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REVITALISATION PROBLEMS OF MINING REGIONS IN TRANSITION – SLOVAK EXPERIENCE FROM THE INTERREG III B CADSES PROJECT READY.



Slovakia belongs to countries with extensive historical mining and this factor along with mining in past few decades caused many problems in environmental sphere, in some cases with severe ecological consequences. The problems of revitalisation of the regions after termination of mining are the subject to political discussion as part of global political strategy of economic and social development in the Slovak Republic. With regard to relatively small share of mining in the total employment in Slovakia, this problem is not as highlighted as in the other European countries, although the environmental dimension of the termination of mining represents complex of serious problems.

Current negative impacts on environment of historical and present-day mining activities and ore processing in the SR can be summarised as follows:

- Changes of land configuration as a result of replacement of huge volume of rock, stability disturbances, development of fractures and faults, depression of terrain, non-even consolidation of sediments, subsidence, activation of landslides, etc.,
- Changes of hydrogeological regime in undermined areas and surroundings,
- Changes of chemical composition of surface and ground waters, as well as soils in mining sites and broader surroundings,
- Disturbance of tailings dams with possibility of contamination of surface and ground water and soil by leakage from tailing ponds, waste rock stockpiles, etc.,
- Development of deep and sheet erosion related to deforestation and re-movement of vegetation cover.

With regards to real financial situation of the public sector there has been a very limited way to impact solution of these problems. Primarily the social problems following from the gradual termination of mining activities were linked also to termination of production activities in processing industry in the context of overall transition process after 1989. The key strategic document - the Raw Material Policy Proposal of the SR from 2001 declares the key strategic goals in the area of utilisation of raw materials and development of mining industry in the SR. The current principal middle-term policy is not to open new deposits and to exploit currently used deposits effectively. Based on this document also the local strategies, either of business subjects, regions, municipalities but also the bodies of

specialised national government (Employment Office, Offices of Environment and others) have been developed. These have been more of sectoral character than integrated strategies yet.

The activities of the public sector have been concentrated mostly on active management of employment problem solution, trying to get political support either in the form of subsidies in to the mining areas by increase of production, or in to the treatment of environmental pollution. The cities have tried to search for new land uses of the former mining areas, including waste dumps and landfills, e.g. for new technology and industrial parks. The problems of environmental devastation are devoted particular attention in the annual statements on the state of the environment in the Slovak Republic and practical solutions of progress in this field belong to the priorities of the Ministry of the Environment.

Elimination of damages caused by mining activities (remediation) is solved in Slovakia in several steps – it is conditioned by character of problems, ecological criteria, but mainly by economic factors. The process includes following stages:

- registration, inventory and evaluation of present (active) mining sites of raw materials - 266 localities,
- complex inventory of old mining sites – this stage was finished in 1997, in total 17 260 localities were registered,
- inventory and evaluation of impacts of all mining sites on environment (on-going project) since 1998,
- preparation of state monitoring of the most risky localities of mining sector (on going project – 20 localities prepared at the end of 2002),
- proposal and realisation of remediation activities (on going project with goal to finish works in 2006).

The processes of rehabilitation covered by the actions analysed in the READY project in mining regions and municipalities in Slovakia pass their kick-off phase. The strategies applied in the rehabilitation process are a combination of different types of strategies. The leading position in all the strategies concerning the real chance to realise the revitalisation projects has got the adaptive strategy as the local sources are very limited and do not allow to realise any from the described projects. The decision making factor has been the availability of the financial sources from the national and EU level. The priorities in the rehabilitation projects have to follow the priorities in the programmes from which the co-financing can be achieved. This dependence influence the sovereignty of the decisions made by the local governments.

Real assessment of the available resources influences the decision between substantial rehabilitation strategies - dealing with the content/approach in the redevelopment itself based on the problem situation, state or art of the functional, physical and social structures in the deprived mining areas. The adaptation as the preferred approach was confronted with the need to converse - replace old structures. Despite of this, there was "extreme" replacement strategy implemented in form of the strategy of re-naturalisation represented by the regeneration of Old River in the Velký Krtíš region.

