



Environment Center
Charles University
in Prague

What Type of Adaptation Measures Do People Prefer?

Survey on Willingness-To-Pay for Public Adaptation Policies

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ECONADAPT

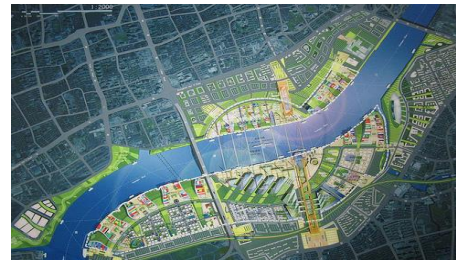
The Economics of Adaptation



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OBJECTIVES

- to examine **preferences of people of three EU countries (CZ, ITA, UK)** for adaptive options using the discrete choice experiments
→ estimate willingness to pay for policy attributes
- trade-off between:
 - **structural: technical, natural and non-structural (soft)** measures to reduce impacts of floods or draughts



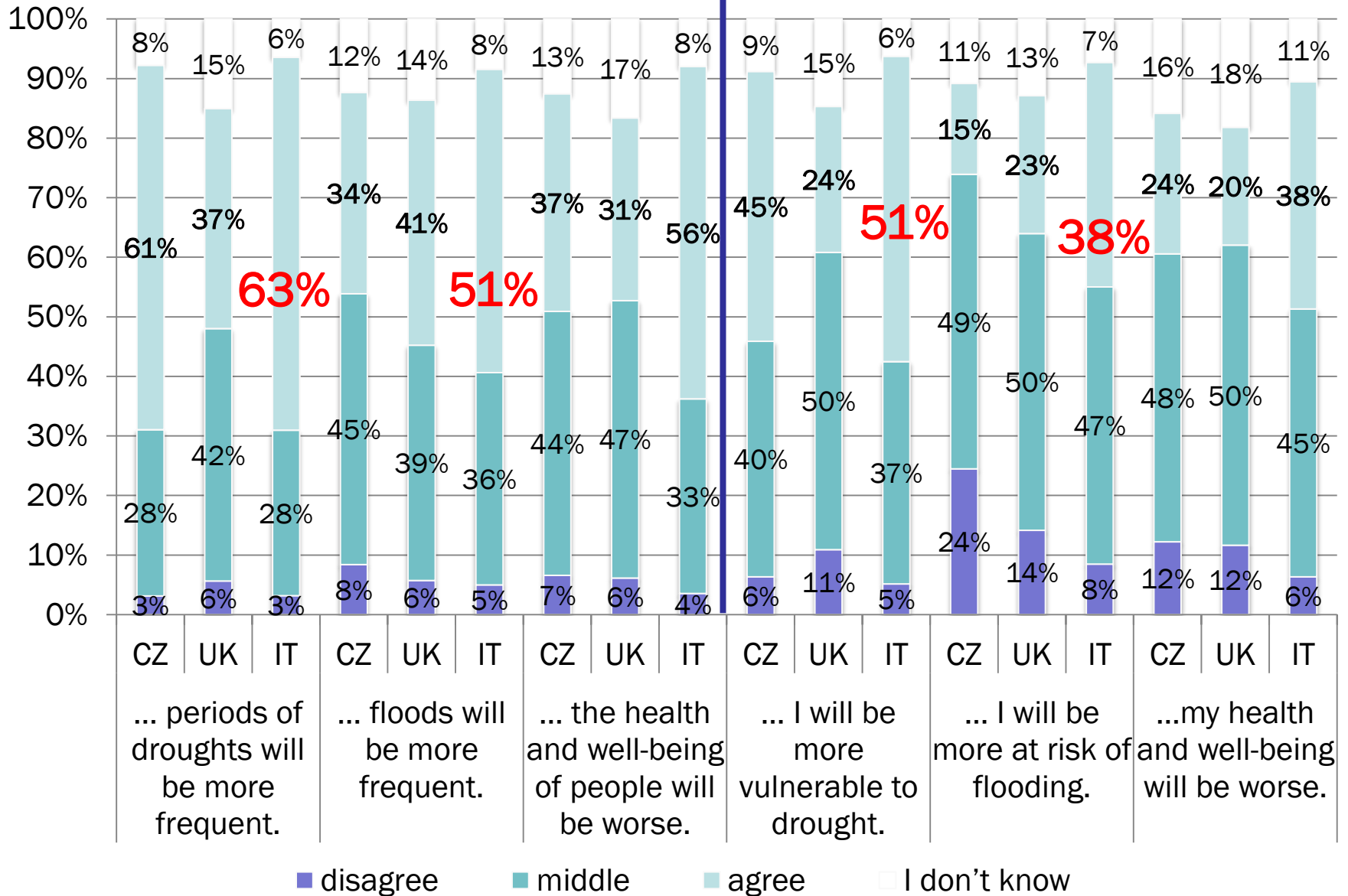


- conducted in Italy, the Czech Republic, and in the UK
- Data collection in July-August 2016 – just after the Brexit referendum (the country-wide, not EU-wide, policies!)
- the country subsamples are representative of national populations aged 18 to 69 years in terms of gender, age, region and education
- **7,042 valid questionnaires** (after excluding „speeders“)
- sampled from members of internet access panels

Perception of impacts of climate change

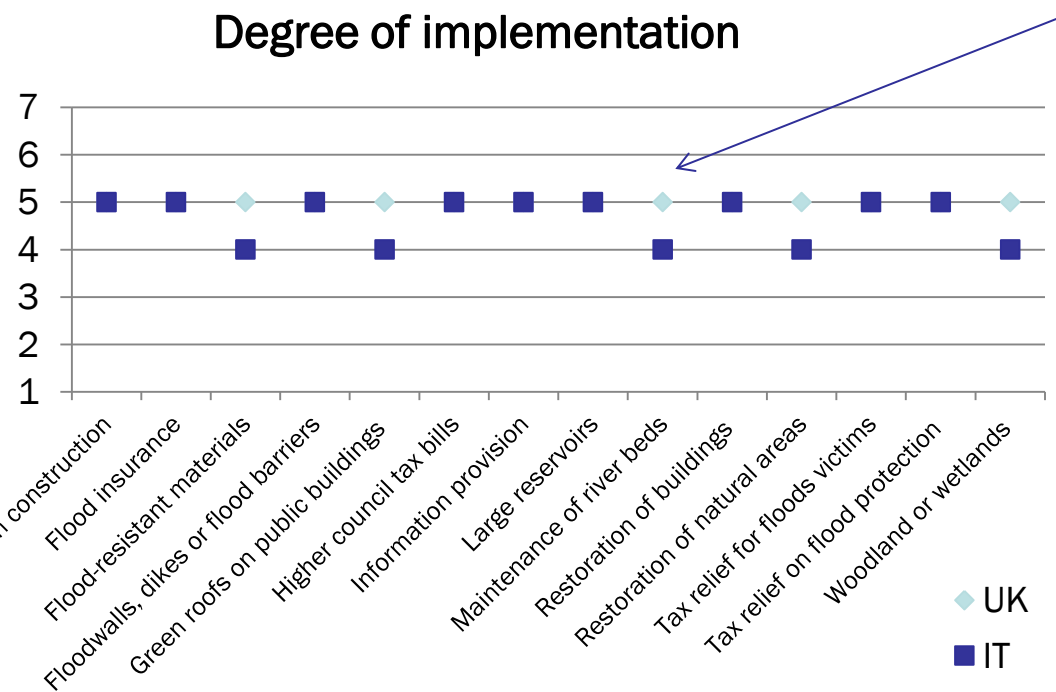
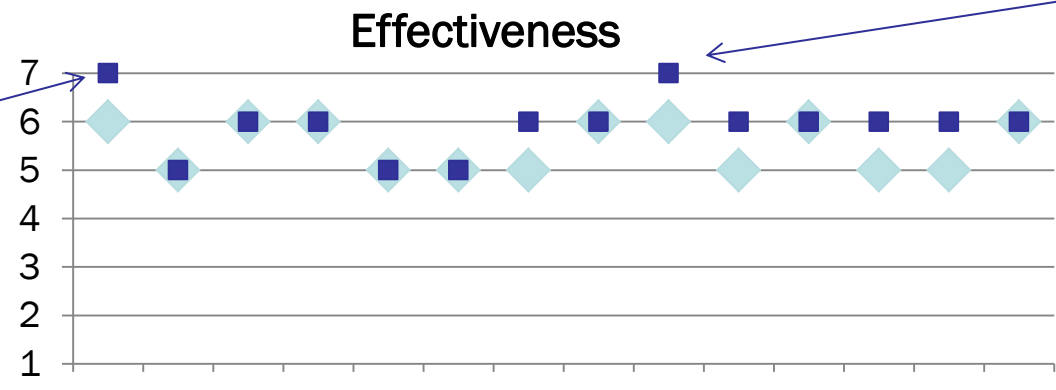
... on region

