



The new bridge over Sieu River at Saratel village (Bistrita-Nasaud county, Romania): economic, social and environmental benefits

¹Cornel Costea, ²Claudiu Gavriloaie, ^{2,3,4}I. Valentin Petrescu-Mag

¹ National College "Gheorghe Șincai", Cluj-Napoca, Romania; ² Bioflux SRL, Cluj-Napoca, Romania; ³ Department of Environmental Engineering and Protection, Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania; ⁴ University of Oradea, Oradea, Romania. Corresponding author: C. Gavriloaie, claudiugavriloaie@gmail.com

Abstract. The state and development of the transport infrastructure is the main support for future economic growth in all sectors. There is a reciprocal relationship between the road infrastructure of an area and its economic development. Thus, the construction and maintenance of a good quality road infrastructure have a multiplier effect in social, economic and environmental directions. The county road DJ 172G had an unmodernized road structure, and at km 23+190 the passage from one bank of the Șieu River to the other for cars and animal-drawn vehicles used to be done through a ford, which used to become unusable at heavy rains. In order to improve road traffic conditions on the county road DJ 172G between Sărățel and DJ 154 at the intersection with Șieu River (km 23+190), an authentic road bridge was proposed and built. The construction of the new bridge aimed to increase the economic and social potential by capitalizing on specific local resources (agriculture, industry, tourism, wood processing, handicrafts, etc.). There are numerous benefits, both social, economic and environmental, brought by the existence of this bridge.

Key Words: development, impact, pollution, road, traffic.

Introduction. Rural and urban areas are of particular importance from an economic, social and cultural point of view. Their sustainable development is indispensable in the process of improving existing conditions and basic services, through the development of infrastructure and a favorable legislative framework (Kadarisman et al 2015; Alhjouj et al 2022). The modern concept regarding the economic and social development of an area starts from the premise that the state and development of the transport infrastructure is the main support for future economic growth in all sectors (Larijani 2016; Blume et al 2022; Ametepey et al 2023; de Vera 2023; Viisimaa 2023). There is a reciprocal relationship between the road infrastructure of an area and its economic development. The greater the development potential of an area the more developed is the access infrastructure. Also, economic growth exerts pressure on the existing access road infrastructure and determines a greater need for its development. Thus, the construction and maintenance of a good quality road infrastructure have a multiplier effect, which creates many jobs and boosts economic development (Sari et al 2021; Blume et al 2022). Road infrastructure is a basic element in ensuring the necessary conditions for a decent life (Engstrom 2016) but also for the economic development of rural communities. Inadequate infrastructure is one of the main elements that contribute to maintaining the gap between rural and urban areas and represents an obstacle to the socio-economic development process (Kale et al 2023). Sustainable road network development should meet 3 essential principles of sustainability – to reduce the impact on climate change; on human health and biological diversity (Puodziukas et al 2016; Raharjo et al 2021; Grael et al 2023).

The county road DJ 172G has an unmodernized road structure, and at km 23+190 (Figure 1) the passage from one bank of the Șieu River to the other for cars and animal-drawn vehicles is made through a ford (Rusu et al 2012) (Figure 2). On days when there is heavy precipitation, road traffic is impossible to be carried put.

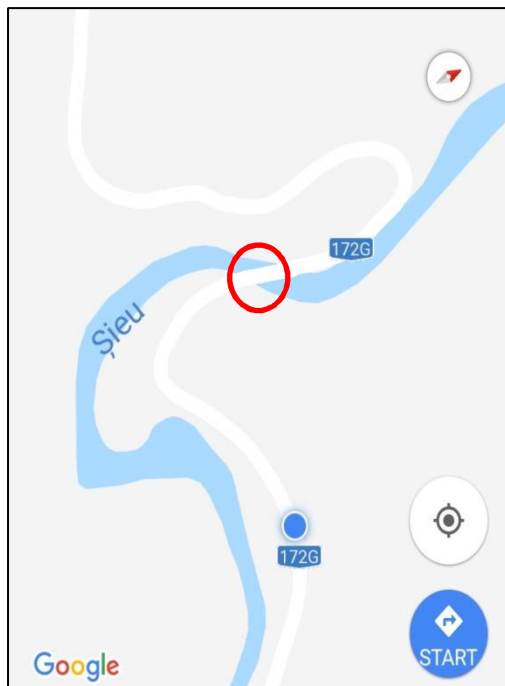


Figure 1. The crossing between the Șieu River and the DJ 172G county road (red circle).



Figure 2. The unmodernized crossing over the river represented by a ford (photo by Claudiu Gavriloiu).

Under the conditions in which the passage through the ford of the county road DJ 172G at km 23+190 would be left in its current state, without intervention on it, the county road and the existing passage through the ford will continue to degrade, in certain sectors reaching technical collapse; the movement of vehicles will take place with increasing difficulty and lower speeds, with increasing operating costs, with increasing travel time, thus the development of the area will be discouraged.

