DRIN CORDA
COORDINATED ACTION FOR A SUSTAINABLE FUTURE

Enabling Transboundary Cooperation & Integrated Water Resources Management in the extended DRIN RIVER BASIN

5th Drin Stakeholders Conference

FLOODS IN THE PRESPA SUB-BASIN, THEIR OCCURRENCE, EFFECTS AND RISKS

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21 – 22 November 2017
Podgorica

Historical data

Three biggest floods in 1942, 1962 and 1979 in Golema reka (river) basin

In 1942-1943 и 1963 (November) floods cause by high level of Prespa Lake (851.93 м) affecting number of villages (Nakolec, Asamati, Ezerani, Perovo) and large percentage of arable land

Last flood in 2015

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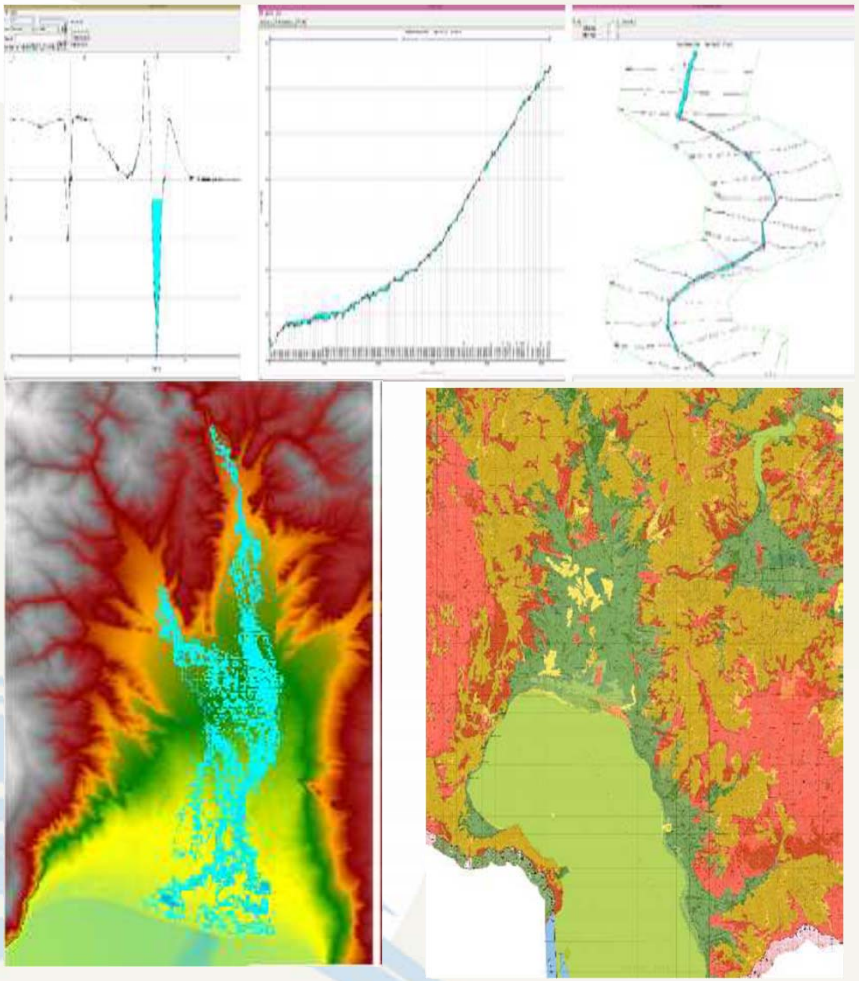
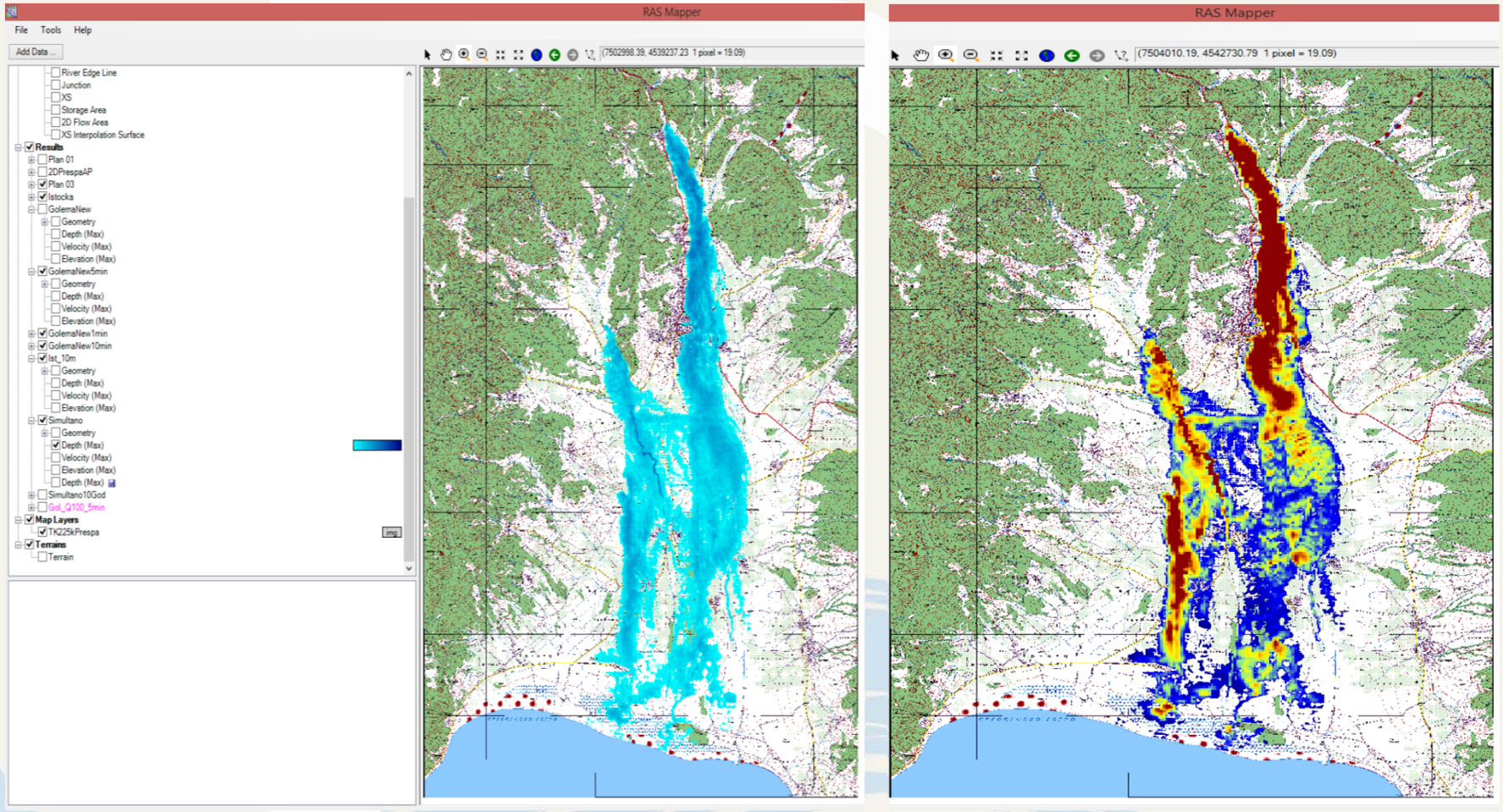
Use of IT Technology - Hydrologic Engineering Centers River Analysis System (HEC-RAS), US Army Corps of Engineers

- User-friendly interface
- Different modules for hydraulic analyses (stationary flow (1D), non-stationary flow (1D and 2D), transport of sediment, water quality
- Data storage and management
- Graphical and tabular presentation of data
- RAS Mapper – providing for GIS mapping of data from the hydraulic analyses



