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GEOECOLOGICAL RISK OF EROSION PROCESSES IN THE BULGARIAN PART OF THE DANUBE

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ABSTRACT

The river bad is subject of permanent reversible and not reversible changes in nature conditions. The reversible deformations depend on the nature of the river flow and opportunity to support correspondence between quantity of moving sediments, transport capacity of the river flow and granulometric contents of the river bad sediments.

The not reversible deformations in the upper part of the river flow are manifested in river bad erosion, and in the low part of the river flow – in sediment accumulation.On the base of multiple studies are determined the "critical section" of Bulgarian part of Dunabe river. The analyze of the existing erosion processes in Danube River shows that it is necessary to be done a systematical study works and full mapping

The erosion processes in Dunabe River are element of the river bad processes. In this report we do not discuss the Dunabe River hydrological regime in our section. The existing observations clearly show that the period of reduced river flow depending most of all from the global planet warming up. The changes of river bad processes during last years in terms of erosion increasing are caused by setting up of hydrotechnical junctions "Jelezni vrata 1 and 2". These facilities detain huge quantity moving sediments and almost all river bad sediments. This is the reason for increasing of river bad erosion and riverbanks erosion. The river bad processes in Bulgarian section had been object of repeatedly studies. The first study made comparison of the existing maps from 1908, 1936 and 1966. This study gives the erosion processes in nature conditions.

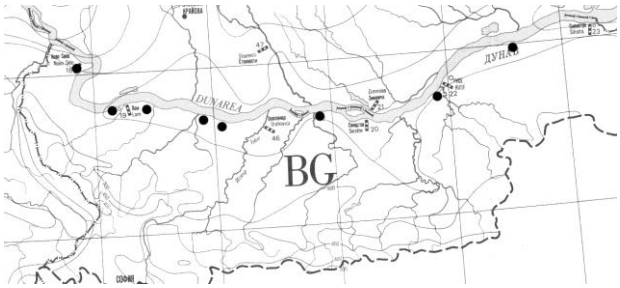

Figure 1. Risk points in the Bulgarian part of the Danube river

Later were made studies for river bad erosion processes by General Staff ,Troian and Russe and Transproekt /1998/.

On the base of this information are determined the following "critical sections":

803 – 805 /Timok – Slanotran/ – the river bank is stable – the bad is eroded and "paved" - as far as fine river bad sediments are taken out and only the bigger sediments are remained. There is riverbank erosion where the riverbank is composed of clay fractions.

803 – 791 /Slanotran – Vidin/ The section is before Vidin' valley. The erosion processes affecting the river bad and bank continue. Considerable quantities of filling agents are taken out. First critical section required protecting facilities and detailed observations.

791 – 723 /Vidin – Staneva/. From km 789 – 770 existing some erosion. From 776 – 774 the river bank erosion is strong and have to be made detailed observations and some protection.

723 –713 /Stanevo – G. Tziber/. This is a critical section according to all indexes. The section borders on danger river bank landslides / 715 km/. This is the second critical section who required strengthening.

713 – 634 /G. Tzibar – Iskar/. In section 657 – 655 exists strong erosion. There is erosion in some sub-sections too. Additional studies have to be made.

634 – 604 /Iskar – Olt/ This section is before Karaboazka vaelly. There are several sections with comparatively light erosion and one section /609 km/ with strong erosion. This section is with active River bank erosion. There is river shoots in km 616, where dragged activities are made. This is the third critical section, requiring engineer protection.

604 – 540 /Olt – Yantra/. Here in the past was marked active erosion. Now the active erosion is observed in section 567 – 559 /in section of shoots Belene II/.

540 – 530 /Yantra – Batin/. The erosion exists from km 539 – 537. This is fourth critical section. The strengthening activities were made from "Transproekt'.

530 – 489 /Batin – Russe/. The river bank is stable.

489 – 479 /Ruse – Sandrovo/. There are active river bad processes. Regardless of the strengthening measures in Marten, the river bank erosion is observed in km 487 – 484. This is the fifth critical section. In all sections have to be made additionally studies. There are some measures taken by Romanian part /shoots in channel of island Marten, steering facilities before Gjurgevo bridge and ets./.

479 – 457 /Sandrovo – Oriahovo/. The section is before Brashlanska vaelly. The erosion in this section is not very well studied.

457 – 438 /Oriahovo – Tutrakan/ - The sixth critical section. The midstream is changed his position around the islands Goliam Brashlian and Vajetaria. Supporting of both shoots impact to the river bad processes.

438 – 408 /Tutrakan – Popina/. Data show active erosion. An additional study is necessary.

408- 398 /Popina – Vetren/. Seventh critical section. The location of midstream, the existing of river shoots and geological type of river bad create conditions for active erosion. The engineer protection here is indispensable.

398 – 375 /Vetren – Silistra/. Eight critical region from 391 – 382 km. The section has to be studied and the dynamic of the processes should be seen.

The river bad is subject of permanent reversible and not reversible changes in nature conditions. The reversible deformations depend on the nature of the river flow and opportunity to support correspondence between quantity of moving sediments, transport capacity of the river flow and granulometric contents of the river bad sediments.

The not reversible deformations in the upper part of the river flow are manifested in river bad erosion, and in the low part of the river flow – in sediment accumulation.

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On the base of multiple studies are determined the “critical section” of Bulgarian part of Dunabe river. The analyze of the existing erosion processes in Danube River shows that it is necessary to be done a systematical study works and full mapping, together with Romania for our part of Danube river

The study on the river flow and comparison of the new mapping with the existing has to be made. Only such kind of approach may give an security for the necessary measures for protection of river bank and river bad. Such mapping is necessary as well for determining the river midstream and boundary line between Bulgaria and Romania. The fourth mapping documents for Dunabe river is being late. The new bridge “Danube 2” may create some problems without existing of such kind of documents. We have not forgotten, that the biggest changes in Danube river in our section are after the Danube bridge I.

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