Sustainable Projects Through Climate Change Risk Management and Adaptation: Lessons Learned

INTER-AMERICAN DEVELOPMENT BANK

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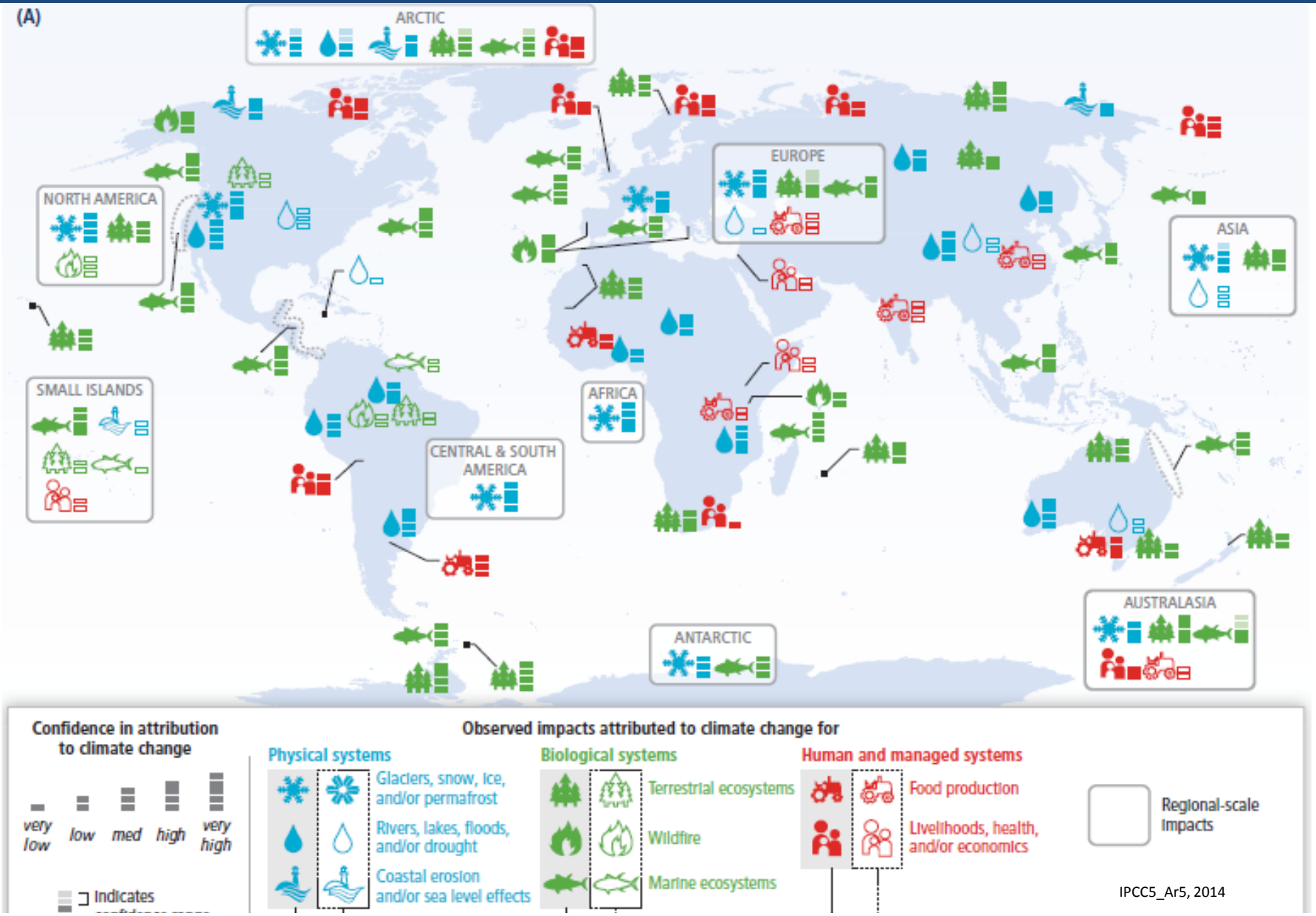
December, 2015

