WISER Virtual Learning Forum

The Triple Dividend of Resilience: from concept to application

5 November, 2020

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Forum Agenda

Item	Presenter
Introduction to webinar, virtual housekeeping	Emily Wilkinson
Introduction to the Concept of TDR	Swenja Surminski
Using TDR framework to calculate global adaptation benefits	Carter Brandon
Results from empirical studies on TDR	Emily Wilkinson
	Viktor Roezer
	Tom Tanner
	Ulrich Volz
Q&A Session	Swenja Surminski
Closing remarks and actions	Suzanne Carter

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Weather and Climate information Services for Africa

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https://www.metoffice.gov.uk/about-us/what/working-with-other-organisations/international/projects/wiser/transform

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PRACTICAL ACTION Technology challenging poverty

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"Pre-event resilience building is the focus of our efforts. We know that prevention is cost- effective, but nearly 87 percent of disaster-related aid spending goes into emergency response, reconstruction and rehabilitation, and only 13 percent toward reducing and managing risks before they became disasters. But flood resilience cannot be enhanced by one stakeholder alone. That is why, in 2013, we created a multi-organizational partnership to enhance community flood resilience. We call this the Zurich Flood Resilience Alliance ('the Alliance')." https://floodresilience.net/

A new approach for a more holistic assessment of the benefits of adaptation and disaster risk management

- **The starting point:**

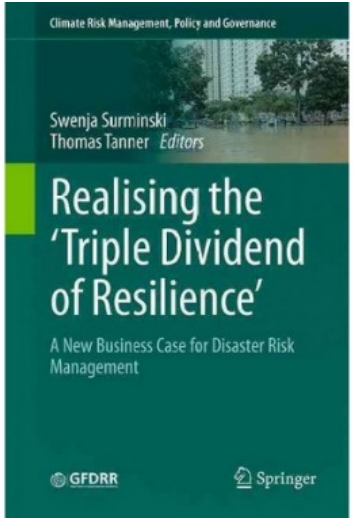
Incomplete cost-benefit analyses result in insufficient investments in adaptation and resilience.

- **The aim:**

Change the way in which investments are decided and evaluated.

- **Message to Ministry of Finance officials:**

To invest in adaptation and resilience is to secure growth and development.



➢ The business case for resilience: Avoided losses (1), Development dividend (2) and Co-benefits (3)

Investing in resilience reduces losses and damages in the case of a disaster. However, it can also yield development benefits regardless of disasters. Typically, standard disaster risk management investment appraisals fail to account for the 2nd and 3rd dividends of resilience.

Disaster risk management (DRM) investments

1st Dividend of Resilience: Avoided losses

Avoiding damages and losses from disasters, by:

- Saving lives and reducing people affected
- Reducing damages to infrastructure and other assets
- Reducing losses to economic flows

Benefits when disaster strikes

2nd Dividend of Resilience: Unlocking Economic Potential

Stimulating economic activity due to reduced disaster risk, by increasing:

- Business and capital investment
- Household and agricultural productivity
- Land value from protective infrastructure
- Fiscal stability and access to credit

3rd Dividend of Resilience: Generating Development Co-Benefits

DRM investments can serve multiple uses which can be captured as co-benefits such as:

- Eco-system services
- Transportation uses
- Agricultural productivity gains

Benefits Regardless of disasters

Costs and potential adverse effects of DRM measures

THE TRIPLE DIVIDEND OF RESILIENCE

Realising development goals through the multiple benefits of disaster risk management

THOMAS TANNER, SWENJA SURMINSKI, EMILY WILKINSON, ROBERT REID, JUN RENTSCHLER, SUMATI RAJPUT

Grantham Research Institute on Climate Change and the Environment

Centre for Climate Change Economics and Policy

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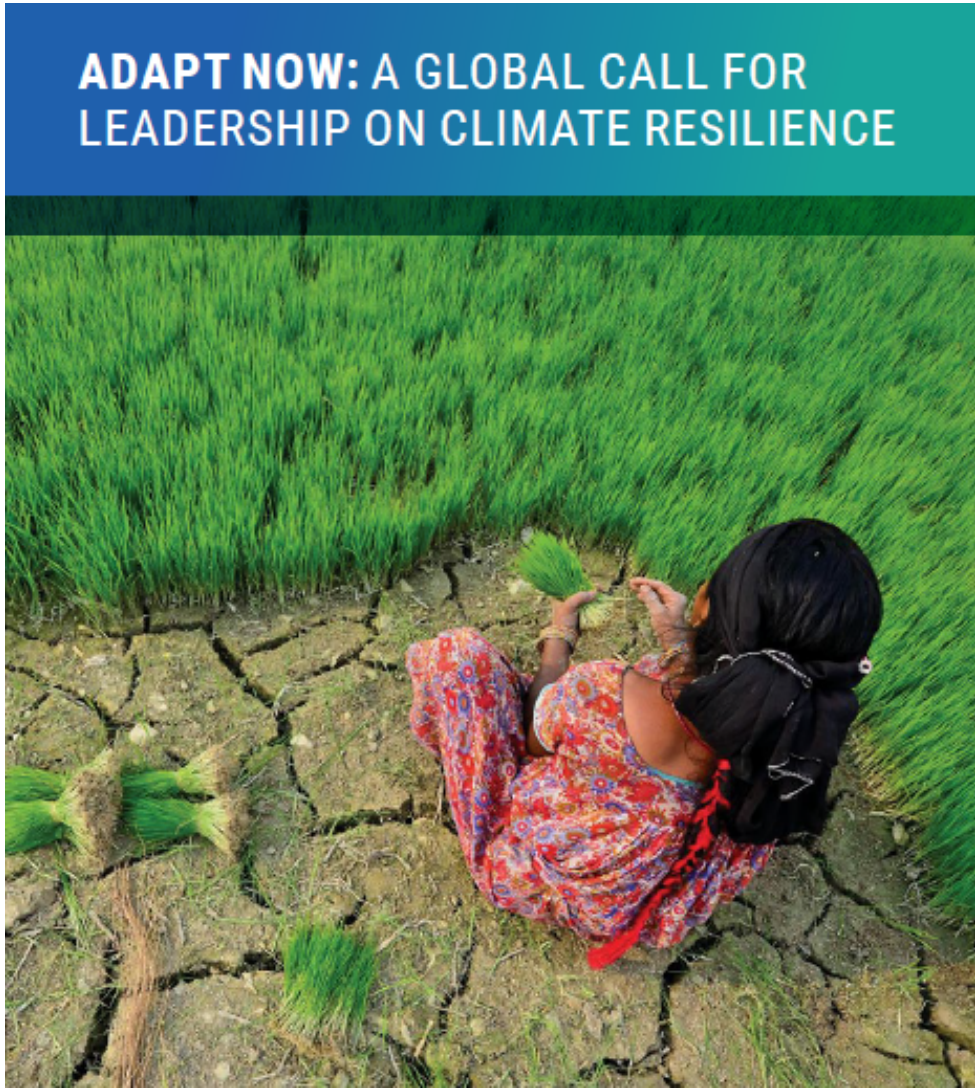
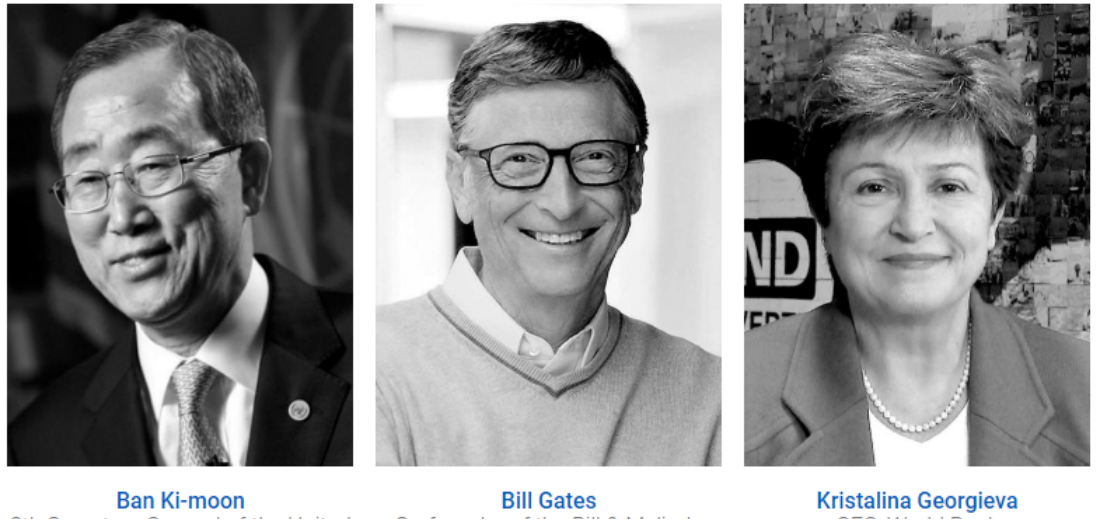
THE GLOBAL COMMISSION ON ADAPTATION





