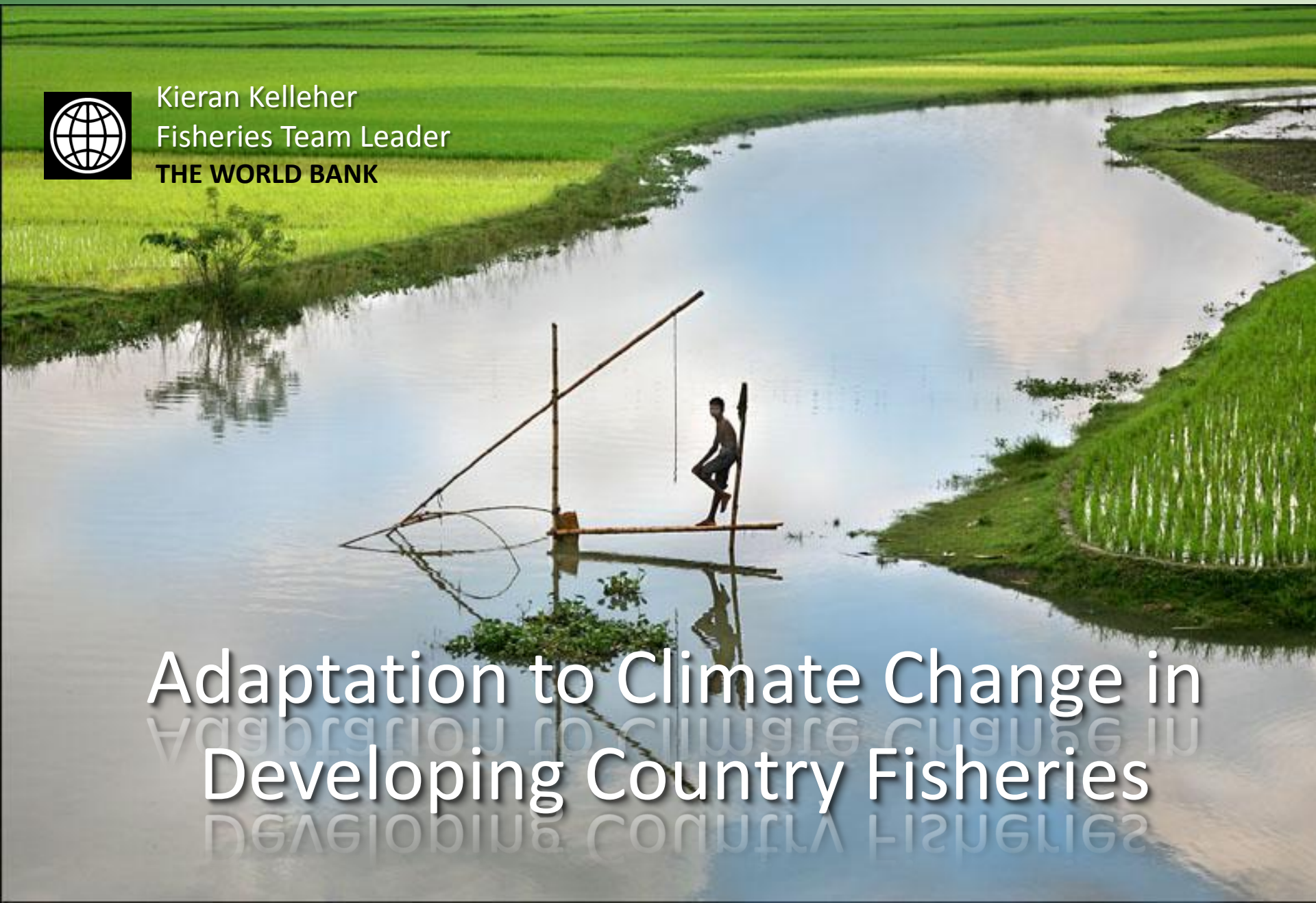
Kieran Kelleher
Fisheries Team Leader
THE WORLD BANK



Adaptation to Climate Change in Developing Country Fisheries

themes

- not just fish
- people & assets
- processes
- tools
- funding
- World Bank actions

