



Environment and Climate
Regional Accession Network **ECRAN**

Climate Change Adaptation in Western Balkans

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First Regional Conference and Seminar on Climate
Change Adaptation
Skopje, 2 July 2014



This Project is funded by the European Union



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Background on Climate Change

- South-East Europe is one of the regions most affected by climate change
- Especially extreme events like **floods** and **droughts** are likely to occur more often

Scenarios:

- Increase of annual temperature of up to 5.6°C in the region by 2100
- Decline of annual average precipitation of up to 5% by 2050



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Climate Change Adaptation in Western Balkan 01/2012- 12/2018

Partners Albania, Kosovo, Macedonia, Montenegro & Serbia: Ministries of Environment, Hydro-meteorological services, communes, municipalities...

Budget 3,500,000 EUR

Objective *Adaptation to climate change in the Western Balkans is particularly improved in the fields of flood and drought risk management*

Components:

**1. Drin-Buna
Flood Early
Warning
System**

- flood warning system based on real-time data
- hydromet equipment
- Data exchange between countries

**2. Climate
Change
Adaptation
Strategies**

- Support in drafting National or sector Climate Change Adaptation Strategies

**3. Local Flood
and Drought
Management
Plans**

- Development of 40 communal flood and drought management plans
- implementation of defined measures

**4. Regional
WRM**

- Support structures and concepts for regional IWRM (Drin Dialogue, Standing Working Group)

**5. Climate
Change
Adaptation in
Urban Areas**

- Integrating Climate Change Adaptation in urban planning and development in Belgrade, Tirana & Podgorica



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Flood 2010



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Flood 2013



Drought 2014



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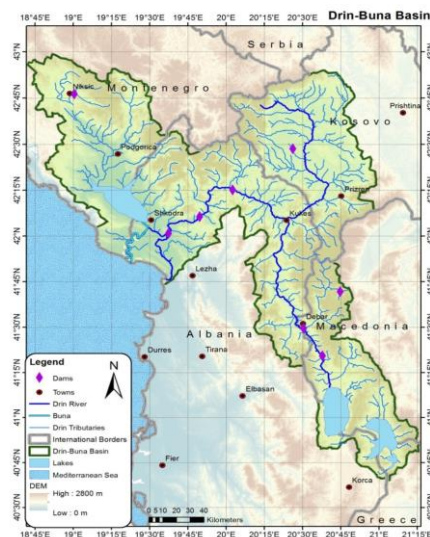


Flood Warning System for Drin Basin

- Transboundary basin with specific characteristics
- Main partners are hydro-meteorological Institutes in Albania, Kosovo, Macedonia and Montenegro
- Support focuses on:
 - upgrading of hydro-meteorological networks
 - hydrological modelling
 - regional data exchange



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Hydrological Model - Water level simulation at Lake Shkodra

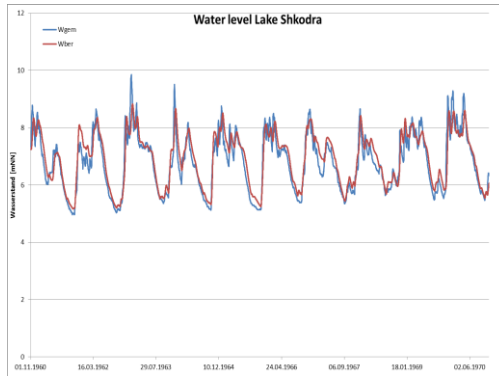


Fig: Simulated (red) and observed (blue) water level at Lake Shkodra 11/1960 – 11/1970; lake parameters est.

+ Simulation boundaries (model configuration)

1. Used observed inflow from Podgorica
2. Simulation of sub-basin between Podgorica and Lake Shkodra with estimated sub-basin model parameters (no calibration)

-> Conclusions

Water level simulation is already very good with respect to parameter estimation

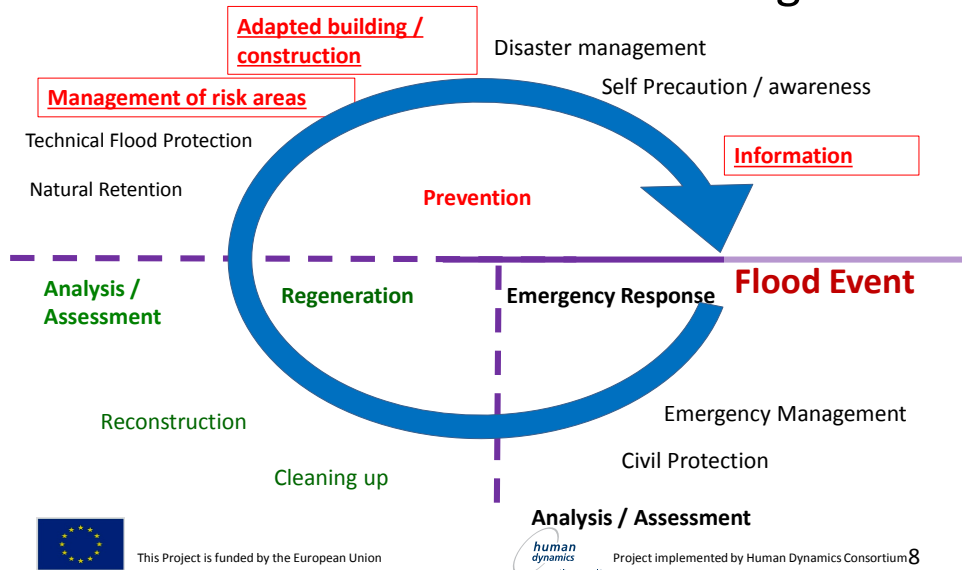


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Fields of action in flood risk management