Hydraulic modeling of Golema River and Istocka River



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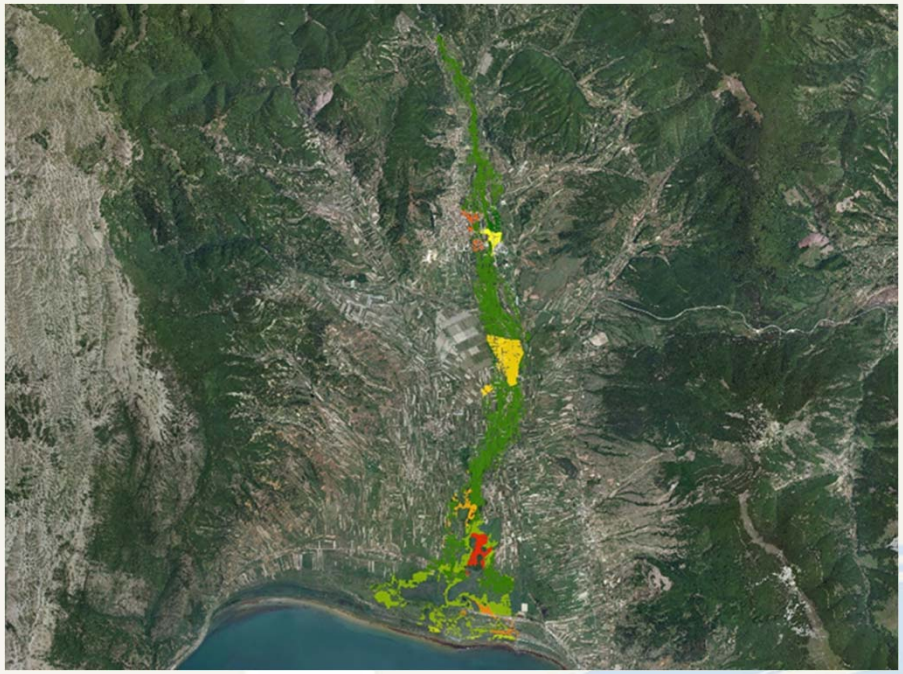
Assessment of the potential damages from floods (Golema and Istocka Rivers)
Scenario I – Golema reka

(Q100=65 m3/s)



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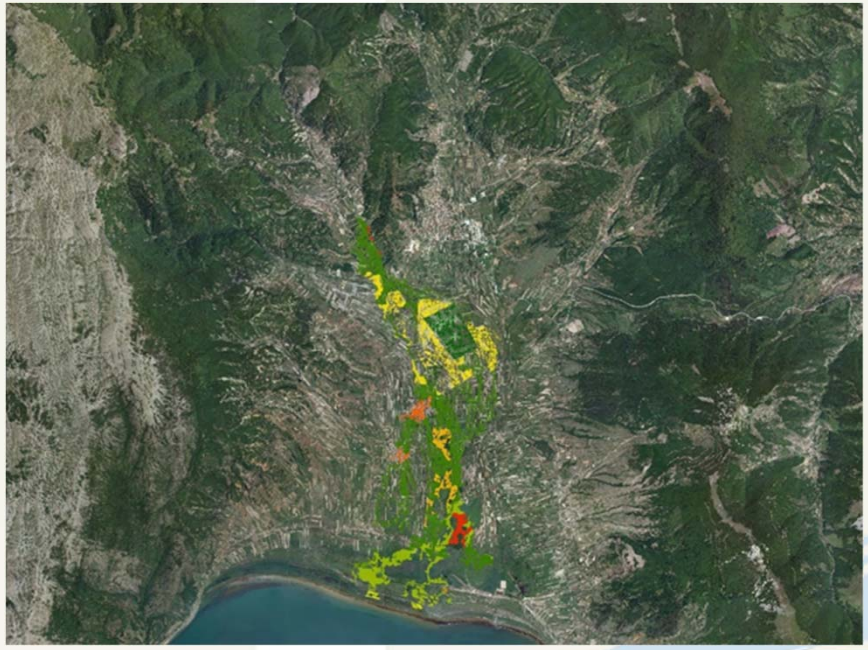
Scenario 2 – Istocka reka

