

## Recommendation

We live on the Earth and using natural resources, we live “from the Earth”. Therefore, besides the moral commitment that we feel toward our Globe, our responsibility for the future of human mankind should be based on the protection of our environment. “Human being can intervene in the World, but not as a Ruler of every Life, but as a World Partner – because of its force and creativity (Homo faber), it is responsible for each life” (following Prof H. Brauer). We have been used and exploited the possibilities provided by the natural environment for thousands of years and we have not thought of the future effects of our unlimited and incautious acts and of the future generation. The current situation can be changed, unfavourable effects can be stopped or turned back if possible only by human being as well. “Only human being is able to preserve the equilibrium of each Life. This is the obligation of the creative man (Homo morales) (following Prof H. Brauer). Problems of environmental protection can be experienced in an even more cumulated way in the Northern Hungarian region. Mining and metallurgy, energetics and chemical industry have their adverse effects here in this region. The elimination of these effects is our duty. What is necessary to establish a livable environment supporting our future, to eliminate the environmental damages and to rehabilitate and revitalise the areas? Basically three things are necessary for them:

- Environmental conscious behaviour, frugality and humbleness toward our environment.
- Knowledge, professional ideas, knowing and taking into account natural laws.
- Money, willingness and determination.

Out of the three factors, creating environmental conscious behaviour is our common task, while getting and transmitting knowledge and professional ideas are the roles of the university. We are engaged in this field. We promote the training of the future leading experts with domestic and international cooperation and the development of the Northern Hungarian region. The necessary financial resources can be obtained for appropriate goals. Willingness and determination are probably not yet as strong as it should be for the success. Cooperation is our common duty in this field, too. This cooperation is more difficult to be created in this region than in other regions provided that social and economic problems attract our attention, divide our ideas and acts. By creating sustainable development and the conditions of sustainable resource management, we can support the better conditions of the future generation. Let us act and do something for it!

Miskolc, November 2006  
Dr. József Böhm

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## **Summaries**

# Summaries

**Ferenc Sallai:**

## **The Water Quality of Sajó River and its Long-term protection**

Until the early 50's, the Sajó was one of the richest rivers in fish in the country. From the 50's on, a number of industrial plants were built in the valley of the river, and their waste water was directed into the Sajó without any or just with minor cleaning. As a consequence of these circumstances, the Sajó has become one of the most polluted rivers in Europe. On the occasion of a water quality measurement on the longitudinal section in 1974, the dissolved oxygen content of the water crossing the border was zero, the organic pollution characterized by oxygen consumption with dichromate (KOICr) was near the 300 mg/l value. According to the examinations in 2005, the water arriving the boundary section – except for the coliform number – is of bearable or better quality. Examinations based on the survey of the ecological state guided by the practise of EU Water Framework Directive exhibit improving water quality, as well. According to fish fauna surveys, 49 fish species have already returned to the Sajó, 15 of them are protected.

**László Lénárt:**

## **Karst water potential of Bükk area – environmental tasks for long term utilization**

The Bükk area is situated in Northern Hungary. Both underground and on the surface, excellent water storing karstic rock massif can be found. The maximal value of dynamic karst water supply is approximately 40 million m<sup>3</sup>/day. The static cold and warm (tepid) karst water supply of the Bükk and its surrounding area is approximately 5\*10<sup>11</sup> m<sup>3</sup>. The cold and warm (tepid) karst water supply is one and unified, their research, exploitation and protection can be realized only jointly. The karst water usage of Bükk and its area is 25-28 million m<sup>3</sup>/year currently, of which the amount of thermal karst water (tepid and warm karst water) is 6-6.5 million m<sup>3</sup>/year. The karst water is mainly used for drinking, the thermal karst water is for bathing and medicine. As of today, the amount of precipitation fills up what is taken out by production. The main reason for this is the significant increase in the volume of precipitation, and at the same time, the significant decrease in production. The production of cold karst water is stable or decreasing, the production of thermal karst water is increasing. This current balance should be maintained. Any further additional karst water production in the Bükk area should be realised only after tests proved it possible and maintainable for the long term.