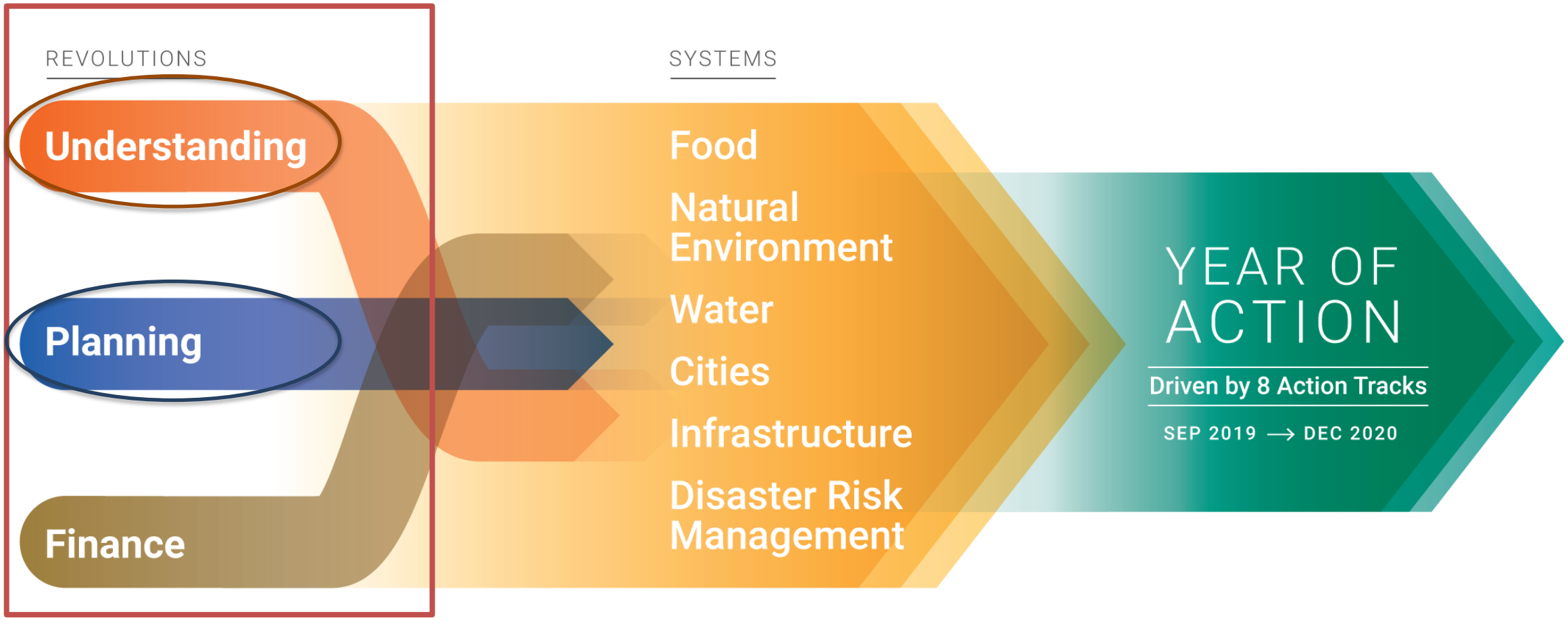
Ban Ki-moon | Bill Gates | Kristalina Georgieva

WORLD RESOURCES INSTITUTE

GLOBAL CENTER ON ADAPTATION

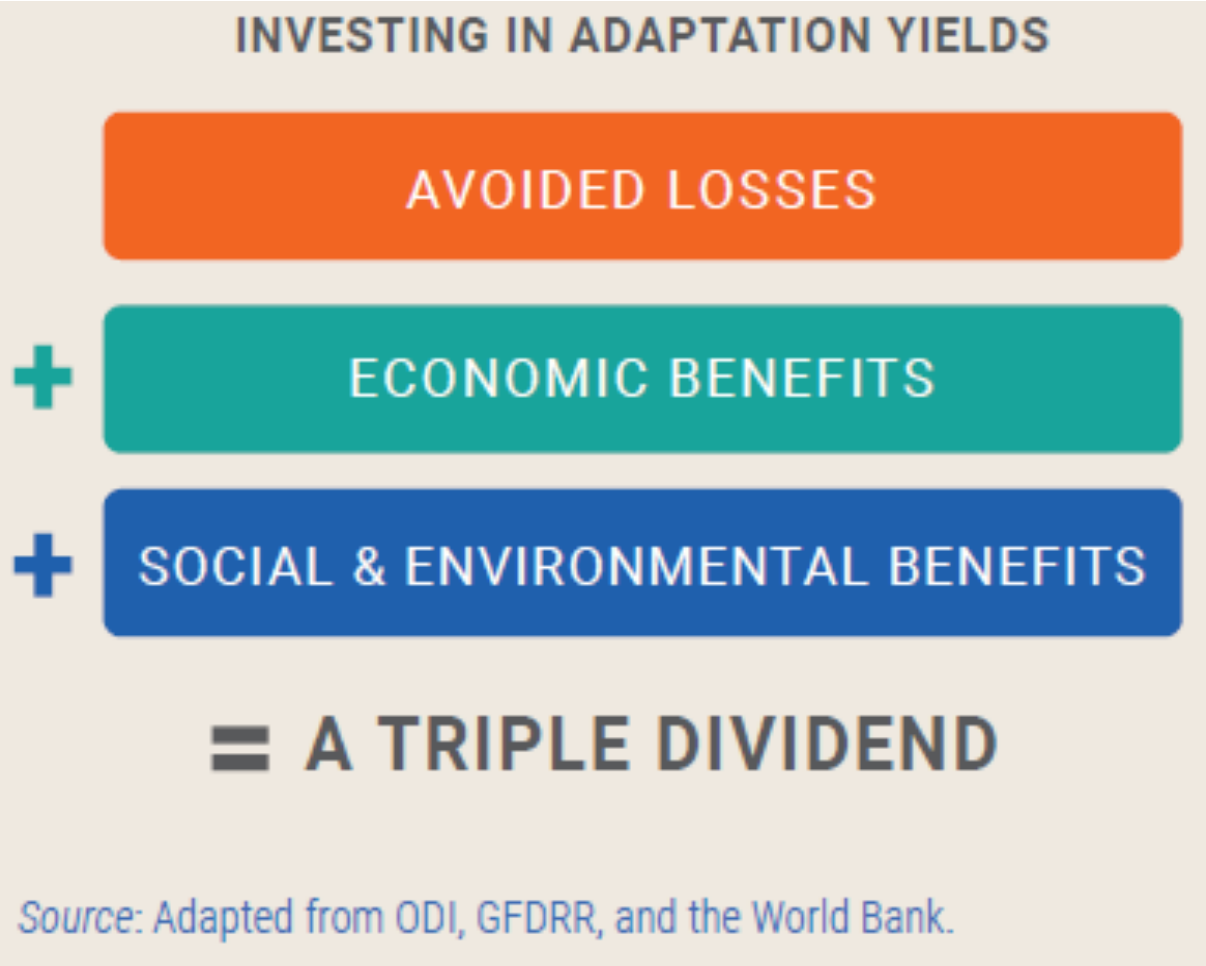
Carter Brandon, World Resources Institute
December 8, 2019

A BETTER WAY – AND TRIPLE DIVIDENDS CAN HELP



Global Commission on Adaptation, Adapt Now, Sept. 2019

CLIMATE ADAPTATION OFFERS A TRIPLE DIVIDEND



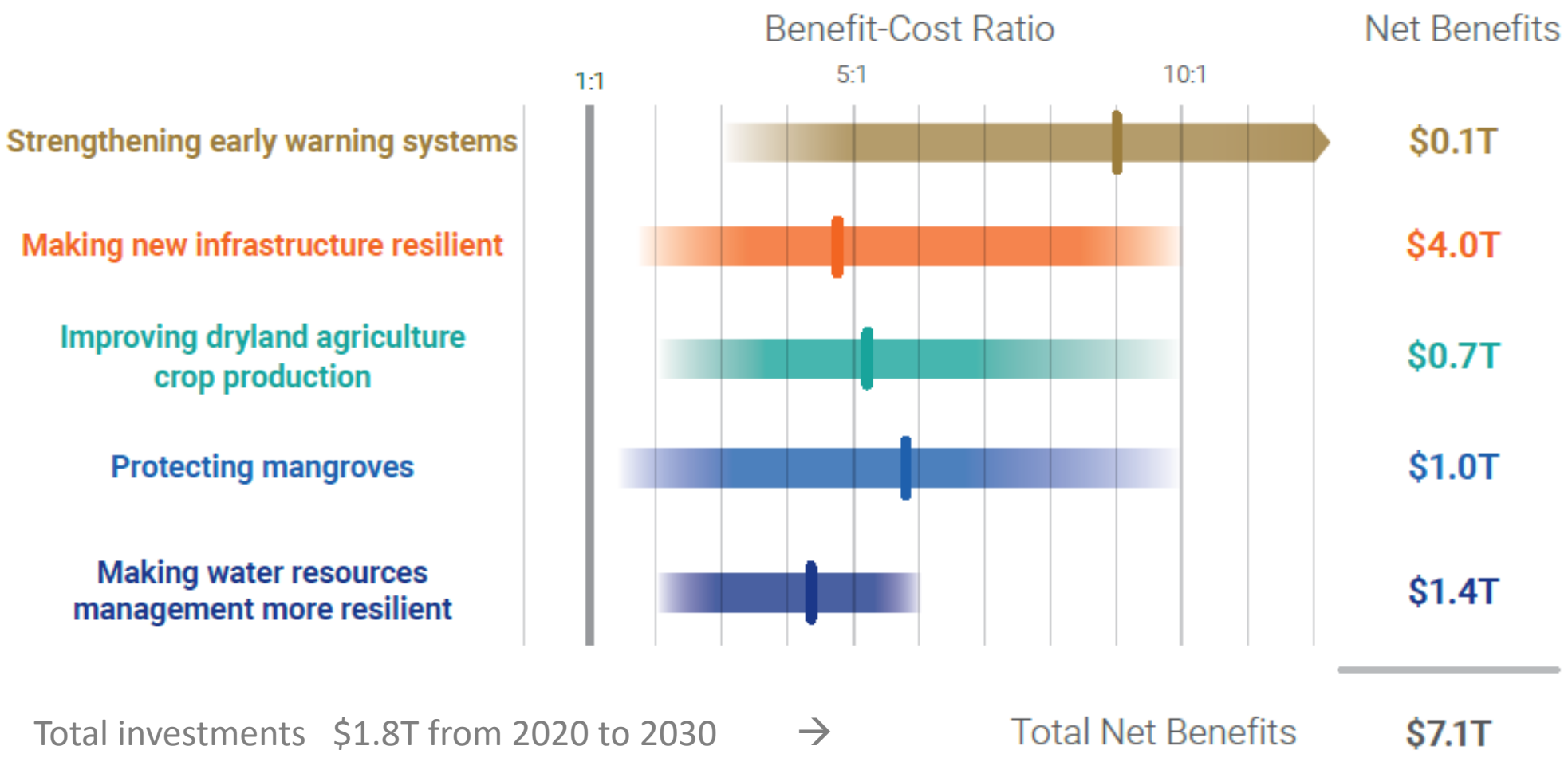
Climate-resilient infrastructure adds 3% to upfront costs but has benefit-cost ratios of 4:1

