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MONITOR II –WP5 – Practical Implementation



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Contents

1	Work Package WP 5_5.1 Contingency Plans	4
1.1	Requirements according Directive 2007/60/EC	5
1.2	Requirements according Bulgarian Legislation.....	5
1.3	Flood risk management plans.....	11
2	Work package WP 5_5.2 Elaboration and update of the flood risk maps.....	12
2.1	Process of flood risk maps elaboration	12
2.2	Discussion of the flood risk maps in Zlatigrad	14



Attachments

- | | |
|----------------|--|
| Attachment № 1 | Emergency plan for Varbitza River |
| Attachment № 2 | Risk maps showing the water depth |
| Attachment № 3 | Risk maps showing the threatened population and industry |

List of Figures

- | | |
|----------|--|
| Figure 1 | Connection between monitoring and emergency activities |
| Figure 2 | Proposals with Measures for flood risk mitigation in the watershed of Varbitza River |
| Figure 3 | Schematic process of risk map elaboration |



1 Work Package WP 5_5.1 Contingency Plans

For the elaboration of Contingency plans it is very important the connection between people to be understood as well as the connection between processes. It is also necessary special attention to be given to flood risk management and to the measures that could be undertaken in order to overcome with the natural disasters. Contingency plans are very important instrument for effective flood risk management.

Contingency plans usually include:

- Scope of activities of the plan
- Description of the administrative structure and responsibilities
- Available resources
- Flood risks in the area
- Risk elements and their vulnerability
- Special situations, scenarios and measures (usually repeated for each scenario):
 - Monitoring
 - Communications
 - Protection, saving and support
 - Assessment and documentation

Monitoring and warning

The warning is based on the information received by the monitoring and on the additional model use for weather prediction in the near future. The connection between monitoring and actions are given in Figure 2.

Figure 1. Connection between monitoring and emergency activities

SITUATION	DESCRIPTION
Normal situation	Use of standard system for monitoring (water level measurments, weather



	forecast)
Situation – increased attention	Increase the attention to possible risk situations. Intensive use of standard systems for monitoring
Situation before signal	Beginning the monitoring on site. Start of emergency duties (24x7)
Situation – signal	The emergency administrations are warned and ready for actions
Emergency situation	Starting of emergency activities and applying measures for protection

In our country as well as in other European countries Continuous situation awareness systems are established for the purposes of use of monitoring and warning.

1.1 Requirements according Directive 2007/60/EC

Directive 2007/60/EC is important part in the European water legislation. The directive covers all types of floods. The directive foresees several steps to be undertaken from each member state. It includes three main periods – for preliminary flood risk assessment, for preparation of flood risk maps and finally – elaboration of Flood risk management plans.

1.2 Requirements according Bulgarian Legislation

The main normative documents that define the purposes, priorities and tasks for protection during disasters, as well as the competent authorities, are:

- Water Law
- Law on disaster protection
- National Programme for disaster protection 2009 -2013

From the beginning of the project in February 2010 till now, the Water Law is amended 4 times and this is mainly in the part for Protection of the population from the adverse water impact. According to the law the protection from the adverse water impact is operative and permanent.

MONITOR II – WP5: Practical Implementation



The necessary measures that are considered to be as a main priority in the National Programme for disaster protection are:

- Construction of engineer equipment for flood protection;
- Elaboration of Early Awareness system;
- Undertaken of planning measures for territory management;
- Undertaken of measures for clearing the river beds from the waste materials and maintenance of the natural flow capacity of the rivers
- Population preparedness for actions during floods and increasing the public awareness
- Coordination and cooperation between all management levels (national, regional, local) of the uniform safety system;
- Increasing the insurance mechanisms as resources for decreasing of financial risk in the flood threatened areas;
- Elaboration of special cadaster for the risk factors that have impact on the cultural heritage;
- Elaboration of System for education of specialists in the area of protection of cultural

The Varbitza water shed is deforested. The Varbitza river bed is destroyed on many places because of use of construction materials (inert materials) without permission and control. Taking into account the existing situation, as well as the Varbitza river terrain topography, it is easy the most widespread floods to be identified – unexpectedly, torrent, caused by heavy rains or combination of snow melting and rains. The measures for flood risk reduction could be divided on the following:

- Measures before flood – preventive measures
- Measures during flood
- Measures after flood

According to their type the measures could be divided:

- Technical
- Ecological
- Administrative
- Legislative

MONITOR II – WP5: Practical Implementation



The preventive measures give the biggest possibility for flood risk management.