……. generic approach

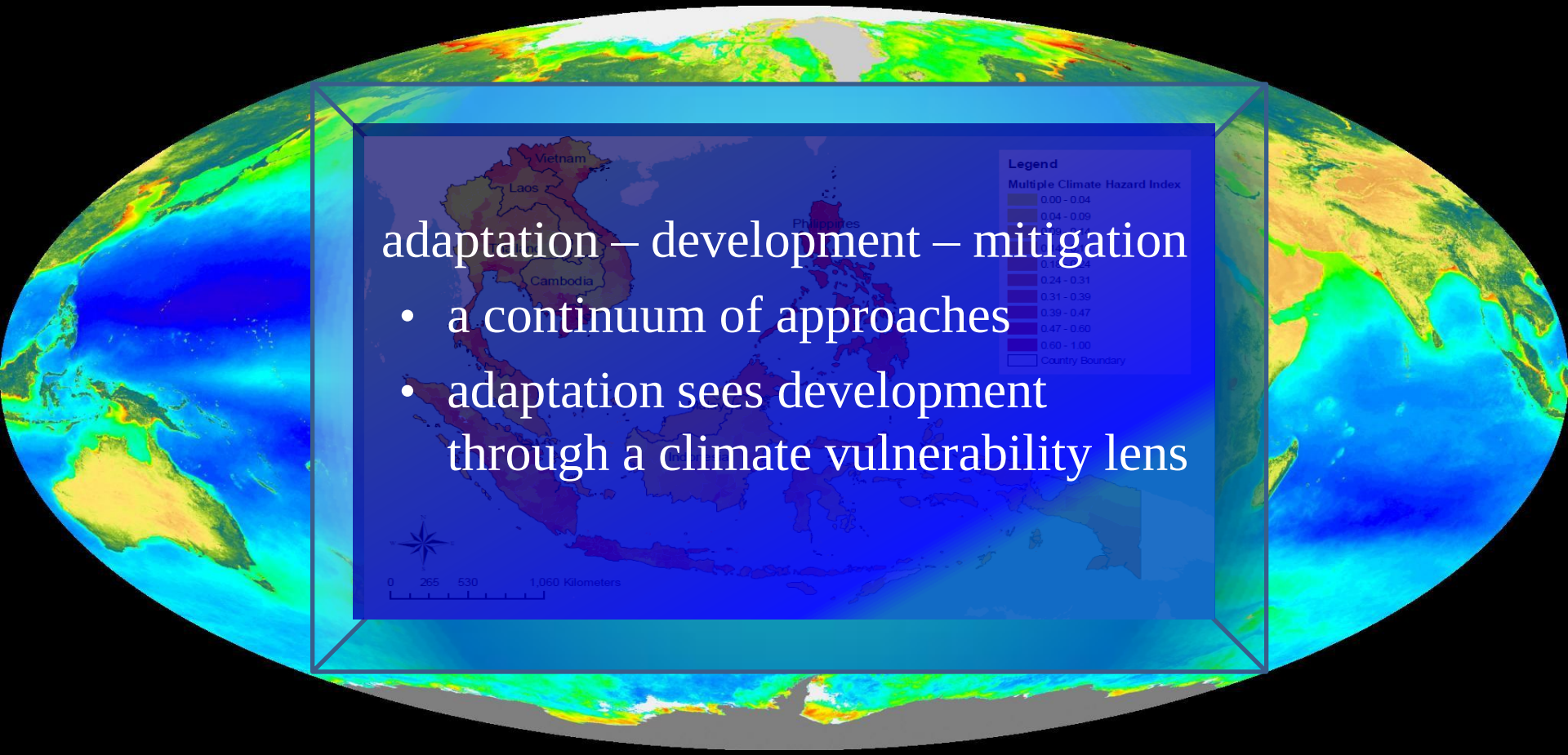
contents

1. impacts on the developing world
2. a framework for adaptation
3. financing and economic issues
4. summary and conclusions

key messages

- act now – inertia limits options
- act together – equity and efficiency – the vulnerable
- act differently – transform production systems
- adaptation is not the problem …. it is productivity, sustainability of systems, political consensus
- awareness – informed decisions by people
- equitable – fair at local, regional, and global levels
- led by rich countries

