THE COAL MINE REHABILITATION IN JIU AREA

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Abstract

The sustainable development of human society imposed the monitoring above the effect of atrophic actives on environment. Along the time the human utilized the resources without restrictions or minimum measures of environment protection without thinking at the future. The degradation and environment pollution increased in the same time with the civilization.

The transformations on the landscape due to the mine coal exploitation in Europe are through the most important transformation which can be observed to the land surface.

The mine coal exploitation use only temporary some surface land and when the activities are stopped is necessary the rehabilitee of this land.

For this it is necessary to have a rehabilitee plan which should be detailed for the affected areas by the mine coal exploitation. Unfortunately in Romania exist a lot of mine coal exploitation which have stopped the activities and in this case the exploitation have been abandoned without to take rehabilitee measures.

This paper present the specific elements of location in Romania, Jiu catchment area, respectively Danube catchment area, mine coal exploitation correlated with catchment area characteristics. Also will be a study about mine coal.

Keywords: degradation, environment, coal mine, rehabilitation.

1 INTRODUCTION

The coal basin Motru is found in Gorj County and it is placed in the middle water course of the river Motru and its affluents, as it can be seen in figure 1.
After 1953 the area was under research with geological drillings by I.F.L.G.S Bucharest, I.P.G.G., I.P.E.G., and several studies were published and as a conclusion in 1959 there was founded the Coal Mine Corporation with its headquarters in Craiova, having 3 sectors:
- Albeni
- Roșia de Jiu
- Valea Motrului

The sector Valea Motrului began its activity in May 1960, having a number of 30 workers and in August 1960 the first investing actions were started for the mine Horasti. Its activity developed very fast, therefore at the end of December 1960 the mine had at least 400 workers.

In 1966 there was founded I.M. Motru as a consequence to the disbanding of the Coal Mining Enterprise Oltenia. Along the time there took place certain changes in the organizational system and by 1997 there was founded E.M.S. Motru, containing the following coal mines:
- Lupoaia
- Roșiută
- Ploștina
- Horăști
- Boca
- Leurda

By 2008 E.M.S. Motru still has the following coal mines:
- Lupoaia
- Ploștina

The rest of them were preserved, closed and ecologized because of their wrong misfit in the productive system.

The activity developed at the present by E.M.S. Motru is to extract the lignite bellow ground and distribute it to different economical agents. This thing led to an economical and urban development of the city and of all the neighbouring localities.

At the level of C.N.L.O. Tg-Jiu the proportion of coal distribution to different agents is as it follows in figure 2:

![Figure 2 Coal distributions at C.N.L.O Tg-Jiu level](image-url)
The exploitation method adopted is with long direction pylons having a frontal mining. The object of this exploitation method lies in the lignite stratum and the inclination doesn’t surpass the working possibilities of the complexes. The equipment used for the execution of the exploitation workings must be chosen according to: the force of the coal, the resistance of the ceiling and the hearth rocks, the underground waters, the thickness, the nature and the position of the sterile interpolations. In order to obtain a good exploitation it is vital to have continuity for the layer of the coal in the limits of the mining field, also to have dropping out works in the case of the water horizons, and the sterile quantity must not exceed 30% of the total excavated mass. The underground production is transported to the surface and henceforth to the loading places in wagons, using conveyer belts. The coal is sorted after categories before loading. The dimensions should respect 0-80 mm used for thermal power stations and 80-350 mm meant for home consumers. The exploitation of the underground coal produces negative local effects like soil break downs, cracks, soil gliding, rams, sterile and coal deposits with more or less severe consequences for the soil. There are also consequences for the mining exploitation in the underground, like affecting the local vegetation and fauna, it changes the regime of water tables, there are vibrations for the fields around and there are several changes in the landscapes.

2 THE DANGER OF THE DESERTED COAL MINES

Mine arrangements use only temporarily certain surfaces and in the end they need to rehabilitate them after finishing their activities. The best methods also have a detailed plan of rehabilitation for the affected areas but there are also exceptions in many cases where the coal mines were simply abandoned and no prevention measures were taken in order to rehabilitate the area.

![Figure 3 The marking of the deserted coal mines](image)

The danger for these areas with deserted coal mines consists of the following:

Reduced soil crumblings for the areas where there were coal mining galleries (Figure 4)
Figure 4 Reduced soil crumblings for the areas

Large soil crumblings that can be easily seen (Figure 5) or hidden crumblings in the vegetation (Figure 6)

Figure 5 Large soil crumblings

Figure 6 Hidden crumblings in the vegetation

Collapses of the galleries’ ceiling that can happen at any moment (Figure 7)
Figure 7 Collapses of the galleries’ ceiling that can happen at any moment

➤ Many abrupt areas that are unstable and that can collapse at any time (Figure 8)

Figure 8 Many abrupt areas that are unstable and that can collapse at any time

➤ The slopes’ instability (Figure 9)

Figure 9 The slopes’ instability
The lakes created because of the exploitation activity (Figure 10) and also lakes that weren't arranged anymore after the mining activity stopped.

Deserted equipment (Figure 11)

In these coal mines there are also lots of other dangers like:
- Deteriorated beams
- Lethal gas
- Sections with flooded galleries
- Sections with collapsed galleries
- Lots of poisonous snakes

3 CONCLUSIONS

The closing of a mine is the process that must be followed once with the stopping of the mining work and leaving the area. There must be assured environmental stability and safety for the affected areas.
Planning a shutting down in the case of a mine is a process that has to start right from the moments of its development stage.
The closed and rehabilitated mining area must last very long in order to offer other developing alternatives in the future.

**Why is so important changing the destination of the mine and what are its objectives?**

This process must be always integrated in the planning process of the mining activities and it has to cover the entire existing period of the mine.

The factors that contributed to shutting down the mining activities include:
- The finishing of the minerals that could be exploited in economical conditions;
- A change in the market;
- The financial viability of the company;
- The adversity towards the environment.

All the shutting down objectives are meant to prevent or diminish the adversity and impact on long term (physical, social and economical) and to create a stable and lasting form for the next uses of the field.

The factors that we should take into consideration when we chose changing the destination of a mine are:
- The safety of the population in case of dangers and risks;
- Ecological compatibility;
- The possibility of becoming a continuous source of pollution;
- The expectations of the community;
- A next usage of the terrain;
- Esthetics.

**What are the effective benefits of shutting down a mine?**

The effective planning of a progressive implementation of a mine can lead to significant benefits during the mine functioning but also at the end of its activity too.
- A continuous reduction of the responsibility by optimizing the process of rehabilitation for the entire lifetime of the mine;
- Providing a base for rehabilitation costs and to make sure that there are enough financial resources up to the moment of its shutting down;
- Research and rehabilitation projects taking into account the issue of a lifetime in the case of the mine;
- To reduce the double manipulation of the steriles and of the soil;
- To reduce the areas with affected terrains by using them efficiently and to realize a progressive filling of the remaining gaps;
- Identifying the high risk areas and solving the problem immediately;
- Involving the entire staff in rehabilitating the mine;
- Involving the key coordinators, especially the local community in order to rehabilitate the mine;
- Reduce the future responsibilities for the location.

The plans and the financial resources must be up-dated periodically and also there must be taken into consideration the changes made in the project, the monitoring
results, the new requests and other factors that can lead to many changes during the mining activities.

Figure 12 The environmental problems

Figure 13 The re-arranging of the area

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