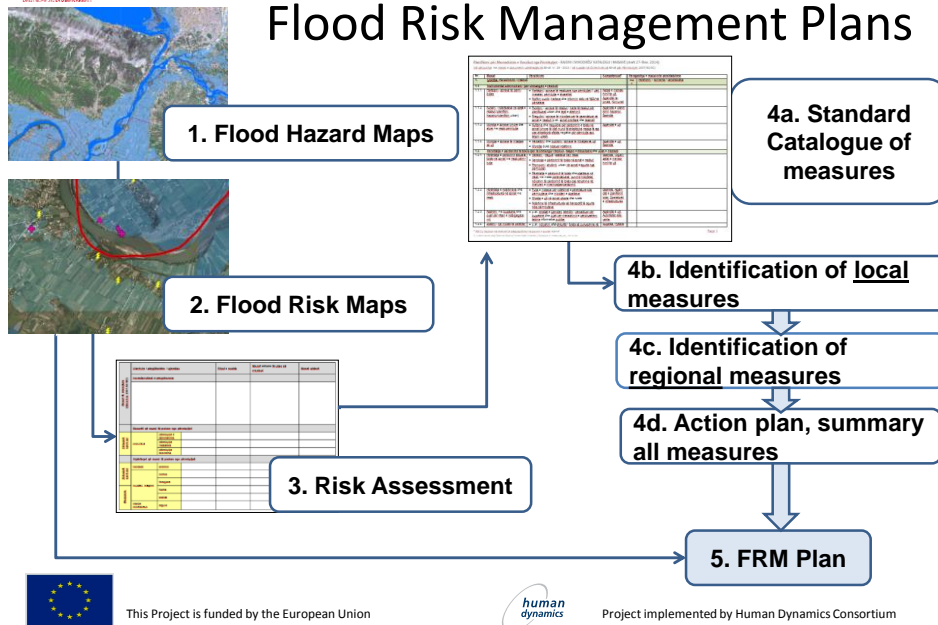


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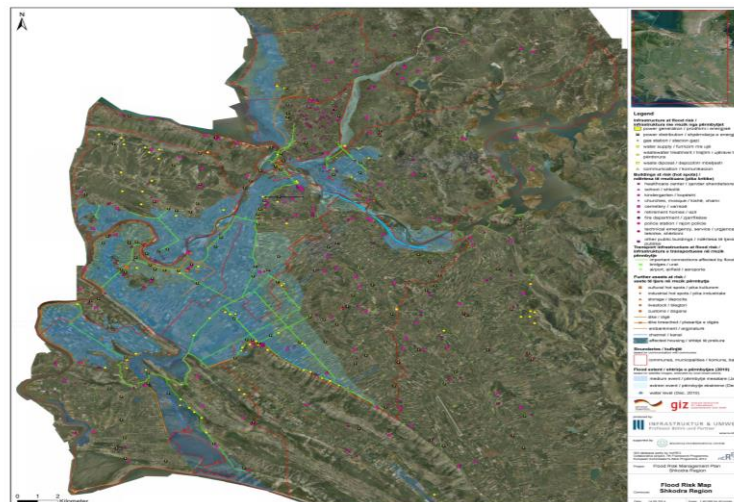


