Scientific Bulletin of Politehnica University Timisoara
Transactions on HYDROTEHNICS

Volume 69(83), Issue 1, 2024

SUSTAINABLE DEVELOPMENT IN COMMUNITIES AFFECTED BY FLOODS

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Abstract: The present study pursuits to analyse the impact of the 2005 floods from the Timiş district in relation with the concept of sustainable development. In the first part of the study it's presented the finalization process of the concept of sustainable development,being followed by the presentation of the effects of flooding and some conclusions.

Keywords: development in the countryside, sustainable development, calamity

1. THE HISTORICAL CONTEXT OF SUSTAINABLE DEVELOPMENT

The occurence approach of sustainable development was the result of the awareness of the negative effects which the economic development produced in the social and ecological plan. The end of the '70s was marked by critisism against economical growth which was considered till than the major lever of development. Pollution, soil erosion, deforestation, environmental degradation generally were the most visible costs of economical growth. In the same time, the new demographic growth trends of the planet's population in an unprecedented pace, and also the negative phenomena produced by industrialization and urbanization contributed to the creation of imbalances which seemed to threaten the long-term development chances. The understanding of the effects of development contributed to the integration of the environmental concerns in the generally ones of development , trying so to synchronize the economical, social and environmental objectives[1].

In the World Report on Human Development, the concept of sustainable development has known a final consecration during the discussions of the Conference of Rio de Janeiro, where inter alia, it was outlined the necessity to harmonize the relationship between economical and environmental, as constituent parts of the ecosphere. „ Nothing can be thought from now on in the industrial field, economical field, in the life of the human , in his habitat without an evaluation from the environmental point of view. Only the synchronizing of both factors , the economical and environmental one , can assure a sustainable development". The problem of sustainable development is to harmonize the need of economical and social development, but also to preserve the environment.

The United Nations Conference on Environment and Development adopted in 1992 " The Rio Declaration on Environment and Development", mentioning as main element the fact that " people represent the center of sustainable development concerns, they have the right to a healthier and a more productive life, in harmony with nature"[1].

The Nations present at the Conference have agreed over a sustainable development plan the so called Agenda 21 and over two other sets of principles: The Rio Declaration on Environment and Development and The Forest Principles.

According to the Rio Declaration : " People have the right to a healthier and a more productive life, in harmony with nature; nations have the sovereign right to exploit their own resources, without destroying the environment outside their own borders". Ten years after the adoption of Agenda 21, in 2002 takes place The Johannesburg Summit, in South Africa, to study the progress made to a sustainable development and the participating countries reaffirm their commitment[3]. From point of view of pioneership, the European Union is the main supporter of sustainable development implementing this concept to all its policesand actions[3].

Considering the entire system of elaboration of polices and of funding in theEU at local level but also the necessity of cooperation between the economical, social and environmental sectors the closest definition to sustainable development is : „think global and act local".

From the Romanian Perspective , „local" means largely the countryside in the context of the existing development gap but also from the point of view of historical evolution.

The sustainable and economical development of Romania means largely also the development of the countryside compared to its vulnerability to different factors.

In the present study we want to present a major event, which changed the way of economical development in the Banatian countryside, the 2005 floods.

The bond of these floods with the Rural Economical Development and the Sustainable Development is fundamental, both in terms of the economical and social impact of the flash flood, as in terms of the measures and prospects of development taken by the community after.

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2. THE HISTORY, THE DAMAGES AND THE MEASURES TAKEN DURING THE 2005 FLOODS

The first flash flood was recorded between the 15th – 19th April 2005 and was triggered by the rainfalls which had values between 60-80 mm in the upstream basin of the Bega and 35-50 mm in the upstream basin of the Timiş, while in middle part and downstream of both hydrographic basins the values of the rainfalls oscillated between 10-30 mm. To these amounts of water were added those from the melting of the snow from the Ţarcu – Godeanu Mountains, respectively an equivalent which oscillated between 169 mm at the Cuntu Meteo Station and 473 mm at the Ţarcu Meteo Station.

In the evening of the 18th April 2005 it has started to rain again, and for two days rainfalls occured which had values from 35 to 95 mm. In the mountain area snow had fallen. Consequently, a new flash flood occured which had superior values than the first one. In the border area, the second flash flood partially overlapped the first one, so that these levels have overcame the defense shares, those exceeding had at the maximum rate the values presented in table 1., the exceedings front of the projected rate are shown in table 2[4].

Tabel 1. Values of exceeding at the maximum quota

Hydrometric station	Registred quota	Exceeding
Şag	600	+ 150 cm F II
Cebza	714	+ 114 cm F III
Rudna	922	+ 122 cm F III
Gad	1036	+ 161 cm F III
Grăniceri	1080	+ 180 cm F III

Tabel 2. Excceding in comparison with the projected rate of the dams

Hydrometric station	Excceding	
	Left bank	Right bank
Şag	+ 15 cm	+ 35 cm
Cebza	+ 35 cm	+ 16 cm
Rudna	+ 48 cm	+ 11 cm
Gad	+ 28 cm	+ 36 cm
Grăniceri	+ 58 cm	+ 41 cm

The cause of the unleash of the flash floods in this period were the conjugation of natural phenomena as a high amount of rainfalls came down within 24 – 36 hours on the entire Banatian plain (60-95 l/m2) and the melting of a significant amount of snow accumulated in the mountain area (Ţarcu, Cuntu Mountains equivalent to rainfalls of 169 - 473 l/m2), plus a soil suprasaturated with water due to earlier rains.