Sea walls allow urban development; dryland farming practices increase yields

Nature-based flood protection also increases biodiversity, makes the air and water cleaner, offers recreation, and improves health.

CLIMATE ADAPTATION DELIVERS HIGH ECONOMIC RETURNS

FIGURE ES.1 Benefits and Costs of Illustrative Investments in Adaptation



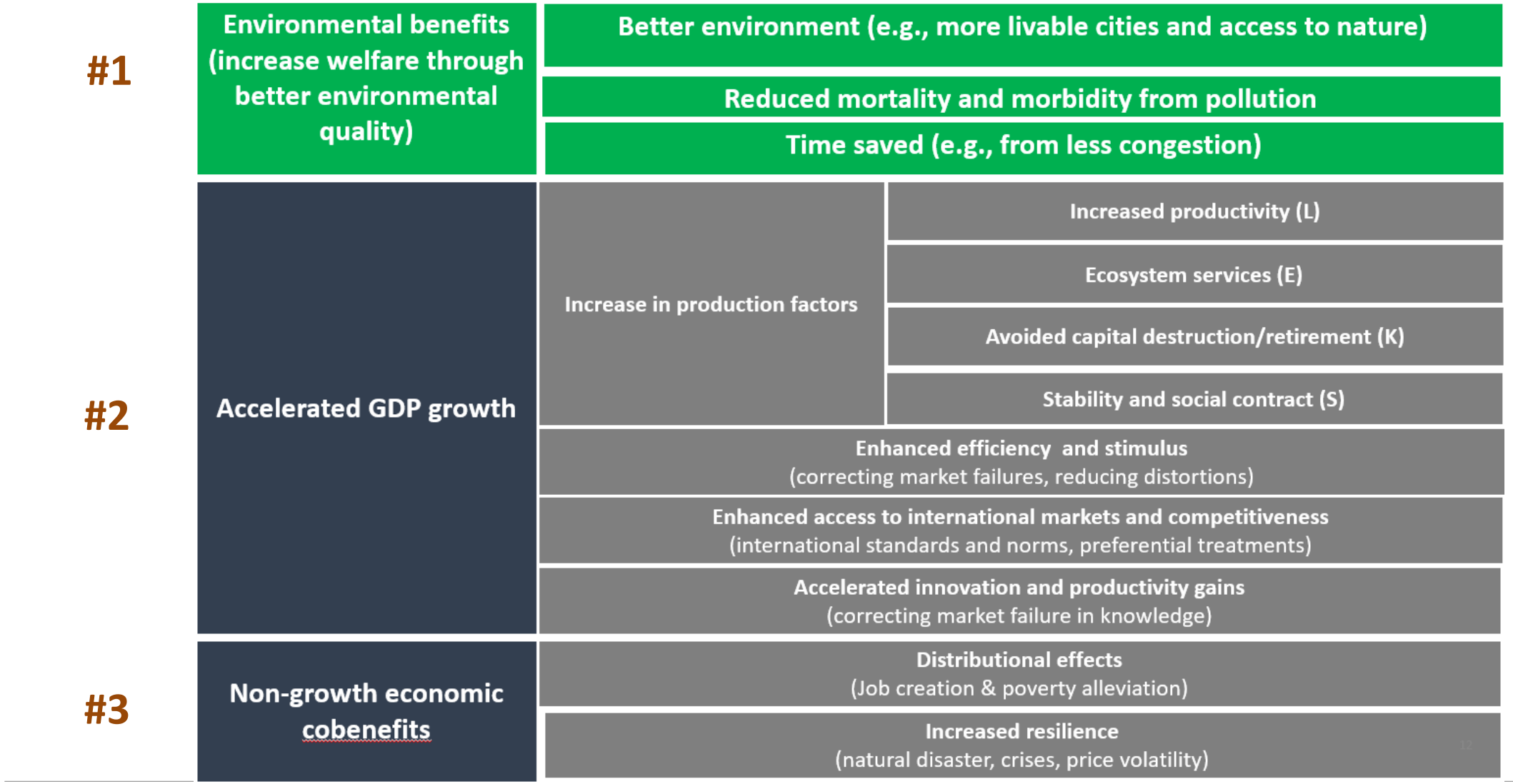
Global Commission on Adaptation, Adapt Now, Sept. 2019

CURRENT COMMON STATE OF SECTORAL PROJECT ANALYSIS

	Avoided Losses	Economic Benefits	Social & Environmental Benefits
Strengthening early warning systems	✓	--	--
Making new infrastructure resilient	✓	sometimes	--
Improving dryland agriculture crop production	✓	✓	--
Protecting mangroves	✓	✓	--
Making water resources management more resilient	✓	✓	--

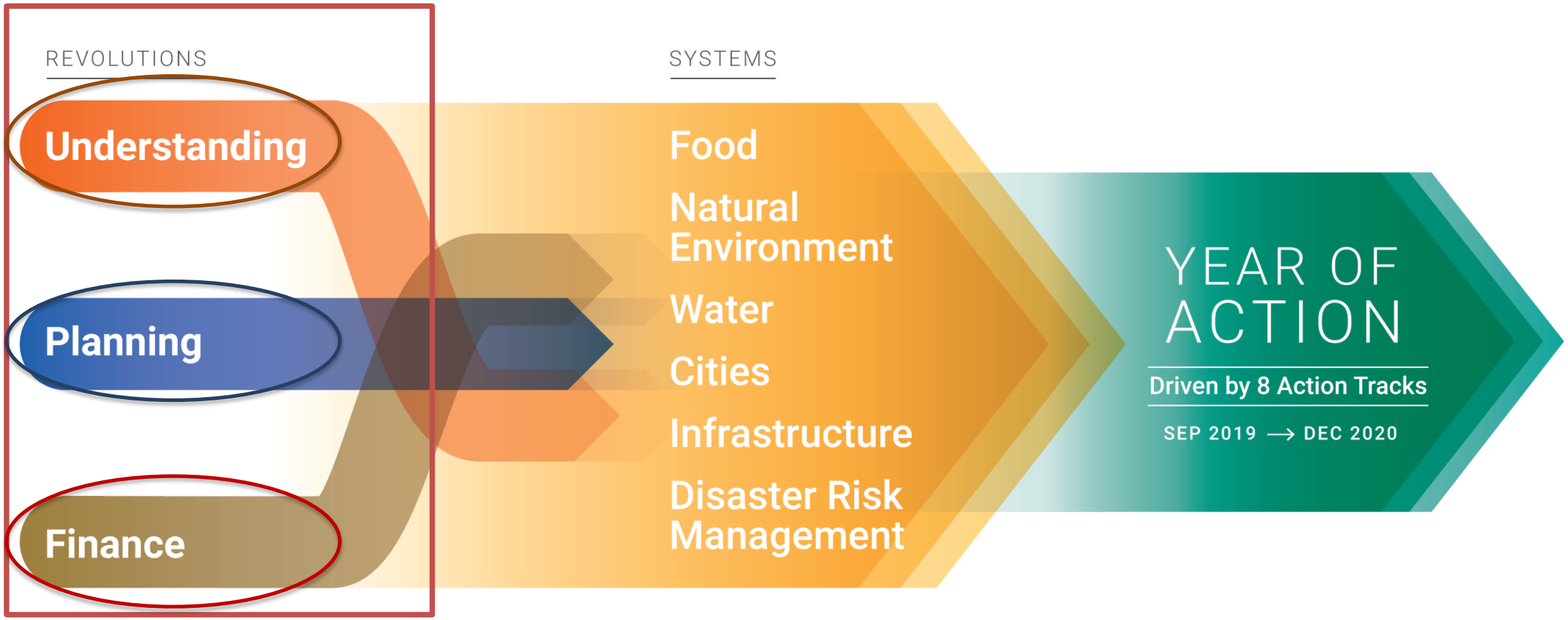
The economic benefits of global adaptation investments, WRI, September 2019

THE TRIPLE DIVIDENDS CONCEPT CAN BE EXPANDED TO GREEN GROWTH



Source: Proposed "Turkey Green Growth and Sustainable Recovery" study by the World Bank, November 2020

A BETTER WAY – AND TRIPLE DIVIDENDS CAN HELP



Global Commission on Adaptation, Adapt Now, Sept. 2019

USING TRIPLE DIVIDENDS TO MAP PUBLIC VS PRIVATE COSTS AND BENEFITS

		Benefits		
		Private	Joint	Public
Costs	Private	**Homeowner raising their house on stilts, Business investing in improved drainage, or relocating**	**- Businesses supporting upstream suppliers (often SMEs) to reduce vulnerability; - Investments in improved supply chain logistics**	Stand-alone philanthropic donations
	Joint	**Subsidized flood insurance for firms and households**	**- Utilities investing in resilient infrastructure (water, power) partly financed through tariffs; - Provision of climate / weather information**	Philanthropic donations linked with public sector programs
	Public	Public finance should not be used to produce only private benefits	Government funded agricultural R&D	Social safety nets, or sea walls to protect coastal towns

Priority areas for "blended finance": deals where private and public costs and benefits overlap

Brandon and Patwardhan, work inprogress

Evidence.
Ideas.
Change.