The Proposals with Measures for flood risk mitigation in the watershed of Varbitza River are given in Figure №2.

Figure №2. Proposals with Measures for flood risk mitigation in the watershed of Varbitza River

MEASURES FOR DECREASE OF FLOOD RISK			
	Before flood	During the flood	After flood
TECHNICAL	<ul style="list-style-type: none"> - Forestation of slopes esp. in the upper flow of Varbitza river - Construction of appropriate river corrections in the settlements - Construction of protection engineer facilities - Construction of retention reservoirs - Clearing of the river beds 	<ul style="list-style-type: none"> - Monitoring and control of technical facilities in order to take effective measures for protection of the population 	<ul style="list-style-type: none"> - Clearing of the river beds from the waste brought by the floods / torrents - Check of the technical facilities and if necessary undertake measures for reconstruction - Continuing with the measures for slope forestation
ECOLOGICAL	<ul style="list-style-type: none"> - Creation of possibility for restoration of the former existing flooded/wetland areas - Creation/ restoration of the possibilities for the river to have more meanders; - Using the flooded areas as pastures with aim of reducing the negative impact of eventual flood on the agriculture production; - Preparation of environmental 	-	<ul style="list-style-type: none"> - Preparation of assessments about the ecological damages in the flooded areas - Using of the existing plans with measures for ecological balance restoration

MONITOR II – WP5: Practical Implementation



	<p>assessment for all activities in the threatened territories</p> <ul style="list-style-type: none"> - Prevention increasement through use of insurances 		
ADMINISTRATIVE	<ul style="list-style-type: none"> - Elaboration of Risk maps - Elaboration of Emergency plans - Development of CSA (Continuous Situation Awareness) system - Increasing connections with public - Restriction of the illegal use of materials (inert) from the river bed through administrative penalties - Fines for using the river bed for waste disposal 	<ul style="list-style-type: none"> - Receiving without delay information about water condition in the Varbitza river watershed - As early as possible warning activities and actions during the flood events in order to eliminate the victims and decrease of damages - Communication and coordination between rescue teams and all interested stakeholders 	<ul style="list-style-type: none"> - Preparation of Assessment of the adequate of used flood protection measures and undertaken of actions for change/ improvement of the existing documents – Risk maps and Emergency plans
LEGISLATIVE	<ul style="list-style-type: none"> - Undertaken of territory management measures – elaboration of territory management plans, which strictly 	-	<ul style="list-style-type: none"> - Preparation of Assessment of the used law measures and if necessary – proposals for changes

MONITOR II – WP5: Practical Implementation



	<p>show restriction and prohibition of construction in potential dangerous flood areas</p> <ul style="list-style-type: none">- Elaboration of additional law mechanisms for restriction of flood threat		
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1.3 Flood risk management plans

It should be foreseen that the Contingency plans that will be elaborated under the MONITOR II project will include activities and measures, which should be undertaken if the disaster occurs, while the Flood risk management plans according to the Directive 2007/60/EC should be more detailed and should include:

- prevention activities – before flood occurrence;
- activities, that should be undertaken during floods;
- activities for recovery – after flood;

In the present report as Attachment № 1 and on the basis of German guidance for elaboration of flood risk maps, we present as a first draft of Contingency plan for Varbitza river. The plan is also taking into account the main requirements of MONITOR II project. The plan consists of only the main parts and in addition there are some measures proposed that should be included in the plan.



