Empowered lives.
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Connecting the dots for knowing the risks in Bosnia and Herzegovina

Disaster Risk Analysis System (DRAS)

DISASTER RISK ANALYSIS SYSTEM (DRAS)

DRAS is an online platform created with the aim to change the approach to disaster risk reduction (DRR) in Bosnia and Herzegovina by providing accurate information to decision makers and citizens about exposure to floods, landslides, earthquakes and mine suspected areas.

DRAS has been developed within the United Nations Development Programme (UNDP). The system allows free access to scientific floods and landslide hazard data to decision makers and citizens in order to increase disaster risk awareness for specific locality. DRAS is available for cities Doboj and Tuzla, and under the development for Brčko Distrikt BiH, Goražde, Laktaši, Livno, Lukavac, Maglaj, Mrkonjić Grad, Odžak, Vareš and Zvornik.
DRAS consists of 3 Modules. Module is 1 being publicly available; while Modules 2 and 3 are accessible to respective local authorities in accordance with their user rights. System can be accessed via the following link: http://dras.undp.ba/

DONORS

ITALIAN AGENCY FOR DEVELOPMENT COOPERATION

CZECH REPUBLIC DEVELOPMENT COOPERATION

Government of Republic of Turkey

Module 1:

- **Uses hazard maps and projects them on a publicly available Google maps that citizens can easily search and use it.**
- **Linked to precipitation and water level data publicly available from Hydrometeorology and Water Agencies** which provides additional information and awareness raising to citizens.

DRAS

11 SUSTAINABLE CITIES AND COMMUNITIES

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

15 LIFE ON LAND

5 GENDER EQUALITY

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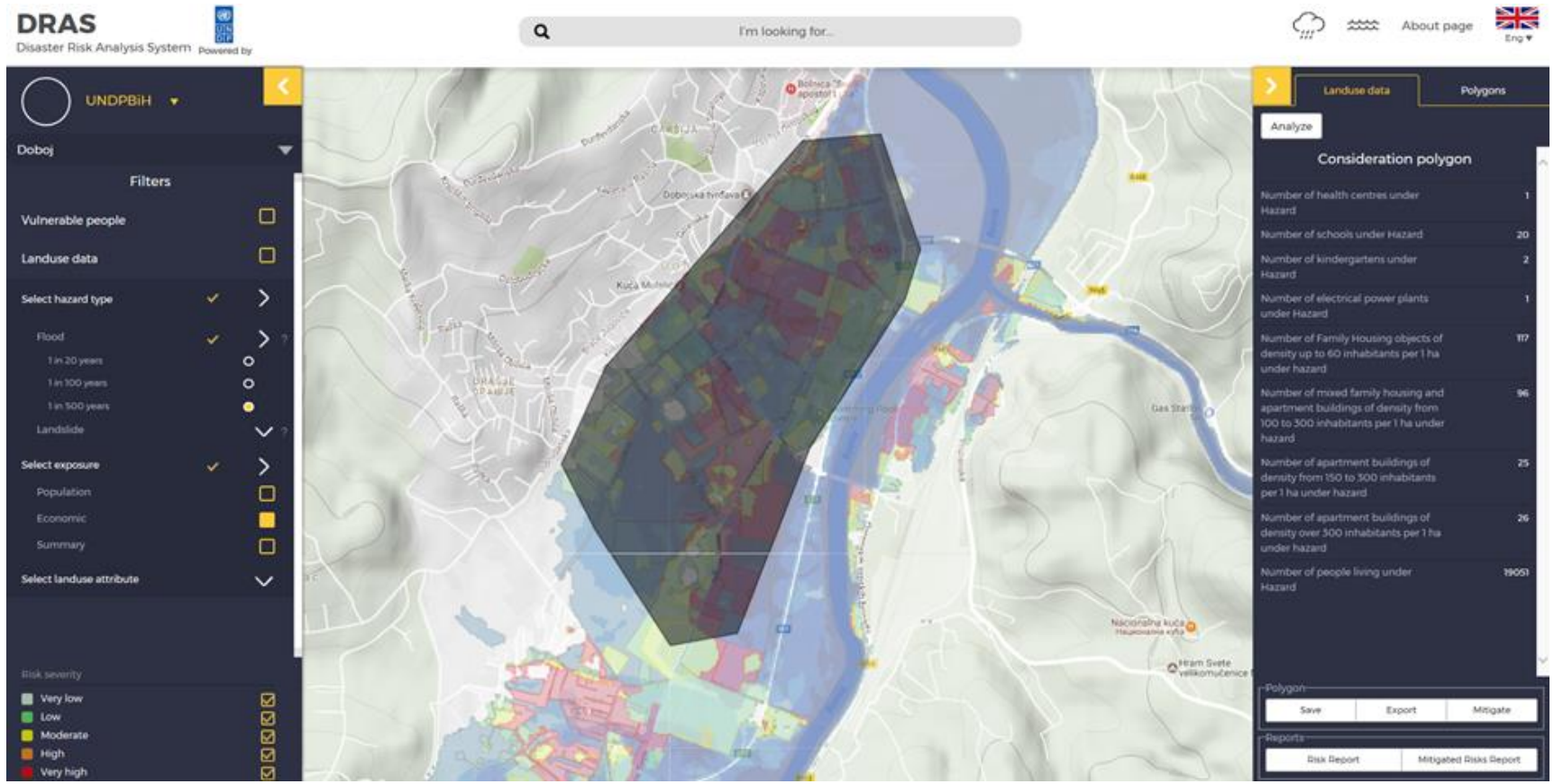

