan. Honda followed in 1999 with the Insight. Ford launched Escape Hybrid in 2004 as the first

American HEV. Non-surprisingly it was also the world's first Hybrid Electric SUV (Sport Utility Vehicle), reflecting the American taste for bigger vehicles, and confirming several issues supporting anti-hybrid opinions.

First, the consumption of a modern diesel ICE is comparable to that of a gasoline-electric HEV, but without the additional weight and potential burden of the batteries disposal. Second, if someone would like to reduce its fuel consumption, why doesn't he reduce the size of the driven vehicle? Indeed, when we buy a vehicle for personal purposes, we go through different phases of the decision making process. We summarize our personal accumulated knowledge, and then start actively to search for latest information on the subject. We collect data on brands we know and/or trust, surf the net for cars of the year, examine the best-selling models, collect references and sometimes (he-he) check for discounts and best deals. We evaluate design, look at performance figures like top speed, acceleration and torque, luggage capacity, sift through active and passive safety equipment, comfort levels, standard accessories, optional equipment, warranty period, and inevitably arrive to the cost of ownership. This usually includes the price of the car, all fees and taxes, maintenance cost and a must-ask question – the fuel consumption. Those absentminded car buyers who never inquire about fuel consumption of the vehicle they are considering to buy (and use) are most probably extinct by now. If any of them are still around, they carry the social stigma of being not only filthily rich, but also politically incorrect. Even in the US market, where huge cars with thirsty engines have always been part of the landscape, things have changed to the extent that carmakers are busy launching new small(er) models, while customers are less ashamed to drive them. Nowadays it is not only progressive to drive vehicles guzzling less gas, but it is also a matter of patriotism – a way to reduce the country's dependency on oil imports. And the fuel costs of the household. The latter, perchance, may often happen to be the stronger urge. Knowing very well that better efficiency comes at a certain development cost, nobody is shocked to see higher prices on the "greener" products. Instead the buyer-to-be simply starts to calculate how later savings may reward the higher price. Ah, there's the rub; for in that mathematical model the common formula starts with the question: what is your mileage NOW. In other words, if I drive like I do now, how much fuel can I save if I choose the more expensive, but less fuel consuming engine for the same size of the vehicle I am now used to? Instead of changing their way of living most customers are trying to keep their habits as constants. They start calculating based on a wrong model, and as soon as the extra purchase cost seems to be too high in comparison to the future returns on this investment, most of the customers abandon the idea of purchasing expensive efficient technology. Or they start driving more in order to justify the more expensive purchase, which brings us to a classical form of the rebound effect. A recent analysis of the driving habits of about 360,000 vehicle owners by an American insurance services company has shown that many owners of hybrid vehicles drive as much as 25% more miles than owners of non-hybrids [13]. In this regard it shall be no surprise, that the highly praised introduction of the HEV – and especially its support by incentives in many countries from Japan through the US to Hungary – is raising concerns, whether that really is a good solution from environmental point of view.

When governments, enterprises, NGO's and private individuals embark on an environmentally friendly initiative they do not always arrive to an environmentally friendly outcome. When we finally overcome the resistance, after a period of slight

improvement (if any) we can have an even worse ecological impact, and even more severe negative economic effects in the long run. Ecologically speaking, we need to support only those recommendations, that not only sound „green" and are politically correct, but also have a high probability of long-term validity. One of the main obstacles to faster progress in environmental protection is the transitional cost, as the expected short-term negative economic implications scare away the common public. Far from many among the consumers are ready to pay a price premium for an already expensive product just because it is „greener", unless they can have reasonably quick returns on their „investment". The financial advantage is often non-existent for the individual users and henceforth is either substituted by emotion and other non-material benefits, or is created by governmental incentives. Therefore governments may have a rather strong word in promoting a particular technology, but governments are lead by politicians, and, as we have earlier seen, there is no insurance against promoting the wrong technology.

So is it a good thing to sell / buy hybrids?