The 'triple dividend' of early warning systems: evidence from Tanzania's coastal areas

Maria Apergi, Emily Wilkinson and Margherita Calderone

WISER TRANSFORM webinar 5 Nov 2020

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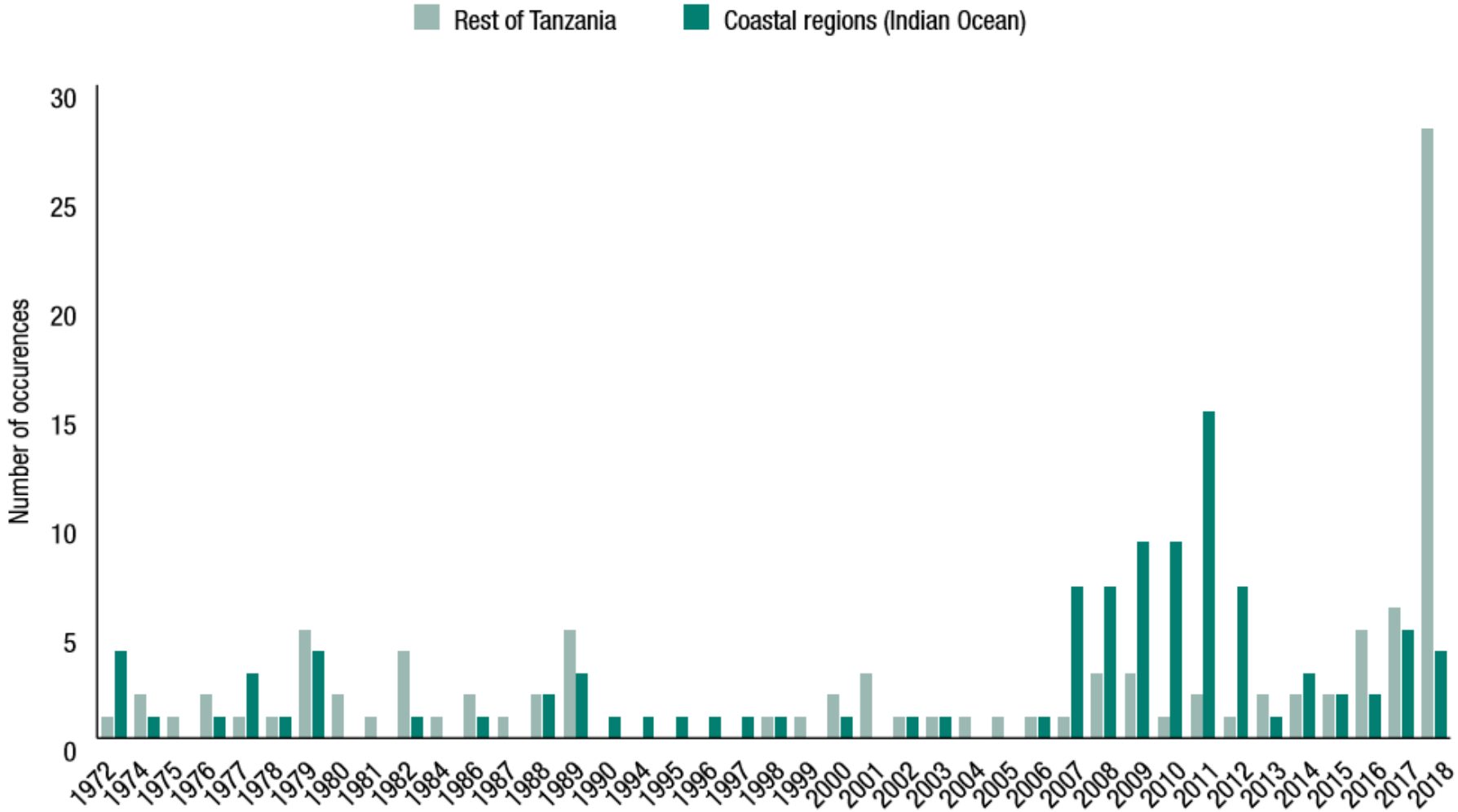
Multi Hazard Early Warning Service (MHEWS) project

- MHEWS, a partnership between TMA and the UK Met Office (2016-2018)
- Improvements in information about extreme weather:
  1. Using pictorial symbols
  2. Colour-coded warnings for different levels of danger
  3. Workshops, trainings for journalists
- Service launched in 2018 in coastal areas, then rolled out nationwide
- Builds on other initiatives/investments in DRR

Disasters in Tanzania



Evidence.
Ideas.
Change.

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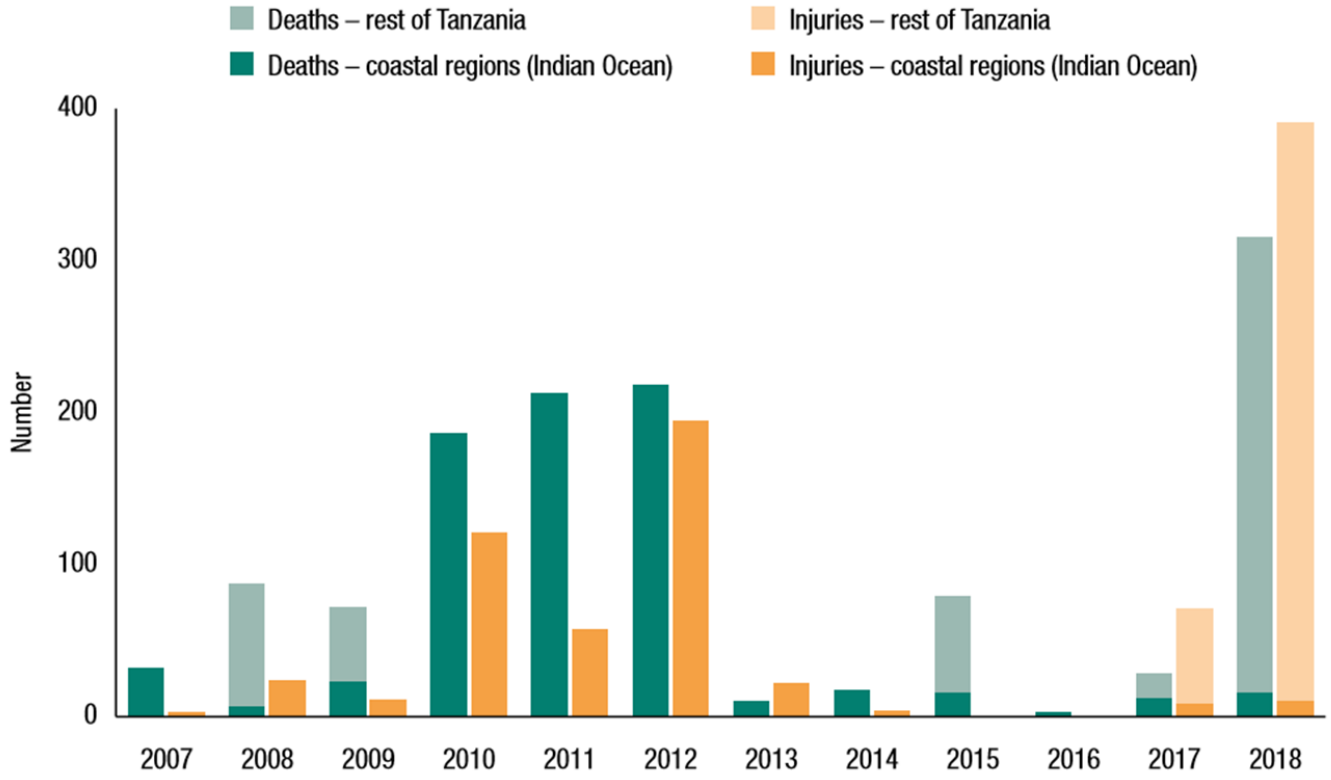
Findings of the study

- The first dividend of resilience – avoided losses
  - ✓ People taking precautions based on the weather information received
  - ✓ Perception that human impacts of extreme weather have reduced along the coast



Findings of the study

- The second dividend of resilience
  - ✓ Lower levels of disaster risk have encouraged small increases in investment, but not widespread
- The third dividend of resilience
  - ✓ Increased community engagement and improved local governance
  - ✓ Use of forecasts for household economic planning