Some Facts and Figures

Climate Change Impacts Already Being Observed



IPCC5_Ar5, 2014

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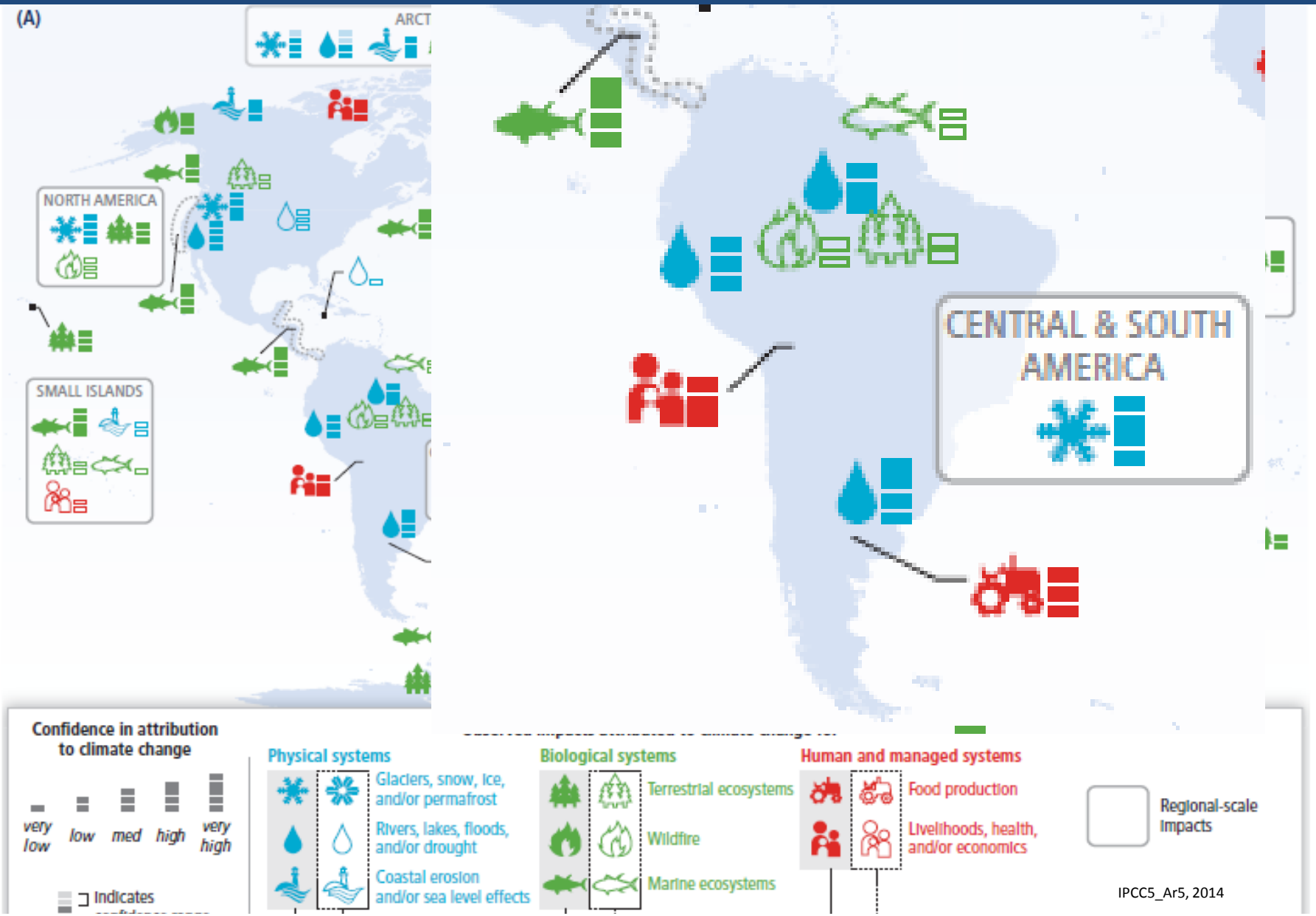
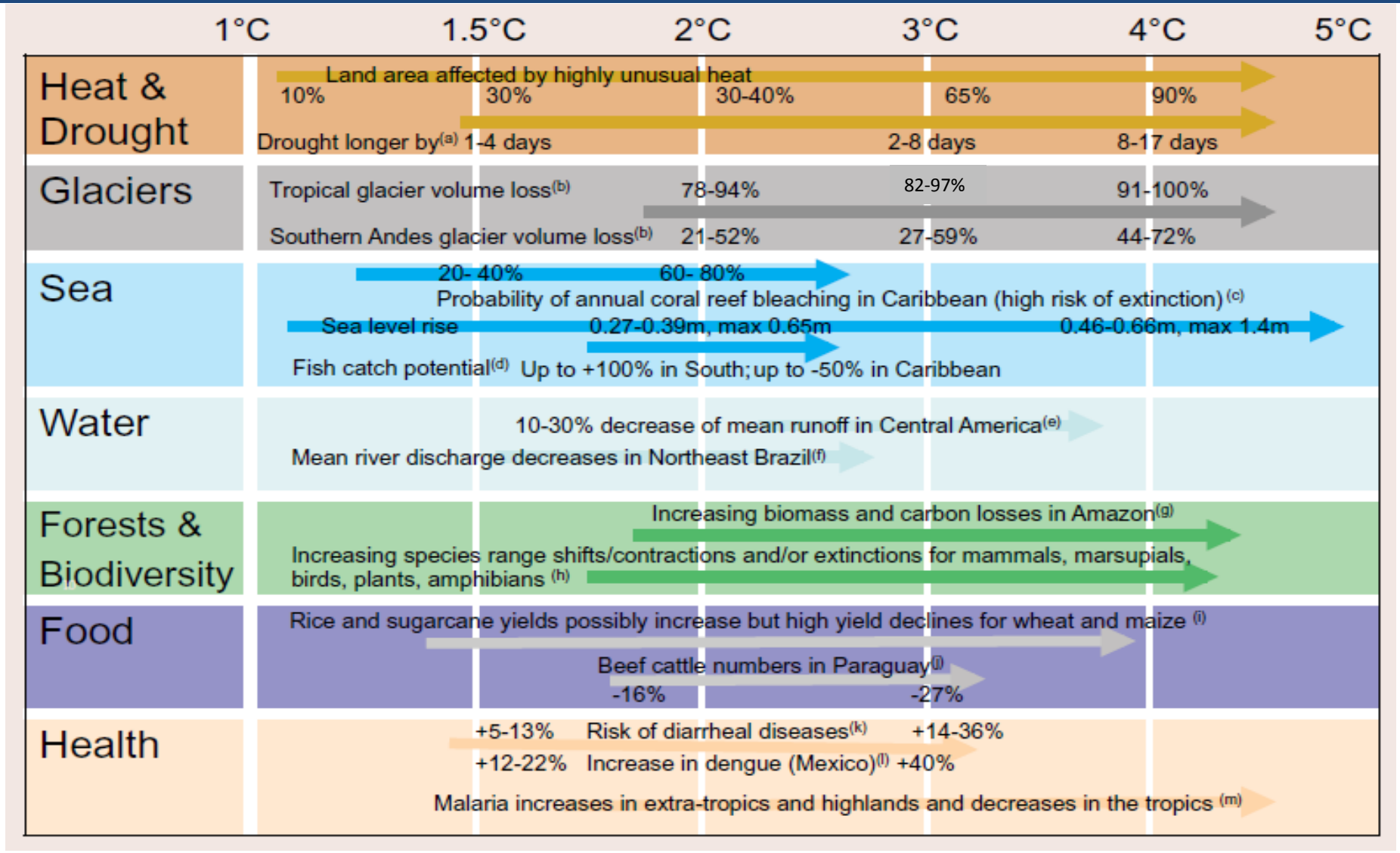