A study in Switzerland investigated two different possible direct rebound effects of Toyota Prius: above trend increase in size of the purchased car and the increase in average household car ownership. No rebound effect was revealed in either case. "On the contrary: vehicle size slightly decreased, and the low numbers of first-time buyers and non-replacement vehicles would, if they were representative for a whole population, even lead to a decrease in average vehicle ownership [14]." This result was confirmed by a later study on the same subject, where the authors also claimed that, "hybrid cars indeed are suited to play a role, during the next 5 years, in energy policy schemes aiming at reducing CO_2 emissions from individual road transport [15]." Furthermore, according to the study, the introduction by some of the Swiss cantons of tax rebates for hybrid vehicles appears to be effective in achieving reduced CO_2 emissions (significantly higher sales in Swiss cantons having tax rebates) [15].

But this is only Prius and only in Switzerland.

An American study in 2002 found that the Prius was not cost-effective in improving fuel economy or lowering emissions: "For the Prius to be attractive to US consumers, the price of gasoline would have to be more than three times greater than at present. To be attractive to regulators, the social value of abating tailpipe emissions would have to be 14 times greater than conventional values. Alternatively, the value of abating greenhouse gas emissions would have to be at least $217/t. There are many opportunities for abating pollutant and greenhouse gas emissions at lower cost. We conclude that hybrids will not have significant sales unless fuel prices rise several-fold or unless regulators mandate them [16]." The authors calculated that "price of $5.10 / gal ($1.35/l) would be required to offset the $3,495 initial price difference [16]"… Since then the prices of gasoline have soared in the US, though still not enough. While I was writing this article the Weekly New York Premium Conventional Retail Gasoline Prices were 2.89 USD per Gallon, which makes it 0.54 EUR per liter [17]. For comparison, based on data by the Hungarian Autóklub on July 15, the price of gasoline in Hungary was 288 HUF (1.05 EUR) per liter [18].

Following the line of thought drawn by the Swiss study, in the future it would be interesting to investigate the change in size of the purchased car in the case of Hybrid Electric SUV like Ford Escape Hybrid, Toyota Highlander Hybrid or Lexus RX 400h. We may then consider the following possible Hybrid Electric SUV cases:

A. If the customer would have bought a smaller and more efficient car, but buys an SUV only because it is available as a hybrid, then we have a negative effect.

B. If the customer would have bought a regular SUV anyway, and chooses a similar size Hybrid Electric SUV instead, then we have a clear reduction in the direct emissions per km as well as in the noise level.

In both cases incentives for the buyers are questionable, because

In case 'A' they will provoke a negative effect.

In case 'B' the state will be financially supporting those buyers, who have higher than average income and are spending it on the more expensive SUVs.

Similar conclusions can be found in a recent paper by Diamond, who investigated the impact of monetary incentives and gasoline prices on the monthly U.S. market share of three top selling HEV: Honda Civic Hybrid, Toyota Prius and Ford Escape. The author describes a positive relationship between income and hybrid adoption for the Escape and Prius and suggests that, "financial incentives may disproportionately benefit higher income consumers who are more likely to purchase hybrids in the first place. Lower income consumers are less able to afford the higher up-front premium for a hybrid and more likely to discount future fuel cost savings from a hybrid purchase. Given the apparent weak or negligible effect of monetary incentives, this could result in incentive payments effectively creating a subsidy for the highest income consumers without significantly affecting their purchase decisions. In other words—current monetary incentives for hybrids may be rewarding those who need the incentive the least for a purchase they were likely to have made anyway [19]." Consequently, instead of tax rebates on hybrid versions it may be beneficial and fair to add a punitive tax to vehicles with worse environmental performance.

Whatever the average European opinion is on the American taste for SUVs with big gasoline engines, if we agree that the hybridization process shall start with the most popular models on the market, then the presence of Hybrid Electric SUVs there shall be fully justified. Obviously, it shall be a totally different issue in other countries, where SUVs are considered luxury goods and are taxed accordingly. From the environmental point of view it is utterly strange to see the Hungarian example. According to the current legislation a new Toyota iQ (998 cm^3 gasoline engine, combined fuel economy 4.3 L/100km, CO_2 combined mass emission 99 g/km) has a registration tax of 250,000 HUF (circa 919 EUR), while any newly registered HEV has a tax of 190,000 HUF (circa 699 EUR), even if it is a vehicle like Lexus RX 450h (Hybrid Electric with 3,456 cm^3 gasoline engine, combined fuel economy 6.3 L/100km, CO_2 combined mass emission 148 g/km) [20].