Between the 15th – 19th April 2005 the first flash flood was registered on the Banatian rivers, which had destructive effects on the rivers Caraş - Vărădia and Bârzava – Gătaia, maximum levels have been registered which overcame Phase III of defense. Although preventive measures against overflowing were taken (raising de dam with 2 -3 rows of sand bags, water couldn't be hold back and it overflow the additional protection works on a length of 2 km, then the dam broke upstream the Gătaia bridge and 2 breaches appeared and as a result the village Sculea was flooded.

Due to increase rainfall, between the 19th – 22th April 2005 a second flash-flood wave produced which partially overlapped the first one, greater as the first one, maximum rates were registered on the Bega and Timiş rivers. The attenuation of the flash-flood waves with the help of the hydrotechnical works and the increase of the transport capacity of the riverbeds by raising the dams in their critical points with sand bags was not enough to avoid the overflow of the defended enclosures.

The massive discharge over the river crest, within approximately 3 hours, had as an result an accelerated erosion and breaches appeared on the right bank of the Timiş river, and from Crai Nou and Grăniceri on, the entire area between the Bega canal and the Timiş river was flooded. (fig.5.8. and 5.9.). And so the localities of Foieni, Cruceni, Otelec, Ionel were profoundly affected. The flood volume registered in 2005 on the Timiş river exceeded 2.5 times the flood volume registered in 2000 on the same river. The levels reached have exceeded by far the projected rate of the dams (it overcame the II defense phase up to 58 cm). A first estimate of the volume discharged through the 2 breaches show that about 250 millions cubic meters of water got in the enclosure defended by the right dam of the Timiş.

Another cause of the fooding is represented by age of the hydro technical works in the Timiş-Bega basin. Their execution was conducted over a period of 200 years, the first works have been started around 1759. The specialists of the Romanian Water Authority indicated that the dams are outdated from technical and functional point of view, and from this cause they have broken.

The measures taken by the specialists to mitigate the floods were performed in 2 steps. The first step was to close temporarily the two breaches in order to remove the water from flooded areas and the second step was to start, practical, the most important work : rebuilding the dams by organizing auctions, according to legal provisions in force.

The data of the Sanitary Veterinary and Food Safety Direction Timiş show that their were vaccinated as followed:

- from 2.175 cattle 1.853 (85%) have been vaccinated, the difference of 322 are in physiological state or are under the age of vaccination;
- from 559 horses 521 (93%) have been vaccinated, the rest is under the age of vaccination or are in advanced pregnancy;
- from 20.969 sheep 19.179 (91%) have been vaccinated, the difference is under the age of vaccination;

Measures taken to prevent outbreaks of infection were :

- collection of dead animals, which died after drowning, by the members of ISU Banat, veterinarians

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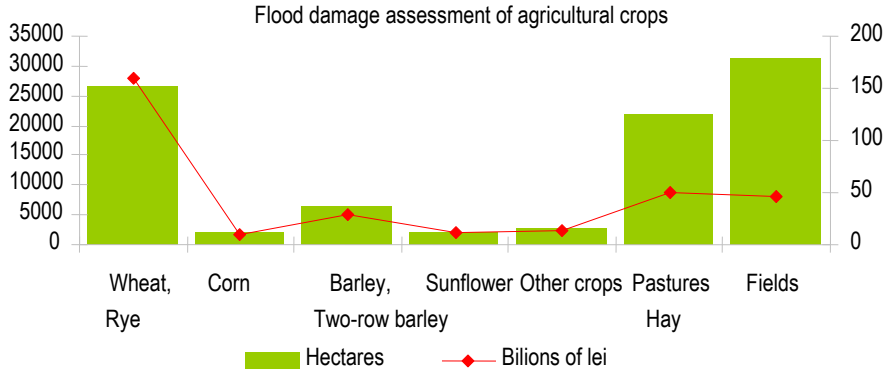
and veterinary technicians, students of the FMV Timişoara, volunteer teams

- deposit of dead animals in containers
- buying and sending dumpcarts for storage of dead birds and small animals
- opening in each town hall in the territory affected by the floods registers daily mortality in animals
- transport and destruction of corpses at SC COMPROTEINE SA Timişoara under veterinary control
- collection of all foods of animal origin from the households under water and without electric power in containers for rendering and destruction
- reactivation and updating antiepizootic local headquarters Foeni, Peciu Nou şi Uivar.

