

# FIRST HORIZON SCANNING ACTIVITY IN HUNGARY

**Éva Hideg<sup>1</sup> – Judit Gáspár<sup>2</sup> – András Báldi<sup>3</sup>**

<sup>1</sup> Economic Geography, Geo-economy and Sustainable Development Institute, Corvinus University of Budapest, Fővám tér 8, Budapest, Hungary, H-1093, [eva.hideg@uni-corvinus.hu](mailto:eva.hideg@uni-corvinus.hu)

<sup>2</sup> Institute of Business Administration, Corvinus University of Budapest, Fővám tér 8, Budapest, Hungary, H-1093, [judit.gaspar@uni-corvinus.hu](mailto:judit.gaspar@uni-corvinus.hu)

<sup>3</sup> Centre for Ecological Research at Hungarian Academy of Sciences, Karolina út 29, Budapest, Hungary, H-1113, [baldi.andras@okologia.mta.hu](mailto:baldi.andras@okologia.mta.hu)

## **Abstract**

In 2016 and 2017 an interdisciplinary research group consisting of professional futurists and ecologists carried out a horizon scanning (HS) research for the first time in Hungary. Academic researchers and futures practitioners were involved as experts and/or stakeholders in the participative phase of HS works under the umbrella of the Centre for Ecological Research at the Hungarian Academy of Sciences. The aim of this research project was to map the visible, possible and perceptible technological, economic, social, cultural and/or international-regional and domestic events on the horizon of 2050 that could interact with the change of ecosystems in Hungary. It was presumed complex research issues could be shaped from the results of HS research and that could also be useful for development of domestic policy forming practice and the future awareness of scientific researchers, decision makers and citizens. The title of this HS project is 'Environmental futures: Hungary for 2050'.

Purposes of HS in Hungary were

- To map the possible changes in natural and human ecological systems until 2050 in the country in a complex manner and

-To show possible interactions between future forming ecological and non-ecological components that would also be useful to research from the aspect of practice. To this end, the research group has further developed the participative phase of HS process.

After a desk research a participative phase was organised that consisted of brainstorming and a questionnaire procedure. The brainstorming of academic experts generated a list of possible future statements. The questionnaire procedure was focused on the estimation of impacts and the relative measure of probabilities of possible future statements. Futures practitioners participated in this phase of classification and estimation of impacts and probability of future statements. During classification they had to classify future statements whether they could be continued trends or new trends or weak signals or wild cards or only simple hype events. The impact and probability evaluation process was based on the use of Osgood's semantic differential scale. This phase of HS process was the new element developed by our research group.

During the last phase the cross-cutting issues of the possible future changes in domestic ecological systems, and their relations to the results gained from the international forecasts processed in the previous desk research phases were explored by the interdisciplinary research group. The cross-cutting issues can be used as a storehouse of complex research topics that can be researched in the interest of fruitful domestic future shaping processes. At present the project is in the phase of dissemination.

**Keywords:** horizon scanning, foresight, cross-cutting issues, ecology, human ecology

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## **Introduction**

An interdisciplinary research group consisting of professional futurists and ecologists carried out horizon scanning (HS) research in 2016 and 2017 in order to map the changes, visible today and possible by 2050, in the natural and non-natural environment and within that, especially in the natural and human ecosystem. The objective of this research was for the research group to unfold the complex ecological research tasks, so called cross-cutting issues, from the possible changes that can likely be utilized for shaping the Hungarian society. The mutually cooperating ecologists, and professional futurists formulated the possible and searchable ecology-related correlations and interconnections between the different elements of the foreseeable future horizon from the future conceptions collected and evaluated with collaboration by broad-minded domestic researchers from different academic fields and futures practitioners. After briefly reviewing the methodological considerations, this study presents the possible and searchable complex natural and human ecological correlations applicable to 2050 and compares them with the futures fields of the international literature addressing 2050. It points out the Hungarian specific complex and ecological future themes by a comparative analysis.

## **Methodological approach**

The subject of our research and study was to map the possible changes in domestic natural environment and, with priority, of the ecosystem within the still foreseeable future, on the time horizon of approx. 2050, for the purposes of allowing for identification of complex ecological research tasks from these possible changes that will expectedly bring useful results for the society.

