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MICROELECTRIC POWER STATION- ECOLOGICAL DISASTER ON MOUNTAIN RIVERS

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ABSTRACT: *The production of "green energy", meaning energy obtained from renewable resources, has also become a priority for Romania. According to the European Union Directive, the Romanian state must secure over 20% of the required electricity, using renewable energy sources, by 2020. The legislation therefore permits, financing is abundant, and the country's energy potential is neither fully exploited. This may sound gratifying, but the reality is quite different.*

Keywords: *microelectric power station; environment protection; flora; fish; construction sites;*

During 1896, the first combined hydro and thermal power plant in Romania was put into operation on the Sadu Valley, called Sadu I. The old vertical shaft was replaced in 1905 with a Francis turbine that operated until 1929.

The Microelectric Power Station (MHC) is a hydroelectric power plant with an installed capacity of less than 10 MW and can be used to support a hostel, house or small factory. Most often, however, they are used to support the national electricity grid. They are located along the river, some of the water being diverted through a duct and directed to a coil. The energy obtained can be used in mechanical processes (pumping water) or for an electric generator. An inverter transmits power to the consumer at a voltage of 220 V or to a storage battery for storage.

In Romania there is a high potential for hydroelectric power generation, about 36,000 Gwh/year (Fig. 1). Although it is necessary to develop as many micro-plants as possible, the lack of legislation regulating construction conditions allowed developers of such projects to commit a series of serious crimes, while being protected by well-informed environmental reports and reports to the point and properly grounded [1].

The problem lies in the way in which the river capture and pipeline operations are directed, without respecting the environmental norms in force and modifying the parameters specified in the projects (Fig. 2).

According to the environmental permit obtained for works, it is forbidden to degrade the bed and river banks as well as to modify or reduce the water drainage section. The water drainage channel must be 0.5 meters above the flood rate. It also mentions the prohibition to carry out work during the migration and reproduction period of the fish and during the period of prohibition of trout, loser or lean.

Also, the environmental pollution rules, which specify that the deposition of building materials on the soil, need to be avoided and waterproofing with polyethylene film should be avoided.

Oil leaks from machinery and river spills have been spotted.

Changes to vegetation through abusive deforestation, biodiversity reduction by habitat segmentation and riverbed alteration

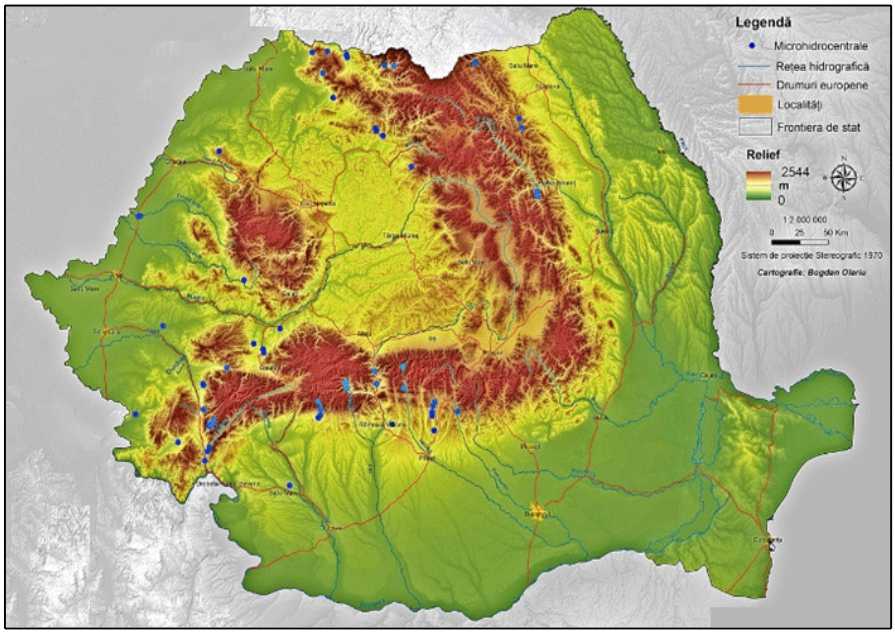

Fig. 1. Map of micro-hydropower projects in Romania

Fig. 2. How to build a micro-hydro power plant

(slope changes, deviation and even obstruction of the watercourse, water loading with sediment and implicitly reduced oxygen) lead to severe changes in the natural environment, impact being devastating.

Once destroyed, the natural environment can be rehabilitated ecologically but never returned to its original form. Therefore, it can be said that any transformation is irreversible and with many, often unknown, consequences on the ecosystem.

The fauna may have the most to suffer. Vibrations and noise pollution remove animals, and in terms of fish fauna, this, given the conditions, is almost non-existent. Nowadays the trout (*Salmo trutta*) is also endangered, being almost impossible to migrate over newly created dams, but also with the impossibility of natural restoration of the species, because the water flow in the breeding area will be insufficient as long as the area more than 90% of the multi-annual average flow of the rivers is captured (Fig. 3).

Fig. 3. Fish affected by pollution

Water is swallowed by the underground pipeline, driven miles on the underground trail, so there is a discontinuity with the natural course of water. A flow of servitude is not clearly delimited, so even the whole water course or the like can be taken over. Even if he left an insignificant "flow of servitude", he does not have the ability to replace the naturally occurring natural stream, which is now absorbed by the huge pipe. To be all the more beautiful, the concrete has a fish scale that has one end on land, on which local fishes interested in wetlands will climb.

