

Assessing and Communicating Country level Climate Impacts in Russia and the UK: Final Project Workshop



HAZARDOUS HYDROLOGICAL
PHENOMENA AND SOCIAL
VULNERABILITY IN RUSSIA

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The relevance of our research

- Climate change increases number of natural hazards
- More than **10 million people** are exposed in Russia
- **The main gap** is social vulnerability assessment

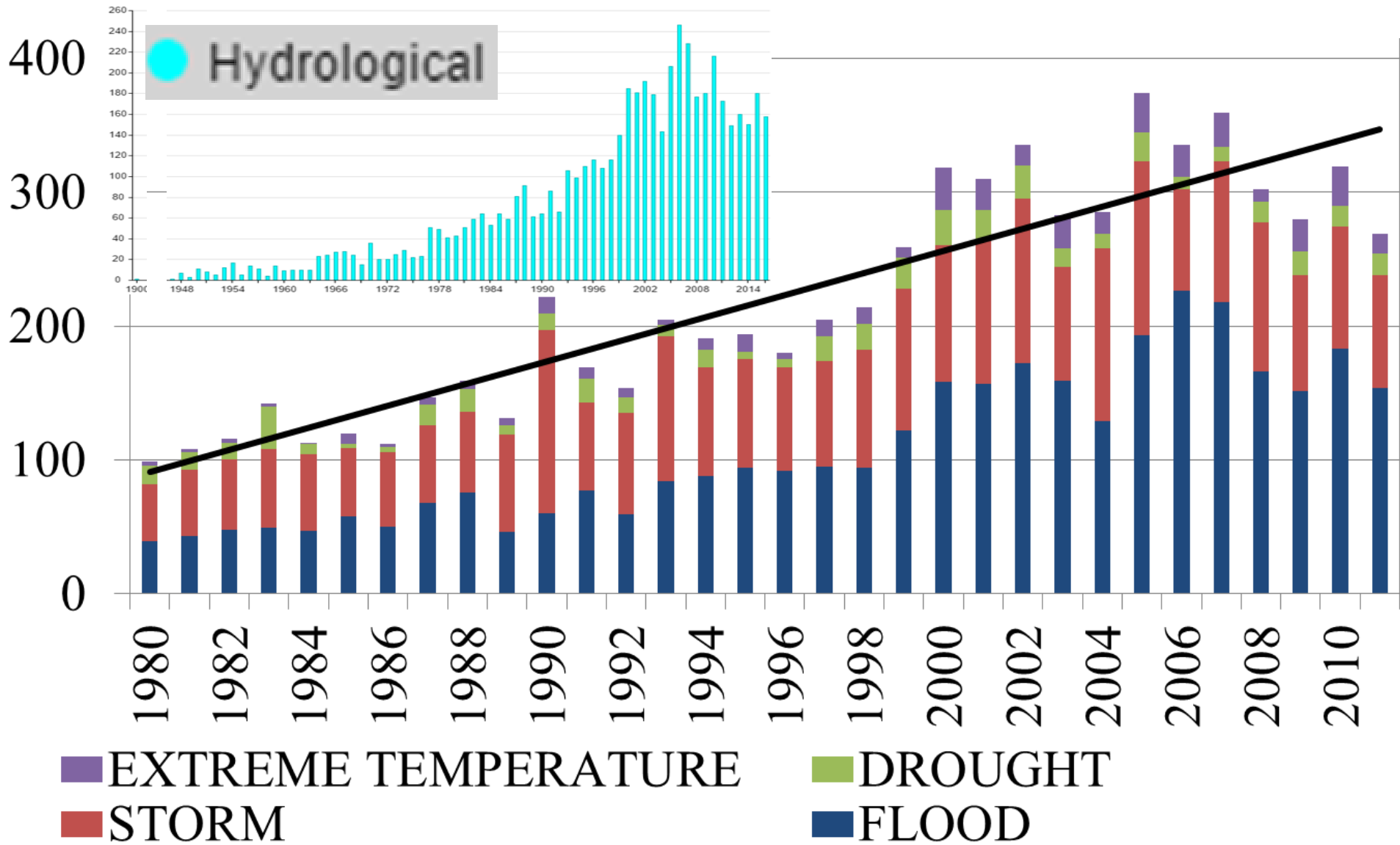
The purpose of the research

- to estimate influence of hydrological phenomena on social and economic development in Russia