**Zoltán Buócz:**

## **The exploitation of mineral resources and their environmental impacts in Northern Hungary**

The paper gives a brief overview of the mineral resources, the volume of production and the size of the area affected by mining in Northern Hungary against the national background. The international and European conditions of mining, the reasons for the emergence of the present situation and the expected trends of development are likewise presented. In the past 15-20 years, there has been an important structural shift towards mineral raw materials used in the construction industry in Hungarian mining production. After the economic recession caused by the change in political regime, there has been a boom in this field in the past 2-3 years. These effects can also be felt in Northern Hungary, where both the number of mining areas and production are on the increase. This welcome development, however, is accompanied by an increase in environmental problems. The second part of the paper focuses on the environmental performance of mining activities and the possible methods of measuring it. An important stage of environment protection is environment-based planning. As mining as such results in irreversible changes, these should be handled, controlled and directed in the stage of planning, which should then form the basis of environment protection activities, recultivation and country planning. Mining as a production industry is distinguished from processing industries by four main features. Earlier, only the economic consequences of these features were analysed. Now, analysis is extended to environmental impacts, through which environmental consequences are investigated. The possible methods of assessing the environmental impacts of mining, handling major environmental impacts and ideal environment control are also covered in the paper.

**János Takács – Ferenc Sallai – Miklós Lipták:**

## **Proposals for the development of the sewage water and sewage sludge treatment in Hungary**

According to the available data and information, the situation of sewage water treatment in Hungary and, similarly to it, in Borsod-Abaúj-Zemplén county is not favourable. Canalisation connection up to canals and

diversion of sewage water are deficient and situation, degree and efficiency of sewage water treatment is even more unfavourable. Among the problems, collection and treatment of sewage water in case of settlements with less than 2,000 inhabitants are especially important as control, location and utilization of sewage sludge originated as the product of treatment at huge sewage farms too. After having reviewed general situation, we have dealt with these two topics in our dissertation leaning on scientific literature, legal prescriptions and experimental work. On this basis, our proposals are the following: To solve lag of little settlements in the county, we suggest custom-built and natural sewage water treatment instead of sewage water treatment companies because significant rise in soluted material content does not happen in short canals (fast diversion) and sewage water does not begin to rot (smell effect does not occur and mechanical employment of canal reduces). Its consequence is more effective treatment. Natural treatment methods can provide the necessary degree of treatment. There are numerous solutions for necessary treatment of sewage sludge at huge sewage farms from which we can choose according to conditions and circumstances. In our dissertation we propose another solution whose essence is disintegration of sewage sludge (with or without an additive) before utilization. During this process, sludge is stabilized and can be utilized directly or after composting in the field of agriculture (because of its nutrient content); and the biogases formed during the anaerob treatment of sludge can be devoted to energetic utilization.

**Imre Szabó – Attila Szabó – Ivett Farkasné Czél:**

#### **The position of landfill sites in Northern Hungary and the technical solutions of the recultivation**

During the last 15 years, there have been a lot of significant changes in the field of Hungarian waste management, landfill-building and regulations of landfilling. From the year 2009 in the European Union member states only those landfills will be allowed to operate that are built according to the European Union directives. A Phare project was of assistance for Hungary for the investigation of municipal solid waste landfills objective. The project specialists mapped 2667 landfills during this nationwide survey of municipal solid waste landfills in 2002. By the help of results of the survey, we concluded tasks in the field of waste deposition to apply to North-Hungarian area.