The ecological disaster, which threatens to slam the entire Carpathian chain, is paradoxically triggered by green energy sources. As can be seen in the maps presented (Fig. 1, 4), many of the micro-hydropower projects are located in the Carpathians, 26% of the points on the map being superimposed on areas occupied by protected areas, either SCI, SPA or Natural and National Parks . If construction continues in the way presented above, in a few years, these protected areas are no longer relevant, as all valuable and endemic flora and fauna will disappear under the tracks and excavators of the great entrepreneurs, militants of so-called green energy.

In people-inhabited landscapes, natural water courses are becoming less and more fragmented, polluted, more full of concrete (Fig. 5). The natural rivers have been largely killed, their souls are broken down into concrete canals, docks of dams clogged with stinking mud, sprinkled with worn tires, piles of plastic bottles; if anyone ever opens one of those bottles, he will find every one of his balls, saying: “There was an aggressive suicidal species here that was doing everything to destroy the environment in which it could eventually persist”.

With the same amount of electricity produced, a micro-hydropower plant has a 5-8 times greater impact on biodiversity compared to a dam hydropower plant. The "efficiency" of these investments is backed up by avoiding taking into account their impact on biodiversity ... and the culmination of irony, by funding green certificates / perverse subsidies destroying the natural. It is like the "efficiency" of the dictatorial desertion of the Danube Delta and the "rendering of agriculture" of former lands formerly inhabited by sturgeons, fishermen and pelicans. A similar ecological disaster.

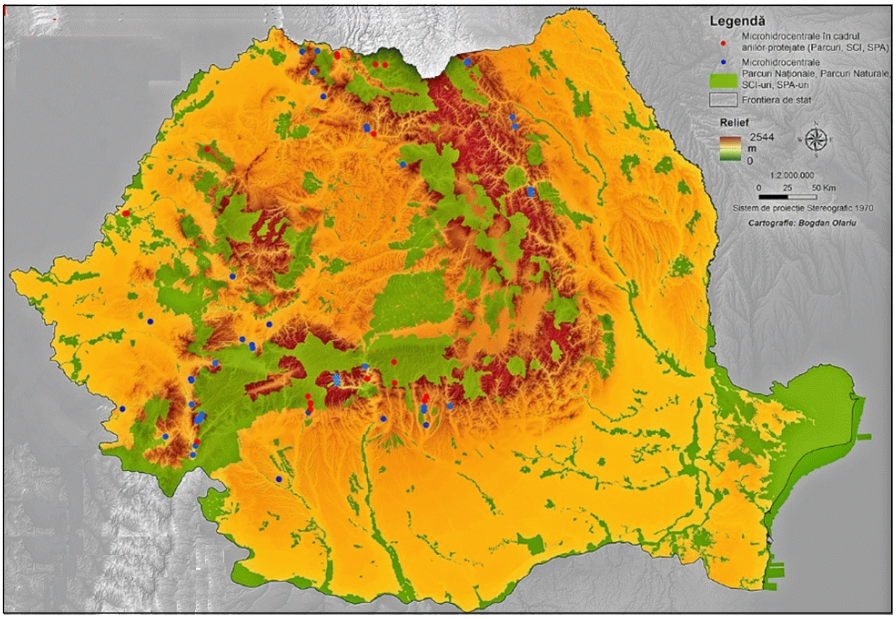

Fig. 4. Map of micro-hydropower projects in Romania
(overlapping on protected areas)

Fig. 5. Construction in riverbed

The entire economic potential to be developed must be achieved. Obviously, the price per kW installed decreases from megapotential to micropotential while the total cost of the investment increases from the micropotential to the megapotential.

Accordingly, the first element to be analyzed is the economic side, taking into account both the indicators and the financial strength of the investor. Regarding the arrangement of the micro-potential for which the investment effort is small, the potential

investor must consider three groups of problems: legal (who owns the watercourse, who owns the land that will be occupied by the arrangement, carrying out negotiations and contracts with the respective owners), economic (cost of investment, operating costs, maintenance, repairs, return price of kWh, for discontinuous or seasonal operations if there are required flows on the river), technical the building of the building objectives and the procurement, transport and installation of mechanical and electrical equipment) [2].

A special problem of small facilities is the danger of clogging the hydrodynamic circuit. If the course of the river is heavily polluted with plastic containers for food liquids (petals) and plastic foils, it is possible that the dump and drainage operations will cost more than the supplied energy. The higher the arrangement and the longer the supply time of the larger grid, the more waste disposal funds will be [3].

Another very important issue is the reliability of the equipment. Frequent and costly repairs are key to the investment's failure. A first tip in this regard is the approach of a company specialized in manufacturing the necessary mechanical, hydraulic and electrical equipment.

On the other hand, the manufacturer must seriously consider increasing the reliability under the operation of the installation with low-skilled personnel. We need to emphasize that often the manufacturer does not have the necessary experience to do so. For an installation that works from time to time with the power of 10 kW, we can not claim the beneficiary to hire mechanics and service technicians. Acquiring the necessary experience at the manufacturer can be achieved by making pilot arrangements to be presented to prospective buyers. The operation of the pilot plant is absolutely necessary for knowing the frequent failures and finding the economic solutions to increase reliability. Our recommendation for potential individual investors is to buy equipment only from manufacturers that can show them pilot installations, give them pertinent operating instructions and ensure that they intervene promptly in the event of an accident. It would be interesting for both beneficiaries and producers to carry out periodic inspections provided by specialized teams under the producer's responsibility. Obviously, for the producer, the organization of intervention teams is a puzzler they fear [4].

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