The hypothesis

- **real social losses** from hydrological events **are similar to economic damage** but the first one is underestimated because of low “value of life”

Number of hazardous events



WORLD RISK INDEX

Natural hazard sphere

Exposure

Exposure to natural hazards



Vulnerability—Societal sphere

Susceptibility

Likelihood of suffering harm

Lack of Coping Capacities

Lack of capacities to reduce negative consequences

Lack of Adaptive Capacities

Lack of capacities for long-term strategies for societal change

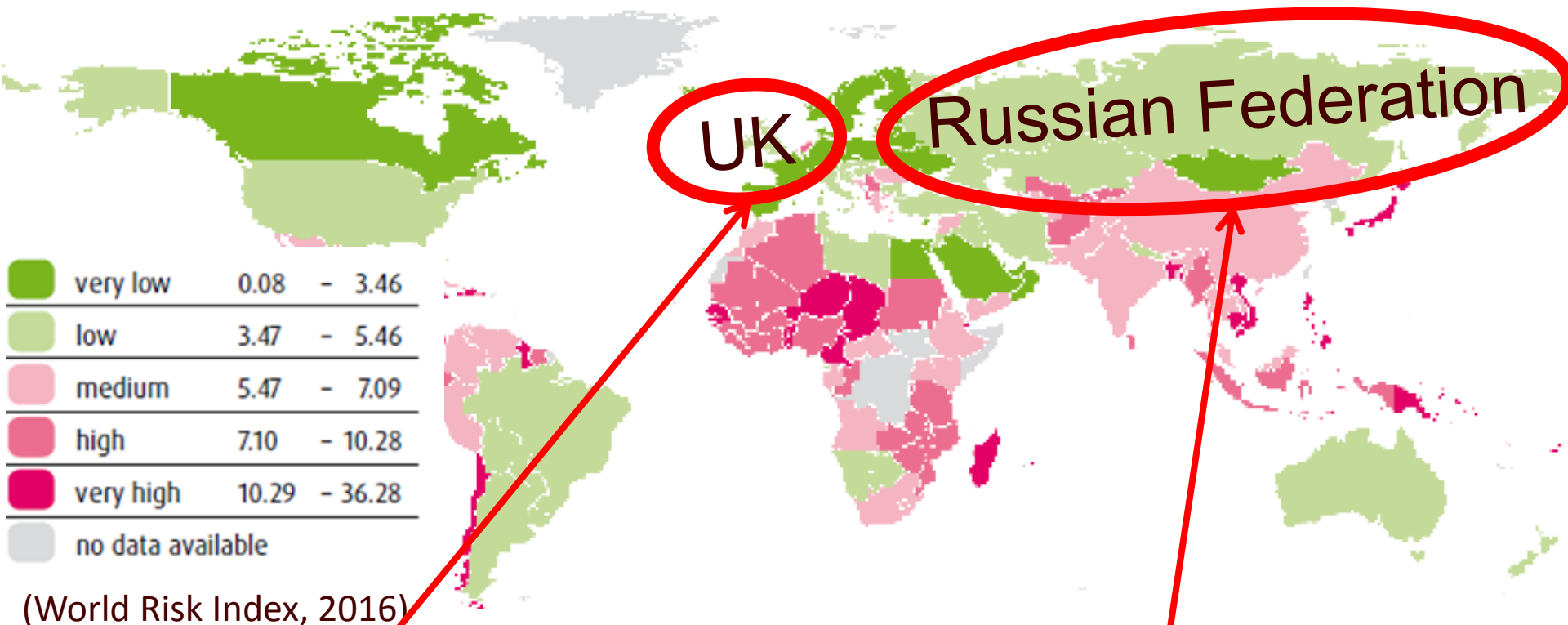


(World Risk Index, 2016)

(Birkmann, 2007; Fekete 2010; Fuchs et al. 2012, Birkmann et al. 2013)

Vulnerability is “the degree of damage that can be expected depending on the characteristics of an ‘element at risk’ with respect to a certain hazard” (Fuchs et al., 2011)

WORLD RISK INDEX



UK

Russian Federation

WRI is 3,54% (131th)
Exposure – 11,6%
Vulnerability – 30,5%

WRI is 3,58% (128th)
Exposure – 9,4%
Vulnerability – 38,2%

But is it correct for large countries such as Russia?