Some caveats/ lessons

- Risk is only one obstacle preventing individuals from investing in more profitable activities
- Socioeconomic starting point is important: not everyone can use information + respond to the lower risk environment by increasing investment

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Realizing the 'Triple Dividend of Resilience'

Learnings from community level flood resilience projects

Viktor Roezer
Grantham Research Institute – London School of Economics

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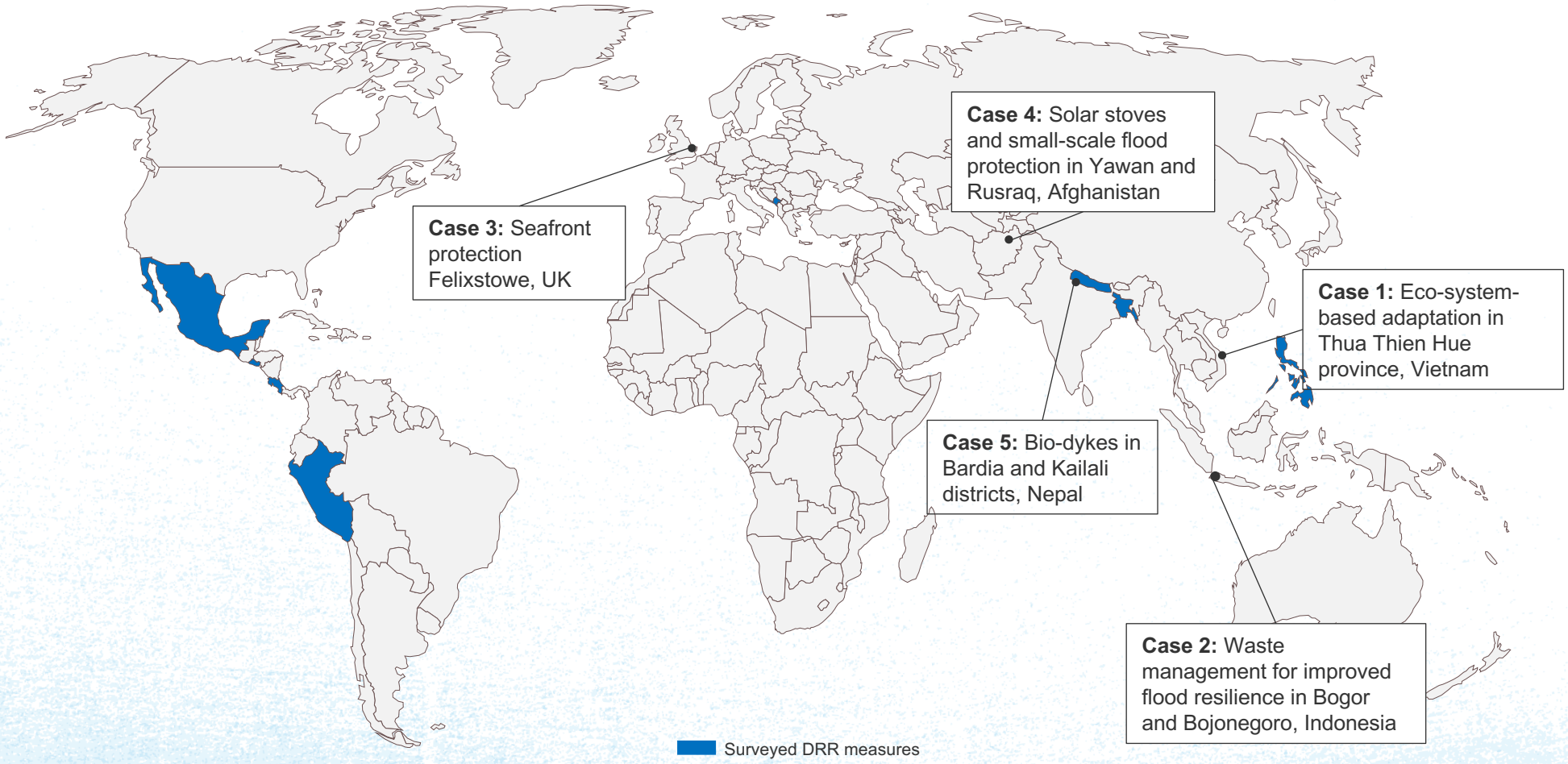
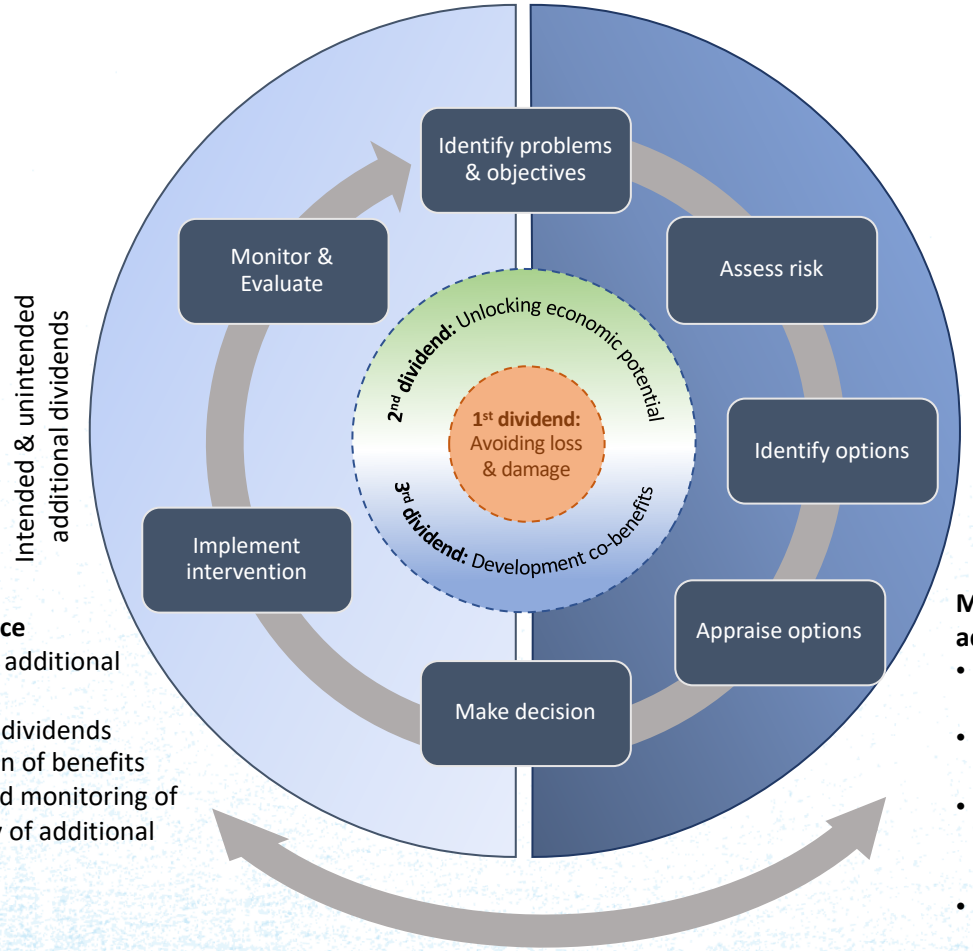
Community level flood resilience projects

Survey of 40 implemented community level measures in 8 countries.



The ‘Triple Dividend of Resilience’ and community level decision making



Empirical evidence

- (Co-)Costs of additional dividends
- Materialized dividends
- Quantification of benefits
- Reporting and monitoring of sustainability of additional dividends