We have chosen the HS procedure because, according to its definition, "... 'It is not about making predictions, but systematically investigating evidence about future trends. ... Scanning allows for the identification of potential new themes or meta-issues and issues that will then need to be analysed in-depth. Horizon scanning looks thus for weak signals indicating the emergence of new meta-issues and issues. A scan must adopt the largest possible scope for the core question under watch.' (Homepage of DEFRA) So, the procedure is not about making predictions, even though it shall systematically investigate the evidences about future trends, but also the potentially advantageous and threatening possibilities. The practical purpose of the HS is to provide assistance to the research institutions, the Government, the different policies to make them able to move and give responses in the various possible environments of the future (Horizon Scanning Programme Team for UK Government). As the HS constitutes a part or a form of foresight process therefore it can also trigger further innovation in the social practice (Sacio-Szymańska, Fantoni, Daheim 2016).

The HS is not a method but a procedure in which we combine different types of future exploring methods with the aim to be able to express the still indistinctly materializing future conceptions and possibilities as versatilely as possible. The selection and interlinking of methods applied shall be solved systematically. A further requirement can be that the whole process of the HS should be bottom-up built so that we explore the futures perceptible on the still foreseeable event horizon as they are felt by the individual people and the participants included in the process (researchers, experts, futurists), i.e. the HS should be an evidence-based exploring research (Schultz 2006, Könnölä et al. 2012).

Since the HS studies the overall future horizon, therefore it shall search the trends, the weak signals, the developing issues, the so-called hype phenomena and the wild cards, the system

changes induced by extraordinary events, that is, it shall be open for any perception of future (Saritas, Smith 2011). On the other hand, as a result of the research, the various future perceptions shall be classified into phenomenon and change types (Amanatidou et al.2012). According to literature, the first stage of the HS may be the literature processing stage, while the second one is a participative stage built on the collective wisdom of experts, stakeholders, decision-makers, etc. (Schooling for Tomorrow, OECD).

Such a demand arises with regard to the results of the HS as well that such a research should endeavour to systematize the explored phenomena, changes, correlations, etc. that are possible in the future. As we have already mentioned, one of its forms may be where the HS also performs the classification of the explored results, future information into trends or weak signals or low probability, potentially high-effect risks (wild cards) or into very uncertainly “visible” future parts, or into “blind spots” indicating non-visible places. However, this ambition for systematization does not mean that complete and complex future images need to be elaborated by the HS but only the fact that it must be explored what is visible in the given context and how the future horizon can be seen and how many interpretations of it emerged according to the relevant research. A second demand following from the former one is that, in order to ensure the practical usability, the possible correlations and relationships among the different elements of the foreseen future horizon are also to be searched. According to Könnölä et. al., so-called cross-cutting issues are also to be explored, which give some possible response to the question how 3 or 4 phenomena detected on future horizon can correlate with each other (Könnölä et al. 2012).

The HS research complying with the above aspects was composed of the following work phases:

- Futures literature processing,
- Brainstorming with the involvement of researchers and experts with natural and social science,
- Compiling the findings for the future from the result of brainstorming in form of a questionnaire,
- Classification of the future events included in the questionnaire into types and having them assessed by the national futures practitioners,
- Based on the results, formulation of complex cross-cutting ecological issues with involvement of ecologists and professional futurists.

Our research consisted of two main work phases. The first phase was literature processing, while the second one was participative based on experts’ participation. We carried out processing of literatures explored and accessible by the Internet in a traditional way, paying regard to financial and time limits. These literatures embraced the possible futures of the hypothetically presumed – global/regional natural environment, technical/technological, economic, demographic, social and ethical – subject areas producing effect on the domestic ecosystem, applying to 2050. The second phase was based on the participation of scientific researchers and futures practitioners as stakeholders and experts. In the participative phase, we held brainstorming and a collective information systematising workshop. We organised the brainstorming in accordance with the rules formulated by Rawlinson; i.e., during the workshops we wanted to encourage free flow of ideas, suspension of making judgements and freely soaring thoughts stimulating each other in synergy (Rawlinson 1981). The literature processing and the brainstorming constituted the gathering of future information. Analysing and filtering futures date and information the moderators gathered and systematised the thoughts, stream of thoughts about the future from the brainstorming documents. After that, in a workshop, from these

