



2026 IRDR Young Scientists Lumos (5th)

UTC 7:00-8:30, 7 April 2026, Online

Economics of Disasters and Climate Change: Addressing inequalities, injustices, marginalisation and vulnerabilities

Agenda

1. Rationale

In order to enhance the connection and promote the innovations and actions of young scientists, IRDR IPO designs a mechanism of “IRDR Young Scientists Lumos¹”, which will be webinars, sessions, meetings, or discussions mainly organised and participated by young scientists and young professionals in the global disaster risk reduction (DRR) community.

Disasters and climate change are not experienced equally across societies. Increasing evidence demonstrates that disaster risks are shaped by structural inequalities, socio-economic disparities, governance gaps, and historical patterns of marginalisation. Understanding the economics of disasters and climate change is therefore essential for revealing how risk, loss, and recovery are distributed, how incentives and policy instruments shape resilience outcomes, and how economic systems can either reinforce or reduce inequalities and injustices. In the new global DRR research agenda “[A Framework for Global Science in Support of Risk-informed Sustainable Development and Planetary Health](#)”, which was adopted by ISC, UNDRR and IRDR, the Priority 2 “Addressing inequalities, injustices, marginalisation and vulnerabilities” calls for advancing knowledge on the social construction and distribution of risk and promoting inclusive, equitable approaches to risk reduction and climate action.

¹ Lumos: a wand-light charm in Harry Potter series. This charm is used to create light and reveal hidden things. Lumos here means that the young scientists create innovations and generate the impacts to the world.

Aligned with the IRDR Young Scientists Programme's mission to amplify youth-led contributions to DRR, this session will:

- Highlight emerging research on the economic drivers and consequences of disaster risk and climate change.
- Examine how inequalities and vulnerabilities are produced, reinforced, or reduced through economic systems and policy choices.

It is expected that through the discussion, the innovation cases from young professionals will be visualised and acknowledged by the global DRR community.

2. Agenda

It will be a 90-minute online workshop. 3-4 young professionals from different regions will be invited to share their cases. Leading scientists and experts will be invited to give a keynote speech and provide comments and suggestions. There will be 30 minutes of discussion for all participants.

Item 1: Keynote (10 minutes)

- *Inequities in Climate Change Losses and Damages, in the Responses to Them, and in Climate Adaptation - Some Examples*, [Professor Ilan Noy](#), Victoria University of Wellington

Item 2: Presentations by young researchers (8 minutes each)

- *Revealing disparities in societal impact of infrastructure service disruptions: A case study of Typhoon Yagi in China*, Dr. Yongsheng Yang, Beijing Normal University
- *“Do good captains make good voyages?” Political leadership and climate readiness*, Chrysoula Chitou, University of Ioannina
- *Heat Poverty: The Hidden Cost of Rising Temperatures*, Dr. Zhengtao Zhang, Beijing Normal University
- *The effect of cyclones on workers' mental health*, Dr. Cristhian Prieto, Victoria University of Wellington

Item 3: Q&A and discussions

3. Organisers

IRDR

Joint International Research Laboratory of Catastrophe Simulation and Systemic Risk Governance, Beijing Normal University

4. Registration and Meeting Link

Registration Link: https://zoom.us/webinar/register/WN_KnWc3TSbRRGRbmUKAbweDA

Open to all researchers, practitioners, students, and community members interested in Indigenous knowledge and DRR. Registration will be free and accessible online.

5. Bios and Abstracts



Ilan Noy

Ilan is the Te Āwhionukurangi Chair in the Economics of Disasters and Climate Change at Victoria University of Wellington (New Zealand), a Professor of Applied Economics at the Gran Sasso Science Institute in L'Aquila (Italy), and the founding Editor in Chief of the journal *Economics of Disasters and Climate Change*.



Yongsheng Yang

Yang Yongsheng is an associate professor from School of National Safety and Emergency Management, Beijing Normal University. He received his Ph.D. from Tsinghua University and was a visiting scholar at DPRI, Kyoto University in 2020. His research interests include social well-being impact of disasters, human-centered infrastructure resilience, and disaster risk management. Over the past five years, he has led two national-level research projects as PI and published over 20 papers in journals, including SCS, RESS, and IJDRR. He currently serves as a member of the Expert Panel for Emergency Management in Zhuhai and Shenzhen, and a member of IDRIIM Society.

Title: *Revealing disparities in societal impact of infrastructure service disruptions: A case study of Typhoon Yagi in China*

Abstract:

Extreme hazards severely disrupt infrastructure systems and reduce the well-being of society. Great achievements have been made in modeling interdependent infrastructure

systems in past decades, while how infrastructure service disruptions impair the social systems is still poorly understood. More recently, several empirical studies found that disruptions affect vulnerable groups unequally, and exploring the societal impact of infrastructure disruption has become a key field. Accordingly, we conducted two empirical studies to explore the social inequalities in societal impact for a case study of Typhoon Yagi (2024) in China: (1) We conducted a post-disaster survey following Typhoon Yagi to examine disparities in tolerance level across social subgroups under disruptions. Interval-censored Accelerated Failure Time (AFT) models are employed to identify key determinants of tolerance level. (2) We collected 103.64 million mobile phone signaling data during Typhoon Yagi, and explored social disparities in impacts of typhoon on human travel time and volume. Machine learning models are combined with SHAP-based interpretability analysis to identify the key influencing factors. The results reveal pronounced inequalities in the tolerance levels and mobility behaviors across different social groups in China. Specifically, the key influencing factors of tolerance level mainly include income, home ownership, vehicle ownership, previous experience, service needs, and satisfaction levels; also, groups with different socio-economic statuses, like income, core-user status, age, and gender, showed large disparities in travel time changes but small disparities in volume changes. These findings facilitate developing human-centered infrastructure resilience analysis tailored to China's context.