adaptation - development - mitigation

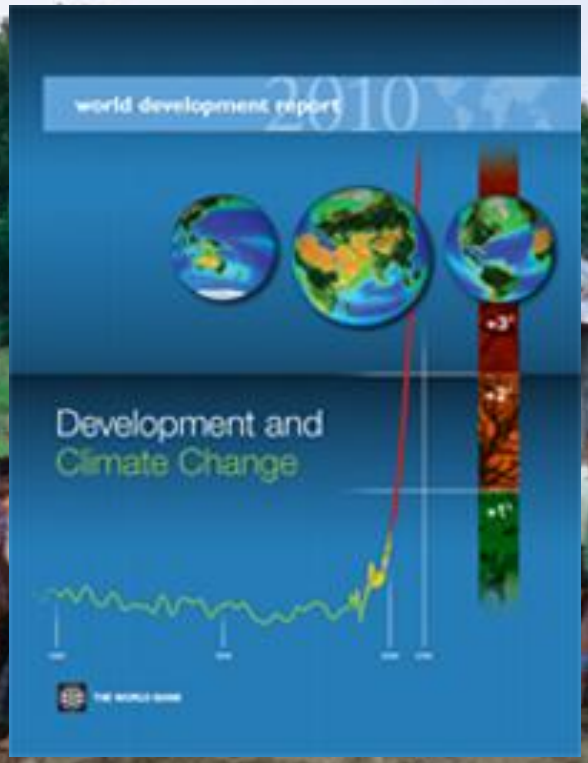


adaptation – development – mitigation

- a continuum of approaches
- adaptation sees development through a climate vulnerability lens

The benefits of adaptation are <u>local</u>

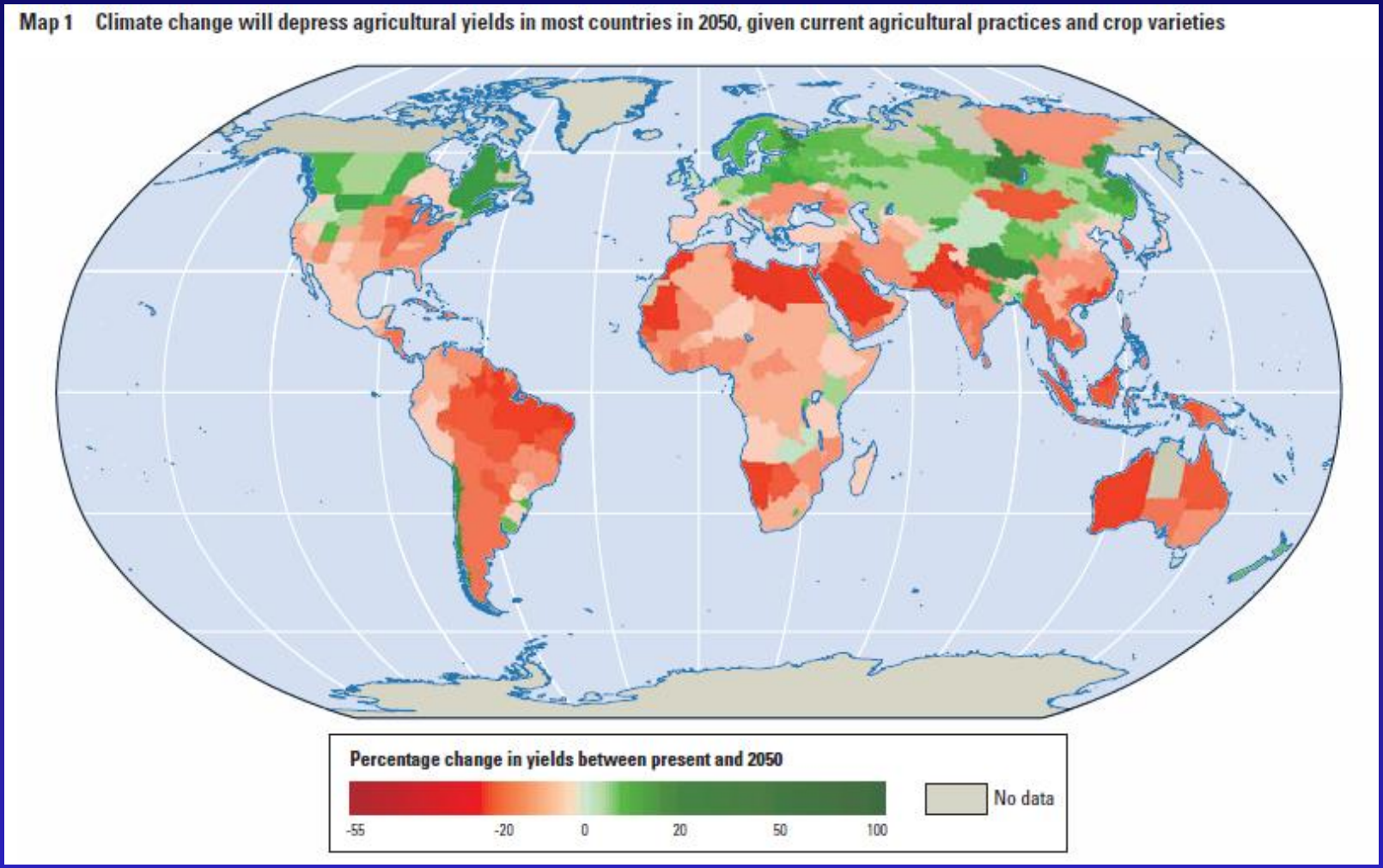
Multiple climate hazard risk map Southeast Asia