Q100=47 m3/s



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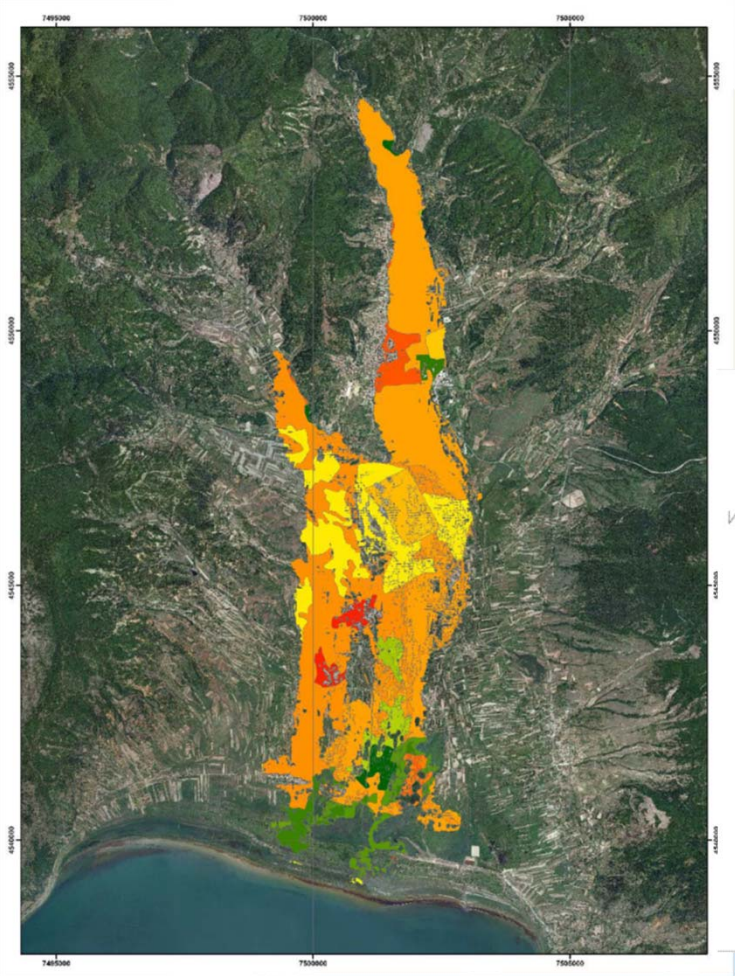
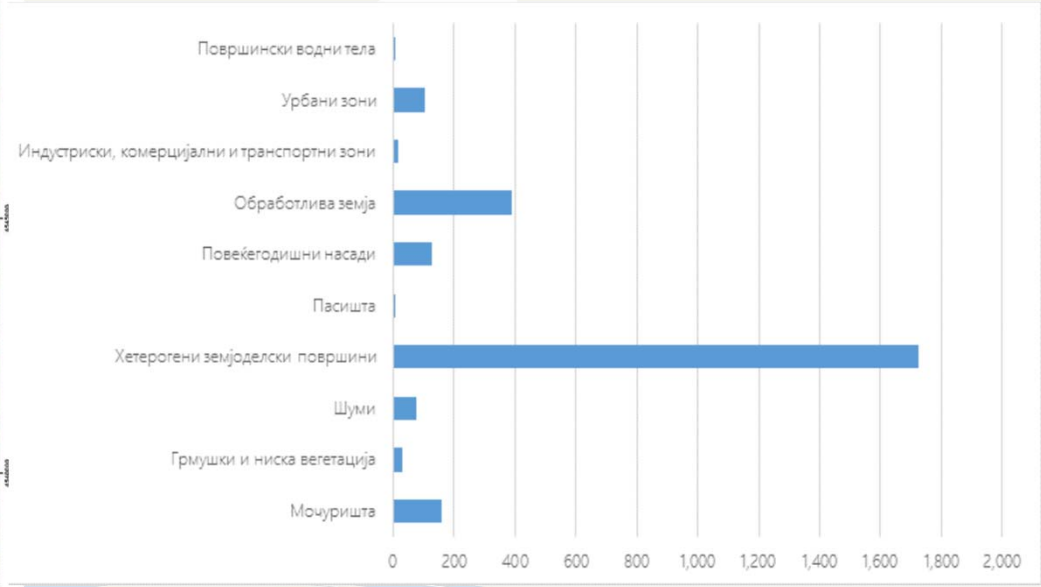
Scenario 3 - Simultaneously for both rivers , 2630ha