May 2014 Floods in BiH - Post Disaster Needs Assessment

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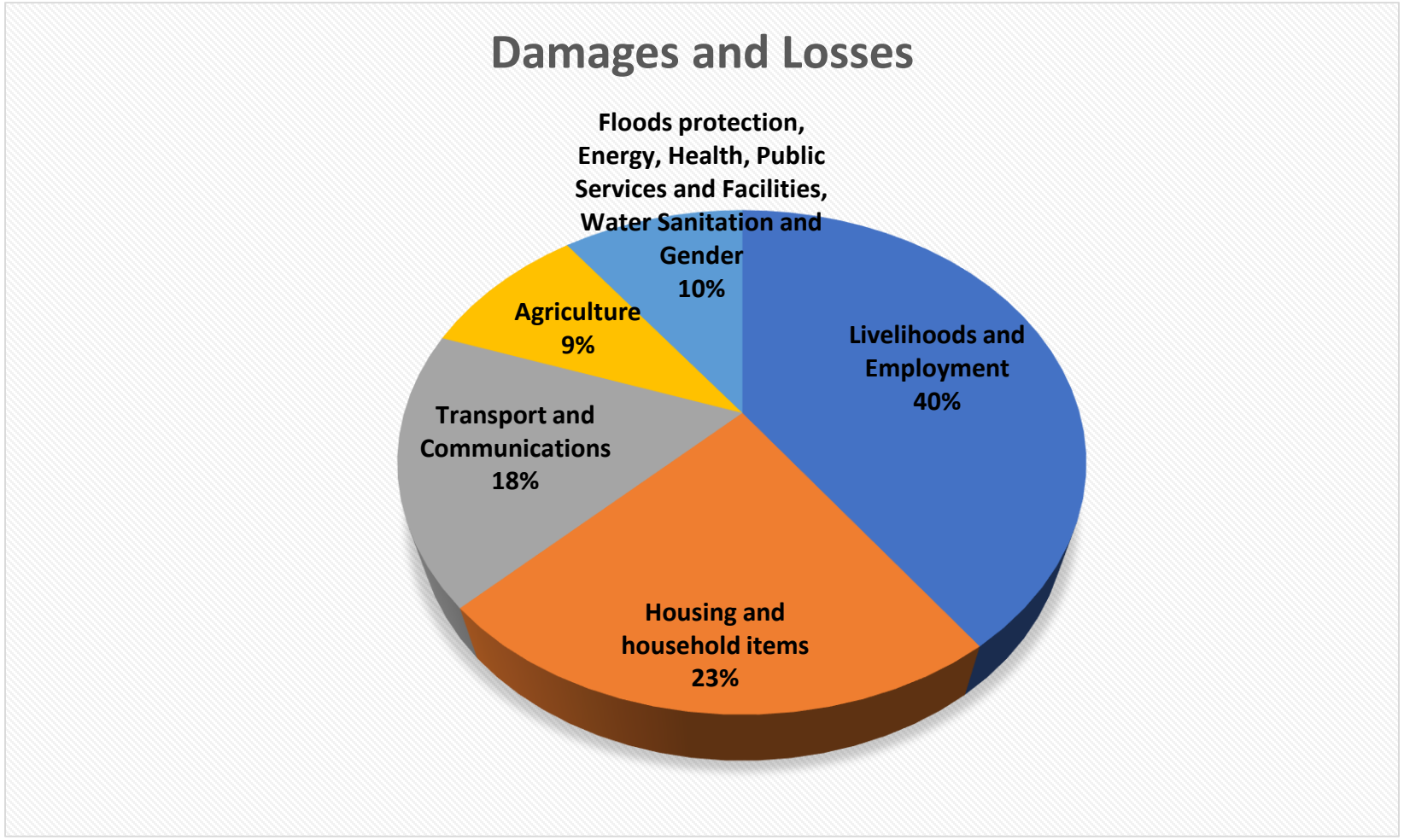

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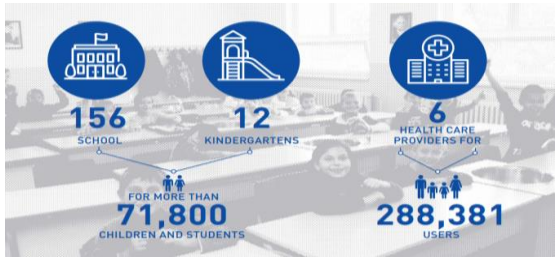
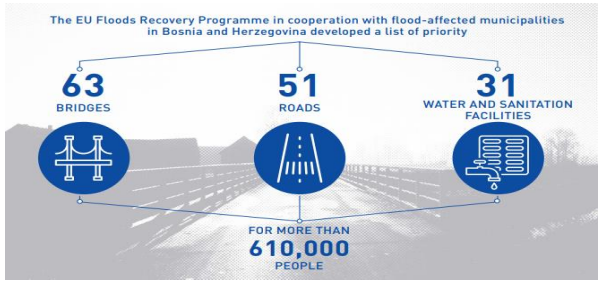
Recovery, BBB and resilience
UN Floods Recovery Programme





Recovery, BBB and resilience

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Resilience

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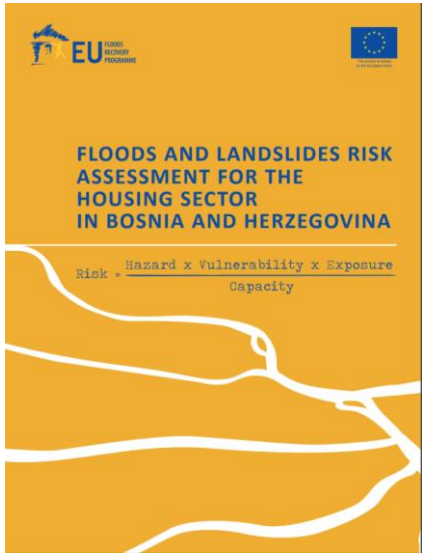