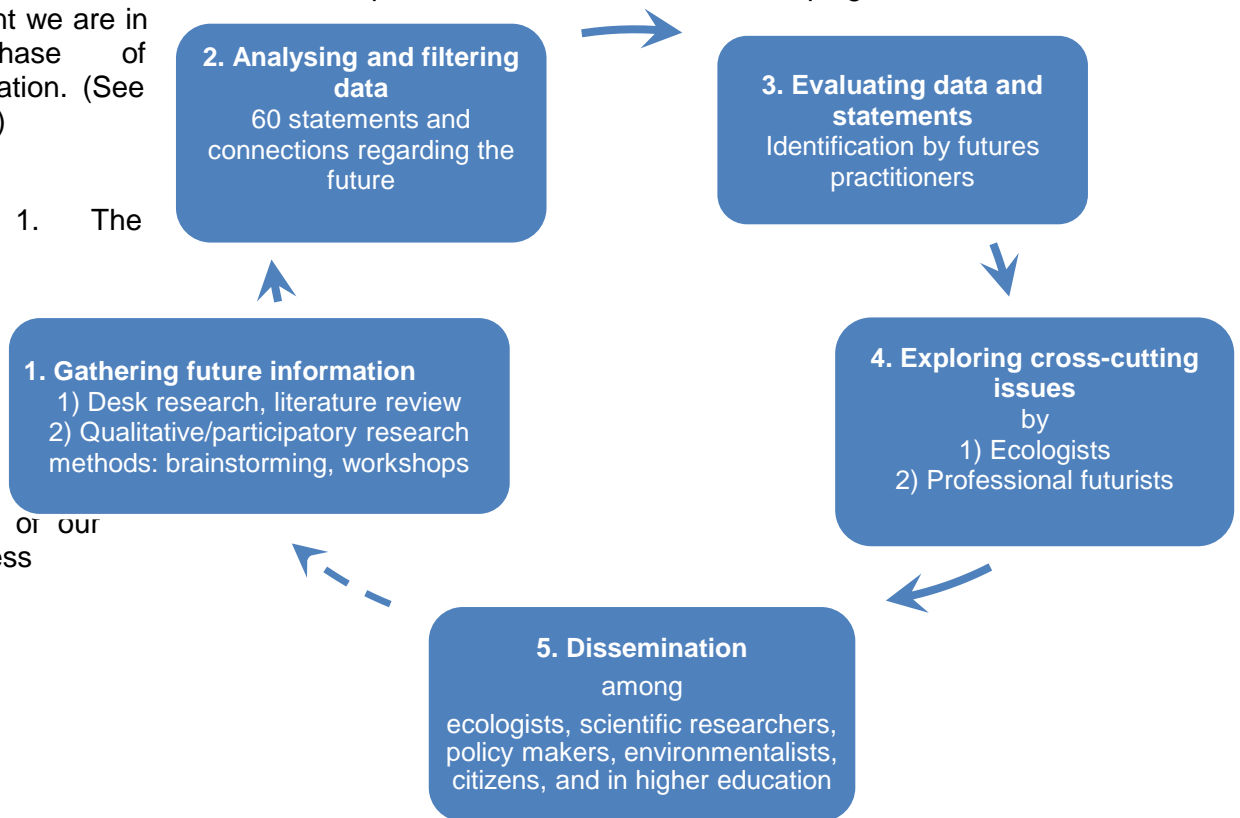
assertions a questionnaire consisting of 60 questions was edited by the research team. Then, we had given the questionnaires to domestic futures practitioners with an overall and interdisciplinary approach for classification and evaluation in a new workshop. The futures practitioners are members of the Scientific Committee of Futures Studies at the Hungarian Academy of Sciences. They had to categorise and evaluate various possible future parts perceived by the participants of brainstorming in terms of whether they represent continued or emerging new trends, weak signals, wild cards or hype events (Sutherland, Woodroof 2009). We solved this with personal presence and in writing, by using Osgood’s semantic differential scale (Osgood 1957). We have put one step towards the practical realization of integral futures field by exploring the whole scope of possible futures and their classification and evaluation (Hideg 2015).