**Barnabás Csóke – József Bóhm:**

#### **Regional waste treatment tasks in Northern Hungary**

Taking into account the points of view of national economy, the utilisation of secondary raw materials and fuels is economically advantageous for the nation, so it is a *national interest*. As we presented in the foregoing, utilisation and preparation of raw materials and secondary fuels *has no theoretical, environmental, technical and technological obstacles*. In the North Hungarian Region, utilisation (recycling) is most disadvantageous for massive industrial and municipal wastes, where the crucial proportion of waste treatment is represented by disposal. We are backward in processing electronic wastes, too. Massive industrial wastes can be utilised most advantageously for construction and road construction purposes. It would be especially important to urge utilisation in road construction as currently only 40 percent of the roads owned and maintained by local governments are paved. By utilising fly ash (mainly as binding agent), mining waste (dirt) and blast-furnace cinder, the missing roads can be constructed in a cost-effective way, flexibly adapted to the local possibilities. The tender system should also support road construction utilising secondary raw materials. For expressways, it is reasonable to require that the possibility of using secondary raw materials should be examined for each road construction. As for solid municipal waste, treatment of residual waste, production of secondary fuel from residual waste for power plants and cement mills as well as collection and utilisation of junk, the most important task for the next period is to reduce the quantity of deposited waste considerably. An advantageous solution for this problem is the use of mechanical-biological stabilisation technologies which can be combined with a complex energetic utilisation of the biologically decomposable portion (production of biogas, growing energy plants). Dry processes, particularly the combined 3A (Aerobic-Anaerobic-Aerobic) technology can be recommended here. Solving the collection and processing of electronic wastes, based on up-to-date mechanical processes, is also an important task for the next few years.

**Iván Gyulai:**

#### **Development policy, biomass, sustainability**

We can hardly open up regional strategies and programs without encountering bio-fuels, as one of the medicine for oil shortage, dependence of external oil sources, reduce pollution and prevent climate change and open up new development perspective for the rural areas. The study, as several well-respected analysts raise serious concerns about the rapid diversion of food crops towards the production of fuel for automobiles. Ecological concerns are raised towards the unlimited use of biomass as well. One of the most serious impacts of using

biomass is on land use. A competition is foreseen among the different land use demands, such as for food crops, energy crops, and maintaining biodiversity. The high demand for bio-fuels can paralyse the safety food supply, and can create enormous biodiversity loss mostly in the tropic region where natural forests are being threatened by changing them to energy crops. The European Union's regulation towards replacing a part of fuel with bio-fuel looks impossible simple because land availability even at a low, 20% rate of replacing. There is a concern about energy balance, if there was any energy benefit to use plant biomass for liquid fuel, e.g. sunflowers require more than twice as much energy as available in the fuel that is produced. There are doubts on the carbon neutrality as well. To produce energy crops and convert those to energy demand fossil fuel that results carbon release. The global carbon balance looks worth after using biomass than before. Greenhouse gas emissions come from deforestation through the loss of embedded carbon when the forests are cut down and burned. A hectare of land may save 13 tons of carbon dioxide if it is used to grow sugarcane, but the same hectare can absorb 20 tones of CO<sub>2</sub> if it remains forested. The study proposes 1% energy use decrease per year coming from energy efficiency, and 1% replacement of fossil, non-renewable energy sources with renewable sources, others than biomass.

**Sándor Karajz:**

#### **A new approach in environmental economics modelling**

In this study an integrated environmental economics model was created. This model describes economic processes on the basis of generic algorithms. The economics approaches are looking at the multidisciplinary approach in a broader sense. One type of approach is the analysis of economics and biology, which according to the scientific literature constitutes a part of scientific dimensions of the modern environmental economics. The importance of the model lies firstly, in the fact that while constructing it an imitation of dynamic economic processes can be used. Secondly, it can be used for explanation and solution of environmental problems when the application probability and success of strategies are separated.

**Éva Seresné Hartai – János Földessy – Tibor Zelenka:**

#### **Environmental impact of the former gold and silver mining in Telkibánya**

In the frame of a PHARE CBC project the environmental impact of the former gold and silver mining was examined. The mining activity lasted about 600 years. Geologically the area is built up by Sarmatian andesitic-rhyolitic volcanics. The epithermal, low-sulphidation-type mineralization occurs in a potassium-metasomatized subvolcanic andesite. The environmental assessment was focused on the examination of water and soil, mainly in the surroundings of the mining objects. Based on the results it can be stated that the former mining doesn't mean any hazards for the environment.

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