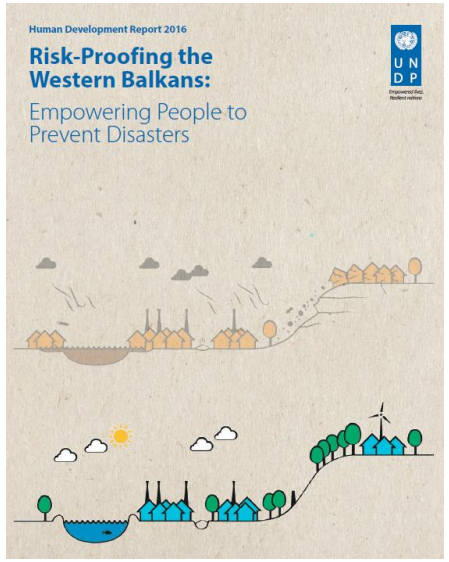

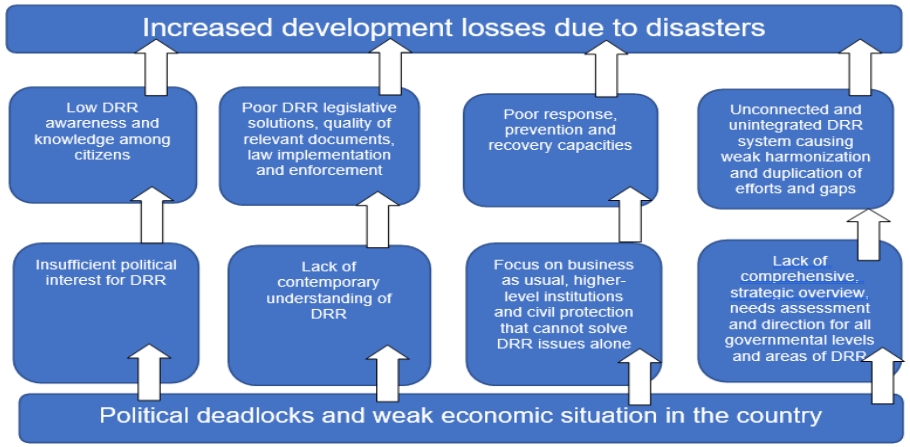

Resilience

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True opportunity to create resilience is in citizens themselves and municipalities

BiH already has solid scientific data on hazards, exposure, and vulnerabilities. The main challenge is a lack of systematic data collection, exchange of information among different stakeholders, and translating the available data into action.

New technologies can bridge the gap

Disaster Risk Analysis System (DRAS)

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DRAS is an online platform http://dras.undp.ba/

DRAS consists of 3 Modules

Allows free access to scientific data on landslides and floods hazard (soon earthquakes and mines)

Helps decision makers in preparation of planning documents and risk assessments that combine spatial data, hazards, land use and data on vulnerable population

DRAS is available for 2 cities and under the development for 10 municipalities.

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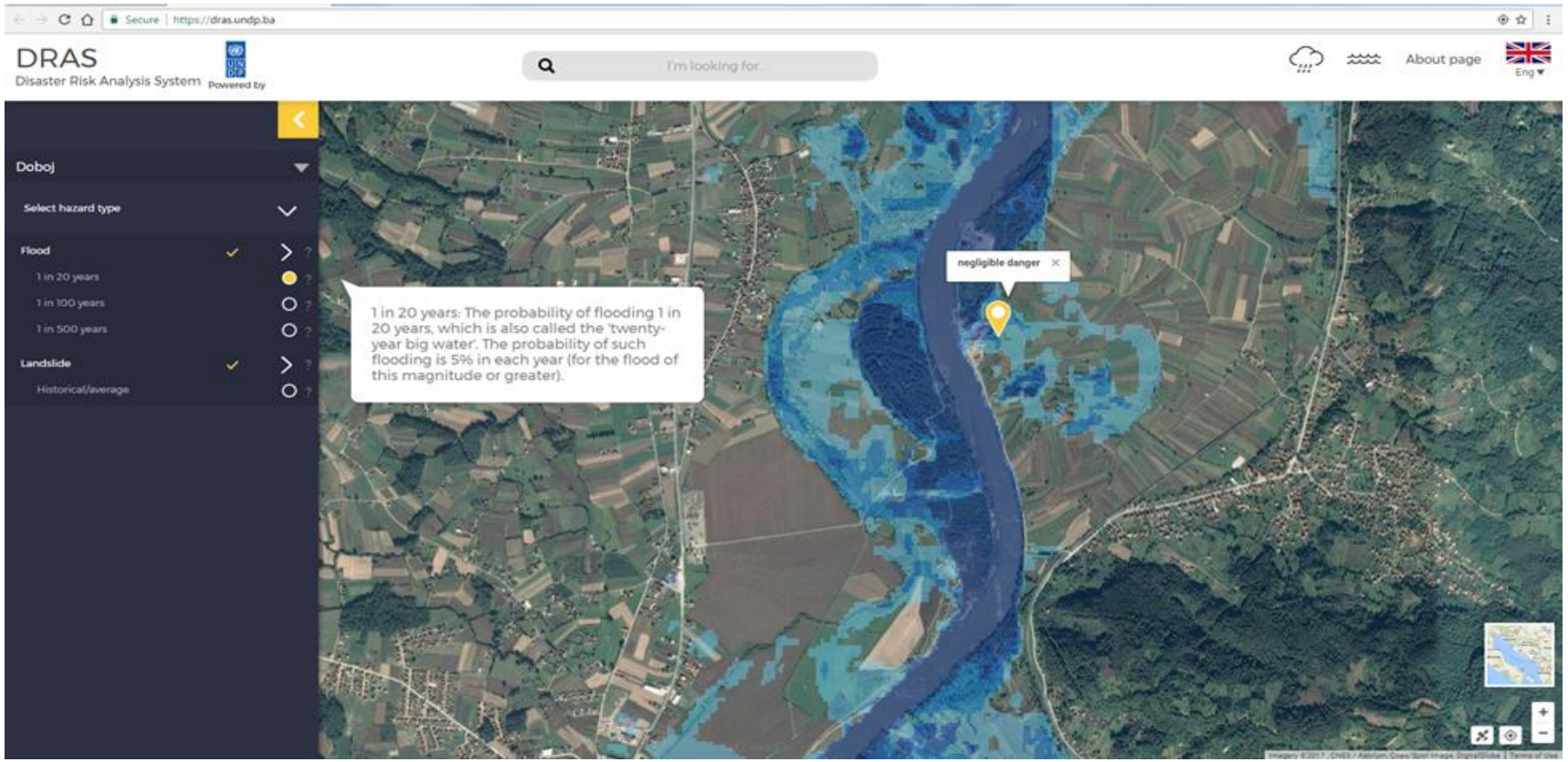
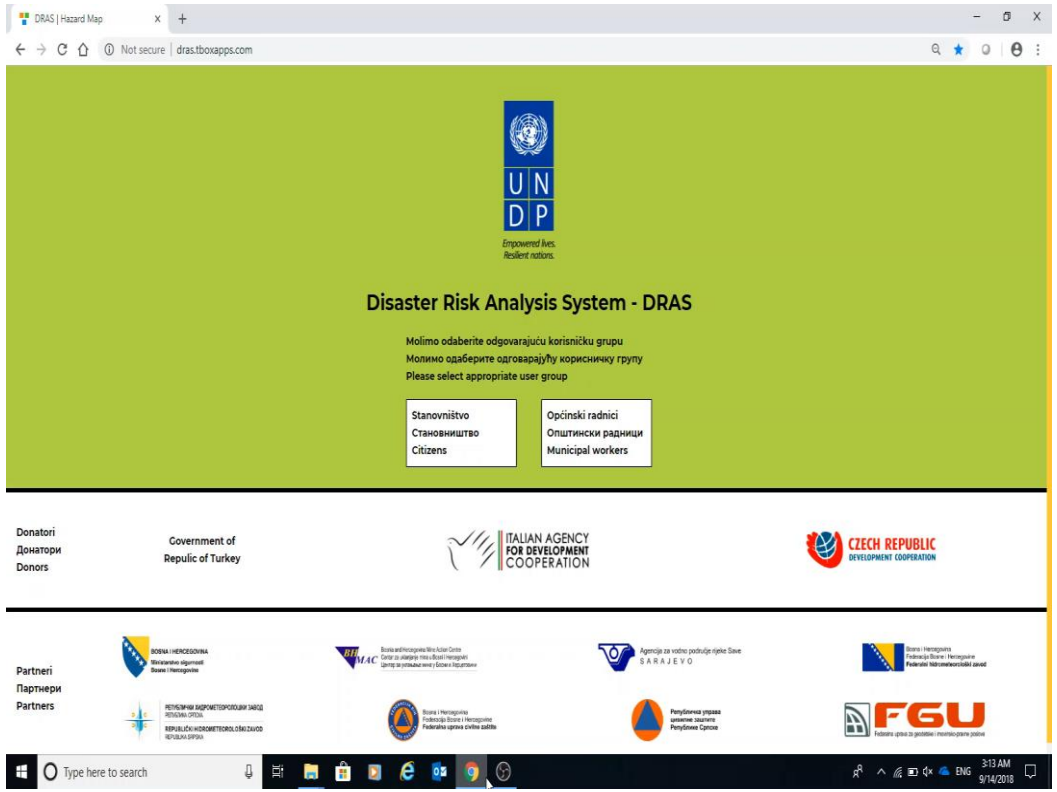
DRAS Modul 1