Closely related to the above subject is the following statement describing the efforts to lower the average new vehicle's CO_2 emissions in Europe: "significant progress will come from the large vehicle segments through their hybridization…There is a paradox of seeing hybrid SUVs or hybrid luxury cars as part of the solution…[21]"

Finally, the strongest point in favour of HEV is the role it plays in bridging the gap between different technologies. Despite the sober understanding that HEVs depending on fossil fuel represent another dead-end street in the quest for sustainable transportation, their commercial success will certainly contribute to the development of better batteries, paving the way for the BEVs of the future or for the PHEV running on biofuel. The greater part of the consumers is distrustful of the new technology and sceptical of BEVs due to its limited range and heavy expensive batteries. It takes time to develop batteries with the necessary

parameters, but most of the customers are so used to the free mobility they have grown up with, that they cannot even accept the thought of a possible flat battery in their BEV. HEV can operate with smaller batteries than BEV due to its ICE and the existing convenient fuelling opportunities. Compared to BEV and FCEV the moderate price premium of the HEVs makes them look affordable, while the constantly rising fuel prices make the purchase look more and more practical. HEV seems a totally acceptable solution to many, providing crucial selling volumes for the carmakers and a great testing ground for improving batteries. This has been noticed and in some way or another welcomed by scholars from different fields.

"Triggered among others by the development of hybrid vehicles, there is renewed interest in electric vehicles as a means to reduce emissions and a lot of research is being done on the development of new battery types [22]."

If the HEV trend shall continue, then the progress in improving the batteries will subsequently influence the development of the Plug-in Hybrid Electric Vehicles (PHEV), which will naturally create a demand for charging facilities. A new network of charging points will gradually appear to meet the new requirements, encouraging more and more customers to join the electric club.

Similar thoughts are expressed by Barkenbus and Bitsche-Gutmann [23], [24],."

Suppes goes further to claim that "petroleum-free automobiles can spontaneously evolve from hybrid electric vehicles (HEVs) based solely on the economic viability of replacing batteries with Regenerative Fuel Cells (RFCs) as fuel cell prices decrease. The evolution can be projected first to plug-in HEVs (PHEVs) and finally to a substantially hydrogen-based transportation system [25]." The idea is that the PHEV will finally be using both batteries and regenerative fuel cells to store grid electricity and eliminate the need for engine [25].

Toyota Motor Company simply says that hybridization allows the ICE vehicles to stay competitive in the future by enabling total energy efficiency that is comparable to future fuel cell systems [26]. Before we reach the hydrogen society we shall improve efficiency and try to save fossil fuel.

Similar conclusion is voiced by Seidel et al: "All current evidence strongly suggests that fuel cells will have a minuscule market penetration as primary propulsion source in passenger vehicles by 2030… Moreover, engine and drive train improvements of existing engines (for example hybrid electric/combustion engines) may potentially reach the same cleanliness and fuel efficiency as hydrogen based vehicles once the efficiency of hydrogen production is included in the calculation, without requiring a new costly gas station infrastructure [27]".

III. CONCLUSIONS

Different countries can have totally different, but nevertheless successful strategies to resolve their addiction to fossil fuels. In the quest for sustainable road transport all options shall be explored, paying attention to local specifics.

A commercial application of the promising FCEV is still at least two decades away. The sustainable production of biofuel and hydrogen is still to be achieved, regardless of the fact where these fuels will be used – in ICE vehicles or in FCEV. While creating an ethanol

fuel network appears to be feasible, the infrastructure for hydrogen filling stations is still in the distant future, waiting for many solutions of technical and safety nature. The HEV technology has matured and has earned a popular progressive image. With proper support HEV can become an essential tool for accustoming the consumers to personal electric transportation, paving the way to PHEV, provoking the spread of electric charging (or "battery swap") points, and finally arriving to a point where the engine would be replaced by fuel cell technology. Until then the HEVs can help reduce CO_2 emissions, pollution and noise.