2 Work package WP 5_5.2 Elaboration and update of the flood risk maps

2.1 Process of flood risk maps elaboration

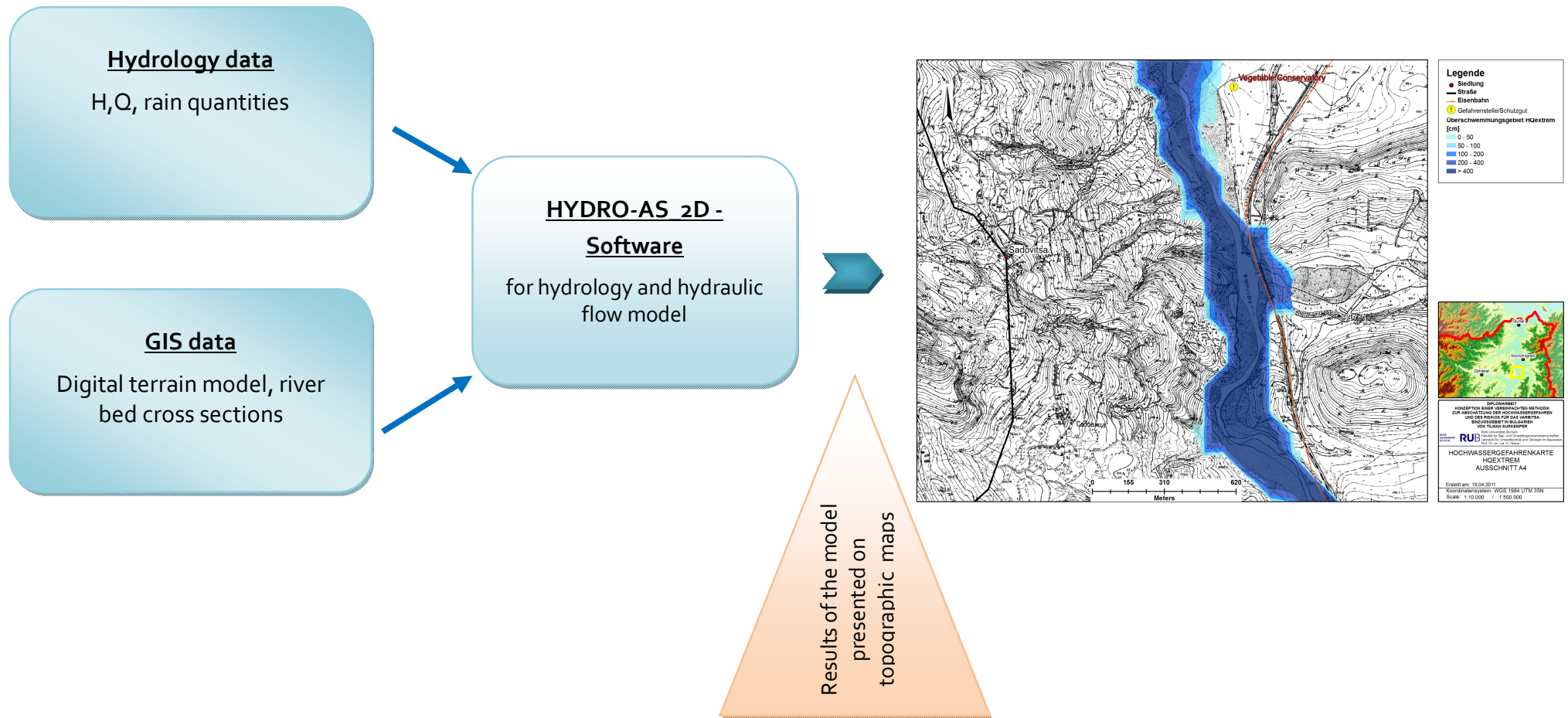
In this project period we continue with the execution of tasks according risk maps. Through the presented in the previous report model HYDRO_AS – 2D and methodology for model execution it was clear that in Varbitza river watershed there are several danger zones, in which the flood risk is very bigq as well as the damages after eventual flood. The process of flood risk maps elaboration is shown on Figure N°3.

In the areas where the risks were identified as big, except the risk maps with values of the water levels, maps with numbers of threatened population and type of industry were also elaborated. On the second type of maps the economical activities were shown with different colours. The max river flow was used for flood risk maps elaboration.