- Average losses per ha flooded areas ~ 2.000 EURO/ha (agriculture & infrastructure)
- Potential losses of a flood occurring 1/100 years (1% probability of an occurrence) ~ 6,5 mill USD (10% BDP for the Municipality of Resen)



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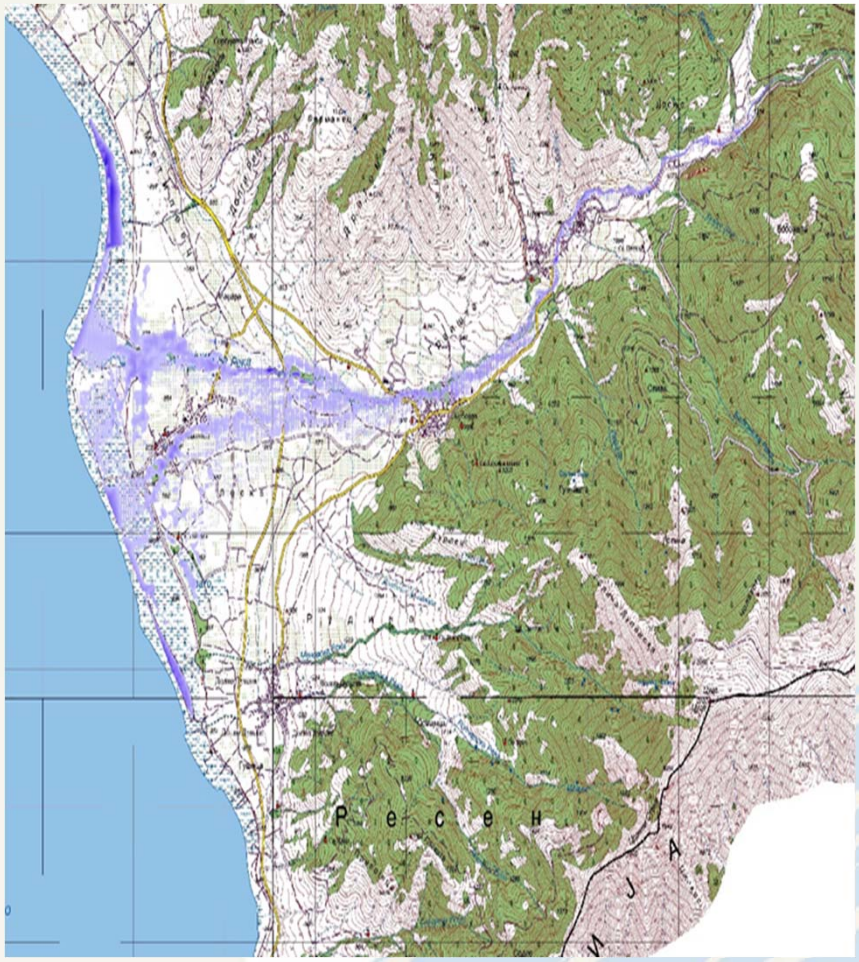
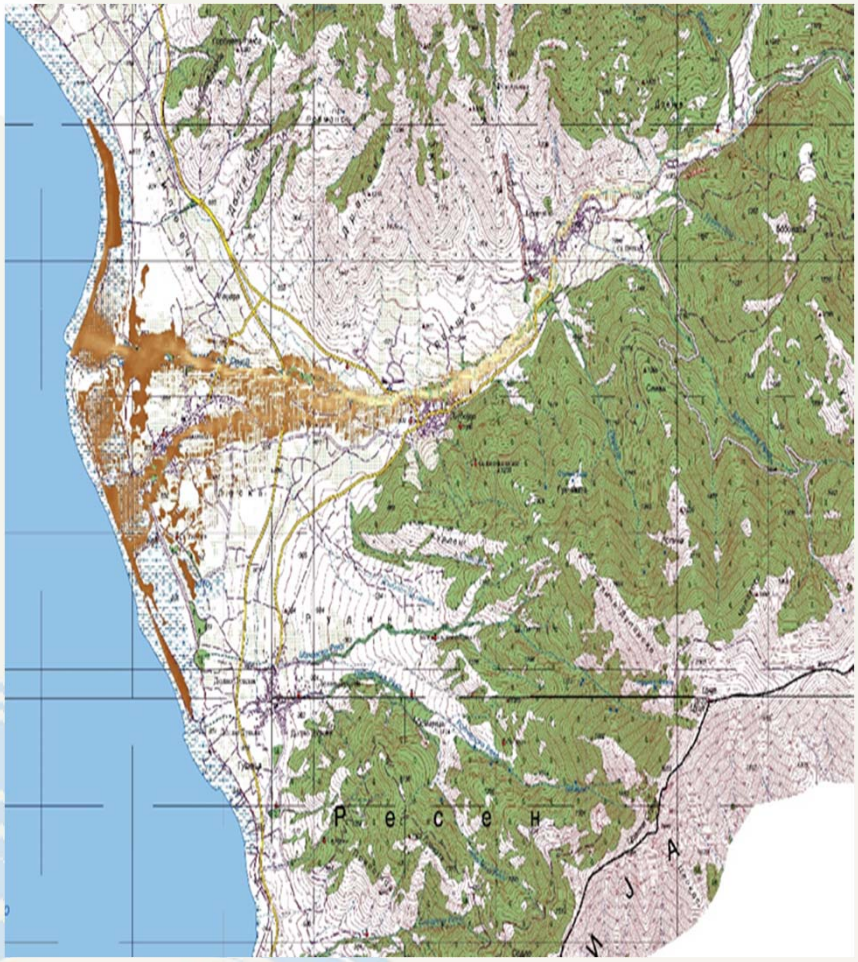
Scenario – 4 Floods caused by smaller mountain rovers – Brajcinska reka





