

CONTINGENCY PLANNING ORIENTED HAZARD MAPS

NEW IDEAS AND LESSONS LEARNED WITHIN THE MONITOR II PROJECT – SLOVENIAN EXAMPLE

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ABSTRACT

As project partners of the SEE project MONITOR II two Slovenian institutions were given an opportunity to assemble some good foreign examples and contribute their own knowledge and experience in the field of contingency planning and hazard mapping. MONITOR II project aims at improvement of information provision for disaster management by developing a common methodology of hazard and risk mapping and elaboration of contingency plan. Slovenian project partners found their role within MONITOR II project in improvement of some aspects of crisis management practice in their own country. This consequently brings new ideas and results, which can enrich common MONITOR II achievements. Since the biggest deficiencies in Slovenian crisis management (covering flood hazards) were recognised in contingency planning on the municipal level the focus of Slovenian project partners lays there. A new approach by using intervention maps and an information tool is considered as a support for decision making.

Keywords: contingency planning, hazard mapping, intervention maps, protection strategies, natural hazards, floods, flood scenario, disaster management, protection and rescue plans, database, information tool

INTRODUCTION

In the past decade the world has been confronted with numerous severe natural hazards and society's need to produce quality hazard maps and to assure good disaster management has grown. The administrative and legal basis for the elaboration of hazard and risk maps and contingency plans was prepared in some European countries alone. But natural hazards pay no regard to national borders so a commonly accepted methodology is required. Another deficiency lies in the fact that the activities of hazard and risk mapping are nowadays mainly dedicated to support spatial planning respectively definition of administratively restricted land use, while the usability of hazard and risk maps in the scope of contingency planning is relatively poor. These gaps will be tackled with the development of a common methodology in the frame of MONITOR II project. The full title of the project is "*Practical Use of MONITORing in Natural Disaster Management*" and it runs under the South East Europe Programme. The partnership combines international scientific experts, authorities, public services and end-users. The project aims at the improvement of information provision for disaster management by developing a common methodology of hazard and risk mapping and elaboration of contingency plan. Furthermore, the goal of the project is also to establish CSA (Continuous Situation Awareness) – an operational tool that would improve situation awareness and knowledge that hold natural disaster management relevance. Both Slovenian project partners are contributing their efforts to achieving good common MONITOR II project results and are simultaneously seeking for Slovenian specific solutions for some deficiencies that have been identified in Slovenian disaster management system, focussing on flood hazard.

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SLOVENIAN LEGAL FRAME

In Slovenia the legal basis for and flood protection and rescue planning and crisis management of flood events in general is being prepared by two authorities. The Ministry of the Environment and Spatial Planning (MOP) is responsible for hazard mapping while the Ministry of Defence (MO) is responsible for contingency planning on a national level. Like in many other European countries this leads to weaker connectivity of these two activities. Following the standards induced by the European Union through EU Floods Directive Slovenian MOP has established a methodology for flood risk assessment by adopting the “*Rules on methodology to define flood risk areas and erosion areas connected to floods and classification of plots into risk classes*” (Off. Gaz. RS, No. 60/2007), a very concrete regulation which thoroughly prescribes how hazard, vulnerability and risk classes should be defined (Steinman et al., 2008). In a few years entire Slovenian country should obtain unified flood hazard and flood risk maps with common classification of plots into flood risk classes as defined in Slovenian legislation. Nevertheless the main purpose of these flood hazard and risk maps is to provide groundwork for spatial planning. On the other hand the “*Instruction on preparing threat assessments*” (Off. Gaz. RS, No. 39/1995) prepared by MO is more general and descriptive, also due to the fact that it applies to a very broad range of hazards.