REGIONAL AND MUNICIPAL RISK INDEX

(Zemtsov et al., 2014, 2016)

$$R = I_{NH} \times I_E \times I_V$$

I_{NH} – **natural hazard** index (how many events, how often, how intensive) (Gladkevich et al., 2012)

I_E – **exposure** index (share of potentially exposed people) (Ministry of finance, 2011)

I_V – **vulnerability** index (share of people in danger)

$$I_V = (I_S + I_{LCC} + I_{LAC})/3$$

I_S – **susceptibility** subindex (infr., housing, poverty)

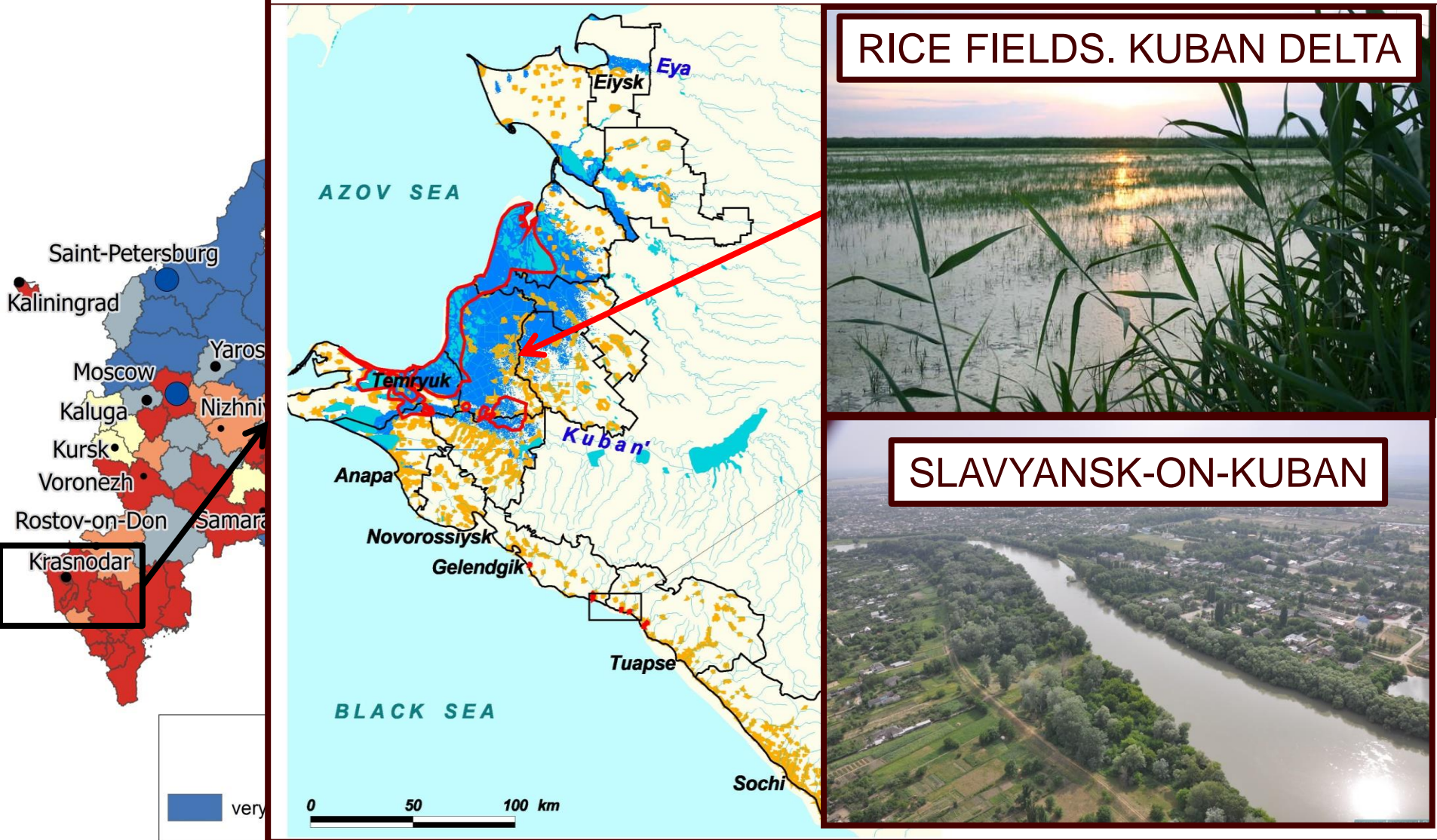
I_{LCC} – **lack of coping capacity** subindex (authorities, preparedness, medical services, social networks)