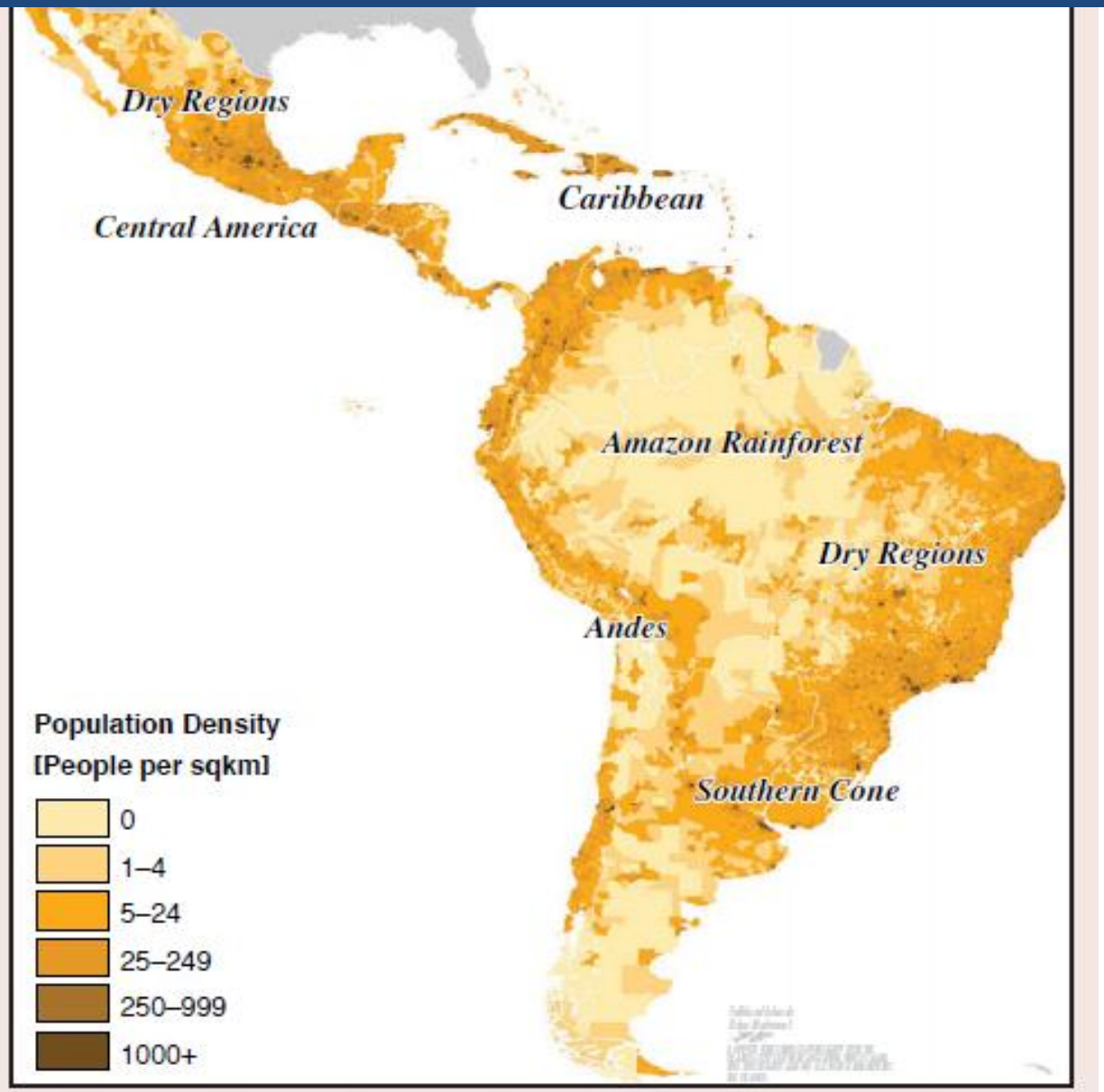
IPCC5_Ar5, 2014

And the Future…..
Projected Future Climate Change Impacts of Key LAC Sectors



From: ***Turn Down the Heat: Confronting the New Climate Normal, the World Bank, 2014.***

The LAC Region Future



Central America & the Caribbean

- Higher ENSO and tropical cyclone frequency, precipitation extremes, drought, heat waves.
- Reduced water availability, crop yields, food security, and coastal safety.
- Landslides, coastal erosion, negative impacts on coastal tourism income

Amazon Rain Forest

- Increase in extreme heat and aridity, risk of forest fires, degradation, and biodiversity loss.
- Risk of rainforest turning into carbon source.
- Shifting agricultural zones may lead to land conflicts
- Species extinction threatening traditional livelihoods and cultural losses.

Other Examples
(included for reference)

Andes

- Glacial melt, snow pack changes, risks of flooding, and freshwater shortages.
- High altitude women, children, and indigenous people particularly vulnerable / agriculture at risk.
- In urban areas the poor living on steeper slopes more exposed to flooding.