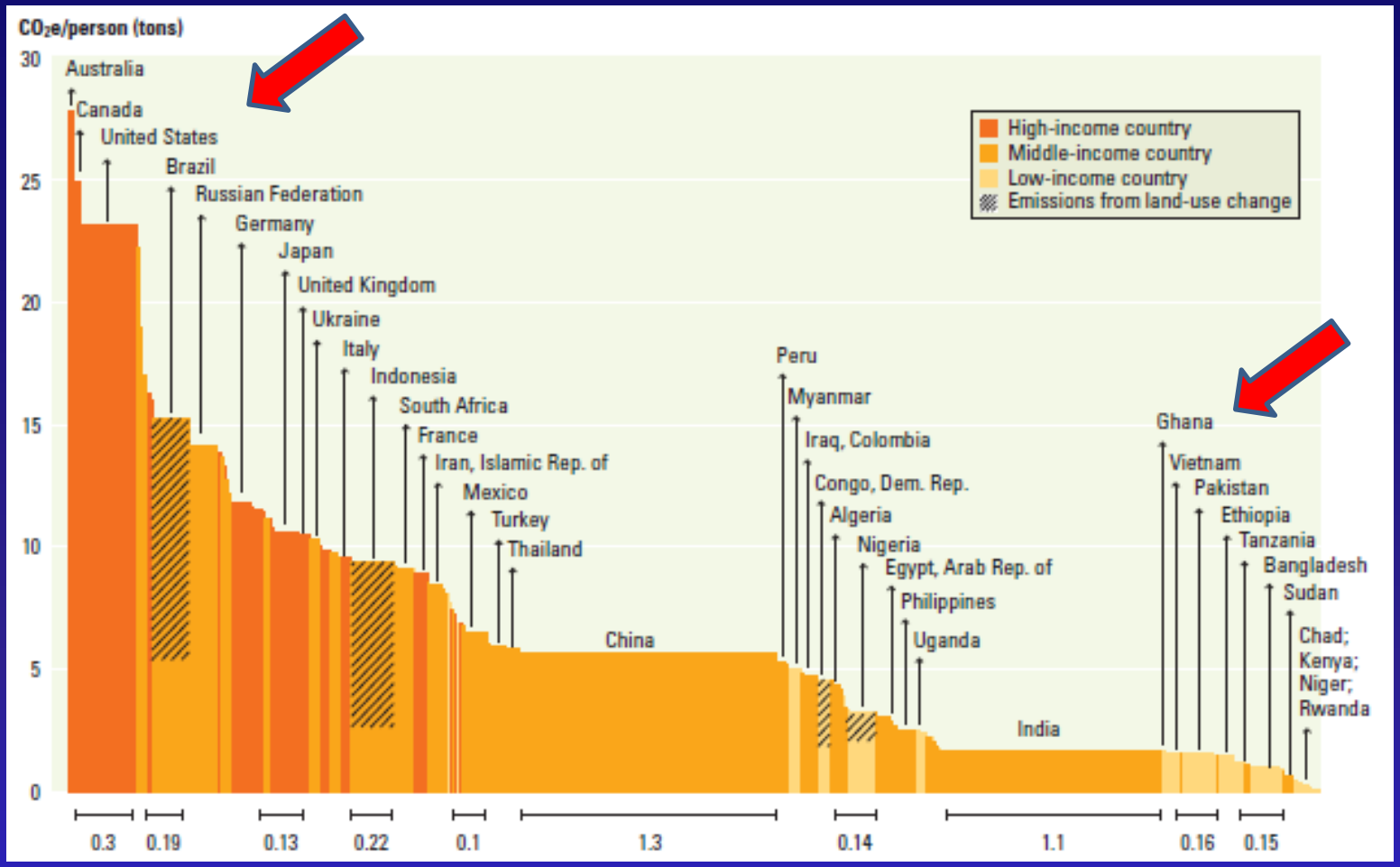
world development report 2010

Development and Climate Change

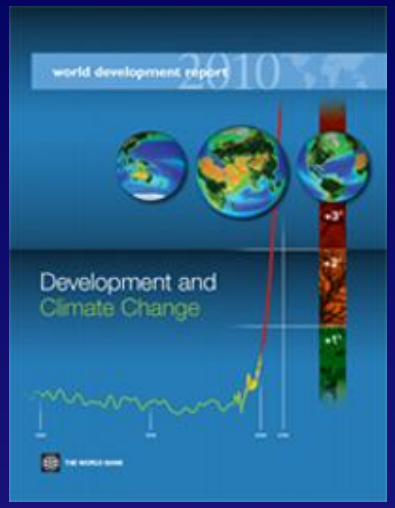
the developing world will bear most of the cost of climate change



but the developed world has reaped most of the benefits

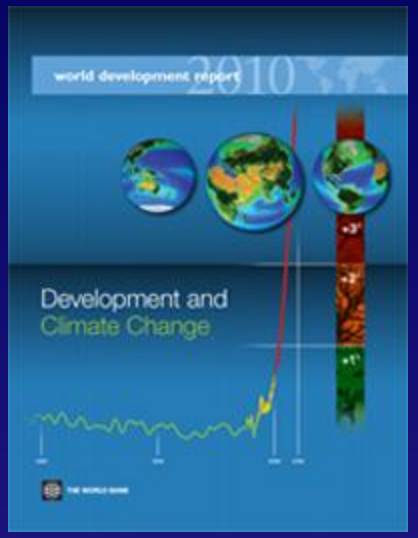


messages from the WDR



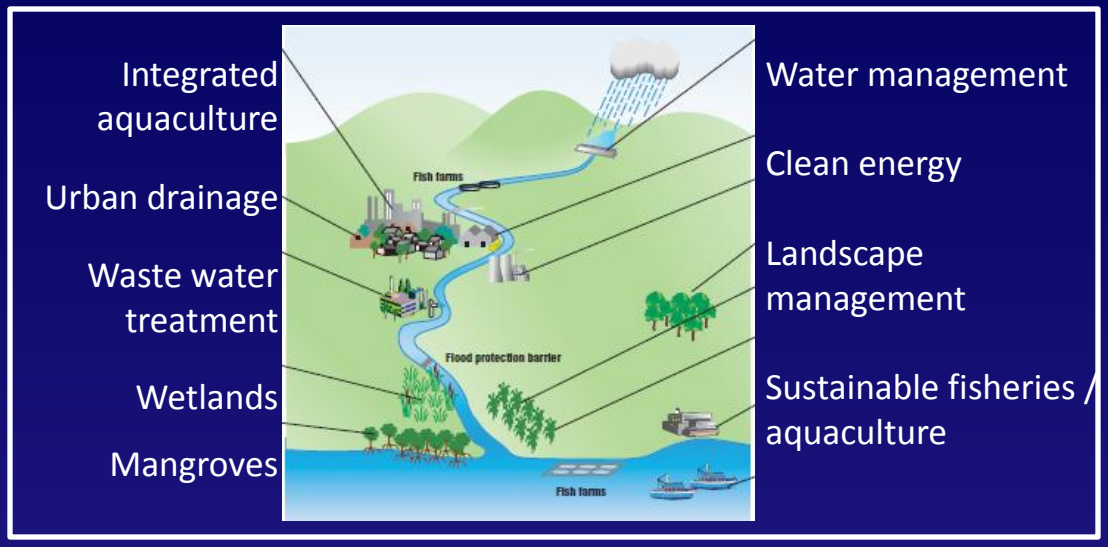
- the projected losses from CC are high
- economic growth alone cannot counter the threats
- to feed 9 billion people society will have to almost double growth in food productivity while minimizing environmental impact
- costs for developing world 2030 … 1-12%+ GDP
  - mitigation $170 billion / year (est.)
  - adaptation – estimates vary $30-135 billion/yr