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FIGHTING THE REBOUND EFFECT IN ENERGY CONSUMPTION: DOUBTS AND OPPORTUNITIES

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Abstract: ***This paper provides an overview on the relationship between improving energy efficiency and total energy consumption. Improving energy efficiency has been in focus of innovations and policy making for long. However, empirical evidence shows that increased energy efficiency does not always result in the desired decrease of energy consumption, if there is a decrease at all.***

This phenomenon called rebound effect has been pointed out and analysed by many scholars concerning different fields of energy consumption: transport, industrial production, household heating and appliances etc.

In this paper there is a literature review based on former research on the quantification of rebound effect regarding energy efficiency. After that there is an analysis on the main challenges and potential measures that energy policy faces, with a focus on improving energy efficiency. Finally there are some suggestions formulated for energy policy regulators with special regard to sustainability.

Keywords: energy policy, energy efficiency, rebound effect, sustainability, sustainable consumption.

I. INTRODUCTION

Improving energy efficiency has been in focus of innovations and policy making for long. However, empirical evidence shows that increased energy efficiency does not always result in the desired decrease of energy consumption, if there is a decrease at all.

This phenomenon called rebound effect has been pointed out and analysed by many scholars concerning different fields of energy consumption: transport, industrial production, household heating and appliances etc.

This paper intends to provide a literature review based on former research on the quantification of rebound effect regarding energy efficiency. After that it analyses shortly the main challenges and potential measures that energy policy faces, with a focus on improving energy efficiency. Finally it formulates some suggestions for energy policy regulators taken sustainability into account.

II. IMPROVING ENERGY EFFICIENCY AND THE REBOUND EFFECT

One of the most straightforward answers for meeting the energy challenge can be the improvement of the energy efficiency. If the same activity is carried out with lower energy usage, not only energy can be saved. At the same time negative externalities (CO_2 and other emissions) as well as energy costs can also be decreased. This „win-win-win" situation offers a painless alternative for both society and economy to achieve parallel economic and environmental benefits (Csutora and Kerekes [2004], p.30.). One could expect that more efficient motor vehicles will result in lower energy consumption in traffic. Better insulated buildings with modern heating systems lead to lower energy bills. If in a

specific industry there are significant opportunities for energy efficiency improving innovations, we should expect a decrease in the total energy consumption in this industry.

In spite of these expectations, there is a connection known for a long time: parallel to the efficiency improvement, the demand for a specific resource (in this case energy) increases *ceteris paribus,* just because it becomes relative cheaper. Literature calls this phenomenon as *rebound effect* (or take back effect, snapback effect, backlash effect etc.). Thus because of the rebound effect, total energy consumption decreases to a smaller extent compared to the increase in energy efficiency. In fact, total energy consumption may not decrease at all; moreover, it can even increase due to an efficiency improving innovation. This phenomenon is called Jevons-paradox (or backfire-effect).

Jevons summarised the effects of the industrial revolution innovations on the coal consumption already in his book in 1865 ('The coal question'): '*It is wholly a confusion of ideas to suppose that the economical use of fuel is equivalent to a diminished consumption. The very contrary is the truth….Every improvement of the engine, when effected, does but accelerate anew the consumption of coal.'*

More types of rebound effect can be differentiated (Greene [1999], Sorrel [2006]):

- *direct rebound effect*: due to improving efficiency and decreasing relative costs the consumption of the same good/service increases. An example for that can be the car owner, who replaces his old and fuel-gobbling Moscvich to a small and economical Suzuki. Because of the lower per kilometre costs, the distance driven will most probably increase. Similar example can be the energetic refurbishment of a flat. Advertisements offer 20-30-40 percentages savings in energy consumption. This can be the truth, but most probably only if we are still satisfied with the let's say 17 degree centigrades (the potential maximum at the formerly badly insulated flat). But if we prefer the already achievable and more comfortable 22-23 degrees, we can say goodbye for the decreasing energy consumption[1].
- *indirect rebound effect:* this effect emerges when money saved with increased (energy-) efficiency is spent on other goods or services causing significant negative externalities. For example, if the savings from an energetic refurbishment of a flat is spent on overseas holidays by a family, the energy saved by the improvement of the heating system leads indirectly to higher traffic energy consumptions.
- *general equilibrium or economy-wide rebound effect:* if energy efficiency improves in specific points of the economy, it makes energy intensive products and activities relatively cheaper. This – based on the law of demand and supply – leads to many changes regarding input-output quantities in the whole economy to a direction that softens the achievements in energy efficiency.