There were several different approaches chosen among the adaptation strategies:

- Completing – via interventions focused on the completing the functional or physical structure in accordance with the identified lacks and demands on new quality of life in the area, economic activities incl. (e.g. Dolné Strháre and Horne Strháre, Koprovňica)
This approach can follow the quality of social structure as well, in the direction of inclusion of different social groups and achieving appropriate social diversity and coherence.
- Reconstruction and protection – focuses on the renewal and protection of existing structures with the special emphasis on the safeguarding of those of highest values (Modry Kamen, open-air village museum in Dolné Strháre)
- Modernising – using the interventions valorising the existing structure implementing the set of innovations.
- Humanisation / ecologisation – comprehensive strategy focused on the revalorisation of the structures towards improvement of the quality of living environment using the different types of interventions and partial approaches like completing the social and technical infrastructure, modernisation, establishment of new green spaces, etc.

The specific challenge indicated in the partner municipalities of the Project in Slovakia was the attempt to face the decline implementing the combination of the above mentioned redevelopment strategies based on awareness about the relation between the economic decline, decline of physical environment and social distress. Important part of the revitalization process in all partner municipalities has been the stage of the identification of local and external stakeholders as well as the consideration of their role of actors in this process, although the situation of the society development and political culture limited the full development of the participative processes. As the practice form the partner municipalities in the INTERREG III B project READY coordinated by the German city Oelsnitz has shown, three main groups of stakeholders are commonly considered in the relation to the redevelopment process in the old mining areas:

- External decisive group (state, regional and local bodies, local administration and external experts, planning offices, designers, environmentalists, engineers, architects, external investors)
- External/internal influencing groups and subjects (facilities managers, real estate and property developers and development agencies, infrastructure owners or providers of infrastructural services, universities representatives, etc.)
- Local subjects (property owners, local companies, non-governmental institutions, citizen groups and individuals, cultural and educational institutions)



Fig. 1: Open-air village museum in Dolné Strháre
Source: Final report, Slovak Republic 2006 in cooperation with Regional Association for the Velký Krtíš Region - REVITAL and BANSKÉ PROJEKTY, Ltd. Bratislava

The role and activeness of the stakeholders differs from the passive up to the very active position. While the local stakeholders from the decisive group and have usually the active part in the process and influence the revitalization by the means of the negotiations, consultations and

immediate decision in the investment process (permission, decision to invest, etc.), the role of the local communities and NGOs varies from the passive observation to the process, via support to the implemented options up to the activation of local decisive bodies, visioning or implementation.

The mining regions are not identical with any administrative units. (Slovak Republic has only two levels of administrative units – municipalities and 7 self-governmental regions). In some cases have been the public bodies at the level of municipalities leading stakeholder group creating micro-regional association and initiating the development agencies of governmental origin. Important role play the private planning and projecting firms (e.g. Banske Projekty) and academic institutions (e.g. FA STU, Berg-Faculty TU Kosice) initiating and methodically supporting local stakeholders. The creation of public-private-partnerships has not developed tradition.

It is necessary to mention strong personalities from the decisive sphere, participating in many ways in the process. Their role in the partner municipalities has been very positive and supportive for the redevelopment motivating and catalysing the improvement actions and participation in the international cooperation like INTERREG. The involvement of the municipalities in such project is mostly determined by the financial possibilities and personal capacities, which are in the large stressed mining areas very limited and in the reality do not allow the participation "in kind" without the state support.

In general, the role of planners is traditionally important, including the external advisers and the newly including planning and regional development agencies. Very important part of the revitalisation process seems to be external lobbying and positioning for the area.

As the practice from the revitalization processes in Slovak Republic has shown, redevelopment processes in the old mining areas are, in addition to the applied strategies, mostly influenced by the set of internal and external determinants in the structure: legal environment, economic environment, physic-structural environment, social environment, problem situation. The ability of the particular municipality to deal with the governance of deprived mining areas has been always anchored in the overall system of the legal, planning and administrative regulations. Although the systems develop, providing the conditions for the implementation of more sustainable approaches, gaining the new types of knowledge, and applying for a broader support of citizens and various experts, the planning culture seems to play very important role.

To solve the complex of interrelated revitalization problems means to manage the communication between huge number of stakeholders, between experts from different disciplines or sectors, as well as between planners and decision makers, and citizens. The lack of management and planning tools was identified mostly in the field of active intervention at the local level (investment,

subventions, tax and allowance system, etc.), efficient tools for inter-sectoral coordination from the EU-level and national level (avoiding contradictions in the localisation policies), and instruments for the flexible planning interventions. The state pushes the municipalities to develop the strategic plans of social and economic development and land-use plan but the municipalities are not able to follow the rules for their elaboration under very limited possibilities to engage external professional support.