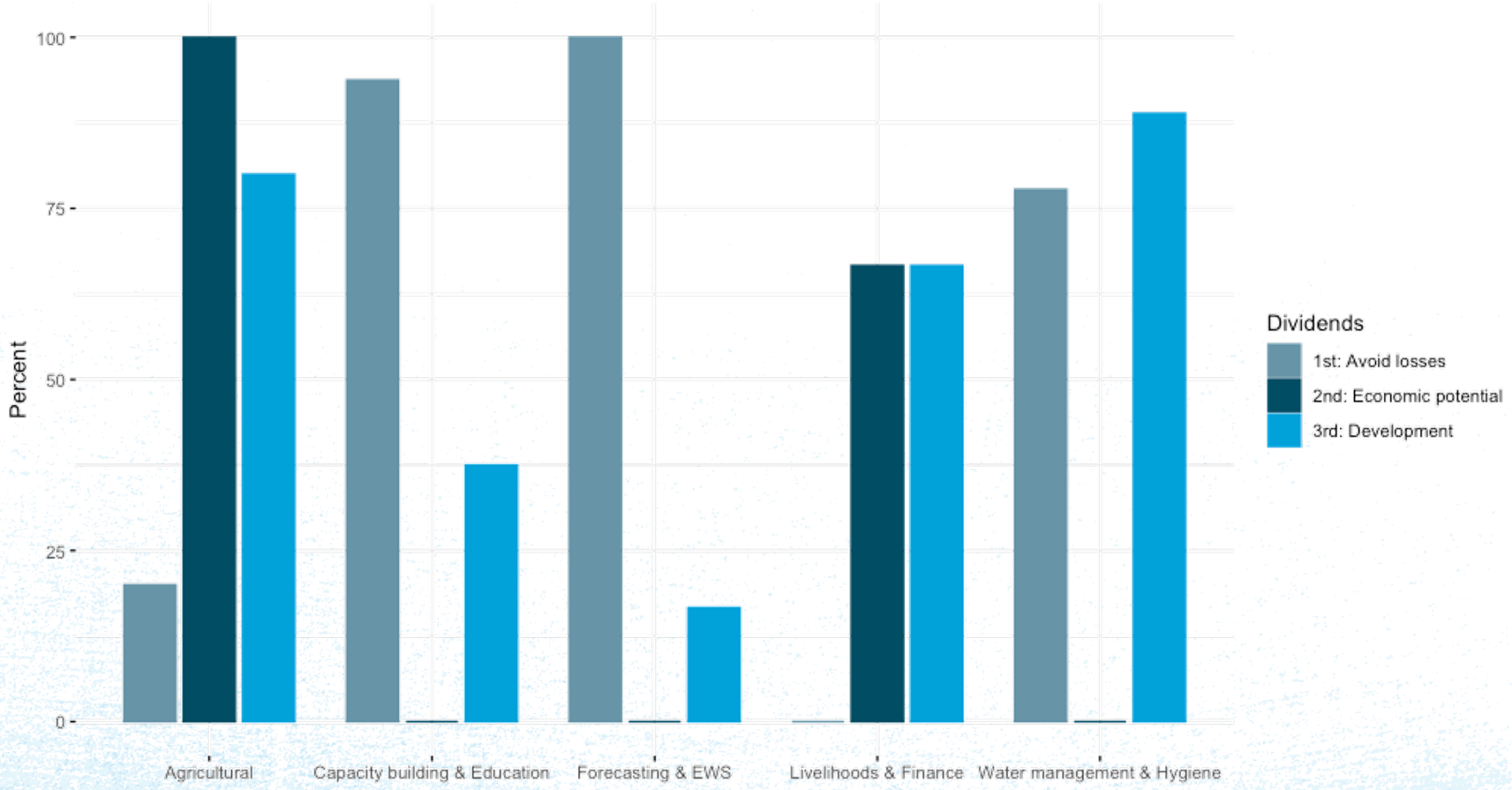
Methodological advancements

- Uncertainty & risk assessment
- Appraisal of additional dividends
- Identification of needs for additional dividends
- Decision making under uncertainty

Strengthen link between empirical evidence base and methods used in the planning and appraisal process

Community level flood resilience projects

Survey of 40 implemented community level measures in 8 countries.



Bio-dykes, Karnali River Basin Nepal

Background

- Two rural communities in Bardia and Kailali districts
- Affected by frequent river flooding destroying mainly crops
- Bio-dykes implemented to protect agricultural areas

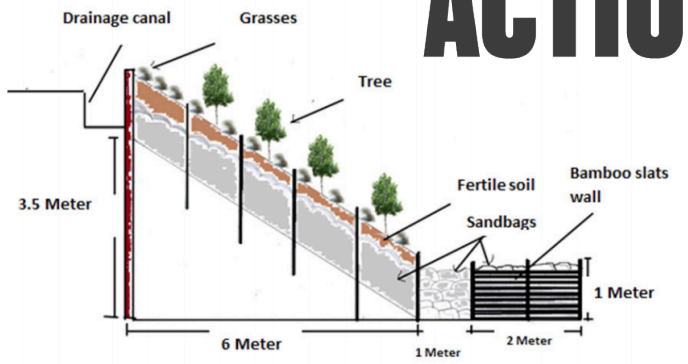
Considered dividends (qualitatively)

- Increased agricultural yields (2nd dividend)
- Lower out-migration (2nd dividend)
- CO_2 sequestration (3rd dividend)
- New wildlife habitats (3rd dividend)

Materialized dividends (since 2015)

- Avoided damage to crops
- Increased fodder production for livestock
- New knowledge and skills

BUT: Local communities remained in favor of hard resilience measures with very few additional dividends (partly due to high co-costs and pressure to deliver on 1st dividend)



Conclusions

- Most interventions have additional resilience dividends but no “silver bullet” solution
- Existing combination of DRR, CCA and development in national level policies provide enabling environment for realizing TDR
- Counteracted through high level of skepticism by local decision makers and communities
  - Political pressure after recent disaster
  - Higher perceived uncertainties on materialization (esp. 1st dividend)
  - Additional resilience dividends not meeting specific needs of communities
- Successfully implemented pilot projects help to overcome skepticism, but so far scarce

Next steps

Decision-making framework and tools for TDR needed:

- Cover entire decision-making cycle (ex-ante appraisal AND ex-post M&E)
- Systematically consider individual dividends and if they meet community’s needs
- Address and communicate uncertainties around materialization of dividends

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Any Questions?

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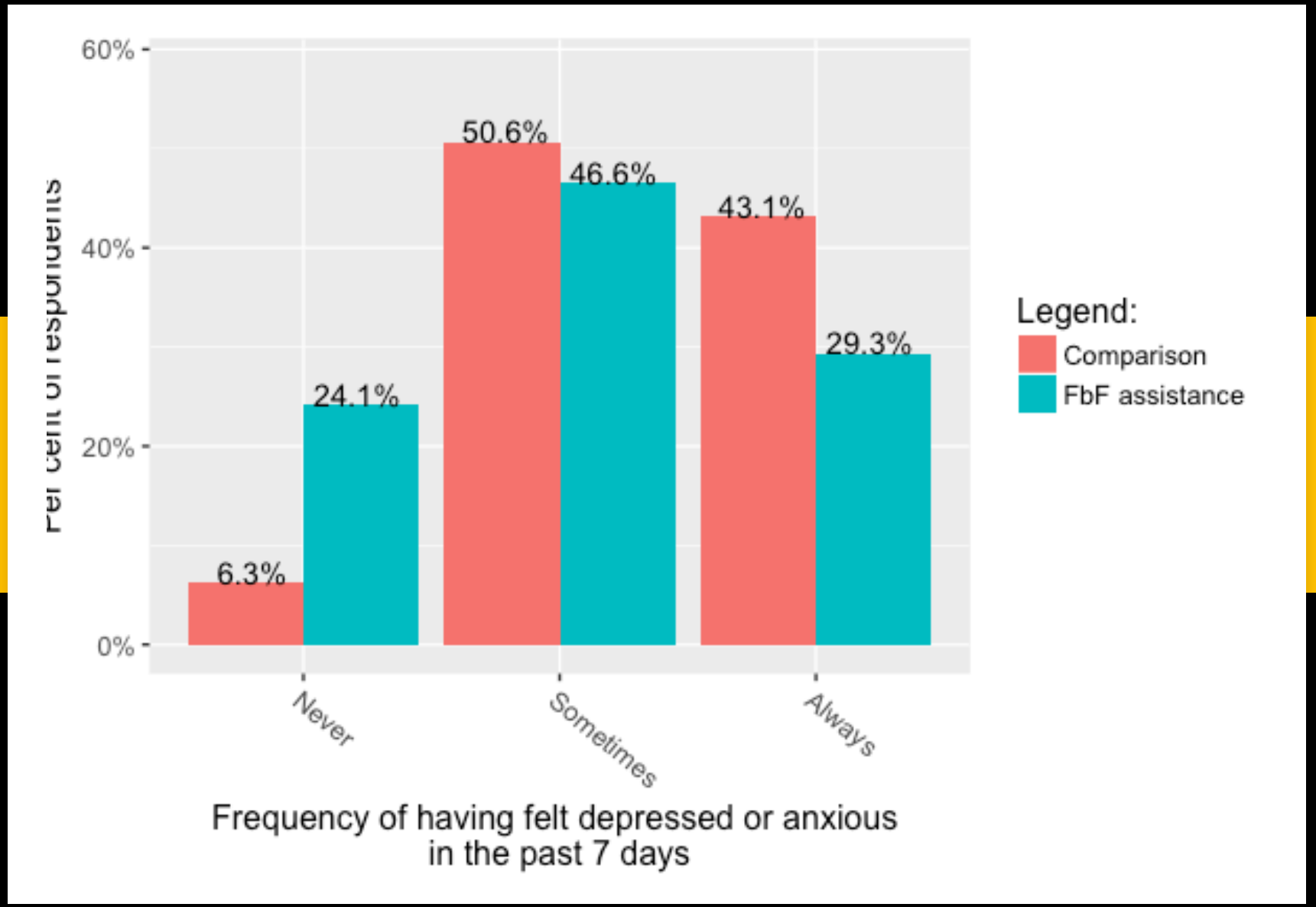
Psycho-social dividends of resilience

Thomas Tanner

SOAS Centre for Development, Environment and Policy



Reduced anxiety and depression

Source: Gros et al. (2019) International Journal of Disaster Risk Reduction, 41, 101275.