DRAS Modul 1



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DRAS Modul 2

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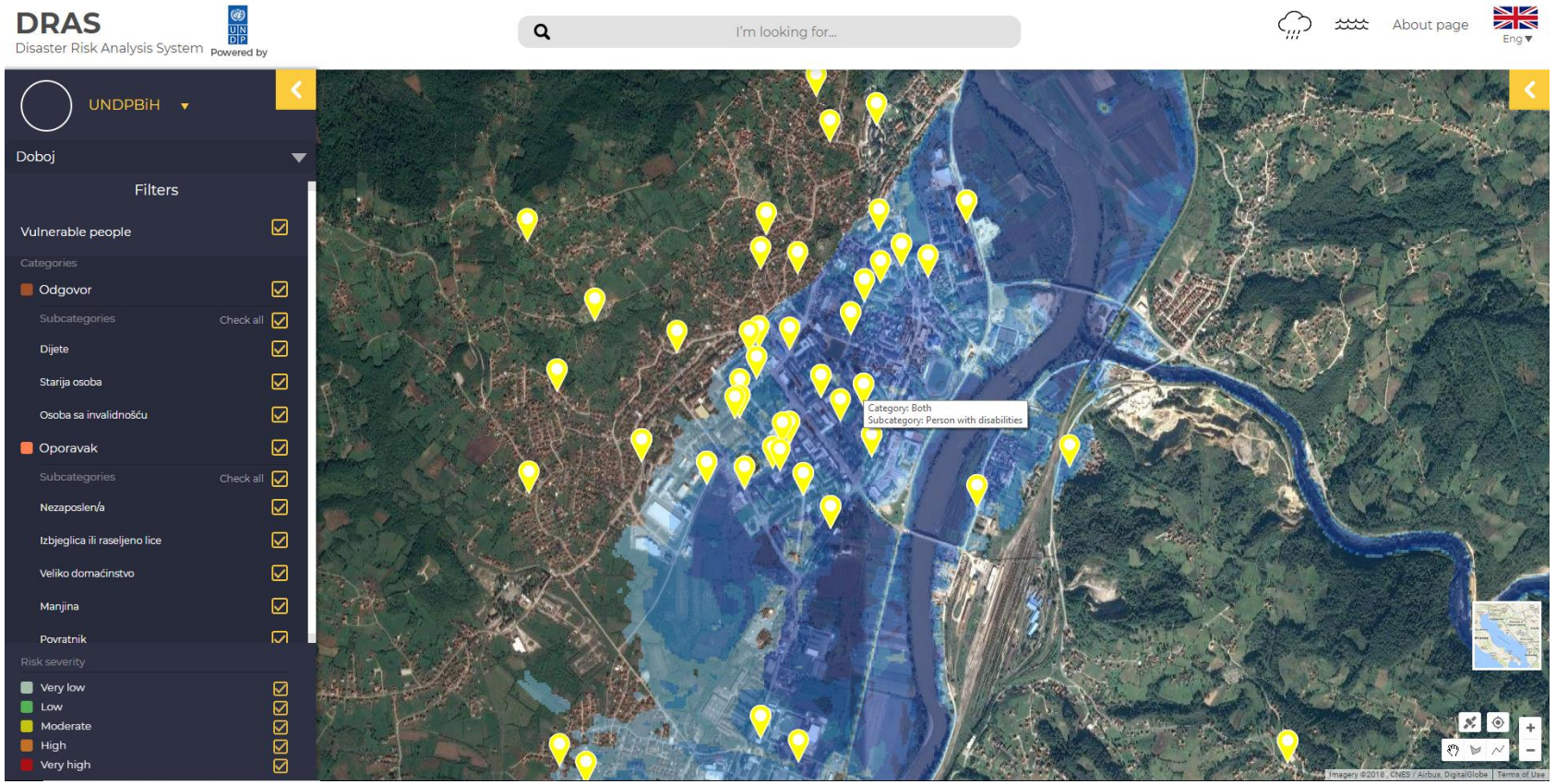
Resilient nations.