Tab. 1 Flood risk mapping (MOP) versus threat assessment (MO)

	<i>Rules on methodology to define flood risk areas and erosion areas connected to floods and classification of plots into risk classes (Off. Gaz. RS, No. 60/2007)</i>	<i>Instruction on preparing threat assessments (Off. Gaz. RS, No. 39/1995)</i>
HAZARD	<p>probability of disaster occurrence (return period) Q_{10}, Q_{100}, Q_{500}</p> <p>extent – spatial extent of the flooded area for Q_{10}, for Q_{100} and for Q_{500}</p> <p>intensity of the flood event for Q_{100} [water depth and product of water depth and velocity]</p>	<p>probability of disaster occurrence</p> <p>possible hazard extent</p> <p>probable disaster consequences</p> <p>hazard sources</p> <p>possible causes of disaster occurrence</p> <p>disaster course</p> <p>chain disaster occurrence probability</p> <p>options of disaster forecast</p>
VULNERABILITY	<p>population density</p> <p>economic and non-economic activities buildings</p> <p>buildings and devices that can cause pollution</p> <p>cultural heritage</p> <p>sensitive structures</p>	<p>endangered population buildings density</p> <p>endangered animals and property economic and energetic characteristics of endangered area</p> <p>location of structures that additionally threaten surroundings</p> <p>endangered cultural heritage</p> <p>location of structures relevant for protection and rescue *</p>
INTERVENTION		<p>location of structures relevant for protection and rescue *</p> <p>recommendations for operation of protection, rescue and relief and prevention respectively mitigation of disaster’s consequences</p>
	risk classes	Type, form and degree of risk

* Some structures are relevant for protection and rescue because of their high sensitivity respectively vulnerability (e.g.: kindergartens, schools, homes for the aged etc.). Some are relevant because of their active role in crisis management (e.g. civil protection headquarters, fire brigade, emergency shelter etc.). Hospital is an interesting example of a structure that is very vulnerable (if it had to be evacuated a lot of help would be needed) and at the same time it can be active by provision of medical care to wounded people.

Despite the different approach, when closely examining Slovenian legislation regarding (flood) risk assessment, several similarities between 'risk mapping' (MOP) and 'contingency planning' (MO) approach were recognised (Table 1). The legislative framework prepared by MOP obviously offers a good starting point for creating the so called intervention maps. The essential contents that are missing to meet the need of contingency planning are mainly related to intervention (location of structures relevant for protection and rescue, foreseen measures, resources etc.) and some additional information on hazard (disaster course, scenarios, disaster forecast). In order to improve crisis management the Slovenian government has also adopted the "*Decree on the contents and drawing up of protection and rescue plans*" (Official Gazette of RS no.: 3/2002, 17/2002, changes and additions in Official Gazette of RS no.: 17/2006 and 76/2008) that regulates contingency plans and their content. In accordance with articles of this *Decree* municipalities and state authorities were obliged to elaborate and adopt their protection and rescue plans until Feb. 17th 2007. The floods that happened afterwards were a perfect test for the adopted national and municipal flood protection and rescue plans and for the legally established principles and methodology in general.

CRISIS MANAGEMENT IN SLOVENIA

Crisis management system in Slovenia is quite heterogeneous - from a professional approach mainly on the national and regional level to numerous commendable volunteers (mainly fire fighters) from all over the country. The Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (URSZR) is the cardinal institution dealing with civil protection in Slovenia. It is based in the Slovenian capital Ljubljana and has 13 regional sections operating throughout Slovenia. Civil protection on national and regional level runs professionally and the National Notification Centre of the Republic of Slovenia, including all 13 regional notification centres, use a modern geographic information system GIS-UJME. This GIS tool incorporates the collection, processing, storage, dissemination and use of data. Notification centres may also use television and radio programmes for their broadcasts, publish notices, forecasts and warnings on national TV teletext. On a local level, the responsibility for civil protection lies with municipalities. They must prepare contingency plans and organise municipal civil protection units when necessary. Unlike URSZR and its sections, municipalities are accountable for a broad variety of activities so they can't devote their entire energy to crisis management. They also don't have any sophisticated tools at their disposal. Nevertheless, in an emergency the municipal civil protection units act well, on average, with experienced volunteers devoting their body and soul to their missions.