I_{LAC} – **lack of adaptive capacity** subindex (education, investment)

REGIONAL EXPOSURE INDEX

Data on subsidies of ministry of finance

POTENTIAL FLOODING IN KRASNODAR REGION



REGIONAL RISK INDEX

Relative potential social losses

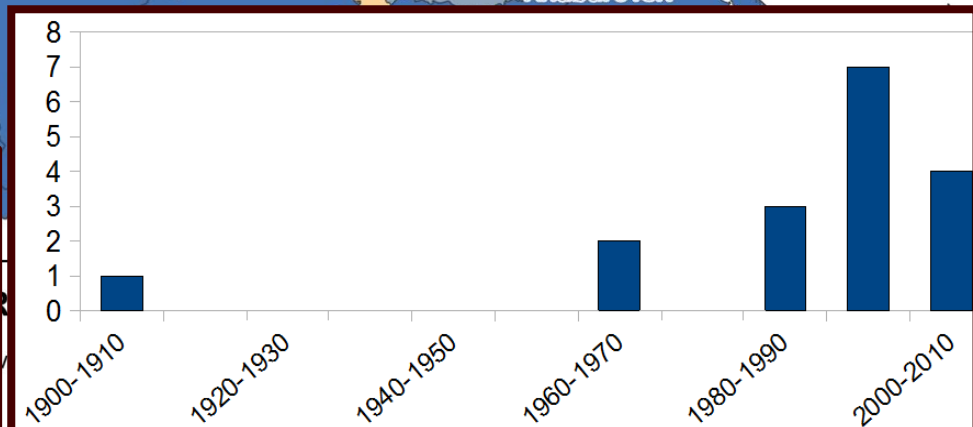
Cuban flood, 2002



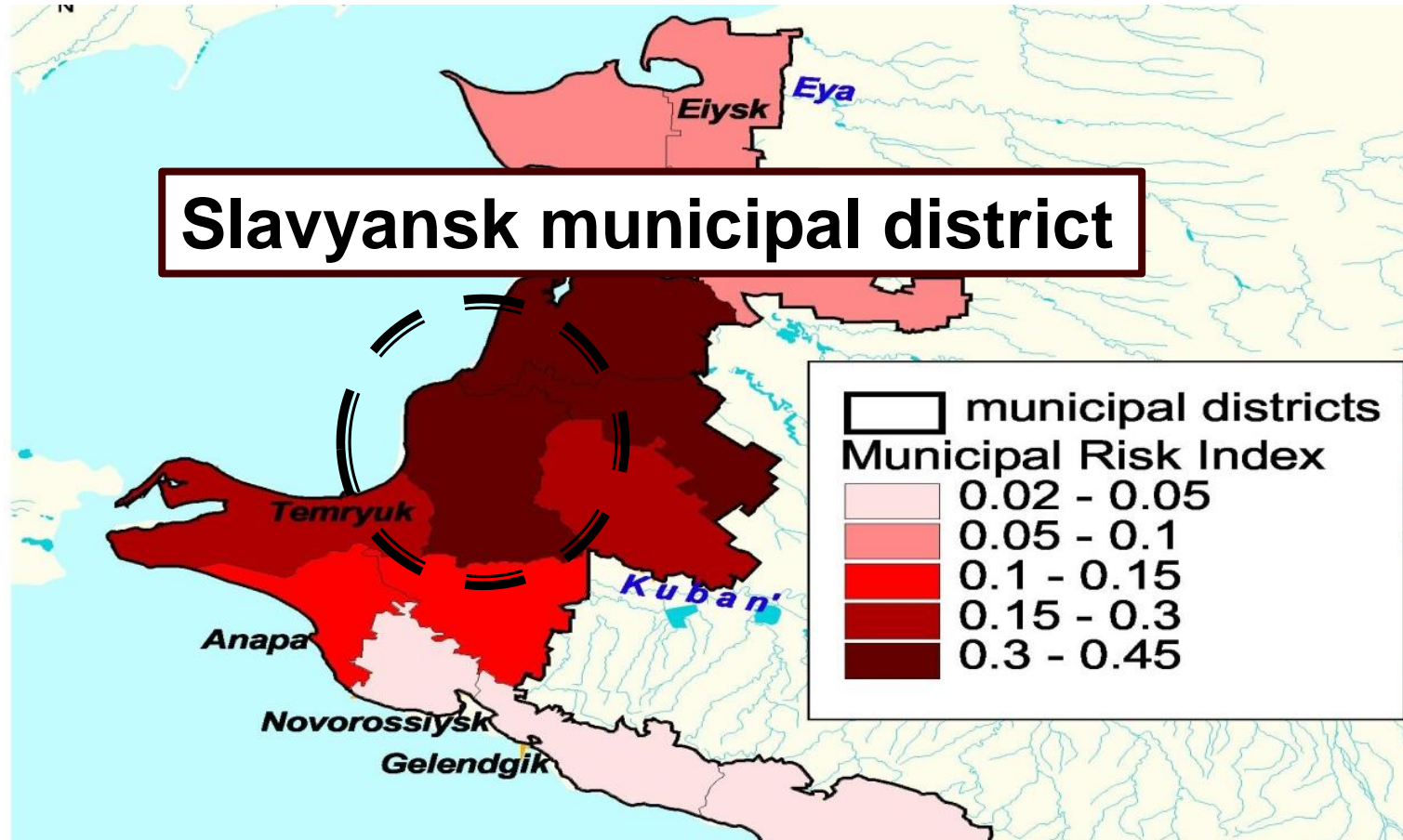
Krymsk, 2012



Number of significant flood events
in Russia on Black Sea Rivers,
events per 10 years
(Mikhailov et al., 2010)