messages from the WDR



- act now – inertia limits options
- act together – equity and efficiency
- act differently – transform production systems
- we have some of the knowledge
- but how do we apply it?
  - address the political and economic issues
  - address the social and economic trade offs

how do we move forward?



- we know many of the solutions
- the problem is applying them – we are not!
- the issues are political, social, economic and financial
- the trade offs at local level are like those between developed and developing countries in Copenhagen
- who pays, who loses, who compensates for changes in the environmental status quo?

framework

framework for adaptation

1. build the case for adaptation
2. identify and engage communities and institutions (including political institutions)
3. assess climate risks
4. identify adaptation measures
5. strengthen policies, capacity, institutions
6. implement and monitor adaptation measures

key cross-cutting elements

- innovative decision-making tools
- applied R&D for smart food productivity
- property rights (e.g. ITQ, TURFs, water leases)
- pricing of resources (e.g. water, fishing access)
- effective markets (e.g. greening of subsidies, WTO deal)
- strong institutions to enforce rules
- shared information & knowledge at all levels
- financial and human resources

1. build the case for adaptation

- public awareness – consensus?
- the business case - the political case
  - e.g. '*Sunken Billions'*, New Orleans & wetlands
  - greening subsidies
  - adaptation – 'seizing the opportunity'
- vulnerability and risk (who, what and where)
- uncertainty – acknowledge, assess, reduce
- understand upstream and downstream linkages – physical and economic

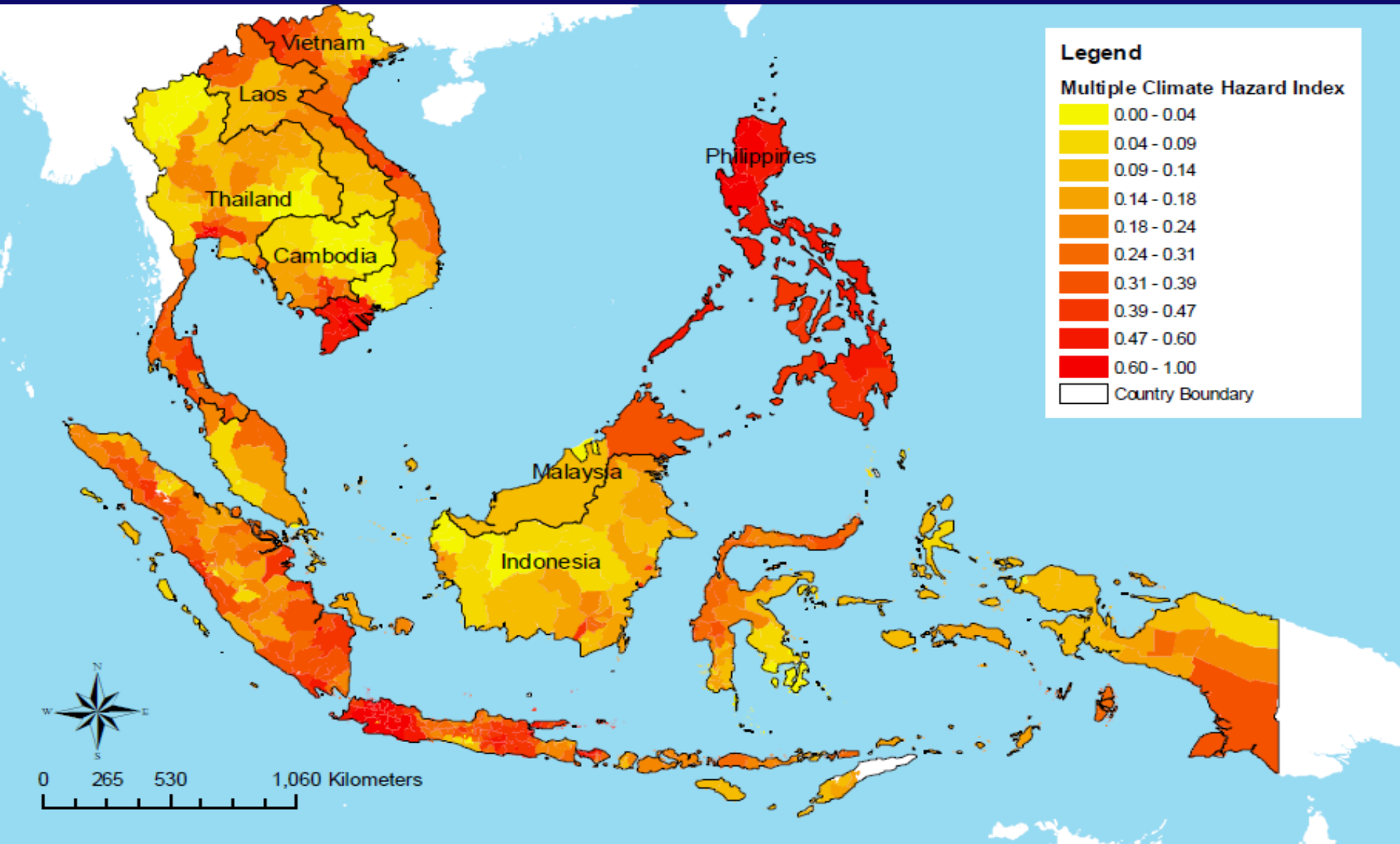
2. identify and engage communities and institutions