Quantifying the rebound effect (especially the indirect and general equilibrium effects) is extremely hard, that is why one can find significantly different data in literature. Based on Frondel et al. [2008], or the summary of the Economist [2007], different researchers put the (direct) rebound effect from insignificant to even over 100%. In this latter case increased consumption overcompensates improvements in efficiency. It can be also seen that in most cases analysis only covers the direct rebound effect, even estimations are very rare for the rest.

[1] Of course the author do not intends to call for feeling as an ice cube in winter. Only points to the tendency that relative improvements in efficiency can easily be surpassed by increased consumption.

Greene et al. [1999] analysed changes in household vehicle usage among the US population in connection with energy efficiency of motor vehicles. The research was carried out based on the data of the Energy Information Administration of the US covering a 15 year period. Greene et al. put the direct rebound effect for 20%, the US citizens have driven more with the more energy efficient cars. They have also pointed out, that improving energy efficiency of the car fleet and changes in fuel prices affects driving habits approximately to the same extent (of course to the opposite direction). The research of Small and van Dender [2007] carried out also in the US resulted in the estimation of the rebound effect in a range of 4,5% and 22,5% depending on different assumptions.

A survey in Germany (Frondel et al. [2008]) pointed out significantly higher rebound effect. During the research 547 households were analysed in the timeframe between 1997 and 2005. The rebound effect resulted to be 57-67%, meaning that the major part of the energy efficiency improvements simply „evaporates", the economic and environmental savings are not realised because of the increased consumption. A reason behind the significant differences between the US and German results can be the totally different public transport system in the two countries. In Germany public transportation is very developed and used by lots of people regularly. In this case, energy efficiency improvements of the vehicles – perceived economically primarily in the case of private cars by the population – tempts more Germans into their cars as Americans (as they sat there already before as well). *As a paradox, improvements in energy efficiency lead to the stretching of the more energy lavishing transport system (personal cars) to the expense of the more energy sparing one (public transportation) and thus the significant part of the benefits from the improved efficiency is lost.*

Rebound effect also depends from the time frame. Possibly more efficient motor cars do not induce significantly more kilometres driven *in the short run.* However, in the long run it can influence decisions like accepting a job in a more distant settlement. For this phenomenon a good example in Hungary (and of course in the US) is the proliferation of agglomerations around bigger cities. The relatively cheaper becoming transportation is undoubtedly supports the growing of garden suburbs, that in fact leads to a direction of increasing total energy consumption.

This statement is fully supported by a study covering the changes in the traffic system in Great Britain (Schulz [2004]). Average speed of traffic has increased to three-fold in the 60 year long period between 1937 and 1997, but the average time spent on travelling has not decreased at all (as distances have also increased). It can be pointed out that time savings by higher speed resulted by modern vehicles and better developed infrastructure were fully neutralised by increased travelling distances. Moreover, *improving energy efficiency was even overcompensated: total energy consumption has not decreased; in fact, it has increased to the double level!*

Gottron [2001] compared the effects of energy efficiency improving innovations at different areas in the United States based on different studies.

TABLE 1. SIZE OF THE REBOUND EFFECT AT DIFFERENT FIELDS OF HOUSEHOLD ENERGY USE

Device	Size of rebound	Number of studies
Space Heating	10-30%	26
Space Cooling	0-50%	9
Water Heating	10-40%	5
Residential Lighting	5-12%	4
Home Appliances	0%	2
Automobiles	10-30%	23

Source: Gottron [2001]

The size of the rebound effect was between 0 and 50% in the studies analysed. It can be stated that although the rebound effect was significant in most cases, the innovations resulted absolute decreases in energy consumption. One has to add however, that these results can be realistic only in a society, where the appliances analysed have been penetrated for long (more cars per households, air-conditioning everywhere etc.). In countries where for instance household air-conditioning is only starting to disperse, such as Hungary, can be expected that minor improvements in energy efficiency makes hordes of households to invest in the appliances. In this case total consumption of air-conditioning appliances increases to more folds, resulting in a rebound effect of well over 100%.