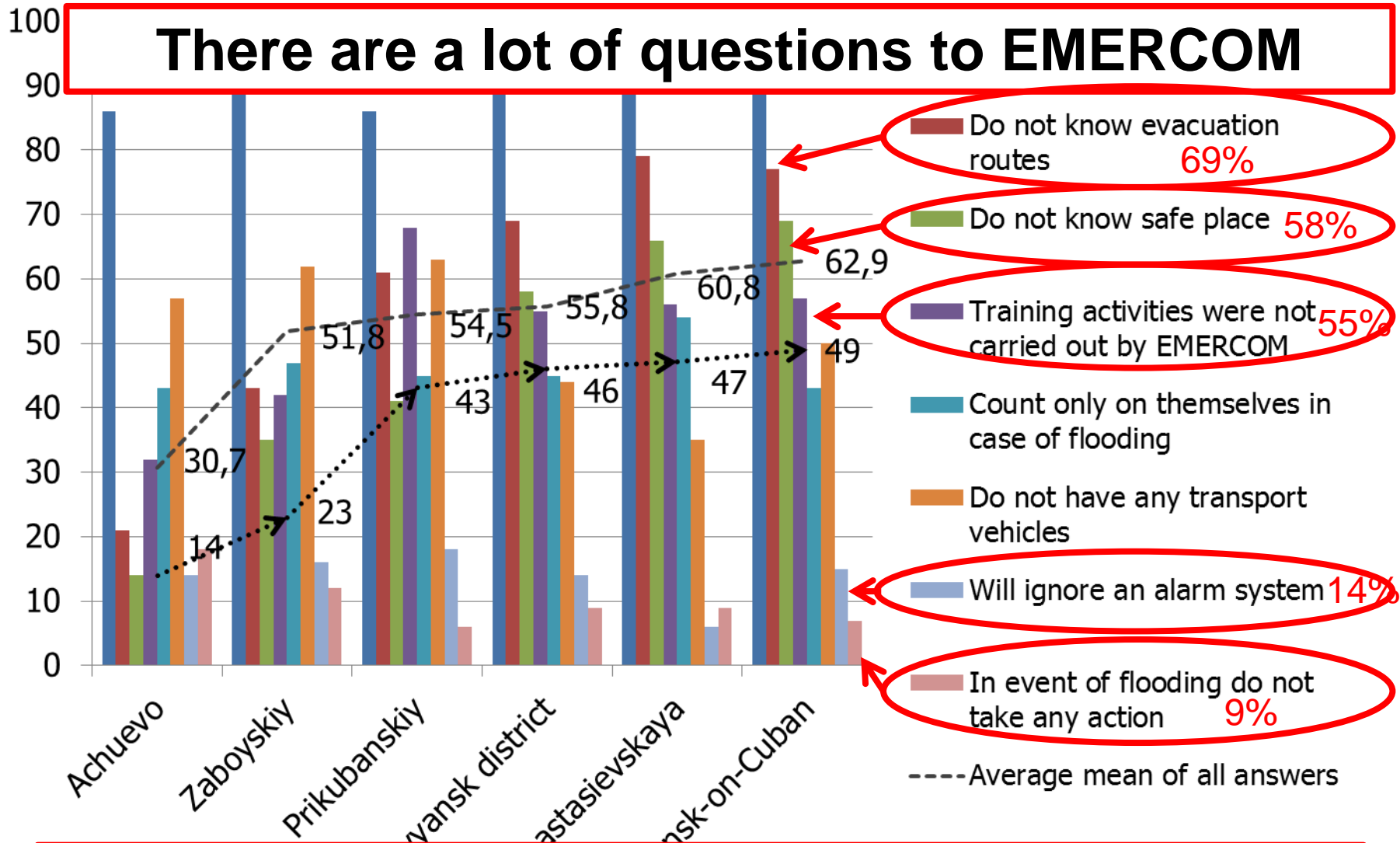
MUNICIPAL RISK INDEX



**But is it really the proportion of vulnerable people?
Can we recommend EMERCOM to strengthen
activities in the area?**

VULNERABILITY ASSESSMENT

Poll. Positive answers to sensitive questions



But there are questions to some people

ECONOMIC AND SOCIAL DAMAGE

Slavyansk municipal district

Potential economic damage

Medium flooding

Category	Agriculture	Fixed assets	Infrastructure	Real estate	Investments	Total
Potential damage (€ million)	1.1	20	12.2	29.1	0.8	63.2

Catastrophic flooding

Category	Agriculture	Fixed assets	Infrastructure	Real estate	Investments	Total
Potential damage (€ million)	32.3	75.7	13.9	150.1	42.1	314.1

Economic damage and social losses can be similar!

Potential social losses

Medium flooding

Approach	Real loss for society (€ million)			Government estimation (€ million)		
Category	Victims	Deaths	Total	Victims	Deaths	Total
Total	0.7	10.5	11.2	0.17	0.35	0.52

Catastrophic flooding

Approach	Real loss for society (€ million)			Government estimation (€ million)		
Category	Victims	Deaths	Total	Victims	Deaths	Total
Total	8.8	264.0	272.8	2.1	8.8	10.9

- Russian regions are very different by its **exposure and vulnerability** but it is even more different on municipal level
- Indices is a **form of monitoring** and **can be verified by polls**
- Poll results from Slavyansk district: a lot of **questions to local government** and **EMERCOM**
- **Social loss is comparable to economic damage**
- Need for change of EMERCOM and scientific paradigm in natural hazards research **from technocratic** (when we try to 'concrete' all the problems) **to social** (preparation of local societies)

Thank you for attention!

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Zemtsov S., Goryachko M., Baburin V., Krylenko I., Yumina N. (2016). Integrated assessment of socio-economic risks of hazardous hydrological phenomena in Slavyansk municipal district. *Natural Hazards*, no 1, 43-61

Zemtsov S.P., Baburin V.L., Koltermann K.P., Krylenko I.N., Yumina N.M., Litvinov V.Yu (2014). Social risk and vulnerability assessment of the hazardous hydrological phenomena in Russia. *GEOGRAPHY, ENVIRONMENT, SUSTAINABILITY*, no 4, 95-118