FLOOD PROTECTION AND RESCUE PLANS ON PROBATION

In the recent past Slovenia has experienced two extreme floods. On 18th September, 2007, a great storm event took place, mainly in the Gorenjska region – heavy rainfall induced rapid flood waves and some landslides (Sušnik et al., 2007). Three years later, from 17th till 19th September, 2010, extensive and heavy rain fell on Slovenia which led to two extreme flood waves on 18.09. and on 19.09., when most of Slovenian rivers were flooding (Strojan et al., 2010). The main difference between these two September flood events was that in 2007 the floods appeared totally unexpectedly while in 2010 the Slovenian Civil Protection units and the public were informed in advance so they were able to prepare to some extent. Both events were also a test of protection and rescue plans and they offered feedback information for people dealing with contingency planning and protection strategies in general. In the municipalities that have adopted the plans, they were proven to be useful although some deficiencies were recognised. Commanders of Civil Protection units found some parts of contingency plans helpful. They said that the list of people authorised and responsible for certain intervention actions that they could find in the appendixes came in handy (Černivec et al., 2008). However civil protection commanders complained that the protection and rescue plans are widely extended. If the hazardous event develops rapidly, which was the case of the storm event in September 2007, there is no time to carefully read the plan and the superfluous amount of text makes it difficult to extract only certain crucial information on time. This resulted in partial usage of plans – the protection and rescue plans were used exclusively regarding responsible people and institutions and their contact data.

NEW SOLUTIONS CONSIDERED

MONITOR II project is seeking new methods for linking hazard mapping and contingency planning. Both Slovenian project partners UL FGG and PUH concluded that their contribution to the common goals of the MONITOR II project will be better if they try to resolve some Slovenian specific problems parallel to the joint work. Major deficiencies in Slovenian disaster management system have been identified on the municipal level of contingency planning. The municipal crisis management usually operates fine however the municipal flood protection and rescue plans are inadequate. These plans are commonly elaborated in the spirit of '*just to meet the legal obligations*'. Hence they contain too much wording and at the same time they are suffering from lack of information on intervention measures. Consequently an idea came up that a new methodology for elaboration of flood protection and rescue plans should be developed and applied to Slovenian test bed – the Municipality of Mozirje. Our knowledge basis for improvement of the approach to elaborate contingency plans are the lessons that Civil Protection units have learned when experiencing the use of protection and rescue plans when flood events actually occurred, and the knowledge that foreign contingency planning experts have shared with us. The aim is to bring the focus from textual parts of current Slovenian protection and rescue plans towards maps, operational schemes of measures and pictures with descriptions of measures that have to be taken in case of a flood event. As work began, the need for a comprehensive information system that would integrate data from different sources became even more obvious. We have already reinforced our communication with the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief and also Civil Protection units from the Municipality of Mozirje. Comprehension of their needs, knowledge and experience is crucial for creating new protection and rescue plans with greater practical value.

GOOD EXAMPLES (FROM ABROAD)

There are no guidelines for elaborating a contingency plan in the field of natural hazards but nevertheless some good examples can be found. Several emergency plans in the field of natural hazards were developed in Switzerland within the last few years following torrential floods, rock fall, landslides and debris avalanches induced by plentiful precipitation in August 2005 (Plattner and Gunzenhauser, 2008). So-called intervention plans in emergency management of flood events in Alpine catchments were also described by Romang and Wilhelm (2009). These intervention plans were elaborated mainly to support fire brigades and provide relief unit officers and safety managers with the information needed to plan and organise operations and to give priority to important objects at risk. They know where, how and when they have to act, e.g. to make optimal use of mobile levees. The need for a new approach was also recognized in Austria where new contingency plans were made based on dyke break scenarios at Morava River (Schwingshandel, 2010). An intervention map proved to be the crucial part of a contingency plan so the two Slovenian MONITOR II project partners decided to focus on setting this deficiency right on the municipal administrative level in Slovenia.

SLOVENIAN TEST BED

Slovenian test bed was placed in the Municipality of Mozirje. It is a smaller Slovenian commune with an area of 54 square kilometres and a population of approximately 4000 people. It is situated in the lower part of the Upper Savinja Valley. It is morphologically extremely diverse; from the flat land at the Savinja River to the medium height range of the Mozirje Mountains (Klemenak, 2006). The entire territory of Municipality of Mozirje belongs to the basin of Savinja River, which has a torrential character. In Slovenia Savinja River is known for its high flood hazard, most floods happen in its middle or downstream section (in towns Celje and Laško). Floods are not a rare event in Municipality of Mozirje. Though section of Savinja passing through this commune isn't as critical as in the lower sections, Savinja's tributaries may cause floods already when their discharges reach values of 20-year flood. Affluents of Savinja River which lay within Municipality of Mozirje are Mozirnica, Trnava, Ljubija and Škrabov potok. The population density of Mozirje is much lower than the Slovene average; there are approximately 1600 apartments within this commune. It is quite typical for this

municipality that it doesn't have any major industrial plants. Economic activities are mainly consisting of manufacture, craft, services, merchant, agricultural, tourist, and catering activities. Due to the variegated historical happening in the past, diverse cultural heritage, which includes archaeological, artistic, ethnological, memorial and technical monuments, was formed. The sacral heritage is especially rich.