After that, we assigned all the gathered and systematised information to two ecologists thinking in future-oriented terms and one professional futurist having ecological approach – they were sub-team of our research group - for studying them with the aim that they should search for and present in terms of the ecological context further interrelated scopes of issues of various nature that might be future-shaping in the changes in domestic ecological systems. Shortly, their tasks was to explore cross-cutting issues. Finally, during synthesis, the research team had to formulate the complex problems that focus on ecological scopes of issues which seem to be an important field of research for development or shaping of the 2050 future.

At present we are in the phase of dissemination. (See Figure 1.)

Figure 1. The

flowchart of our HS process



Source: Own

### **Results, discussion and implications**

From the very abundant results of HS we emphasize and review only cross-cutting issues that can also be associated with possible technological changes.

One of the most positively assessed statements and a continued trends is that the non-transgenic biotechnology will spread, which will be used in the medication, the food production and in the environment protection in Hungary. The persistent headway of biotechnology, especially the so called CRISPR gene editing technology, is the development which can have fundamental influence on people in the field of medication and food production because it will give rise to genetic changes. A further wide field of research can be the environmental utilization of biotechnology, which may have a direct effect upon the ecosystems and people as well. A proportion of them will be intended and pre-planned changes, while another proportion – hopefully a smaller one – may be not intended and not pre-planned changes. Both the accurate elaboration of the directions of direct utilization and the synchronic and follow-up tracking and checking of the possible positive and negative human and non-human consequences may become an important research field for the purpose of the future of ecosystem.

In terms of ecology, the statements assessed similarly positively and as a continued trend raise a number of questions, stating that the use of GMO will spread and an agriculture employing a low number of employees will be developed.<sup>1</sup> These were evaluated by the futures practitioners as a trend with positive effect, however another claim also relating to GMO, stating that the GMO would appear in the domestic agricultural production system and they would percolate into the natural environment as well, was evaluated by them as a negative effect resulting in extraordinary changes. These two evaluations also show how much dilemmas are raised by this issue. With the growth of efficiency of the agriculture, the exploration of the possibilities of greening and ecological intensification, etc. in an as wide circle as possible is an important factor. The exploration of the environmental and ecological risks of the GMO is a key point and it is also a question, how the expansion of these technologies influences the landscape structure and the agricultural biodiversity.

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<sup>1</sup> This option is harmony of statements exposed in a book edited by Balázs, Dudits, and Sági (Balázs, Dudits, and Sági eds. 2011).

Another statement evaluated as mostly positive and as a continued trend is that the restoration ecology will play an increasingly important role in the improvement of our environment condition. One of the advantages of the ecological restoration is, for example, that it fosters the self-purification for contaminated habitats by starting up natural processes. It is worthy to overview how much this approach can be applied in the case of domestic areas and which are good practices? With regard to the environmental future, it would be advantageous if the objective for 2020 of the CBD + EU Biodiversity Strategy (The EU Biodiversity Strategy to 2020, 2011), i.e. the commitment of achieving a 15% restoration ratio in Hungary (Contribution to the Mid-term Review of the EU Biodiversity Strategy to 2020 Based on the 5<sup>th</sup> National Report to CBD 2015) came true and it were continued even after 2020 with further commitments. Its preparation and the prioritisation of the areas are important for the domestic habitats, taking into consideration the efficiency aspects (e.g. the size of the area). In addition to the restoration of the natural habitats, an increasingly high emphasize should be given to the inspection and nature protection role of the urban habitats, which are also determined by the experts as a positive effect phenomenon. The restoration ecology will play an increasingly important role in the improvement of our environmental condition, and will also indirectly but positively affect the human system. On the one hand, it may make our natural environment healthier and more natural and, on the other hand, the planning, timing and scheduling of implementation of these processes require series of social science researches and decisions.

