

## Angol nyelvű összefoglalók / 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 river of the country in fish. 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 river of 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 ( $KOI_{Cr}$ ) 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

The 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  $5 \cdot 10^{11}$  m<sup>3</sup>. The cold and warm (tepid) karst water supply is one and unified, their research, exploitation and protection can be done only jointly. The karst water usage of Bükk and 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 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 done only after tests proved it possible and maintainable for the long term.

**Zoltán Buócz:**

### **The exploitation of mineral resources and there's 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 North 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's and sewage sludge's 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. Canalization connection up to canals and diversion of sewage water is 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 effectation 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 an other 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 situation 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 will be allowed to operate only those landfills, which 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 Csőke – József Böhm:**

#### **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 using plant biomass for liquid fuel. E.g. sunflowers require more than twice as much energy than is 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 is looking at the transdisciplinary 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.