DRAS Modul 3

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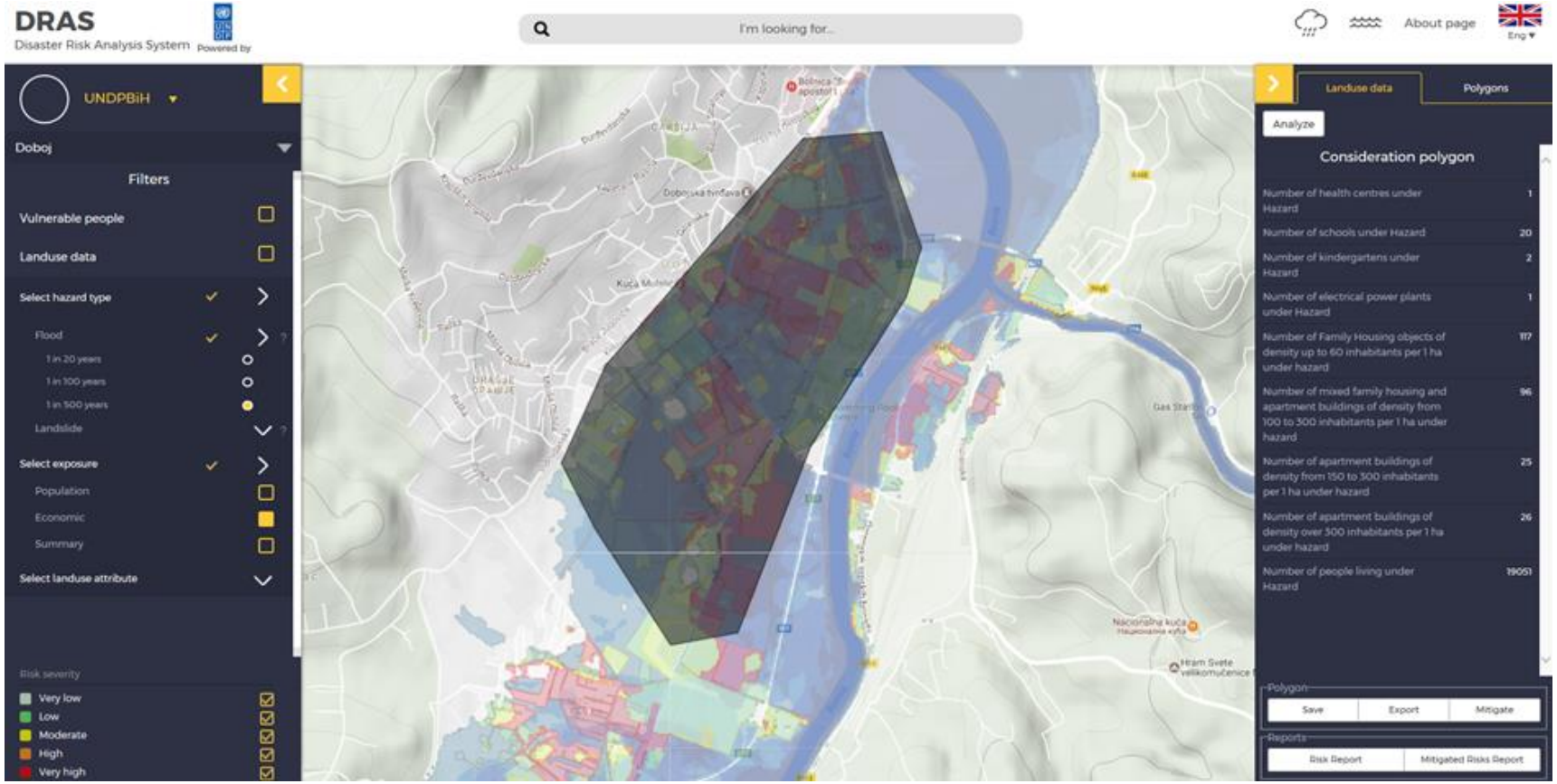

DRAS Modul 3

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Flood risk calculation

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The individual risk maps are obtained by multiplying the value of vulnerable categories:

	KF
1. population,	0.40 (40%)
2. economy,	0.35 (35%)
3. protected areas,	0.15 (15%)
4. cultural and historical heritage,	0.10 (10%)
5. *IPPC facilities,	no category

with the weight factor and the hazard map values.

$$RF = S_n \bullet WF \bullet H$$

RF – risk factor, n – number of dots, km ili km^2, TF – weight factor, H – hazard.

Summary risk map is obtained by summing the individual values of all vulnerable categories, adjusted with relative risk factors for each category.

*IPPC facilities - facilities and plants that could cause sudden water contamination in the event of a flood (chemical, metal, energy, waste management ...)

Population

Faktor rizika	Klasa	Kategorija rizika
0-49	0	Zanemariv rizik
50-499	0 < R <0,25	Nizak rizik
500-999	0,25 < R< 0,50	Umjeren rizik
1.000-1.499	0,50 < R< 0,75	Visok rizik
≥1.500	0,75 < R < 1,0	Ekstremni rizik

Economy

Faktor rizika	Klasa	Kategorija rizika
0-49	0	Zanemariv rizik
50-249	0 < R <0,33	Nizak rizik
250-499	0,33 <R < 0,67	Visok rizik
≥500	0,67 < R < 1,0	Ekstremni rizik

Cultural and historical heritage

Faktor rizika	Klasa	Kategorija rizika
0-499	0	Zanemariv rizik
500-3.499	0 < R <0,25	Nizak rizik
3.500-6.999	0,25 < R< 0,50	Umjeren rizik
7.000-9.999	0,50 < R< 0,75	Visok rizik
≥10.000	0,75 < R < 1,0	Ekstremni rizik

Protected areas

Faktor rizika	Klasa	Kategorija rizika
0-499	0	Zanemariv rizik
500-1.499	0 < R < 0,33	Nizak rizik
1.500-2.499	0,33 < R < 0,67	Visok rizik
≥1.500	0,67 < R < 1,0	Ekstremni rizik

IPPC facilities

Faktor rizika	Klasa	Kategorija rizika
0-149	0	Zanemariv rizik
150-299	0 < R <0,50	Visok rizik
≥300	0,50 < R < 1,0	Ekstremni rizik

Summary risk map

Klasa (RF)	Kategorija rizika
0	Zanemariv rizik
0 < R < 0,25	Nizak rizik
0,25 < R< 0,50	Umjeren rizik
0,50 < R < 0,75	Visok rizik
0,75 < R < 1,0	Ekstremni rizik