Important issue concerning legal and institutional environment are the conditions for the investment (private capital, joint investments, public-private partnerships), financial flows (bank system, currency, investment protection) and access to the financial sources (e.g. EU funds, private capital, public sources) determined by the legal system and decision-making system. The practice in the Slovak municipalities, partners in the READY project has shown the crucial role of the financial aspects for the redevelopment process. The municipalities in the mining regions and especially the municipalities starving under the transformation process, have in the reality minimum of the possibilities for active policy. Small municipalities have even limited financial and personal capacities to prepare strategy and project proposals for financing from the EU, even when they create micro-regional associations. The intervention from outside seems to be necessary. In case of mining region Velky Krtis the holder of such intervention was a private project firm, which offered its know-how and capacities with the hope to take part in the developed revitalisation projects.

The framework for the rehabilitation process in the old mining areas consists of the proper perception of the situation by the politics at the different levels of decision making, creation of the flexible institutional background for the rehabilitation processes, creation, choice and application of appropriate measures and their inclusion into the more comprehensive re-development projects reflecting the local situation, possibilities and limits, local legal system, assuring the appropriate funding and proper evaluation of the process progress.

The process of identification of the problems, their assessment, definition of their hierarchy and their tackling follows the wide range of approaches, from different forms of scanning and following individual planning experience to central decision-making, with the particular case of the event-oriented rehabilitation.

Decision-making bodies at the higher levels (supralocal) use to be not sensitive enough to begin the scanning and observation of decline of the own initiative and therefore the communities have to signalise the problem situation and initiate the actions and press the politics from higher levels to deal with the problems. This role can be also overtaken by the external forces (foundations, professional organisations, governmental institutions) pushing the local authorities toward more efficient interventions.

The rehabilitation processes and chosen strategies are dominantly influenced by the set of external determinants in the structure - legal environment, economic environment, physic-structural environment, social environment, and problem situation. The perception of the planners is considered in the applied approaches, but sometimes the framework conditions defined for official programmes and actions supported by the EU, national or other institutions (often formulated by the planners) are limiting for the application of the approaches proposed by the planners.

The influence of the legal and institutional environment was identified mostly towards the limitation for rehabilitation strategy development and choice, redevelopment process flow, financing modes, decision-making and management responsibilities in the rehabilitation process.

The decline of the mining industry is mostly connected with the territorially bound social problems. The rehabilitation strategies target immediately not only ecologic problems but more or less social environment and social environment. Reflection of the social environment in the modification of the rehabilitation process and choice of the applied instruments seems to be crucial for the successful rehabilitation process.

Economic environment is leading phenomenon in the decline of mining areas as well as in the their rehabilitation. The influence of the economic environment starts with the rehabilitation area appearance continues by the strategy development and choice flowing into the planning, programming and implementing. Availability of capital, mobility of capital, attractiveness for the investment created by the legal and institutional environment, political environment, transparency of decision making, seems to be important factors for the choice of the rehabilitation strategy, stakeholders involvement, processual and financial management of the rehabilitation.

Physic-structural environment was identified as the matter of the decline, as the matter and potential, and in some cases as the potential for the rehabilitation of the former mining areas. Decision-making is not only the physic-structural environment of the former mining area itself, but the character of the surrounding environment as well. The experience of particular cultural meaning or hosting special exhibitions shows the role of events as the catalyst for the redevelopment processes.

The ability of the particular mining municipality to deal with the deprived areas has been always anchored in the overall system of the legal, planning and administrative regulations but the availability of external capital seems to be crucial factor for the choice of the rehabilitation strategy and approaches. The conditions for the eligibility of the external financial sources for the redevelopment process have been decision making for the definition, or at least structuring of the re-development goals in all Slovak mining cities. This dependence use to be mostly realized via the acceptance of the preferences and goals, defined for

the grant schemes offering financial support for the rehabilitation process. In this way, the overall strategies and goal systems use to be overtaken and implemented into the own rehabilitation strategies or in some cases they replaced own goals and strategies. This cause in particular lower efficiency or even can be misleading for the rehabilitation process in the context of sustainability policies (e.g. the competition of the structure via green field development instead of renovation because the Brownfield redevelopment is not prioritised in the state policy).