- ensure key ministries/ agencies are ‘on the same page’
- target major concerns, e.g. food security, natural disasters
- engage private sector and civil society
- make the economic case for environmental issues
- link to the poverty & growth agendas
- link environmental governance to climate change
- maintain transparency – data/ assumptions

3. assess climate risks

- define target - region, fishery, coastal zone and time horizon
- assess current and future risks and degree of uncertainty
- understand key drivers variables and sensitivity to change
  - e.g. subsidies, land degradation, high dependence on fisheries, most vulnerable groups, floodplains
- are existing coping strategies effective?
  - can they be reinforced – or need to change?

mapping vulnerability/ CC threats



CC response toolkits

Tool/ Developer	Type of tool	Current Climate	Climate Change Scenarios	Climate Change Sector Impacts	Analysis of Adaptation Options	Analysis community Level	Economic Analysis
ADAPT World Bank	Data generators, databases and data platforms / Computer-based	x	x	x	x	x	
ALM UNDP	Computer based/ Frameworks for adaptation / climate risk management processes	x	x	x	x		
SERVIR USAID, NASA, CATHALAC, IAGT	Information generation, databases and platforms	x	x	x			
CCE SEI	Data generators, databases and data platforms	x	x	x		x	
CRiSTAL IISD, IUCN, SEI	Computer based	x		x		x	
Adaptation Wizard (UKCIP)	Computer based		x		x	x	x
ORCHID IDS	Frameworks for adaptation / climate risk management processes	x	x	x		x	
CEDRA Tearfund	Frameworks for adaptation / climate risk management processes	x	x	x	x	x	
Climate Wizard TNC	Data generators, databases and platforms	x	x				
ECA report Swiss Re +	Economics of adaptation Case studies				x		x

4. identify adaptation measures

- technical and stakeholder assessment of options
- economic and social assessments
- sequencing – priority investments
- balance 'hard' (dikes) and 'soft' (policy) measures
- prioritize/ favor
  - synergies adaptation + mitigation
  - 'no-regrets' or 'low-regrets' actions
  - safety margins for more informed investments later
  - reversible and flexible options
  - increasing resilience of vulnerable groups
  - phase/ prioritize according to costs, benefits and risks

5 framework

5. strengthen policies, capacity, institutions

- get the incentives right (e.g. subsidies)
- build partnerships with private sector/ civil society
- decentralize planning to coherent units (river basins, cities, coastal zones, fishery management units)
- work out the financing – public, private, recurrent, new investment, domestic, external
- build knowledge – e.g. maintain local meteo. services, environmental economics capability
- create incentives for ministries/ provinces/ sectors to work together, e.g. conditional budget allocations