In order to improve road traffic conditions on the county road DJ 172G between Sărățel and DJ 154 at the intersection with Șieu River (km 23+190), an authentic road bridge was proposed and built (Figure 3). The bridge was built having a length of 28.5 m and a carriageway width of 7.8 m, 2 sidewalks with a width of 1.50 m each, and pedestrian safety parapet on both sides. The works comprised: infrastructure works (two reinforced concrete piers, retaining walls and reinforced concrete retaining walls), superstructure (nine prefabricated T-beams, reinforced concrete slab), bridge track (waterproofing, asphalt, access ramps), development of the riverbed and bank defenses. The bridge was inaugurated on October 11, 2023.

The construction of the new bridge over the Șieu stream on the county road DJ 172G aims to increase the economic and social potential by capitalizing on specific local resources (agriculture, industry, tourism, wood processing, handicrafts, etc.), ensuring access to the localities and properties in the area of the county road in conditions of comfort similar to those in the localities of the European Community. At the same time, the works on the bridge will ensure drainage conditions for the waters crossed simultaneously with the protection of the banks upstream and downstream of the bridge, in lengths that allow a long exploitation of the new work, without the risk of the foundations coming out, washing the bed or the ramps of access.



(Source: <https://timponline.ro>)



(Source: <https://timponline.ro>)



Photo by Claudiu Gavrioloaie
Figure 3. The bridge over the Șieu River.

The benefits brought by the bridge construction. Inadequate road infrastructure represents a weak point in terms of the socio-economic development of Bistrița-Năsăud county, discouraging the investments of economic agents, tourism, while also reducing the quality of life. Given the disadvantages of continuing the current state of affairs, the Bistrița-Năsăud County Council, as credit orderer and county road administrator, initiated the project to build a bridge in the analyzed area. There are numerous benefits, both social, economic and environmental, brought by the construction of this bridge.

Socio-economic benefits. These benefits are as follows:

- improving the performance of the rehabilitated/modernized road by reducing maintenance and repair costs;
- streamlining the traffic in the area by increasing the transport speed and crossing the Șieu River in safe and comfortable conditions;
- reducing travel time and saving fuel for car traffic;
- ensuring the connection with the main roads and other means of transport;
- increasing the value of real estate (land and buildings) in the area of the county road DJ 172G;
- ensuring access to properties in safe and comfortable conditions;
- creating new jobs;
- making the area viable, creating a constant demand for leisure, tourism, and other services that will be available to the local workforce by highlighting local tourist attractions and local traditions and celebrations;
- increasing the mobility of tourists, determining a sustainable touristic development of the area;
- increasing the quality of life parameters;
- the possibility of prompt intervention of ambulances and firefighter vehicles;
- making economic agents, tourist areas, and social investments more accessible;
- making other investments financed from accessible European or national funds.

Environmental benefits. These benefits are as follows:

- reduction of the current noxes caused by very low speed car traffic, which leads to the improvement of the air quality;
- the noise associated with low speed traffic will drastically decrease;
- creating the premises for sustainable development by protecting non-polluting natural resources for future generations;
- protection and preservation of the environment in the area of the localities crossed by the county road DJ 172G;
- ensuring the drainage of water through arranged gutters and ditches;
- unclogging and recalibration of the water course;
- improving the local infrastructure to attract investors in the field of agro-tourism;
- pleasant appearance.

Conclusions. The works proposed to be carried out on the county road DJ 172G at the bridge over the Șieu River will lead to the improvement of the level of comfort and safety of car and pedestrian traffic and will have a beneficial influence on the area from social, economic and environmental points of view. Thus, it is expected that, in the medium and long term, these investment will lead to the improvement of the quality of life of the inhabitants of the localities intersected by the county road DJ 172G, from a social and economic point of view, living conditions and the quality of the environment in which they live.

Conflict of interest. The authors declare that there is no conflict of interest.

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Authors:

Cornel Costea, National College "Gheorghe Șincai", Avram Iancu street, no. 33, 400394 Cluj-Napoca, Romania, e-mail: cornel.costea@sincaicj.ro

Claudiu Gavriiloaie, SC Bioflux SRL Cluj-Napoca, 54 Ceahlau Street, 400488 Cluj-Napoca, Romania, e-mail: claudiugavriiloaie@gmail.com

Ioan Valentin Petrescu-Mag, Department of Environment and Plant Protection, Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine, 3-5 Calea Mănăștur, 400372 Cluj-Napoca, Cluj, Romania; SC Bioflux SRL, 54 Ceahlău St., 400488 Cluj-Napoca, Cluj, Romania; University of Oradea, 1 Universitatii St., 410087 Oradea, Bihor, Romania, e-mail: zoobiomag2004@yahoo.com

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