All Slovak mining municipalities strive in their rehabilitation projects to assure self-sustaining processes, which can be further developed after the basic interventions and maintained with own resources. This shapes both the goals of the projects and contents. External pressure of the upper level (European, national, regional) as well as the lobbying for the aggressive investments affecting the area should be mentioned. The influence of the funding actions from the European level can be also a factor modelling the rehabilitation projects or programmes. The role of the situation-oriented decisions and flexibility of the decision-making authorities is as important, as the supply of the financial sources from the upper levels. However, it can be stated on the example of the Slovak mining municipalities that the innovation can be possible even without external intervention, although in a very limited way.

The methodologies/approaches applied in the Slovak mining municipalities usually follow the internal logic and very pragmatic orientation applied more intuitively. Among the relevant methods feasibility studies, workshops, brainstorming, SWOT, environmental and economic impact assessments and cost benefit analysis has been found. The chosen approaches are mostly influenced by the required procedures of the granting schemes or by the legally required procedures incorporated into the legal planning system.

Regarding the organisation of the rehabilitation process, the problem of limited personal capacities and need for the "care taker" or the devoted rehabilitation leader, in the form of the selected institution operating on the area, is an important issue. The positive experience from the Slovak mining municipalities that the institution focused on the needs of the rehabilitation process, managing the process in communication and connection to the local administration, but being at the same time excluded from the system of limitations of the municipal services is able to act in the relatively independent way. Rehabilitation processes have their own features and the formulation of the comprehensive methodology can be rather difficult, concerning the particular conditions in each of the examinees mining municipal. There are complex approaches, but the dominant approach is narrow perception of the rehabilitation process, depending on the limited sources and on the specifics of the particular area and its internal differentiation. In order to act with the appropriate flexibility, the differentiation of the actions within the deprived mining area seems to be necessary.

Based on the understanding of decline and rehabilitation of the former mining areas, where the municipalities are not able to start the rehabilitation using own internal power, external interventions are of special importance in the kick off phase of the rehabilitation process, but in most mining municipalities are continual goal oriented interventions (at least passive interventions) the pre-conditions for the sustainability of the redevelopment process of the former mining regions as well.

Passive financial interventions are important for the optimisation of the economic environment and for increasing the attractiveness of the respective area for the investment. Active financial interventions are mostly oriented towards elimination of the old environmental loads, improvement of the infrastructural, transport and social infrastructure and implementation of other measures towards improvement of the quality of living environment and environment for the development of economic activities. Important role in the rehabilitation processes of the mining areas in the decline play the organizational support and institutional support mostly focused on the preparation phase, on the mediation of different interests in the respective area and coordination of the action of different stakeholders. Legal interventions, identified in the researched rehabilitation processes can be classified in two categories - particular measures (restrictions, norms.) and comprehensive measures (planning documentations, planning regulations, legal planning decisions).

Specific problem situation, limiting legal and economic environment and limited access to the know-how led to the differences between the applied instruments and to the development of new innovative approaches. Majority of innovations covers the particular solution of the distress problems in the former mining areas, but some of them targeted the rehabilitation process control. To achieve the goals of the rehabilitation strategy using the diverse financial sources implementation of new instruments and organization methods supporting the administrative simplification of the rehabilitation process management seems to be necessary. Some innovative ideas concern even the philosophy of the rehabilitation process and became show the need to redevelop the national-wide policy. Multi-financing based on public-private-partnership and diverse public sources became mainstream in the operationalizing the rehabilitation strategy.

The analyse of the rehabilitation processes in the Slovak mining municipalities allowed to identify a set of limits, bottlenecks and obstacles in the rehabilitation.

- **Different opinions to the new use of the area** – various stakeholders can have different opinions to the new use of the area. There are not known future users in some cases and the opinions of the current representatives of the users can differ from their imagination. In some cases the municipality prefers also non-commercial

functions (exhibition centre, entertainment and culture facilities, city park) and gives emphasis also to the public space, while the owner of the real estates prefers remunerative uses - such as business centres, shops, and luxurious housing.