INTERVENTION MAP

Hydraulic modelling has made some significant steps forward in the past few decades. On the one hand the capability of computers has improved; on the other hand new methods for obtaining elevation data needed to create digital terrain models became cheaper, hence more accessible. The improvements of the state of the art in hydraulic modelling had already been turned to advantage in the field of spatial planning. However experts of crisis management in Slovenia still have to resolve how they could benefit most from the new approaches in flood hazard mapping. One of our tasks within Monitor II project was to investigate and evaluate usability of the flood hazard maps as defined by the *Rules on methodology to define flood risk areas and erosion areas connected to floods and classification of plots into risk classes* (Off. Gaz. RS, No. 60/2007) for the needs of contingency planning. We created intervention maps for Slovenian test bed (Municipality of Mozirje) as a supplement of the existing municipal flood protection and rescue plan. Spatial data from different sources was used; in the first steps (concerning hydraulic part) only the official flood hazard zones were considered as three most basic hazard scenarios. Later on hydraulic models for eight extra scenarios were obtained and their results were analysed for the purpose of contingency planning. When preparing different scenarios one must have in mind that the number of scenarios should correspond to prognostic capabilities of the investigated area. So in the end all scenarios were compared and distinctions among them were reconsidered from the viewpoint of their relevance to intervention map.

Tab. 2 Summary of spatial data presented on the intervention map (example of Municipality of Mozirje)

Hazard	Vulnerability	Additional hazard	Forces & resources	Intervention
spatial extent of hazard	vulnerable entities	indirect hazard sources	civil protection and rescue forces & resources	foreseen intervention measures
	locations of vulnerable facilities and sites, indicating those of greater vulnerability	locations of facilities and sites that poses some hazard potential and might cause additional damage and danger	all human and material resources, facilities etc. that are at disposal for protection and rescuing in case of a hazardous event (also contractors)	Needed measures that can be concluded in advance on the basis of hazard, vulnerability and additional hazard and should be executed by "forces"
<ul style="list-style-type: none"> • flood warning map – flood hazard area • spatial extent of the flooded area for scenario Q₁₀ • spatial extent of the flooded area for scenario Q₁₀₀ • spatial extent of the flooded area for scenario Q₅₀₀ • eight extra scenarios taken in consideration 	<ul style="list-style-type: none"> • day care and work centre • primary school • kindergarten • buildings in general • cultural heritage 	<ul style="list-style-type: none"> • chemical works • sewage treatment plant • petrol station • landfill 	<ul style="list-style-type: none"> • civil protection headquarters • fire brigade • emergency shelter • health centre • police station • company for road maintenance and reconstruction • radio club • humanitarian organisations 	<ul style="list-style-type: none"> • observation of critical bridges • road closures • spots where intervention was needed in the similar past events • cut-off areas – accessibility in urgent cases

A new approach was developed which was at the same time partly implemented to the Slovenian test bed. Interim results for the Municipality of Mozirje will be presented as an example of the proposed methodology. In the first step a flood intervention map was elaborated, including data given in the following scheme (Table 2). Presented topics in the last line are a subject of this particular municipality. Once all the spatial data regarding hazard, vulnerability, additional hazards, and forces and resources is presented on the map, one can get a fast insight on what will probably have to be done; which measures can be foreseen (intervention). The resulting composition of spatial data from all the mentioned data groups is an intervention map (example of the Municipality of Mozirje can be seen in Figure 1).

