,Costs of Natural Hazards': Modelling direct economic costs

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POTSDAM Poster-

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Objective

Project

The EU-project ConHaz has the objective to compile and systemise methods, data sources and terminology for the assessment of costs due to natural hazards. Similarities and differences between the approaches concerning droughts, floods, coastal hazards and alpine hazards will be identified. Recommendations for best practice of cost assessments will be given and research needs identified. This poster focuses on direct economic costs, which have a great importance for risk management. Besides, direct costs are considered a good indicator for the severity of natural hazards and are used by some approaches to estimate indirect damages.

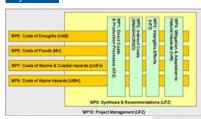


Figure 1 ConHaz structure and partners: German Research Centre for Geosciences (GZ2): Societé de Mathématique Appliquée aux Sciences Sociales (SMASH-CIRED): Helmholtz Centre for Environmental Research (UF2): Vrije Universiteit Amsterdam (IVM): Universitat Autonoma de Barcelona (IJAB) Middlesex University (MU); University of Ferrara (UniFe); University of Innsbruck (UIBK).

Preliminary findings – knowledge gaps

- There is no common terminology used across various bazards. This makes it difficult to compare cost assessments.
- The lack of reliable, consistent and publicly available data has been continuously identified as a major obstacle to develop, improve and validate methods for direct cost assessments. > Many damage-influencing parameters are hardly reflected by
- current models.
- The quantitative individual and combined effect of damage
- influencing parameters on damages is largely unknown. > The fact that resistance factors, such as the level of precautionary
- measures, are rarely taken into account by current cost assessment methods hampers the evaluation and development of effective adaptation strategies. > Validations and uncertainty analysis of damage models are hardly
- performed.

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eliminary recommendations for damage model improvement for different hazards Coastal hazards Floods Alpine hazards Droughts Improve understanding Undertake validations 1111 Improve damage data bases Improve damage models of damaging processes and uncertainty analyses Example: Flood damage modelling in Germany Surveys after recent flood Flood Loss Estimation MOdel Flood 2002: • 1697 private households • 415 companies FLEMOps for residential buildings Flood 2005/2006 • 461 private housef • 227 companies on the micro-scale Floods in Dresden • 454 private housef • 120 companies adapted n= 78 Private precaution none good very Topics: • flood damage • flood impact paramet • building/company cha good Conta-0.92 0.64 0.41 none minamoderate 1.20 0.86 0.71 • pre tion 10 early warning 1.58 vere MURI ICPR ELEMO (2000) -27.6 34.0 adapted n= 101 eso Temporal RMSE [Mill. €] scale at data ner I and cover data Characteristics of the ICI C2000 unicipal building stock orincipal omponent analysis 115 -0.02 -0.12 0.09 0.5 102 0.73 0.03 -0.06 -0.1 0.09 -0.20 0.56 0.03 and 59.23%, number of valid cases: 707 * Bold variables are marking variables with absolute (codings > 0.5, * Bold correlation coefficients are significant a level of 0.05 (two-sided 0.13 -0.11 0.20 0.06 0.02 0.00 -0.73 0.11 0.08 0.97 -0.02 0.02 0.93 -0.08 0.00 building value [Euro] inkernet al. (2005) . . 10 20 30 40 50 60 70 80 Reported Building Repair Costs at SAB [Mill. Euro] (n = 623) ** 0.21 -0.02 0.49 -0.11 -0.09 -0.0 -0.14 -0.09 0.55 -0.11 -0.14 -0.0 age estimate per References: Emerg F, Thesen HI, Konklich H (2010) Influence of flood frequency on residential building losses. NHESS, 10, 2145-2159 Emerg F, Thesen H, Rich I, Kreibich H (2010) Development of TEBNOS. - A new model for the stimultion of flood losses in the commercial sector, Hydrological sciences journal, 55, 8, 1302-1314 Kreibich H, Thikler A, H. Theken, AHZ, 2020, Flood greatential of companies and their ability to cope with the flood in August 2002. In Roser greatential to 10.1029/2005WR004691 Kreibich H, Thikler A, H. Theken AH, 2010 Application and evaluation of EXENDS. - A new flood loss reduction of private households due to building presential sector, Hydrological sciences journal, 55, 8, 137-1314 Kreibich H, Thikler A, H. Theken AH, 2010 Application and evaluation of EXENDS. - A flood loss centration model for the commercial sector, Hydrological sciences journal, 55, 8, 157-1524 Theken AH, Olschewski A, Kreibich H, Kotsch S, Merz B (2008) Development and evaluation of LEMOSP = a new Flood Loss Estimation MOdel for the private sector. In: Proverts, D, C.A. Brebbia, E. Penning-Rowsell (Hrsg.) Flood Recovery, Innovation and Response. WIT Press, Chichester, 315-324 Theken AH, Muller M, Kreibich H, Kotsch S, Merz B (2008) Development and evaluation of LEMOSP = a new Flood Loss Estimation MOdel for the private sector. In: Proverts, D, C.A. Brebbia, E. Penning-Rowsell (Hrsg.) Flood Recovery, Innovation and Response. WIT Press, Chichester, 315-324 Theken AH, Muller M, Kreibich H, Kotsch S, Merz B (2008) Development and evaluation of LEMOSP = a new Flood Loss Estimation MOdel for the private sector. In: Proverts, D, C.A. Brebbia, E. Penning-Rowsell (Hrsg.) Flood Recovery, Innovation and Response. WIT Press, Chichester, 315-324 Theken AH, Muller M, Kreibich H, Kotsch S, Merz B (2008) Flood damage and influencing factors: New insights from the August 2002 flood in Germany. Water Resour: Res., 41(12): 1-16 (W12430, doi:10.1029/2005WR04177) \odot CONHAZ is a Coordination Action project C HELMHOLTZ

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