- **Unclear ownership relations** - Transformation in the former socialistic countries caused the process of the reprivatization and restitution, leading often to the unclear or unstable ownership relations. In the cities of new EU member states, basic obstacles for implementing the rehabilitation strategies are connected to the ownership issues and the possessed land reserves. This relates not only to historical mining infrastructure, but even newer buildings at the plots with unclear ownership conditions or at the illegally gained plots, presently in the restitution process.
- **Lack of financial sources** – lack of internal economic resources for the rehabilitation in the combination with the restricted access to the external financial resources build one of the most important barrier for the rehabilitation in the old mining municipalities, especially in the new EU member states. The dynamics of the rehabilitation process seems to depend mostly from the outside sources used for the implementation of the rehabilitation strategy, although the success and sustainability seems to be determined by the combination of external and internal sources.
- **Lack of human resources** – often bind with the lack financial resources has several dimensions - lack of specific educated specialists, lack of experienced management staff able to manage the rehabilitation processes, public participation incl., negative demographic development etc. The staff of the municipality is often overloaded by the administrative routine. The potential holders of the EU financed projects are temporary not able to prepare complicated submission forms in English and the service providers in this field are too expensive. Lack of experienced management staff able to animate the economic dynamics in the area, “intellectual drainage” by the national and regional centres and need for the human “outsourcing” for the area, may cause the economic and social failure of the programme, even, if certain funding was invested into the local economic growth.
- **Lack of experience** - combined often with the barriers for the experience transfer like language barriers, administrative staff oriented only at operational management with less skills in the strategy development, lack of strategic thinking ability, lack of the public experience from the active public participation
- **Greenfield competition** on local, regional and national scale - Several national and EU policies

support the opening of new developments on the base of unused land without infrastructure and built-up environment, what sometimes can be more attractive for the investors than the brownfield, due to the costs of the demolitions and removing possible contamination. Lack of tax and administrative preferences can be a reason for the higher competitiveness of the greenfield to the large urban distressed areas in need for new investments. The public and legal interventions are necessary to increase the investment value of the deprived areas.

- **Risk and unprofitable projects** – tensions in the municipal budgets and relative low economic power of private enterprises often do not allow investing into the projects even with the minimal risk or into the financially unprofitable investments
- **Lack of trust** – Lack of trust among the involved parties can be a reason for the failure of the planned partnership and in this way a block in the negotiations on the future uses and development of the area.
- **Instable legal environment** - Rehabilitation in old mining regions is a prospective process with private and public investments of long-term validation. The planning and programming of such process require predictable conditions in the sphere of economics, as well as legislation in the same way, as it is for the competitiveness of the municipality in the investment market. Only in the constant and secure legal circumstances the public-private partnerships can be created with the guarantee of future benefits for the private actors, and their absence can be a crucial issue for the financing of the whole project.
- **Instable institutional environment** - Long-term character of the rehabilitation process in the former mining municipalities requires also the assurance of the continuous effort, independent from the changes in the local political scheme and personal preferences of decision-makers. This continuity can be preserved only by the legal regulations concerning the application of the planned solutions of the previous elected members by the following political group, and by the constituted structures of the specialised professional staff at the municipal institutions, to avoid the dominance of the political powers over the administration and technical implementation.
- **Lack of rehabilitation experience** - combined often with the problems in the experience transfer (language, modern technology and facilities), operation-oriented, under-skilled administrative staff, missing the perspective for the development of scenarios and strategies, can be a barrier for the proper preparation and application of the

redevelopment programme. Ability of strategic, creative thinking and the experience in the active public participation are important features of the project administration and their lack can cause difficulties in the understanding of the internal processes within the renewed area. The municipal professionals are often overloaded, or suffer from the administrative routine and bureaucracy. The potential holders of the EU-funded projects are often not able to prepare complicated submission forms in English, losing in this way a chance for the successful application. Service providers and consultancies in this field are often too expensive.

- **Different visions** on the new development - Various stakeholders can have different opinions concerning the new use of the area. In some cases the prospective visioning is not applied and the opinions of the current stakeholders from their imagination of the projected redevelopment. Typical example here is the situation of the conflict of the municipal vision, preferring non-commercial functions (exhibition centre, entertainment and culture facilities, city park) and emphasising the public space, and the expectations of the real estate developers, focusing on the strictly commercial uses (business centres, shops, and luxurious housing).

The READY project has shown, that the problems of Slovak mining regions are very similar to the problems in the other Central European countries. The outputs of this project show the necessity to urge the responsible bodies of the European Union and the respective nation states to support the difficult process of economic, social and ecological adaptation of mining cities and regions to the post-mining era. Greater attention needs to be given to the problem of regeneration in the mining cities and regions at all political levels and within the framework of international co-operation. The specific requirements following the needs to support the kick off phase of the rehabilitation processes should be explicitly stated in the eligibility criteria of European structural policy as well as in operational programmes at national level. Cross-sectoral strategies are indispensable when handling the complex tangle of problems associated with the termination of mining and support must be given to establishing and implementing such strategies. One of the central results of the READY project is that remarkable synergetic effects are released when local and regional development strategies are integrated with local regeneration plans.