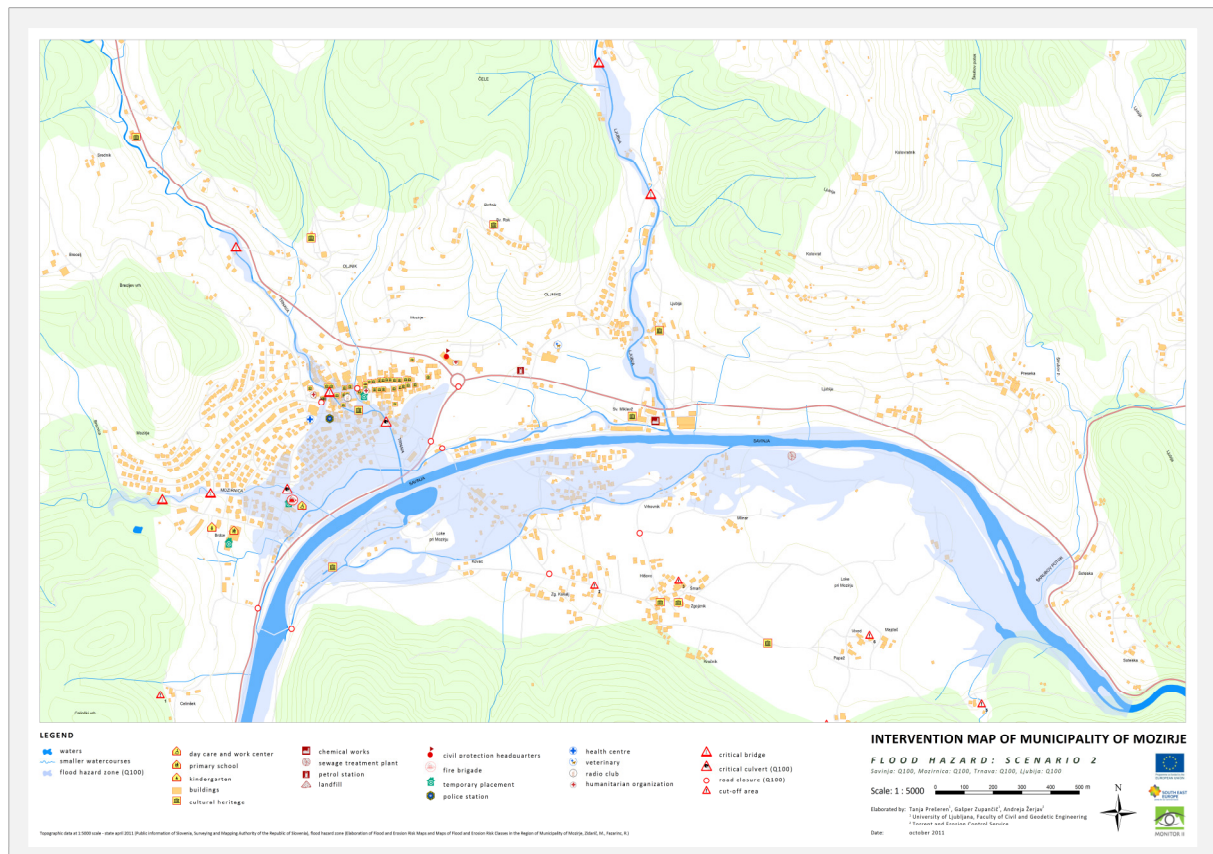


Fig. 1 Intervention map of Municipality of Mozirje

HANDLING WITH NUMEROUS INFORMATION

It is obvious that the intervention map itself is a powerful source of information however the map alone is not sufficient. It has to be supplemented with additional data and explanations. These can be given in reports that will illuminate pithy data from the map. Two types of solutions are proposed:

1. Static: maps and reports should be available in a physical form, printed on paper. There are more arguments to back this decision. For example, in case of an extreme weather event an electrical blackout can't be excluded. Secondly it should be taken into consideration that contingency on a local level is performed by commanders of civil protection units with different knowledge backgrounds. A variety of computer knowledge is to be expected: someone might be much more familiar with using a paper map than clicking on the computer.
2. Quasi-dynamic: maps and reports should be sensibly connected in a geographic information tool. A net can be built upon links between data from different data groups. The tool should enable different data queries.

These two types are closely connected. The elaboration should be made in such a manner that one should avoid double work when setting both: static analogue maps and reports on the one hand and quasi-dynamic tool on the other. Inputs or implementations and changes of data should be executed

only once (in one data base) even though this data can be shown in more documents (reports). This principle not only avoids doubling the work load, but also prevents confusions and mistakes such as different information on same thing in different files (for example: two different phone numbers for the same institution because data would be updated only in one file).