Calculation of population risk

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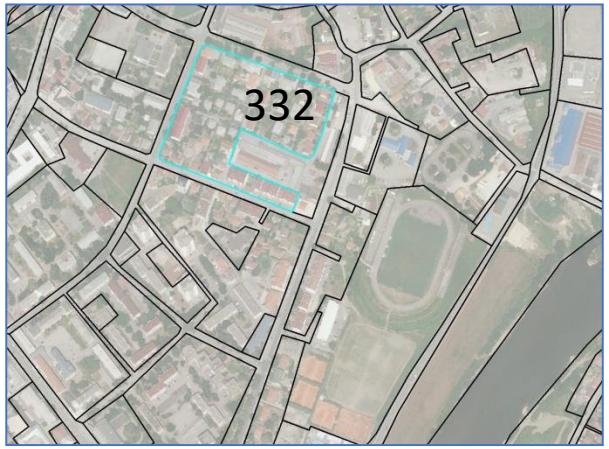
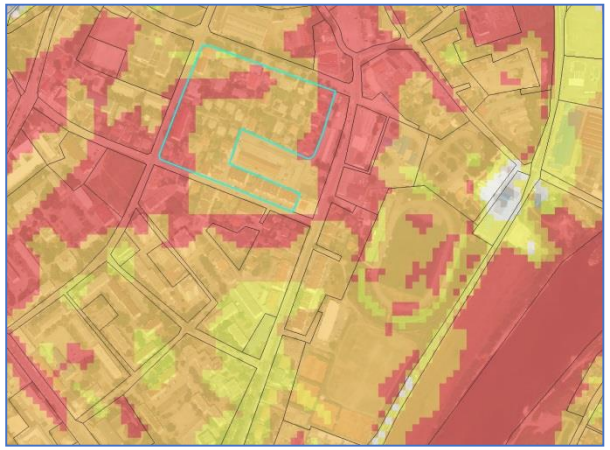
Number of people



✖ 100 (WF) ✖

Hazard (value)



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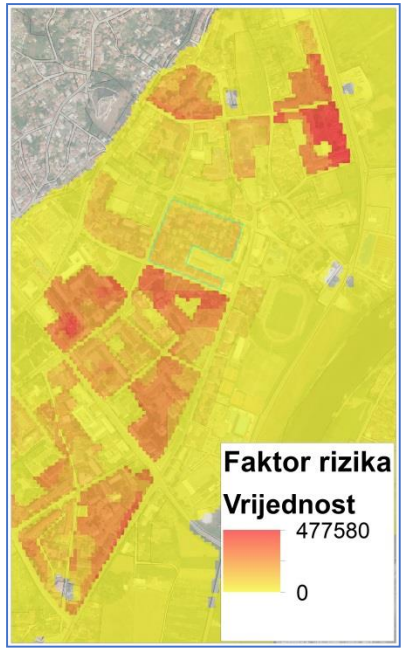

Reclassification

Faktor rizika	Klasa	Kategorija rizika
0-49	0	Zanemariv rizik
50-499	0 < R <0,25	Nizak rizik
500-999	0,25 < R< 0,50	Umjeren rizik
1.000-1.499	0,50 < R< 0,75	Visok rizik
≥1.500	0,75 < R < 1,0	Ekstremni rizik

Population risk

332 (number of people) x 100 (WF) x 1,5 (hazard) = 49800 (FR) → reclassification 1

EXSTREME RISK

Calculation of economy risk

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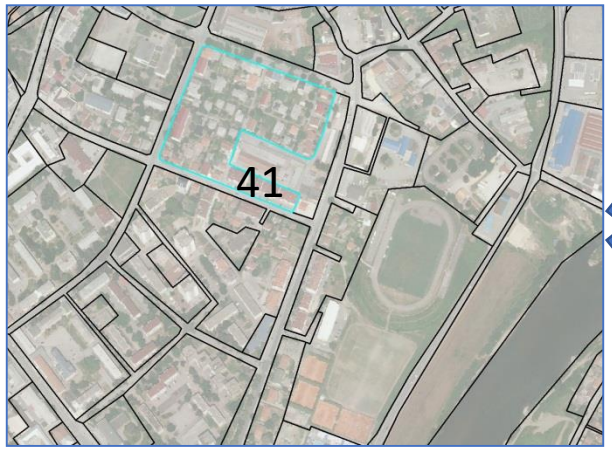
Categories:

- Social objects (schools, hospitals, nursing home for elderly people, cultural centre ...)
- Municipal infrastructure and production and business activities (gas station, factory, heating facility ...)
- Housing (housing density - individually, mixed and multiple housing)
- Traffic (motorway, regional road, highway ...)
- Natural areas (agricultural land, forests, water areas ...)

Reclassification

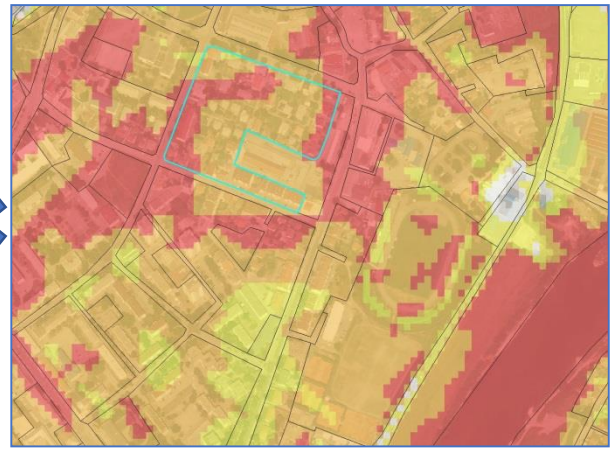
Faktor rizika	Klasa	Kategorija rizika
0-49	0	Zanemariv rizik
50-249	0 < R <0,33	Nizak rizik
250-499	0,33 <R < 0,67	Visok rizik
≥500	0,67 < R < 1,0	Ekstremni rizik

Polygons – unit of measure



(WF)

Hazard (values)