From the economical point of view the floods were serious affecting in varying degrees a number of 52 localities, respectively 16% from a total of 324 as there are in the county . The most are located along the valleys of the Timiş and Bega, respectively : 29 localities in the Făget area on the Bega river; 9 localities in the Lugoj area on the Timiş river; 4 localities in the Topolovăţu Mare area on the Timiş şi Bega rivers; 3 localities in the Recaş area on the Cherteamoş river; 11 localities in the Sacoşu Turcesc area, on the Pogăniş and Şurgani rivers; 2 localities in the Timişoara area on the Bega river; 15 localities in the Foieni area on the Timiş and Bega rivers; 17 localities in the Gătaia area on the Bârzava and Moraviţa rivers and other 4 isolated localities .

Housing stock was affected in a very large proportion: 3876 houses were flooded, 739 proprieties destroyed,1934 damaged and 2568 households flooded[6].

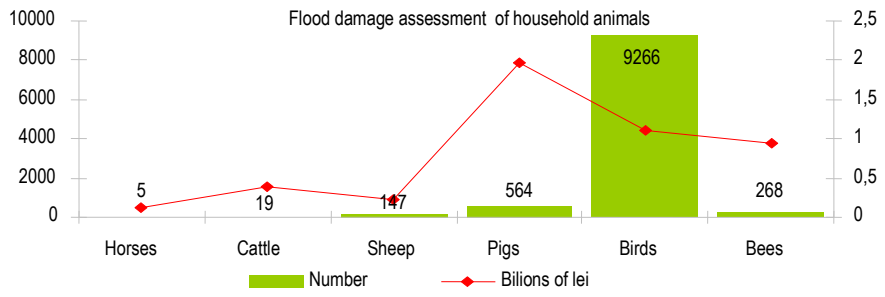
The floods caused significant damages. From the data of the Timiş County Inspectorate for Emergency Situations results that a total area of 92.456 ha was flooded, from which 39.432 ha were crops, 21.744 ha pastures, hay and 31.280 ha other agricultural land.



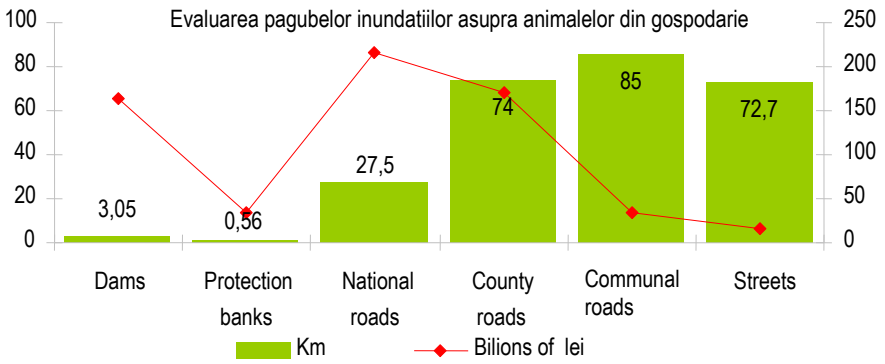
From the data of the Sanitary Veterinary and Food Safety Direction Timiş we can see that 479 animals died during the floods. The animals which have died and the destroyed crops show the diverse rural economy of the area.

In the Infrastructure Domain the following effects have been reported: 96 damaged footbridges, 47 damaged bridges, 31 flooded communal streets, 40 km of damaged National Roads and 22 km flooded, 70 km of damaged County roads and 20 km flooded, 81 km of damaged communal roads,and 8,7 km of flood damaged rail road and 12 km flooded.

From the data provided by SC Electrica SA, Timişoara Branch, these damages appeared : 994 damaged electrical connections following the collapse of the flooded houses, 33 flooded transformers etc.



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Those losses are added to the deterioration of dams : 400 m on the Bârzava river at Gătaia, 300 m on the Timiş river at Giulvăz, 400 m on the Timiş river at Foieni, 250 m on the Timiş river at Găvojdia, 100 m on the Bârzava river at Birda, 750 m on the Timiş river at Lugoj, 1.650 m on the pe Bega river at Margina, 100 m on the Timiş river at Ciacova. There were damaged 5 pumping stations at Giulvăz, Foieni, Banloc and Uivar and 2 non-permanent accumulation at Brestovăţ.

3. CONCLUSIONS

From the economical point of view it's obvious from those presented until now that the damages were significant. What is difficult to estimate is related on how much it will cost, to recover those strongly affected areas, from the economical point of view, in a manner that assures their sustainable development and if these investments are economically on long-term justified.

The Rural Economic Development in the flood affected areas should also respond to a sustainable need, otherwise the investments that will be made, will not be productive and will not maintain a critical mass of population in the area that can assure the future of the community.

Without arguments of this kind, the investments that will be made will have just a psychological function and not an economical one.

From a strategically point of view other flood prevention measures are necessary through:

- Rehabilitation of the existing works and the development of new works to defend the natural environment and those should be build to defend against floods;
- Raising public awareness regarding how intervention are to made and what actions have to be taken in case of dangerous weather phenomena (cloudburst, heavy rain, ice bridges on watercourse etc.);

Supporting the construction of controlled flooding areas to avoid flooding residential areas.

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