The UK Energy Research Centre (UKERC) states that although improvements in energy efficiency in most cases lead to a direct rebound effect of a moderate 30%, the general equilibrium effect can be significant, an additional 10-50% (Energy Design Update [2007]). This latter effect can be quantified even more difficult, but the sum of the two is already close to the level to totally neutralise the positive environmental and economic effects of the improved efficiency.

III. POSITIONING THE IMPROVEMENT OF ENERGY EFFICIENCY IN THE ENERGY POLICY

Hungarian energy policy faces many challenges that define its direction of movement:

- increasing domestic energy consumption,
- significant import dependency,
- need for ensuring supply security,
- price fluctuation of fossile energy sources (increase on the long run),
- climate change/environmental challenges,
- (compliance with EU energy policy).

As an answer to the formulated standpoints, usually the following ideas arise:

- Increasing of capacities (building new power plant, developing the storing and distributing capacities).
- Improving energy efficiency, energy saving.
- Increasing the share of renewable energy sources in consumption.

Certainly, different opportunities can solve the previous challenges to a different extent.

Increasing capacities seems to be a relatively straightforward solution for serving the increasing energy demand. If new power plants using domestic energy sources are established, or capacity is developed for storing the in price and quantity unpredictable import raw materials, then import dependency can be decreased and supply security can be improved. However, from an environmental perspective bigger capacities are responsible for the highest loads regarding both environmental risks and emissions causing climate change. Another risk factor is the price of energy sources both in the short and in the long run. Recently there is lot of talk on rethinking the role of nuclear power as well. In this case price fluctuation of raw materials might be not the biggest issue, and what can be even more important, nuclear power generation is carbon-dioxide neutral. On the other hand, environmental risks of nuclear power generation are huge; just consider management of nuclear waste, risk of accidents or heat pollution. In general, it is not unambiguous either that capacity enlargement is the most cost-efficient solution for decreasing import dependency or increasing supply security.

Steps towards *energy saving* also improve supply security and decrease import dependency, as ceteris paribus less energy is needed. If relative energy demand can be decreased, providing the same products or services with less energy, economic and environmental benefits can be realised at the same time. For a more active governmental participation in improving energy efficiency is also supported by the environmental policy of the European Union (2006/32/EC directive on energy end-use efficiency and energy services). Of course, as it could be seen before, effectiveness of these kinds of policies is hugely influenced by whether and to what extent rebound effect can be avoided.

An increasing share of renewable energy sources in consumption can also be very advantageous from many perspectives. As the renewables are mainly of domestic origin, can support state goals regarding import dependency and supply support. At the same time share of fossiles can be decreased. Renewable energy sources are usually regarded as environmentally friendly, although first generation biomass utilisation[2] and high-scale hydro power generation[3] is considered at least as controversial. European Union energy policy definitely supports renewables.

The following table gives a short summary on the relationship of the formerly defined challenges and potential measures.

[2] First generation biofuels mean such biomass utilisation, when fuel is generated from potential food raw materials (e.g. bioethanol from grain or corn, biodiesel from rape-seed etc.). In contrary second generation processes use agricultural by-products or wastes that are inappropriate for human consumption.

[3] Opinions are diverse on what counts as a ’high-scale” hydro power plant. According to István Szeredi [2006], in Hungary capacities over 5 MW already account here.

TABLE 2. EVALUATION OF CHALLENGES FACED BY ENERGY POLICY AND POTENTIAL MEASURES.