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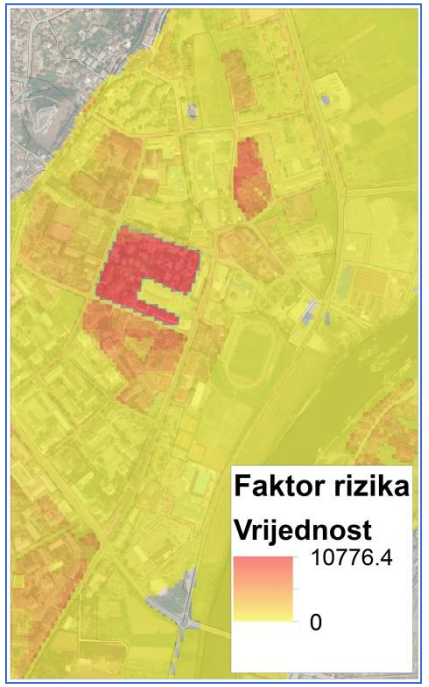

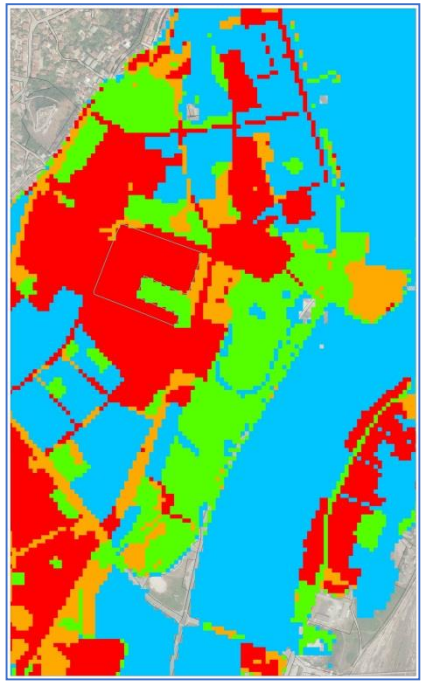

Economy: 41 (number of objects) x 80 (WF) x 1,5 (hazard) = 4920 (FR – risk factor) → reclassification 1 - EKSTREME RISK

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Calculation of IPPC risk

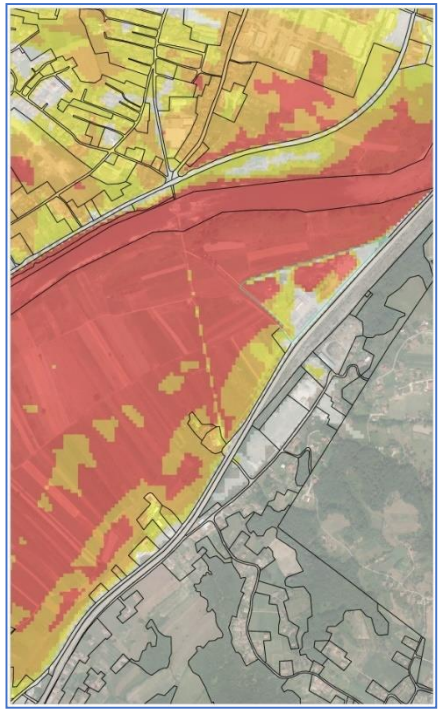
Reclassification

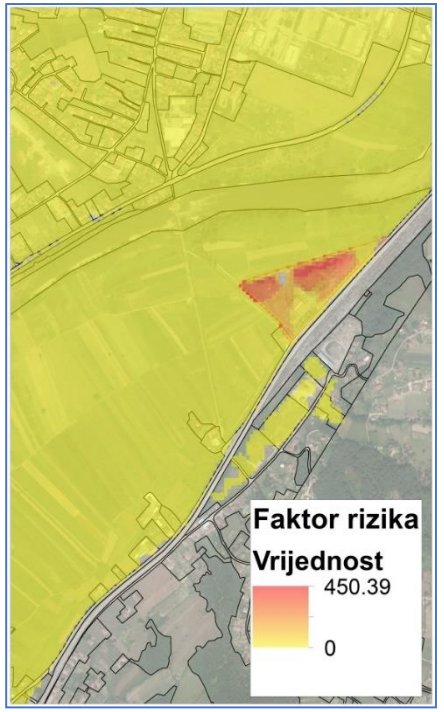
Faktor rizika	Klasa	Kategorija rizika
0-149	0	Zanemariv rizik
150-299	0 < R <0,50	Visok rizik
≥300	0,50 < R < 1,0	Ekstremni rizik

Number of IPPC

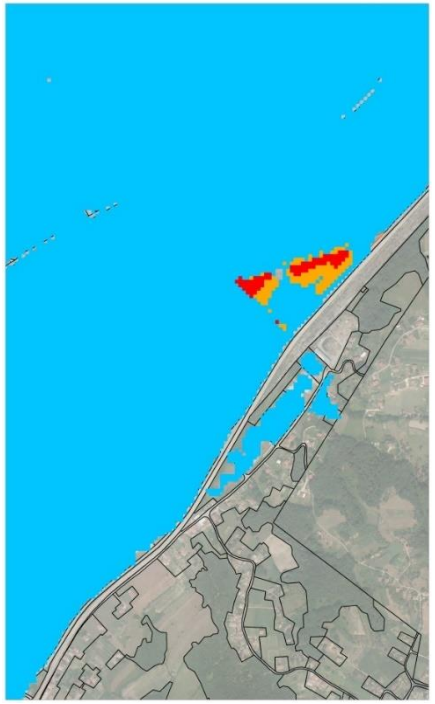
(WF) 100

Hazard (value)





IPPC risk



1 (facility) x 100 (WF) x 2,99 (hazard) = 299 (FR) → reclassification 0,50 - HIGH RISK

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Calculation of cultural-historical risk and protected area risk

Culrural-historical heritage

Reclassification

Faktor rizika	Klasa	Kategorija rizika
0-499	0	Zanemariv rizik
500-3.499	0 < R <0,25	Nizak rizik
3.500-6.999	0,25 < R< 0,50	Umjeren rizik
7.000-9.999	0,50 < R< 0,75	Visok rizik
≥10.000	0,75 < R < 1,0	Ekstremni rizik

Number of protected objects (polygon) ✖ TF ✖ Hazard (value) = Faktor rizika ⬇ ➡ Economy risk

CH: 1 (monument) x 95 (WF) x 1,5 (hazard) = 142.5 (FR) → reclassification 0 - NEGLIGIBLE RISK