The flood risk maps with water depth are presented in Attachment N°2 – there are 5 risk zones. In Attachment N°3 for the same 5 areas there are risk maps, which present the threatened population and industry.

Figure №3: Schematic process of flood risk maps elaboration

Flood risk maps



2.2 Discussion of the flood risk maps in Zlatograd

The first draft flood risk maps were presented on a regional seminar with subject "Practical use of monitoring in natural disaster management" that was held on 22.06.2011 in Zlatograd. Representatives of the Executive Agency of Forest as well as stakeholders from Zlatograd and Momchilgrad took place.

All of the activities that were done for the project were presented on the seminar. The presentation started with the analysis for the information sources and interested stakeholders taking part in disaster management. Special attention was given to the existing data and Varbitza watershed information, which are store in different administrations, and are also very expensive. That's lead to difficulties in hydrological model elaboration. First draft flood risk maps with water levels as well as maps with threatened population and industry were presented.

For elaboration of the model and flood risk maps the existing river corrections were not taken into account. That's why the results for Zlatograd show big and deep flooded areas, which is not the reality. Based on the simulations five areas were defined as areas with high flood risk. The first is Zlatograd. The second is close to Zlatograd. The third is close to the village of Stareishino. The fourth is close to village of Sadovitza and fifth – close to village of Balabanovo.

For the town of Zlatograd the risk area is around 160 m (from both parts of the river around 80 m). The threatened areas are areas around hospital, school, the building of municipality, as well as living houses. It could be expected that the roads first class between Smoljan - Zlatograd and Zlatograd – Kardjaly are flooded up to 1,0 m. More than 1500 people are at risk. The agricultural areas which are situated near the town could be also flooded. The expected water level is more than 4,0 m.

The second risk area is situated along the river immediately after the town of Zlatograd. A lot of industries could be affected in flood situation. The width of the expected flooded area is also around 160 m. Two gas stations, shops, autoservice, dress factory and factory for furniture production are threatened. Agricultural land could be also affected.



In the third area – near to Stareishino village, one drinking water pump station is at risk. The railway station Podkova and part of the railways are also threatened. The area that could be flooded has width around 900 m. The population threatened – 10. All agricultural land could be destroyed. In this area if there is flood the risk of termination of drinking water supply would be very big.

In the fourth area near Sadovitza the railway is at risk, as well as green-houses, agricultural land and forest. In this area the width of eventual flood could be more than 300 m.

The risk of floods will affect drinking water pump station, national roads, railways and agricultural lands in the fifth area. Except the depth (which is expected to be between 2,0 and 4,0 m), the width of the flooded areas could be achieved more than 400 m.

Special attention on the seminar was given to the maps, which were elaborated on the topographic maps given by the Cadaster agency. It becomes obvious that the topographic maps are old and they do not show the already constructed protection facilities.

After the discussion the following conclusions and recommendations were given:

1. For elaboration of the final flood risk maps the existing protection facilities to be taken into account.
2. During the elaboration of the Contingency plans, the data from the Ministry of regional development and public works according the population and main economic activities to be taken into account; the routes for evacuations to be proposed
3. On the base of forestry management plans analysis to be made including measures against erosion and measures for forestation in order to decrease flood risk
4. The project results to be used for preparation of proposals for the applicability of the existing information for flood risk plans and maps elaboration.

There was a proposal special preventive measure to be written in the Contingency plan proposal.



ATTACHMENT Nº 1

CONTINGENCY PLAN FOR VARBITZA RIVER



ATTACHMENT Nº 2

FLOOD RISK MAPS WITH WATER DEPTH DURING FLOODS



ATTACHMENT Nº 3

FLOOD RISK MAPS WITH THREATENED POPULATION AND INDUSTRY

MONITOR II – WP5: Practical Implementation



REFERENCES

1. www.monitor2.org/index.php?option=com_docman&task=doc_view&gid=178&tmpl=component&format=raw&Itemid=24 - MONITOR II – New Methods for linking hazard mapping and contingency planning
2. Directive 2007/60/EC