Climate Change, Macrofinancial Risks and the Cost of Capital: Strengthening Resilience is a Good Investment

Ulrich Volz

WISER Webinar: The Triple Dividend Of Resilience: From Concept To Application

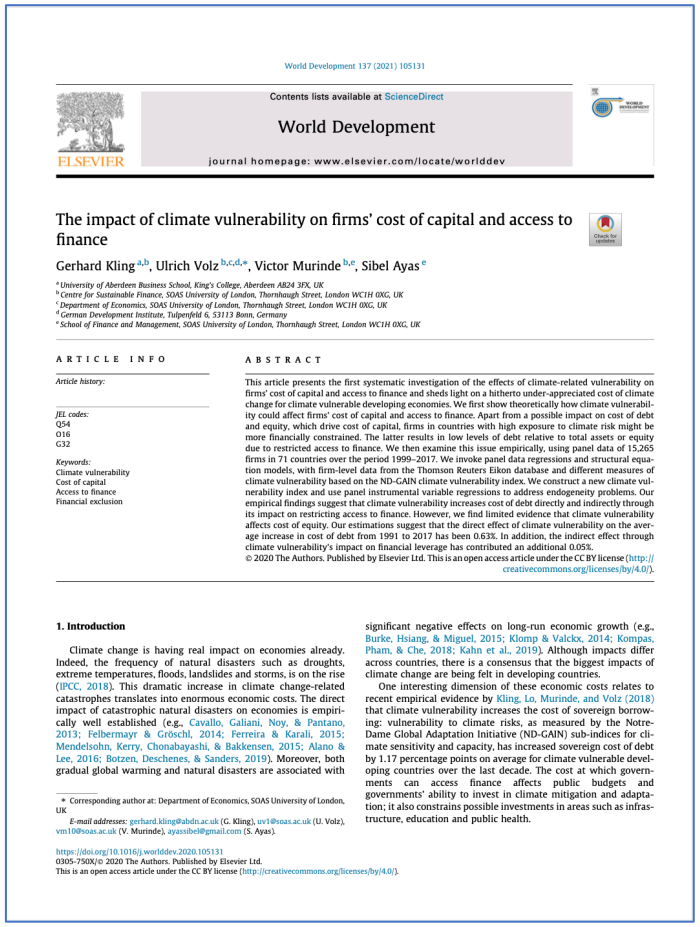
5 November 2020

Centre for Sustainable Finance

SOAS University of London

Climate change has an impact on the cost of capital in climate vulnerable countries

- Governments and firms in climate vulnerable countries incur a risk premium on their debt.
- Serious implications for capacity to invest in climate adaptation and resilience, growth & development prospects, and debt sustainability.



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The impact of climate vulnerability on firms' cost of capital and access to finance

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ABSTRACT

This article presents the first systematic investigation of the effects of climate-related vulnerability on firms' cost of capital and access to finance and sheds light on a hitherto under-appreciated cost of climate change for climate vulnerable developing economies. We first show theoretically how climate vulnerability could affect firms' cost of capital and access to finance. Apart from a possible impact on cost of debt and equity, which drive cost of capital, firms in countries with high exposure to climate risk might be more financially constrained. The latter results in low levels of debt relative to total assets or equity due to restricted access to finance. We then examine this issue empirically, using panel data of 15,265 firms in 71 countries over the period 1999–2017. We invoke panel data regressions and structural equation models, with firm-level data from the Thomson Reuters Eikon database and different measures of climate vulnerability based on the ND-GAIN climate vulnerability index. We construct a new climate vulnerability index and use panel instrumental variable regressions to address endogeneity problems. Our empirical findings suggest that climate vulnerability increases cost of debt directly and indirectly through its impact on restricting access to finance. However, we find limited evidence that climate vulnerability affects cost of equity. Our estimations suggest that the direct effect of climate vulnerability on the average increase in cost of debt from 1991 to 2017 has been 0.63%. In addition, the indirect effect through climate vulnerability's impact on financial leverage has contributed an additional 0.05%.

1. Introduction

Climate change is having real impact on economies already. Indeed, the frequency of natural disasters such as droughts, extreme temperatures, floods, landslides and storms, is on the rise (IPCC, 2018). This dramatic increase in climate change-related catastrophes translates into enormous economic costs. The direct impact of catastrophic natural disasters on economies is empirically well established (e.g., Cavallo, Galiani, Noy, & Pantano, 2013; Felbermayr & Gröschl, 2014; Ferreira & Karali, 2015; Mendelsohn, Kerry, Chonabayashi, & Bakkensen, 2015; Alano & Lee, 2016; Botzen, Deschenes, & Sanders, 2019). Moreover, both gradual global warming and natural disasters are associated with significant negative effects on long-run economic growth (e.g., Burke, Hsiang, & Miguel, 2015; Klomp & Valckx, 2014; Kompas, Pham, & Che, 2018; Kahn et al., 2019). Although impacts differ across countries, there is a consensus that the biggest impacts of climate change are being felt in developing countries.

One interesting dimension of these economic costs relates to recent empirical evidence by Kling, Lo, Murinde, and Volz (2018) that climate vulnerability increases the cost of sovereign borrowing: vulnerability to climate risks, as measured by the Notre-Dame Global Adaptation Initiative (ND-GAIN) sub-indices for climate sensitivity and capacity, has increased sovereign cost of debt by 1.17 percentage points on average for climate vulnerable developing countries over the last decade. The cost at which governments can access finance affects public budgets and governments' ability to invest in climate mitigation and adaptation; it also constrains possible investments in areas such as infrastructure, education and public health.