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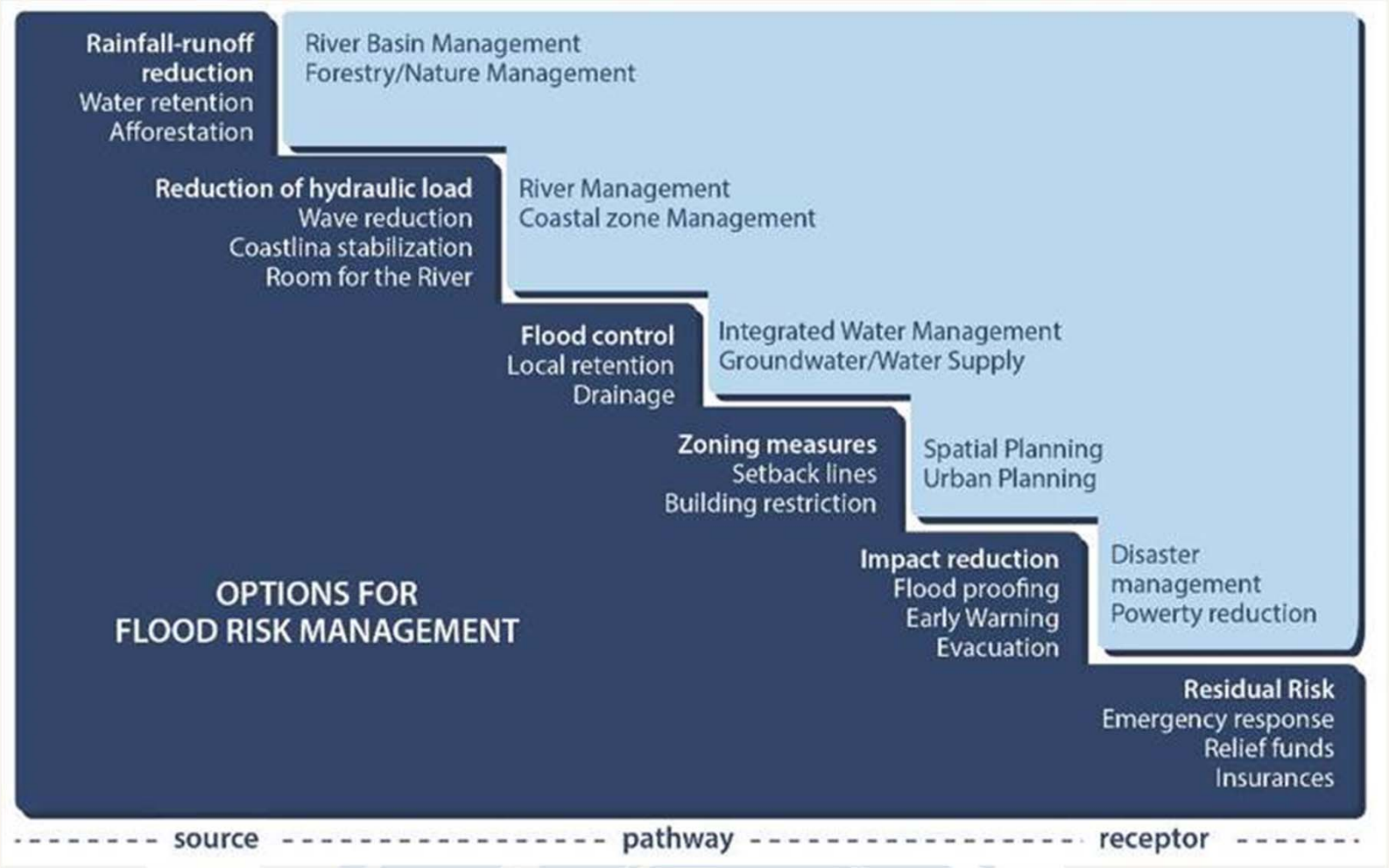
Operational Plan for Flood Prevention in the Municipality of Resen

- Regular maintenance of riverbeds and drainage channels;
- Construction of preventive structures on critical areas for flooding;
- Finalization of the rain water collection system in Resen;
- Preparation of technical documentation for resolving the problems with open channels;
- Public awareness activities and education;
- Targeted education of farmers for good agricultural practices that will prevent erosion and will decrease the risk of flooding;
- Mainstreaming flood risk assessment (ant other risks) into land use and urban plans;


Rainfall-runoff reduction
Water retention
Afforestation
River Basin Management
Forestry/Nature Management
Reduction of hydraulic load
Wave reduction
Coastlina stabilization
Room for the River
River Management
Coastal zone Management
Flood control
Local retention
Drainage
Integrated Water Management
Groundwater/Water Supply
Zoning measures
Setback lines
Building restriction
Spatial Planning
Urban Planning
Impact reduction
Flood proofing
Early Warning
Evacuation
Disaster management
Powerty reduction
OPTIONS FOR FLOOD RISK MANAGEMENT
Residual Risk
Emergency response
Relief funds
Insurances
source
pathway
receptor

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THANK YOU FOR YOUR ATTENTION