The greening of the urban environment, the expansion of use of GMO in the Hungarian agriculture as well as the spreading of degrowth movements<sup>2</sup> and, through them, the cooperation business models will prospectively take a positive effect on ecosystems both directly and indirectly. The highlighting of future importance and development of these three areas shows that main natural environment of the human being of future will be an urbanised and agriculturally cultivated nature. For the modification and shaping of which the Hungarian society will gladly use the GMO solutions, for the purpose of which the cooperation business model seems to be desirable. The bunch of these expectations offers alone and in its internal relationships complex and interdisciplinary research themes.

Forecasts regarding the effect of global climate change upon the domestic ecosystems shall appear as a special priority in the research. As a consequence of the climate change, in addition to desiccation at lowland regions, decrease can also be expected in the lowland water supply. Because, due to weather extremities, presumably there will be more rarely but more abundant rain or snowfall. Due to sudden leakage, water supply will be insufficient in the hilly areas even with abundant rain and snowfall, as a consequence of which the water supply of these habitats may considerably change, thus jeopardizing the survival of the local ecosystem and fostering the acceleration of their change. The research experts and futures practitioners evaluated the change of the Hungarian climate to a Mediterranean-type. It will affect our ecosystems especially strongly and directly. In this respect, the unusual hot weather, the sudden and extreme temperature fluctuations, the appearance and expansion of new microorganisms, the necessary alteration of our cultivated plants, the urgent modification of eating habits, etc. may bring the healthcare, microbiology, ecology, agriculture, lifestyle and curriculum developing researches in closer relationship with each other and may highlight them.

The futures practitioners see negative continued trends with medium uncertainty and significant effect in the thinning down of biodiversity of the Hungarian landscape<sup>3</sup>, in the health challenges

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<sup>2</sup> Its meaning is very similar to the idea of Weiss and Cattaneo (Weiss, Cattaneo 2017).

<sup>3</sup> This option is well underpinned by the international forecast and foresight literature. See for example OECD Environmental Outlook to 2050 2012, CBD Biodiversity Scenarios 2010 and 2017.

generated by the climate change and in the privatisation of public goods. The first two of these three negative effect trend expectations have and will have considerable relationship network affecting human ecology, and that in the field of searching and prevention of spreading new pathogens. The third issue, however, can be connected to the development of unfavourable change mechanisms of the human ecosystem in social and mental respects. Thus, the significant decline in life conditions of those deprived of public goods and the possibility to counteract it may become a particularly important research area.

Domestic futures practitioners assume the appearance of two new trends by 2050. These are the repopulation of the emptied countryside and the development of use of nature complying with the local endowments<sup>4</sup>. Both new trends can be connected to the significance of exploring the inventories of ecosystem services (ES), the knowing of local landscape use specificities as well as the spreading of knowledge. They may be closely connected to each other, because making the countryside habitable and repopulated can be implemented in an environmentally conscious way and by consolidating the local democracy, irrespective of the fact whether it is made with migrants or urban poor, homeless people, or by revitalisation of the local population. The resettlement can be in relation with studying, knowing and forming the ecosystems of the countryside, furthermore with teaching and extending the skills of future inhabitants, i.e. in addition to finances, making the settlers environment-conscious and suitable to form their own and their community's healthy lifestyle and local society.

The futures practitioners assessed the spreading of international cooperation in the nature conserving efforts replacing the national efforts as a positive effect weak signal.<sup>5</sup> Regional cooperation agreements are key factors for a larger region (e.g. chain of mountains, basin – see Carpathian Convention (2003)) or for the drainage-area of water flows. A number of regional, cross-country border cooperation processes is already in course for the protection of natural values in the form of joint tenders or projects, however, their results have not yet become a daily practice. One of the tasks to be solved is to bridge differences between the regulation and administration of various nation-states.