DATABASE

A basis for the proposed information tool is a database that would contain various data, some have already been mentioned. A general overview of the acquired data is given in Table 3.

Tab. 3 Database contents

Spatial data (shapefiles with attributes)	Catalogues	Additional material
1. Hazard 2. Vulnerability 3. Additional hazard 4. Forces & resources 5. Intervention	1. Catalogue of general measures – (Standard) Operational Procedures → related to a category of a feature which is placed in the spatial data base 2. Catalogue of specific measures → related to a particular feature which is placed in the spatial data base 3. Catalogue of criteria → related to a general or to a specific measure • condition given with numerical values (trigger values) • condition given in textual description (trigger situation)	1. General pictorial material → related to a category of a feature <i>or</i> related to a general measure • schemes; drawings; pictures 2. Specific pictorial material → related to a particular feature <i>or</i> related to a specific measure • snapshots; designs; schemes 3. General film material → related to a category of a feature <i>or</i> related to a general measure • instructional films 4. Specific film material → related to a particular feature <i>or</i> related to a specific measure • film documenting past events; computational simulation of a flood wave propagation

Luckily the database doesn't have to start from zero. Many countries have already established a qualitative geodetic information system and geographic database that covers a huge variety of contents. In Slovenia the starting point for a spatial data database is definitely encouraging. Creating the spatial part of the database needed to implement the proposed methodology in some cases requires only adding a few additional attribute columns to existing shapefiles. However the work that has to be done is not little, especially when considering catalogues and additional material. And once the database will be established it will still have to be maintained, updated and upgraded.

ATTRIBUTES OF FEATURES IN THE DATABASE

To strengthen the informative role of the tool it is wise to expand the database by including several data inputs – as additional attributes.

The following is a list of attributes for data group forces & resources (mainly these attributes will refer to an accountable institution or person):

1. Type of institution (standardised classification should be used)
2. Name of institution/name of responsible person
3. Institution section
4. Contact information
 - Contact person of the institution
 - Spare contact person (deputy)
 - Person's position, duty
 - Mobile phone
 - Pager number
 - Phone at work
 - Phone at home

- E-mail
5. Location (address)
 6. Quantity (quantities) – number of people (e.g. fire fighters) or items (e.g. dredging machine excavators) at disposal

Not always will all of these attributes be available; for some features they are not even reasonable or logical. In this case the attributes should be left blank.

List of attributes for a structure:

1. Category
2. Short name
3. Location (address)
4. Contact information (when reasonable)

EXTRACT REPORTS































List of extract reports:








1. List of all activities that are supposed to be carried out in the municipality or region
2. Extract reports for structures, facilities and sites
3. List of all activities that should be carried out for each one responsible (individual or institution)

The contents to be included in the *extract report* for a structure:

1. Name of intervention measure - general
2. Intervention measure, warnings description – general for this type of structure; as a Standard Operational Procedure (SOP) [short / in detail]
4. Intervention measure, warnings – specific for this structure [short / in detail]
5. Threshold values - criteria that indicates when the measure should be initiated
 - Given with numerical values or
 - Given in textual description
6. Picture of the structure
7. Picture(s) with additional explanation on what has to be done
8. Map containing crucial locations (the structure itself, location of responsible institution)
9. Person or institution responsible for the measure
 - Name of the contact person
 - Phone number(s) or pager number of the contact person
 - Address of the responsible (person or institution)

Tab. 4 List of all activities for the Municipality of Mozirje to be carried out in case of flood (or flood prediction)