Challenge/ Measure	Increasing capacities	Energy efficiency	Renewable energy
Increasing consumption	+	+	+
Import dependency	+	+	+
Supply security	+	+	+
Price fluctuation/ change of fossile energy sources	-/+	+	+
Climate change, environment	-	+	0/+
EU energy policy	0	+	+

+: moving towards the given direction can provide solution for the given challenge,
0: moving towards the given direction does not provide solution for the given challenge,
-: moving towards the given direction only worsens the situation from the perspective of the given challenge.

IV. SUGGESTIONS FOR THE REGULATORS

A. Decreasing demand versus increasing supply

In the previous part of this paper more possible directions and measures were briefly introduced to meet the challenges rising for the environmental policy. Of course, none of them can be suggested exclusively, all of them have their own advantages and disadvantages.

At the same time, one has to be aware that in case of governmental participation these different possibilities compete with each other for state funding.

In the field of increasing capacities there is a significant present and planned state participation. Just consider the development of the natural gas pipeline systems (e.g. Nabucco, South Stream), the state funded development of strategic natural gas storing, or the potential construction of an additional nuclear power plant.

Governmental participation is also present in the field of energy saving, although to a significantly lower extent (see for example the National Energy Efficiency Action Plan, [2008]). The Action Plan aims to achieve an annual 1% energy saving during a 9-year period (between 2008 and 2016). This would mean a cumulated 15960 GWh (or 57,4 PJ) saving annually. According to the calculations of the ministry, this results could be achieved with an investment of about 2295-2870 billion HUF (8,3-10,4 billion Euros).

Just compare this investment need with the construction costs of a potential new nuclear power plant. According to Péter Kaderják, leader of the Regional Centre for Energy Policy Research (REKK), the construction of a new power plant would cost about 8 billion Euros or about 2200 billion HUF (Menedzsment Fórum [2009]). If we assume a 100% utilisation – 24 hours a day, 365 days a year – the two 1600 MW blocks are capable for producing 28032 GWh or 101 PJ energy per year (in reality a bit less if we also consider the standstills because of maintenance and other reasons). Peter Kaderják estimates that in this case of power generation, investment costs account for about 60% of total costs.

If we summarise numerical data, it turns out that the cost-efficiency ratio of investment in improving energy efficiency or building a new nuclear power plant is about is about the same. In fact, there are still a couple of minor differences:

- In case of investing in energy efficiency, current energy consumption can be decreased; while in case of investing in new power stations, further increase in consumption is generated.
- Constructing a new power plant is a huge investment, and if we consider multiplicative effects it surely creates a great amount of jobs. However, this job generating effect is most probably still minor to the one resulted by energy efficiency improving measures (many small investments regarding individual heating system reconstructions, building renovations etc.). In fact, it seems that executing an improvement in energy efficiency is more work-intensive than constructing a new power plant.
- *Initial investments in improving energy efficiency return most probably even on a market basis, so in this case state support of 20-30% of the investment costs can be lucrative enough. However in case of a new nuclear power plant much higher governmental participation is needed..*
- *Differences regarding environmental effects are huge: even a power plant considered to be the cleanest, most environmentally friendly and modern can not compete with the fact that 'the non-used energy is the cleanest energy'.*

As a consequence it can be stated that a balance of energy consumption and supply can be achieved by both increasing of supply (increasing of capacities) and decreasing of demand (improving energy efficiency). However, these two possibilities are not 'symmetric'; in the first case the level of energy consumption in the equilibrium is much higher. This can be beneficial for the energy sector, but for sure not from a sustainability perspective. Fort hat reason improving energy efficiency has to be a distinguished priority of governmental energy policy, in specific cases even prior to supporting capacity enlargement.

In a former part of this paper on the rebound effect one could see that improving energy efficiency is not a miracle in itself, as the rebound effect can decrease effectiveness of the measures significantly. On the other hand one also has to remark that ceteris paribus decreasing of energy prices (through increasing supply) projects further future increase of energy consumption (and thus need for building further power plants).

B. Integrating the principle of sustainable development into regulation

The need for moving towards improving energy efficiency and saving energy is present in Hungarian and especially in the European Union energy and environmental policy.