Chrysoula Chitou



Chrysoula Chitou is a PhD Candidate in Economics at the University of Ioannina, Greece. Her research focuses on the economics of climate change, energy, natural resources management, and institutions, with particular emphasis on social impacts. She contributes to academic and policy discussions through publications and active participation in European and international initiatives. She is one of the IRDR Young Scientists and serves as Assistant Manager at the IRDR ICoE on “Resilience Economics and Sustainable Risk Transitions” at the Department of Economics of the National and Kapodistrian University of Athens, Greece. She also co-leads the Climate Change Working Group of

the Mediterranean Youth Group, promoting inclusive dialogue.

Title: *“Do good captains make good voyages?” Political leadership and climate readiness*

Abstract

The global transition toward climate change readiness is often attributed to macroeconomic factors, yet the extent to which political leaders’ characteristics can overcome systemic structural constraints remains a critical “black box” in climate governance. Here, we analyze a novel, comprehensive global database of 1,287 political leaders across 192 countries (1995-2021) to determine how leaders’ characteristics, including education, gender, age, and ideology, shape countries’ climate change readiness. Using fixed, random-effects, Driscoll-Kraay robust standard errors and triple-interaction specifications, we show that the influence of leaders’ formal education (bachelor’s degree or higher) is conditional on the interaction between economic wealth and political regime. In democracies, institutional accountability appears to sustain a positive association between having a leader with a bachelor’s degree or higher and climate change readiness across income levels. In non-democracies, this association diminishes as income rises. Female and younger leaders are also positively associated with higher readiness. Crucially, we identify a structural break following the 2015 Paris Agreement. In the post-Paris era, the influence of leaders’ characteristics diminishes significantly as climate governance becomes increasingly institutionalized. Our findings indicate that institutional frameworks provide a rising floor for global climate action, but further progress is increasingly contingent on leaders specialized human capital capable of navigating complex legal and financial architectures.



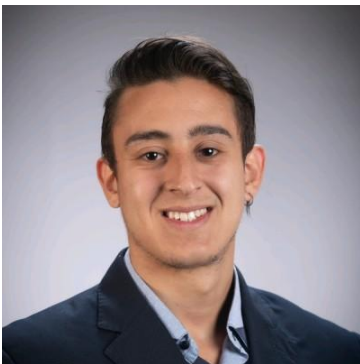
Zhengtao Zhang

Zhengtao is an Associate Professor and Ph.D. Supervisor at Beijing Normal University. His research focuses on climate change economic impacts and disaster safety assessment. He is a selected member of the “Young Talent Support Program of Beijing”. He served as an expert member of the assessment group for China’s first National Comprehensive Natural Disaster Risk Survey and has participated in post-disaster investigations for major events, including the 2021 Zhengzhou extreme rainstorm and flood, as an expert for the Ministry of Emergency Management.

Title: *Heat Poverty: The Hidden Cost of Rising Temperatures*

Abstract:

Heatwaves don’t just threaten health—they threaten livelihoods. Using climate, economic, and poverty models, we mapped global heat-poverty risk at 1-km resolution from 2030 to 2090. By 2090, up to 1.29 billion people could fall into poverty due to extreme heat. Nearly 60% are already poor and sink deeper; the rest are newly impoverished. South Asia, especially the Ganges Basin, will become the global hotspot. Crucially, heat poverty travels. Trade links mean heatwaves in one region can push people into poverty elsewhere—over 60% of the heat-poverty burden in higher-latitude, wealthier economies comes from supply chain disruptions originating in lower-latitude countries. Tackling heat poverty requires both local adaptation and resilient global supply chains.



Cristhian Prieto

Dr Cristhian Prieto is a Research Economist at BRANZ and an Adjunct Research Fellow in the School of Economics and Finance at Victoria University of Wellington. He specialises in applied microeconometrics, climate economics, economics of disasters, and housing. His research uses large-scale administrative and geospatial data to examine how natural hazards and environmental risks affect labour market outcomes, housing systems, and population wellbeing.

Cristhian was awarded a place on the Doctoral Dean's List in recognition of his exceptional contribution to economic research. His professional career has focused on translating rigorous empirical evidence into policy insights through his work with the New Zealand Government, with a strong emphasis on climate adaptation, resilience, and the social impacts of extreme weather events.

Title: The effect of cyclones on workers' mental health

Abstract

Natural hazards adversely affect mental well-being. Yet, evidence on the causal mechanisms remains limited, particularly regarding the impacts on diagnosed psychological disorders and the extent to which earnings operate as a mediating channel. This study uses an event-study Synthetic Difference-in-Differences approach to examine Cyclone Gabrielle's impact on workers' mental health and earnings in New Zealand. By leveraging administrative data on flood damage, prescribed medications, and income tax records, we show that workers residing in severely affected areas were significantly more likely to receive prescriptions to treat psychological disorders than comparable workers in unaffected areas. For the average worker, income played a limited mediating role as earnings losses were negligible; instead, direct exposure to physical and emotional trauma appears to be the dominant channels. The effects are, however, heterogeneous. Among workers who experienced substantial income declines, earnings losses explain a sizable share of the increase in psychological disorders. Overall, the results highlight the dominant role of non-income channels in shaping post-disaster psychological well-being, while income losses matter primarily for a vulnerable subset of workers. These findings are particularly relevant in the context of climate change, which is expected to increase cyclone intensity and, consequently, amplify the associated mental health risks.