The cross-border transfer of knowledge on municipal and regional revitalisation strategies in former mining areas supported by the READY project has to be continued by the enhanced joint development of solutions for specific problems as the European value-added of the trans-national co-operation.

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Fig. 2: The "Koprovnica" area
Source: Final report, Slovak Republic 2006 in cooperation
with Regional Association for the Veľký Krtíš Region
- REVITAL and BANSKÉ PROJEKTY, Ltd. Bratislava

References

- Finka, M. et al., 2006: **READY Project Final Report** – Slovak Republic, Bratislava
- Finka, M., Petriková, D., (eds.) 2006: **Trajektórie územného rozvoja**, SPECTRA Centre/ROAD, Bratislava
- Grecula, P et al., 1995: **Mineral Deposits of the Slovak Ore Mountains**. Volume I.. Published by Mineralia Slovaca Corporation & the Publishers Geocomplex, Bratislava
- Mineral Resources Of Slovakia*. Ministry of the Environment of the **Slovak Republic & Geological Survey** of the Slovak Republic. Published by the Publisher Geocomplex, Bratislava, 1997
- Slovak Republic Minerals Yearbook 2001**. Ministry of the Environment of the Slovak Republic. Published by Geological Survey of Slovak Republic, Bratislava, 2002
- State Mining Administration Report 2001**. Ministry of Economy of the Slovak Republic and Main Mining Office, Banská Štiavnica, 2002.
- Vrana, K. et al., 2000: **System of evaluation and monitoring of impacts on environment originating from mining activities**. Manuscript. Ministry of the Environment of the Slovak Republic, Geocomplex, Ltd., Bratislava.
- Vrana, K., Vojtaško, I., Žák, D., 1997: **Project of geological task "System of evaluation and monitoring of impacts on environment originating from mining activities"**. Ministry of the Environment of the Slovak Republic, Geocomplex, Ltd., Bratislava.
- Marsina, K., 1999: **Geochemical Atlas of the Slovak Republic – Rocks**. Ministry of the Environment of the Slovak Republic, Geological Survey of Slovak Republic, Bratislava.
- Rapant, S., Vrana, K., Bodiš, D., 1999: **Geochemical Atlas of the Slovak Republic – Groundwater**. Ministry of the Environment of the Slovak Republic, Geological Survey of Slovak Republic, Bratislava.
- Čurlík, J., Šefčík, P., 1999: **Geochemical Atlas of the Slovak Republic – Soils**. Ministry of the Environment of the Slovak Republic, Soil Science and Conservation Research Institute, Bratislava.
- Bodiš, D., Rapant, S., 1999: **Geochemical Atlas of the Slovak Republic – Stream Sediments**. Ministry of the Environment of the Slovak Republic, Geological Survey of Slovak Republic, Bratislava.
- Maňkovská, B., 1996: **Geochemical Atlas of the Slovak Republic – Forest Biomass**. Ministry of the Environment of the Slovak Republic, Geological Survey of Slovak Republic, Bratislava. Forest Research Institute, Zvolen.
- Franko, O., Remšík, A., Fendek, M., 1995: **Atlas of Geothermal Energy of Slovakia**. Ministry of the Environment of the Slovak Republic, Geological Survey of Slovak Republic, Bratislava.
- BP Statistical Review of World Energy 2004** (www.bp.com).
- Mining Annual Review 2003** (CD). London, Mining Journal Ltd.
- The Evidence of Deposits of Non-exclusive Minerals of the Slovak Republic**, state to 1. 1. 2004. Ministry of the Environment of the Slovak Republic, Geological Survey of Slovak Republic, Bratislava, 2004.
- The Register of Reserves of Exclusive Mineral Deposits of the Slovak Republic**, state to 1. 1. 2004. Ministry of the Environment of the Slovak Republic, Geological SUNey of Slovak Republic, Bratislava, 2004.
- Annual Report of Main Mining Office 2003**. Ministry of Economy of the Slovak Republic and Main Mining Office, Banská Štiavnica, 2004.
- Statistical Yearbook of the Slovak Republic 2002**. Statistical Office of the Slovak Republic. Publishing House of the Slovak Academy of Sciences, Bratislava, 2002.
- Finka M., Jamečný, L. 2007: **Sanácia a rozvoj európskych banských regiónov**, In: Človek, stavba a územní plánování II. - Collection of abstracts, Fakulta stavební ČVUT v Praze, Katedra sídel a regionů, ISBN 978-80-01-03704-1