However, legislation is not consistent in many cases. As it was already mentioned, the Hungarian government supports the improvement of energy efficiency of buildings by subsidising the modernisation of the heating systems, insulations etc. It even requires an energy diploma for buildings summarising its energetic parameters. On the other hand, as Maria Csutora calls the attention, there are other and very controversial pieces of legislation with significant indirect effects on energy consumption of buildings. Such regulations are the obligatory cooling of office rooms below 24 degrees of centigrade in summer or the prescribed minimum size of rooms in flats and houses (Csutora [2009]).

It can be suggested to consider including sustainability as a *horizontal principle* in laws and regulations, and also taking into account when implementing different measures. And this should definitely not only apply to environmental policy – as in this field the principle

of sustainability is more or less well represented – but especially in other fields with significant direct or indirect effects on sustainability issues.

C. Controlling the rebound effect

As it could be seen before, the implication of the rebound effect is that *improved energy efficiency causes relative decrease in energy prices, and that latter leads to a smaller decrease as expected or even an increase in its demand.*

This leads to the question whether governmental programmes aiming to improve energy efficiency llead to the decrease of energy consumption and thus, make sense at all. Bialik [2009] raises the need for analysing the rebound effect regarding the energy efficiency improvement goals of the Obama-administration.

According to the previously quoted UKERC-study the general equilibrium effect at governmental energy efficiency improving projects – that can reach even about 50% – is totally disregarded in most cases.

From a social perspective increasing energy efficiency is for sure desirable, but the rebound effect is not. Thus tools are needed that can handle this situation properly.

Gottron [2001] calls the attention to the fact that some even question the basis of governmental interventions into energy efficiency issues claiming that because of the rebound effect it is only a wasting of public resources. Even if there is any decrease in energy consumption, this is not the most cost-efficient way to achieve it. Of course, if we would accept this reasoning, not only energy efficiency should not be subsidised from public resources. Neither capacity development nor supporting renewable energy resources should not supported from state money, as through the increasing of supply these also result in a rising consumption.

Parallel to programmes increasing energy efficiency state subsidies that decrease energy prices are suggested to be continuously cut down and stopped. If there are significant negative external effects in connection with energy production or consumption, these also have to be internalised, built into the energy prices.

D. Shaping consumer habits, environmental education

Creating consumer habits that are in accordance with sustainability is an exceptionally hard and long process, with special regard to the fact that the society influenced by mass media is getting strong impulses just from the other direction (cheap new car, air-condition appliance on sale etc.).

Although it is for sure not directly the task of the energy policy makers, the government should put much more pressure onto the environmental education, so that upcoming generations would see the continuous increase of material consumption not as the way towards their well-being and a high quality life. Of course this is not even only the job of the state, there is even higher need for smaller communities, above all for families, but it can also be seen that it can not be expected from economic actors interested in the increase of consumption.

In case of a truly environmentally conscious consumer one can expect with a higher probability that money saved as a result of better energy efficiency will not be spent on the further consumption of the same (or another) energy intensive product or service.

V. CONCLUSIONS

Evidence of energy efficiency literature indicates that significant rebound effects are associated with the improvement of energy efficiency. Consequently, better energy efficiency can contribute to economic growth and let consumers consume more but it is no way a guarantee for effectiveness from a sustainability perspective.

There are more types of measures that can be taken to face the energy challenge. In this paper it was argued that increasing energy efficiency is altogether more beneficial than increasing capacities. In the first case, equilibrium of energy demand and supply can be reached at a lower level which is definitely beneficial from a sustainability perspective.

Although there are significant policy efforts to increase energy efficiency, even policy making is controversial in this field. On one hand there are targets for improving efficiency while on the other hand energy policy focuses too much on sustaining current patterns. Sustainability as a horizontal principle should be integrated into policy making not only regarding environmental policy but all fields relevant to sustainability.

As increasing energy efficiency is still on of the best policy answers for the energy challenge, there is a strong need in research and policy making how to supplement energy efficiency efforts with other supplementary tools to be able to decrease rebound effect.

Last but not least, environmental and sustainability conscious education would be needed so that unsustainable consumption patterns would not be that lucrative. In this case improving energy efficiency might not go together with significant rebound effects either.

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