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Flood Risk Management Plans



Flood Risk Map- Shkodra



Drought Management

Cause of the 2013/14 Drought

H Year	SPI-1 Oct	SPI-1 Nov	SPI-1 Dec	SPI-1 Jan	SPI-1 Feb	SPI-1 Mar	SPI-1 Apr	SPI-1 May	SPI-1 Jun	SPI-1 Jul	SPI-1 Aug	SPI-1 Sep	SPI-6 Oct-Mar	SPI-6 Apr-Sep	SPI-12 Oct-Sep
2004	-0.46	1.33	-0.64	-0.01	0.22	0.72	0.29	0.98	0.24	0.49	1.05	-0.66	0.24	0.75	0.61
2005	-0.42	-0.30	1.13	0.18	1.26	1.17	0.96	-0.70	0.21	-0.16	1.30	-0.27	0.75	0.35	0.65
2006	-0.19	-0.85	-0.65	0.65	-0.50	-0.14	-1.02	0.64	-1.19	-1.73	-0.32	-0.69	-1.14	-1.61	-2.06
2007	1.21	1.85	-0.74	-0.57	-1.92	1.77	-1.63	0.15	1.64	0.81	-0.48	0.21	1.47	0.39	1.18
2008	-0.15	-0.12	1.54	0.91	0.60	1.38	-0.93	-0.03	1.16	-0.33	0.40	-0.90	1.23	-0.32	0.53
2009	0.86	0.56	0.93	1.20	1.71	0.68	1.05	0.49	0.84	0.79	-0.19	-0.42	1.97	0.68	1.73
2010	0.77	1.06	1.66	-0.54	-0.47	-0.27	-0.55	0.19	-1.03	0.35	-1.75	-0.12	1.00	-1.11	-0.14
2011	-0.05	-2.64	0.74	1.93	0.27	-1.03	0.19	1.07	-2.54	0.43	-1.64	-1.07	0.05	-0.83	-0.67
2012	0.26	-0.75	0.41	-0.44	0.08	-0.25	-1.43	-0.11	-0.39	-0.22	-1.45	0.56	-0.67	-1.17	-1.42
2013	0.36	-0.26	-1.54	-1.05	-2.49	0.68	3.89	0.32	-99	-99	-99	-99	-1.36	-99	-99

Prolonged deficit in precipitation since JUNE 2012!



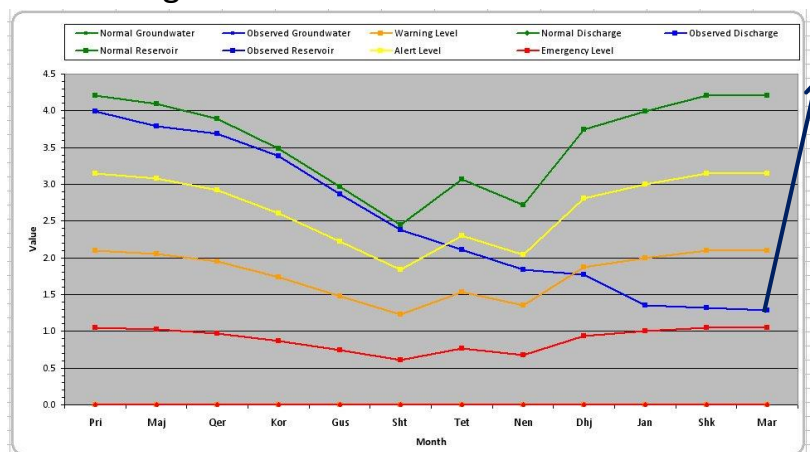
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Drought Management

Monitoring essential



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Drought Management Plan

HIDROMORAVA DROUGHT PLAN										Hidromorava Gjilan		Household Net Consumption			
Stage 1															
HIDROMORAVA DROUGHT PLAN										Hidromorava Gjilan		Household Net Consumption			
Stage 2															
HIDROMORAVA DROUGHT PLAN										Hidromorava Gjilan		Household Net Consumption			
Stage 3															
HIDROMORAVA DROUGHT PLAN										Hidromorava Gjilan		Household Net Consumption			
Stage 4															
HIDROMORAVA DROUGHT PLAN										Hidromorava Gjilan		Household Net Consumption			
Stage 5										Supply Measures		Demand Measures		Household Net Consumption	
Gjilan															
Recovery										Baseline System Input Volume (M/ls)		Baseline Water Losses (M/ls)			
										7.68		2.67		5.01	
S.5.1 Monitor Indicators to confirm end of drought												Balance of non-household Demand from DMP Stage 4 (M/ls)		0.50	
S.5.2 Assume source 'Guri I Hoxhes' increased to full output										4.92		D.5.1 Losses associated with Measure S.3.8 are +35%		1.72	
S.5.3 Assume source 'Baja' increased to full output										1.95		D.5.2 Losses associated with Measure S.3.8 are +35%		0.68	
												D.5.3 Divert % of sources to downstream ecosystem		1.20	
												D.5.4 Restore all business to 75% supply		1.40	
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CCA in Cities- main receptors

✓ Population	✓ Infrastructure	✓ Built environment	✓ Economy	✓ Natural resources
				
<ul style="list-style-type: none"> • Health services • Social services • Rescue services / civil protection 	<ul style="list-style-type: none"> • Water supply • Waste water management • Water management / Flood protection • Transport / public transport • (energy) 	<ul style="list-style-type: none"> • Urban planning • Housing departments / companies • (architects) • („handcraft people“) 	<ul style="list-style-type: none"> • „relevant“ Public companies • „relevant“ Private companies 	<ul style="list-style-type: none"> • Green urban planning • Landscape planning • Urban climate protection • Water management (= see left)

- Which sectors are in the focus / interact with other sectors?
- Which actors shall be involved?



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Awareness Raising

Heat Wave Campaign



Drin Day celebration



Air Quality Campaign



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Conclusions

- Climate Change calls for regional, national and local actions
- Adaptation to Climate Change must take place in sectors
- Topics always cross-cutting → coordination and cooperation essential
- No regret, no harm measures & focus on things already visible
- Public awareness important
- **Data is crucial!!!** Institutions collecting data must get more resources



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