WHAT has to be done				Flood occurs (flood foreseen)		WHO will do it, WHO has to be informed				Accomplished	
Category	Name/No.	Location	Measure	Criteria		Responsible institution, person			Ordered		
				Thresh- hold values	State (actual value)	institution	person (deputy)	contact: pager, phone ..			
1. ! 	bridge	No. 1	Cesta v Loke	 observe	act now!		municipal CP unit			<input type="radio"/> no <input checked="" type="radio"/> yes	<input type="radio"/> NO <input checked="" type="radio"/> YES ✓
2.				 clean bridge opening (remove debris and wood)	if bridge gets jammed		CVE Mozirje	Miran I.	03839#	<input type="radio"/> no <input checked="" type="radio"/> yes	<input type="radio"/> NO <input checked="" type="radio"/> YES ✓
3.				alert: immediately inform commander of municipal CP unit	h > 3.27 m	h = 2.78 m	municipal CP unit			<input type="radio"/> no <input checked="" type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
4. ! 	bridge	No. 2	Orožnova ulica	 observe	act now!		municipal CP unit			<input type="radio"/> no <input checked="" type="radio"/> yes	<input type="radio"/> NO <input checked="" type="radio"/> YES ✓
5.				 clean bridge opening (remove debris and wood)	if bridge gets jammed		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
6. ! 	bridge	No. 3	Na tratah	 observe	act now!		municipal CP unit			<input type="radio"/> no <input checked="" type="radio"/> yes	<input type="radio"/> NO <input checked="" type="radio"/> YES ✓
7.				 clean bridge opening (remove debris and wood)	if bridge gets jammed		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
8.		kindergarten	Vrtec Mozirje	Šolska ulica 25	 notify: children should be kept in kindergarten until danger is gone	if children are in kindergarten		Vrtec Mozirje	Ana R.	03837#	<input type="radio"/> NO <input checked="" type="radio"/> YES ✓
9.		primary school	OŠ Mozirje	Šolska ulica 23	 notify: children should be kept in school until danger is gone	if children are in school		OŠ Mozirje	Andreja H.	03839#	<input type="radio"/> NO <input checked="" type="radio"/> YES ✓
10.		sewage treatment plant	-	Loke pri Mozirju	 notify: make precaution measures	act now!		Javno podjetje Komunala	Andrej E., Branko M.	03839#, 03839#	<input type="radio"/> NO <input checked="" type="radio"/> YES ✓
11.		cultural heritage	-	Hofbauerjeva ul. 14	 notify	act now!		Zavod za kulturo Mozirje	no info	035833 351	<input type="radio"/> NO <input checked="" type="radio"/> YES ✓
12.	road	No. 1	Savinjska cesta	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
13.	road	No. 2	Savinjska cesta	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
14.	road	No. 3	Šolska ulica	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
15.	road	No. 4	Savinjska cesta	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
16.	road	No. 5	Nove Trate	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
17.	road	No. 6	Savinjska cesta	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
18.	road	No. 7	Na tratah	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
19.	road	No. 8	Hofbauerjeva ulica	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
20.	road	No. 9	Orožnova ulica	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
21.	road	No. 10	Mlinska pot	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
22.	road	No. 11	Ljubija	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
23.	road	No. 12	Ljubija	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
24.	road	No. 13	Papež	 close road	if road is under water		CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES

25.	road	No. 14	Papež	<input type="radio"/> close road	if road is under water	CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
26.	road	No. 15	Loke pri Mozirju	<input type="radio"/> close road	if road is under water	CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
27.	road	No. 16	Zgornji Kokalj	<input type="radio"/> close road	if road is under water	CVE Mozirje	Miran I.	03839#	<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
28.	 day care and work centre	VDC Mozirje	Savinjska c. 31, phone: 059090010	evacuate (physically and mentally disabled people will need special help)	if staying in the building isn't safe anymore	municipal CP unit			<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
29.	 cut-off area	No. 1	Celinšek	provide essential goods: water, food	if isolation lasts long	municipal CP unit			<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
30.	 cut-off area	No. 2	Zg. Kokalj	provide essential goods: water, food	if isolation lasts long	municipal CP unit			<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
31.	 cut-off area	No. 3	Loke pri Mozirju	provide essential goods: water, food	if isolation lasts long	municipal CP unit			<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
32.	 cut-off area	No. 4	Sp. Kokalj	provide essential goods: water, food	if isolation lasts long	municipal CP unit			<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
33.	 cut-off area	No. 5	Loke pri Mozirju	provide essential goods: water, food	if isolation lasts long	municipal CP unit			<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES
34.	 cut-off area	No. 6	Papež, Papež	provide essential goods: water, food	if isolation lasts long	municipal CP unit			<input checked="" type="radio"/> no <input type="radio"/> yes	<input type="radio"/> NO <input type="radio"/> YES

Default values in this table are a function of a scenario. Meaning, if the scenario points out that certain operations should be executed immediately, these activities should be listed on top of the list and their high priority should be indicated by a red exclamation mark. The other activities should follow after. At the bottom of the list in gray colour are activities which are supposed to be unnecessary within the scenario we are focusing on. As scenarios are only approximations of actual situations it is wise to keep the whole list of activities (for the worst case scenario). Actual information coming in the civil protection headquarters during a crisis event can make order of precedence of the list of activities disputable. Therefore priorities shouldn't be unalterable fixed – by clicking on up or down arrow a civil protection commander should be able to change the default priority level.