Futures practitioners qualified the further quick expansion of the ICT in the robotics, medicine, education, etc. as a positive continued trend with high uncertainty but significant effect.<sup>6</sup> The presence of ICT pervading our whole life is so much unstoppable that it was qualified as a weak signal bearing high volume of novelties of the future but certain domestic experts also expect extraordinary changes from it. Depending on the fact whether the ICT develops more slowly or more quickly and has a wider or narrower scope of action, it may affect the ecosystem favourably or unfavourably. Favourable effects can be if it makes our life easier, breaks through the limits of our senses and mental capacity, serves environment protection or when it is used as a searching tool in an as wide circle as possible, etc. It can have an unfavourable effect if it jeopardizes our human dignity or freedom, or if it takes over the control of our life or society, etc. These various future possibilities related to the ICT and human ecosystem can be matured to several research issues, which will be suitable to shape our long-term development subject to the human selection. Since in the field of these technologies Hungary is rather an applying than

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<sup>4</sup> Both new trends are harmony with the decreasing population trends for European Union and among them for Hungary until 2050 and land use problems expressed by Fisher at al.(The 2015 Ageing Report 2015 and Fisher at al. 2014)

<sup>5</sup> In this respect, there is a full harmony between the domestic expectations and the forward looking literature of international nature conservation (see for example OECD Environmental Outlook to 2050, 2012, Sutherland et al. 2017.

<sup>6</sup> This kind of technological optimism is represented for example by Kurzweil (Kurzweil 2005) and Meskó (Meskó 2014) in the futures literature.

a developing country, therefore, its major long-term duty is the continuous learning related to the development of ICT and to find the forms of applications that are appropriate for us.

In Hungary, migration is a very negatively judged social phenomenon, as a consequence of which the Hungarian countryside may become depopulated. Trend expectations relating to migration make the reduction rather than the rise of the environment load likely in Hungary because more and more people are leaving the country. This kind of depopulation and its mechanisms influencing the nature, the municipal environment and the health, family status and micro environment of the people should be studied so that we have the chance to organize a healthier migration process where migrants may move back.

The futures practitioners see very negative extraordinary changes only in form of religious differences spiced with mass migration that may end in wars and religion-motivated conflicts as well as in form of wars caused by shortage in natural resources. We are facing an abundance of local wars in this field even now, but we do not study how to peacefully and successfully manage the conflict situations with such an intensity as the war tools and the thresholds of unleashing war conflicts. We also propose the assessment of damages of war conflicts and wars embodied in human and non-human ecosystems, in the deterioration and destruction of human ecosystems so that the world's wars arising from its multicultural character should not be understood as a natural disaster.

Comparing our research results with the processed international literature, the domestic experts do not regard the fresh water issue, the extinction of species and the catastrophic speed depopulation of habitats as a serious domestic environmental problem. We do not see much breaking point and turning point in the Hungarian life conditions in general either, but a continuity or slighter changes are supposed to dominate until 2050.

As regards the future of religions, international forecasts suppose an increase in religious tensions as just one but the worst of the possible alternatives of future. However, they account for the religious revival and the possibility of spreading an accommodating religiousness as a better alternative than the one mentioned above (see for example McFoul 2006). Unfortunately, these latter two alternatives have not been included in our research.

As regards the migration, the international forecasts primarily expect its increment just due to the degradation of the natural environment (see for example Brown 2007 or Bettini 2013). This has not appeared as a future problem here in Hungary, and if still so, then in the form of migration or leaving the home country for economic reasons as well as by repopulation of depopulated regions as a necessary development program that must pay maximum attention to the local natural and environmental endowments as well as to the development of local democracy.

Above mentioned some circles of cross-cutting issues have revealed that traditional technological issues could be associated with soft, social and human technological ones in the would-be research activities, too. All these special problematic issues and expectations draw attention to the fact that, when the research is put on agenda again, the international forecast literature related to these themes shall be reviewed again and we should try to find and process the new special international forecasts and foresights that may relate to the expectations in Hungary. Furthermore, in order to improve the internal processes of the HS, the literature exploration phase should be transformed into a building process of database that could be used continuously by wide circles of experts and stakeholders participating in the forthcoming HS processes.



## Conclusions

At present we are in the phase of dissemination. Achievements gained from the HS process have proved interesting for scientific researchers of different fields who have not participated in this HS process and for public audience and students of higher education. It can be said that we are successful in traditional fields of dissemination for example in publication of papers or in teaching the HS process and results of it for university students. But we have some difficulty in communication with experts of science and environmental policy, government, municipality governance systems as well as NGO and business organisations. It would be desirable for us to be able to open towards them not only as potential appliers but as active participants in HS process as well. We should like to find some solution to this problem in renewing our HS research.

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