Mekong
dams
water
&
Pangasius

6. implement and monitor adaptation measures

- …..
- examples
- financing adaptation
- economic issues
- *monitoring/ evaluation*

examples

- Bangladesh – maintain natural and constructed capital (dikes and drainage canals)
- Indonesia – MPAs and coastal zones
- Vietnam – technology - saline tolerant *Pangasius*?
- Maldives – concentrate communities, seawalls
- India – typhoon shelters and early warning
- Fiji – fisheries and coastal zones
- Latin America – payment for ecosystem services
- Trinidad – Biocarbon $ for mangrove aforestation
- Peru – weather insurance (crops …. aquaculture?)

examples 2

Peru – CC Response Strategy Process

- 4 workshops on *agriculture*
  1. identified CC implications for agriculture
  2. identified potential response options
  3. prioritized response options
  4. developed regional action plans
- planning to replicate for Peru's fisheries
  - focus on institutions
  - e.g. El Nino 'insurance/ stabilization', social funds, aquaculture insurance

financing adaptation/ resilience

- review public expenditure – CC lens
  - greening of subsidies
  - generate economic rents – *'Sunken Billions'* – e.g. Peru
  - improve efficiency, reduce fuel consumption - phasing out older fishing vessels (China CC - 2007)
- insurance products
  - improved aquaculture governance
  - improved weather data modeling
- 'bankable' technology
  - CGIAR $50 million / year from WB (e.g. WorldFish)
  - aquaculture breeding/ low trophic level – 'GIFT' – over 100% RoI
- regular development assistance projects
  - CC in 80% of WB country assistance programs
  - e.g. $300m Indonesia (1st CC policy support loan), Peru, PNA countries

the ‘climate funds’

- Strategic Climate Fund (approx $1 billion)
  - Pilot Program for Climate Resilience
    (e.g. Pacific, Caribbean, Bangladesh, Mozambique)
  - Forest Investment Program – sustainable forests + REDD
- Carbon funds (mitigation) – approx $6 billion/ year
  - Biocarbon Fund – mangroves, ….. blue/ ocean carbon
- Adaptation Fund – WB sales of CERs $100m (pending)
- Clean Technology Fund (energy, mitigation)
- Global Facility for Disaster Risk Reduction and Recovery
  ($15 million – 20 countries)
- Global Agriculture and Food Security Program ($1 billion)
- IFC – private sector window (water, agriculture, tourism)
- Global Environment Facility – various instruments

economic issues (1)

- plausible scenarios for decision making - transparent
- separate analytics from politics
- discount rate – unresolved debate
  - low rate favors future, but may skew investment decisions
  - social or project discount rate?
  - Stern 1.4%, WB default 10% (cost of capital)
- actions with high RoI preferred but …
  - ecosystem services not captured in market values
- WB does not account for global externalities in projects .. yet!

economic issues (2)

- estimating costs – whole project/ activity or incremental adaptation cost?
- estimating benefits - attributing the benefits to the adaptation?
- hard and soft adaptation economics
- the economics of (un) certainty – the cost of delay?
- *Economics of Climate Adaptation* report (Swiss Re)

conclusions

- the developing world will bear the greatest cost
- act now – inertia limits options
- act together – equity and efficiency – the poor
- act differently – transform production systems
- adaptation is not the problem …. it is productivity, sustainability of systems, building political consensus
- awareness – informed decisions at appropriate levels
- clear roles, communities, public & private sectors
- led by rich countries

감사합니다.

thank you

PROFISH
Global Program on Fisheries

useful links

- World Bank Global Partnership on Fisheries (PROFISH) www.woldbank.org/fish
- World Bank climate change http://beta.worldbank.org/climatechange/
- World Development Report 2010. Development and Climate Change. http://go.worldbank.org/ZXULQ9SCC0
- World Bank Climate Data Portal. http://sdwebx.worldbank.org/climateportal/
- Climate Investment Funds. http://www.climateinvestmentfunds.org/cif/
- Economics of Climate Adaptation (Swiss Re) http://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf
- Fisheries and Climate Change wiki. http://en.wikipedia.org/wiki/Fisheries_and_climate_change