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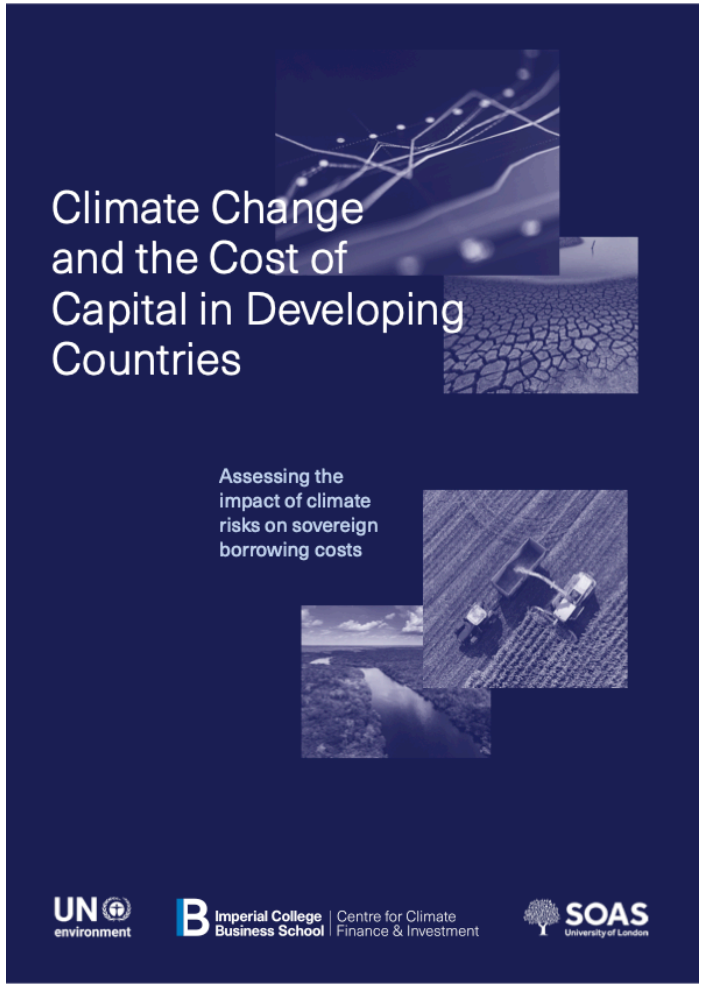
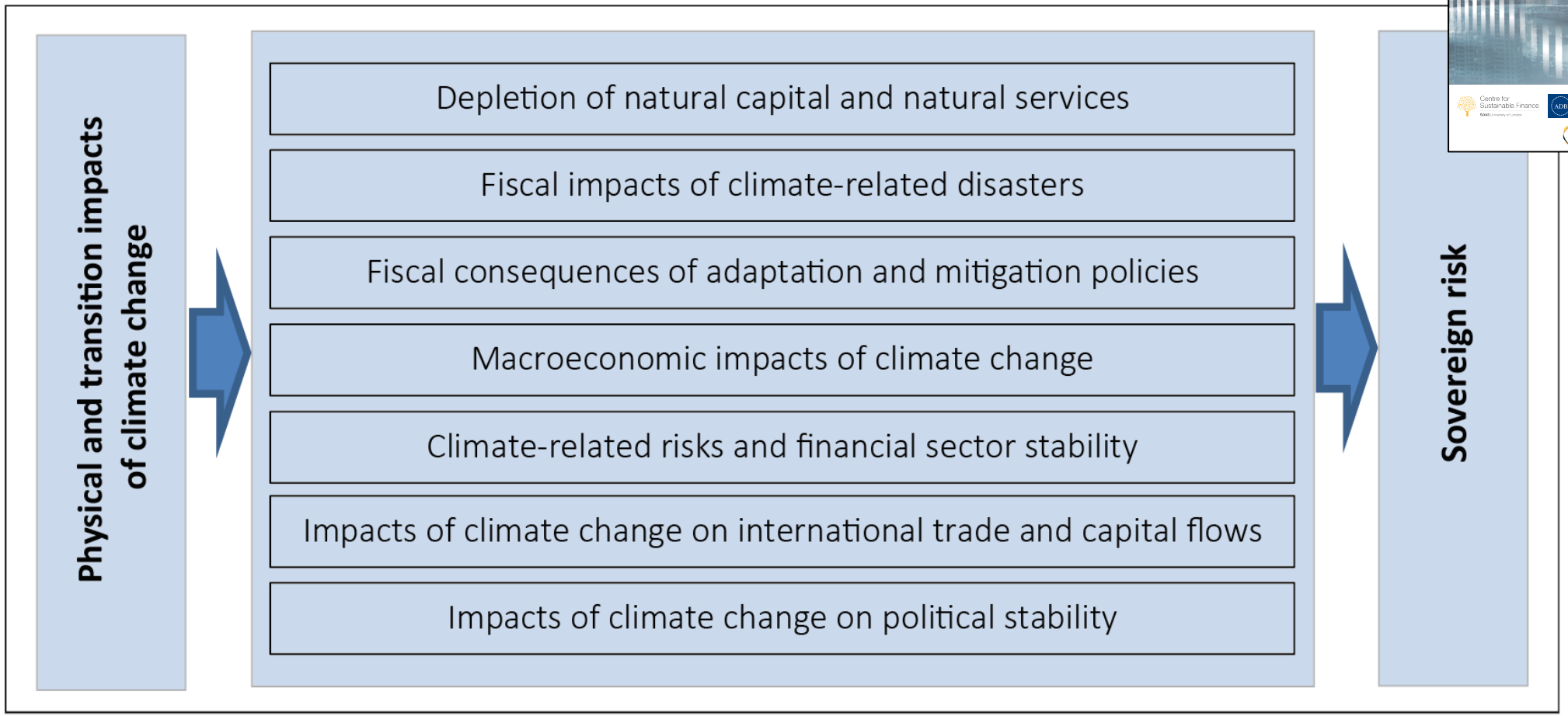
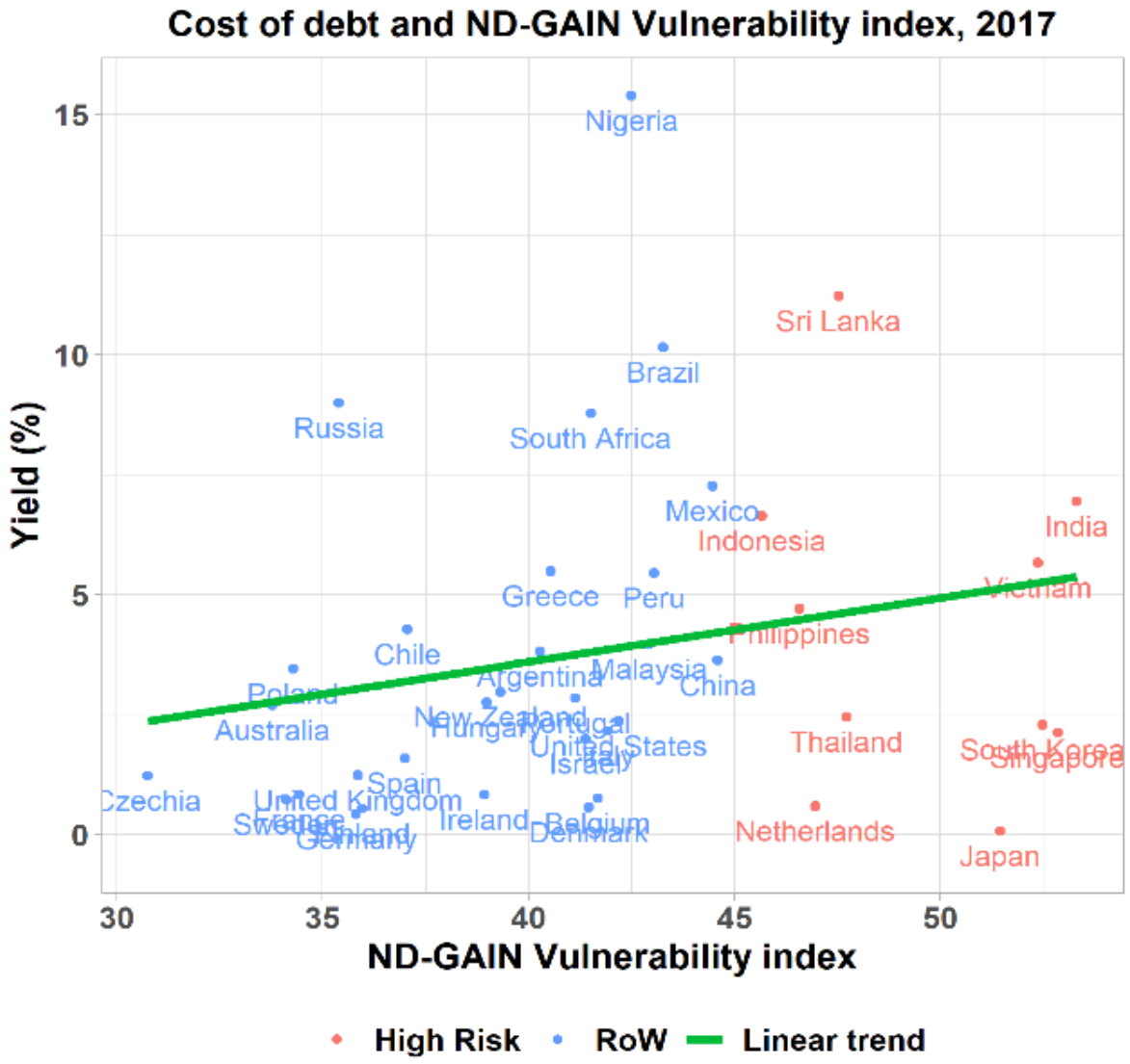
0305-750X/

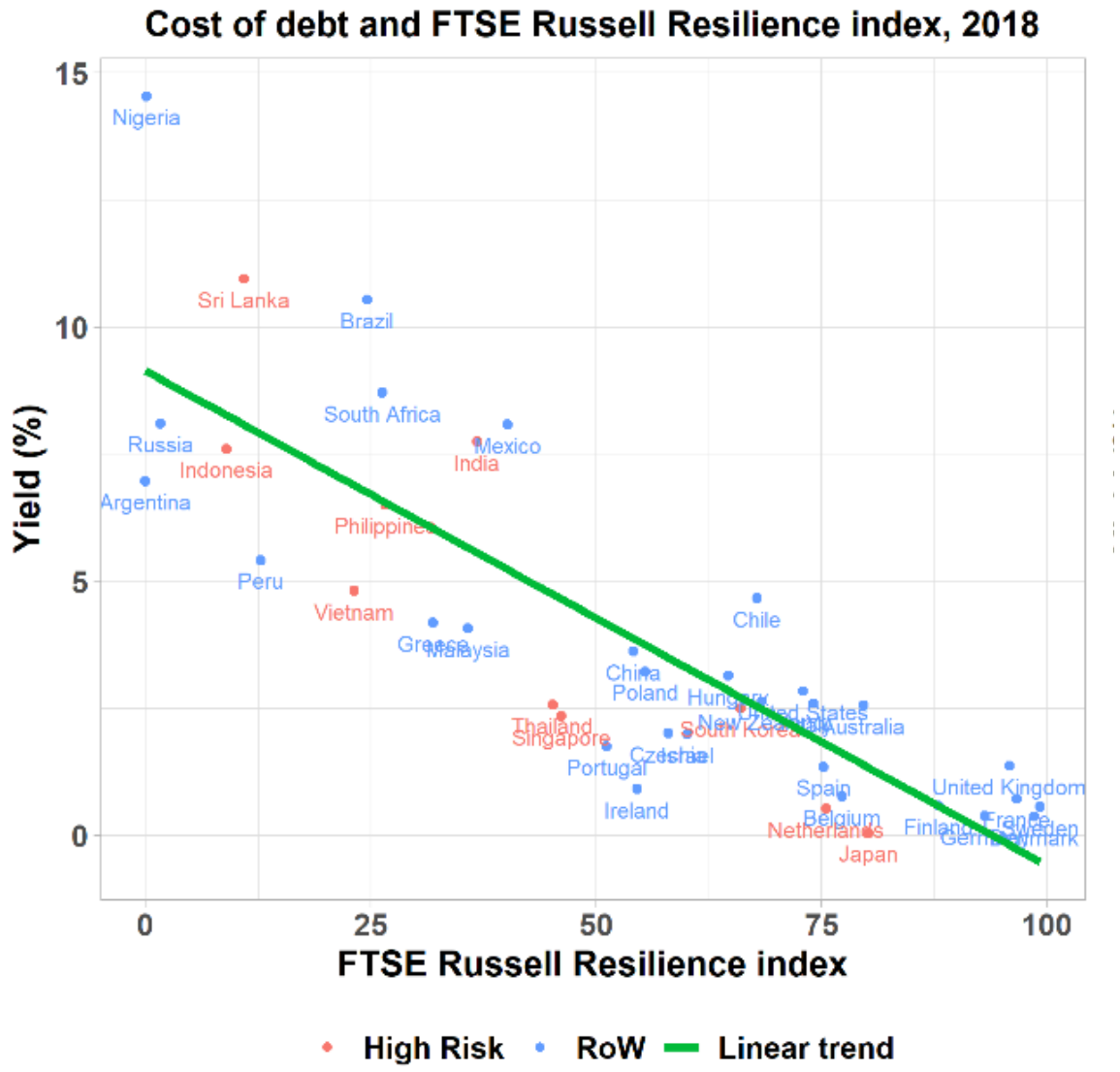


Climate change has material impact on macrofinancial stability



Source: Volz et al. (2020).





Source: Volz et al. (2020).

Five areas in which climate-related financial risks should be addressed in a coordinated manner:

1) Conduct a comprehensive vulnerability assessment and develop a national adaptation plan.
2) Mainstream climate risk analysis in public financial management.
3) Adjust monetary and prudential frameworks to account for climate risks.
4) Implement financial sector policies to scale-up investment in climate adaptation and resilience and develop insurance solutions.
5) Provide international support to mitigate and manage climate-related sovereign risk.