EXTRACT REPORT FOR AN INSTITUTION

In case of a severe event, the commander of a civil protection unit has to call several people in order to dispense tasks that should be carried out. Hence an extract report of tasks for each institution would come in handy. The report should contain data on the accountable (name of responsible institution or name of responsible person, contact person of the institution, mobile phone, pager number, phone at work, phone at home, address, e-mail), a list of sites where they should intervene and a map including locations of these sites.

Name: Vzdrževanje in obnova Celje, d.d. (VOC Celje)
Section: Cestno-vzdrževalna enota Mozirje (CVE Mozirje)
Phone: 03 839 49 80
Contact person: Miran I. (director) CVE
Mihael G. (assistant) CVE
Address: Savinjska cesta 64,
3330 Mozirje

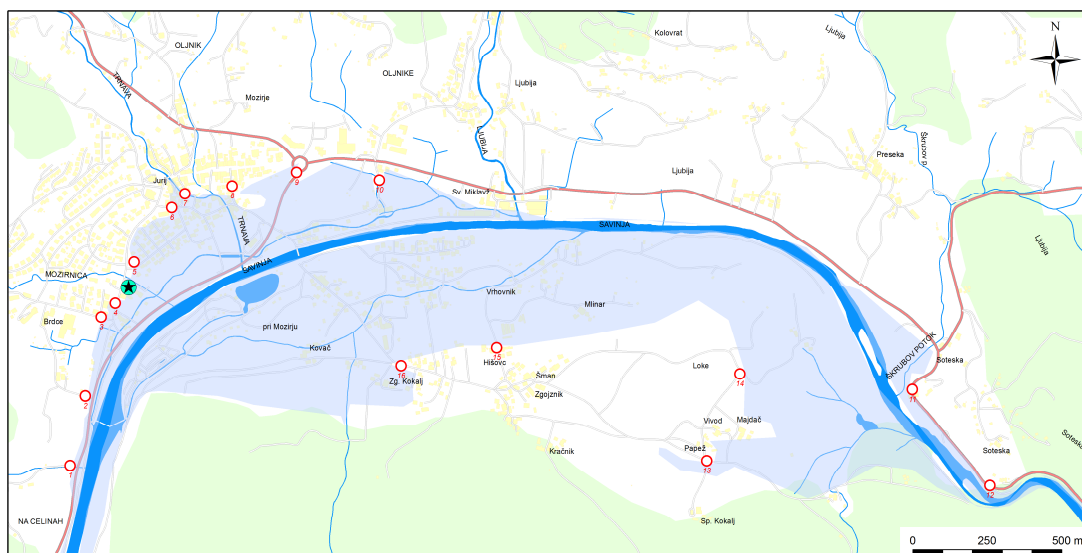


Fig. 2 Spots where the highlighted institution should intervene

CONCLUSION

The concept of the proposed methodology for creating an intervention map and the structure of the advanced information tool is not final. Regarding the map - the appearance (symbols, colors, and spatial layers) and some of the content might change in the future. The Slovenian MONITOR II project partners have examined closely the data disposability and legal framework in Slovenia in the field of flood hazard mapping and contingency planning. The work that has been done so far is a good basis for a discussion with Slovenian stakeholders as well as with other project partners from the MONITOR II group. Some stakeholder meetings with Slovenian civil protection units on national, regional and local levels have already been carried out. Representatives of the Slovenian Administration (URSZR) and from Celje regional section have applauded the idea. Meeting participants from the municipal civil protection unit staff on the other hand exercised restraint. Since they are going to be the main users of the municipal intervention map, their doubts should not be overheard. In the first step our goals are pragmatic: implement new methodology for elaboration of flood protection and rescue plans with greater practical value. In the second step we aim higher: the goal is to establish an advanced information tool – decision support system for the hasty conditions in case of a flood hazard event.

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