Protected area

Reclassification

Faktor rizika	Klasa	Kategorija rizika
0-499	0	Zanemariv rizik
500-1.499	0 < R < 0,33	Nizak rizik
1.500-2.499	0,33 < R < 0,67	Visok rizik
≥1.500	0,67 < R < 1,0	Ekstremni rizik

Area PA (polygon) ✖ W ✖ Hazard (value) = Risk factor ⬇ ➡ Economy risk

PA: 10 km^2 (protected area) x 50 (WF) x 2,99 (Hazard) = 1499 (RF) → reclassification 0,33 - LOW RISK

Summary risk

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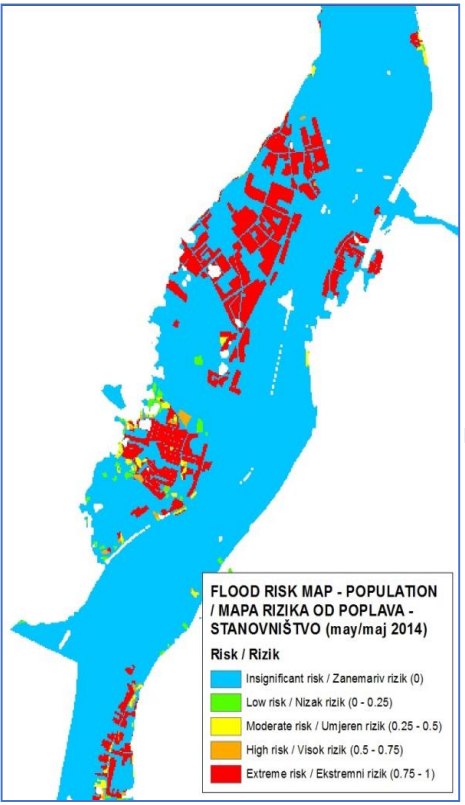
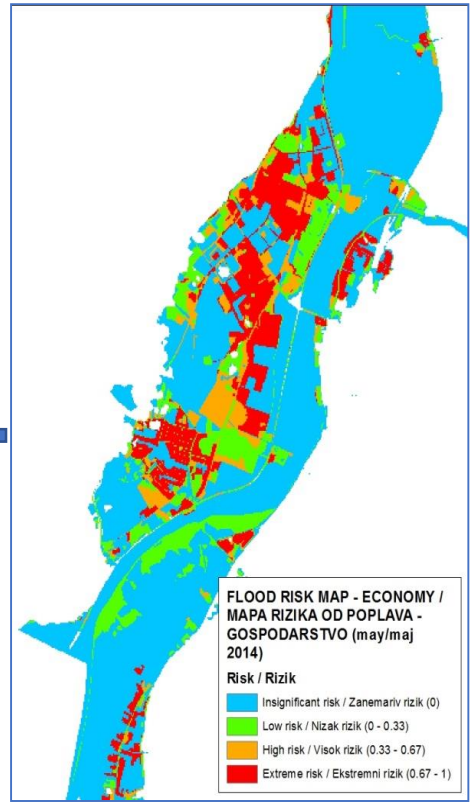
Risk class for population x 0.4 + Risk class for economy x 0.35 + Risk class for cultural-historical heritage x 0.1 + Risk class for protected areas x 0.15 + Risk class for IPPC = SUMMARY RISK

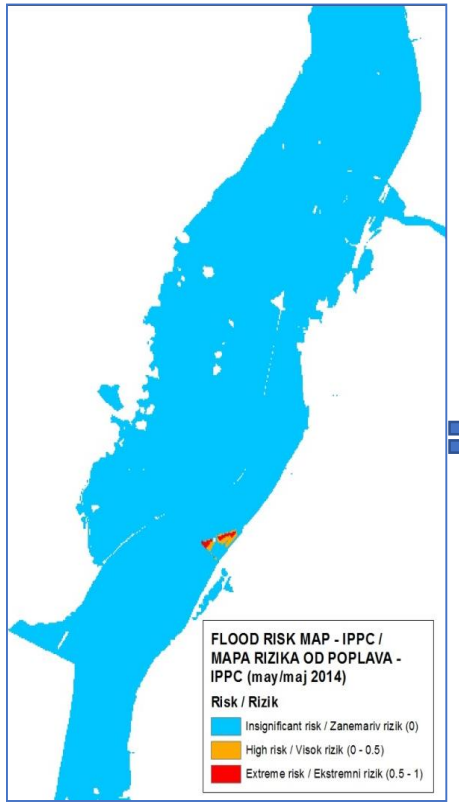


x 0.525 (WF)



x 0.475 (WF)

CH Map + PA Map +



Full values

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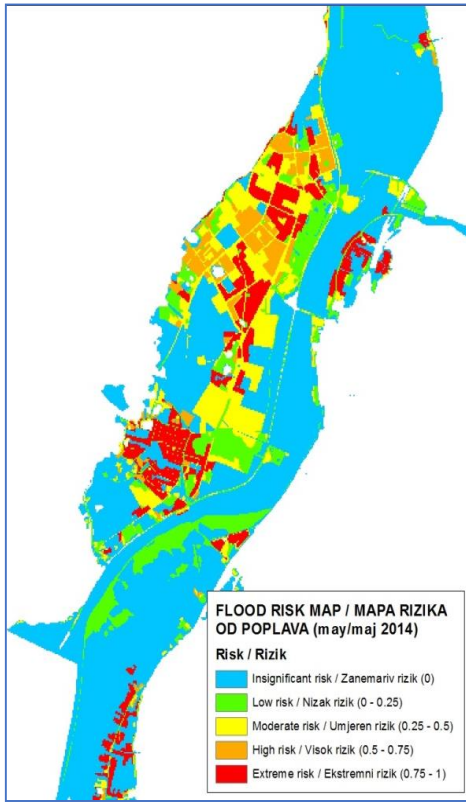

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Future for DRAS

Institutionalizing DRAS to 10 additional municipalities (in total 22 by 2020). DRAS is affordable tool and easy to use.

Possibility to be introduced in other countries in the region.

Introduction of fire hazard and risk data as well as environmental sensitivity risk.

Familiarizing more advanced users such as insurances, International Financial Institutions (IFIs), investors and private businesses with DRAS features to unlock greater funding for DRR.

We want to make DRAS ones to-shop for increasing resilience.

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Aida Hadzic Hurem

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Disaster Risk Reduction Project Manager

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