... on respondents





Floods: Perceived effectiveness and degree of implementation



Control on construction:
Effective for 58% in the UK
73% in IT

Maintenance of river beds:
Effective for 56% in UK
78% in IT
but insufficiently implemented 30% in IT

◆ UK
■ IT

7-point Likert scale (1=ineffective; 7=effective); medians

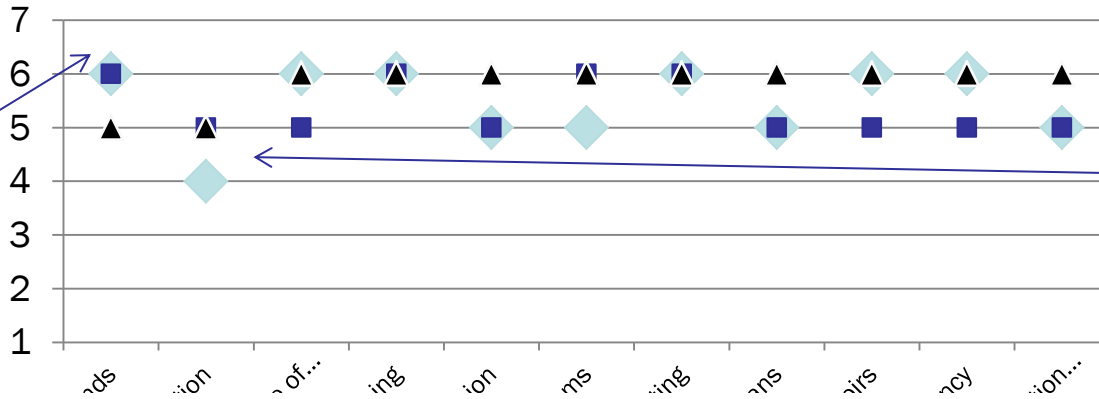


Droughts: Perceived effectiveness and degree of implementation



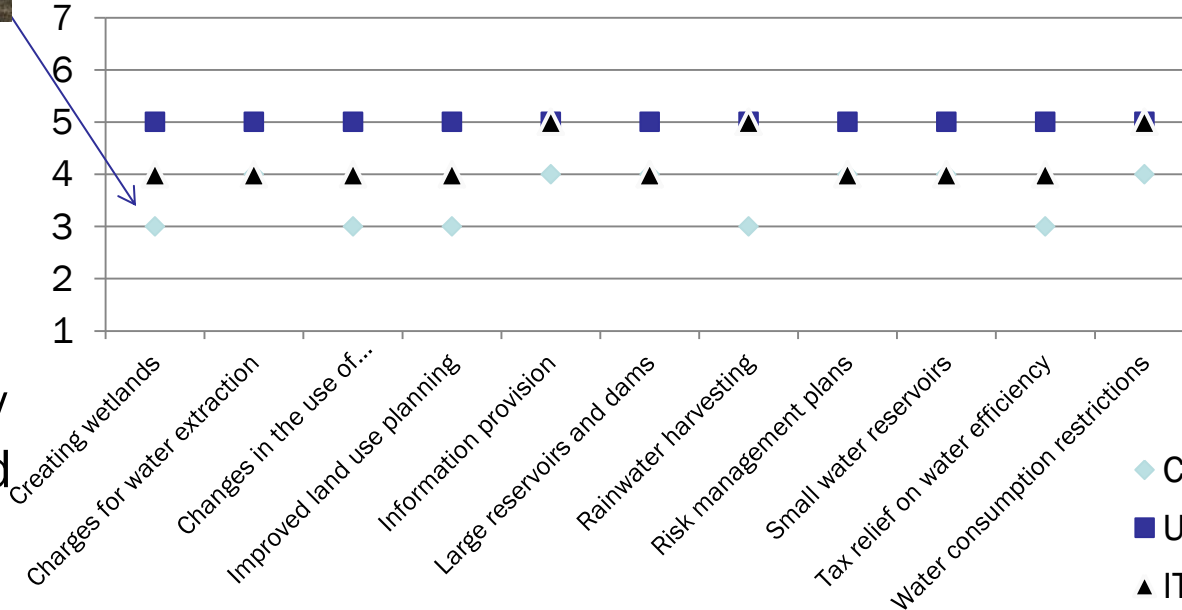
Creating wetlands:
Effective for 60% in the UK, in CZ
Insufficiently implemented 29% in CZ

Effectiveness



Higher charges for large water extraction is the least effective option

Degree of implementation



14 % to 25 % perceive that structural measures are introduced sufficiently

◆ CZ
■ UK
▲ IT



DCE Floods: example of a choice card

FIRST CHOICE



Plan characteristics to limit flood damage:

Technical measures

Natural measures

Non-structural measures

Proportion of people at risk of a one-hundred-year flood by 2040 (currently 4 %)

Increased monthly costs for your household (per year)

	Plan A	Plan B	No plan
Technical measures	No new	Floodwalls, dikes	No new
Natural measures	Creating woodland or wetlands	Restoration of natural areas after flooding	No new
Non-structural measures	Tax relief on flood protection measures	Control on construction in vulnerable areas	No new
Proportion of people at risk of a one-hundred-year flood by 2040 (currently 4 %)	3 %	7 %	8 %
Increased monthly costs for your household (per year)	£10 (£120)	£15 (£180)	£0 (£0)

Which option do you consider to be the best?

Plan A

Plan B

No plan



Willingness to pay for structural measures in nominal euro per month and a household



	Droughts			Floods	
	Czech	Italy	UK	Italy	UK
Technical measures					
Large reservoirs and dams	9.4 €	15.7 €	24.8 €	27.4 €	18.2 €
Small water reservoirs and ponds	14.8 €	17.3 €	17.4 €		
Rainwater harvesting	16.4 €	28.5 €	23.9 €		
Floodwalls, dikes				32.1 €	16.0 €
Flood-resistant materials				33.2 €	14.8 €
Maintenance of river beds				56.4 €	25.5 €
Restoration of buildings (ex post)				26.3 €	11.8 €
Nature-close measures					
Creating wetlands	15.5 €	14.3 €	20.2 €	31.1 €	32.4 €
Changes in the use of agricultural land	15.4 €	17.5 €	18.6 €		
Restoration of natural areas (ex post)				21.1 €	18.6 €
Green roofs on public buildings				11.2 €	16.9 €

Willingness to pay for soft measures in nominal euro per month and a household



	Droughts			Floods	
	Czech	Italy	UK	Italy	UK
D: Information on efficient water use F: Information provision	5.4 €	21.0 €	11.5 €	15.7 €	(4.0 €)
D: Drought risk management plans F: Control on construction in vulnerable areas	6.3 €	20.2 €	9.2 €	40.0 €	31.7 €
Improved land use planning	6.0 €	18.6 €	10.6 €		
Tax relief on (D: water efficient technologies) (F: flood protection measures)	6.0 €	23.0 €	7.6 €	24.3 €	15.5 €
Tax relief for floods victims (ex post)				22.7 €	17.0 €
Higher charges (D: for large water extraction) (F: council tax in flood-prone areas)	(0.3 €)	6.6 €	5.7 €	(4.9 €)	(0.8 €)
Water consumption restrictions (ex post)	3.2 €	13.1 €	4.8 €		
Provision of flood insurance				12.7 €	22.1 €
Proportion of people at risk	(0.3 €)	1.2 €	1.2 €	(- 0.0 €)	2.1 €

Note: The estimates reported in the brackets are not significant at any conventional level, there are virtually not different from zero.

CONCLUSIONS

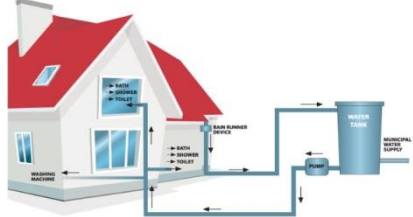





What are the estimated benefits of measures?

- WTP per month in a range of €3-16 in the Czech Republic, €6-29 and €11-56 (floods) in Italy, €5-25 and €12-33 (floods) in the UK

What Type of Adaptation Measures Do People Prefer?

- WTP is lowest or close to zero for **higher charges** for large water extraction and **council tax** in flood-prone areas
- the most preferred measure is rainwater harvesting in all countries
- proportion of people at risk is not as important as measure used (WTP is small or zero)
- otherwise WTP depends on type of risk (floods or draughts) and country

CONCLUSIONS

	structural		soft
	technical	natural	
droughts	 <p>Rainwater harvesting (CZ, IT, UK) Dams (UK)</p>	 <p>Creating wetlands (CZ, UK)</p>	 <p>Tax relief on water efficient technologies (IT)</p>
floods	 <p>Maintenance of river beds (IT)</p>	 <p>Creating wetlands (CZ, UK)</p>	 <p>Control on construction in vulnerable areas (IT, UK)</p>

**Thank you
for your attention**



August 13th, 2012

Oskar Exner

<http://www.praha.eu>



August 21st, 2015

<http://www.ceskatelevize.cz/>

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