Dry Regions

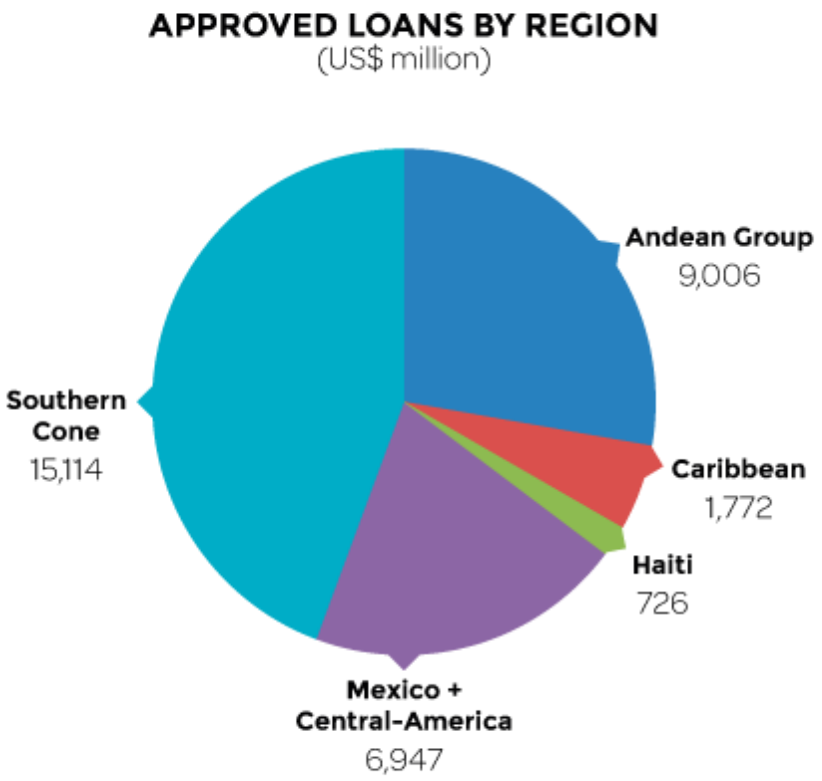
- Increasing drought and extreme heat leading to cattle death, crop yield declines, and challenges for freshwater resources.
- Risks of localized famines in remote indigenous communities, water-related health problems. Stress on resources may lead to conflict / urban migration.

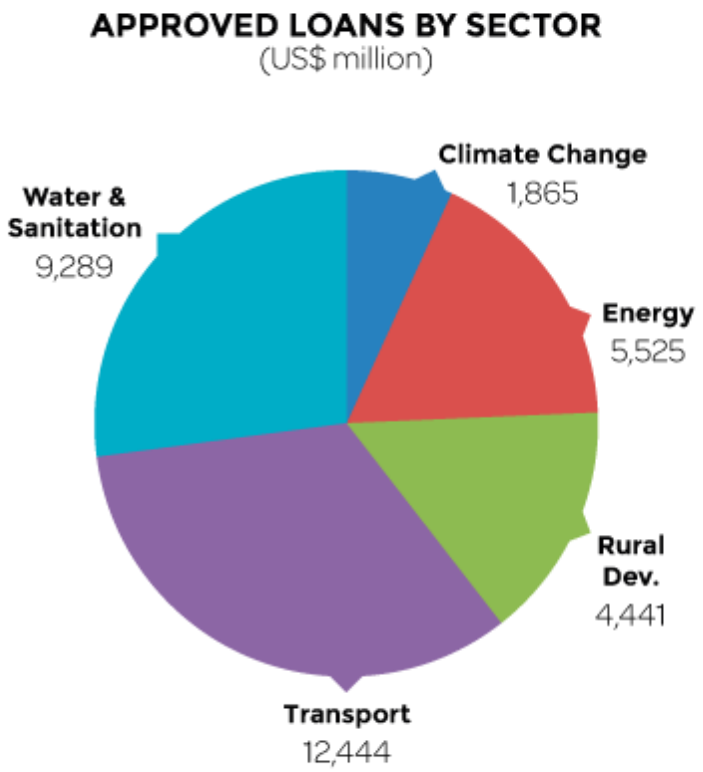
Sothern Cone

- Decreasing agricultural yields and pasture productivity, northward migration of agro/eco zones.
- Risks for nutrition status of the local poor.
- Risks for food price increases and cascading impacts beyond the region due to high export share of agriculture.

What Does This Mean for the IDB?

Snapshot of IDB's Infrastructure Portfolio: 2008 - 2014

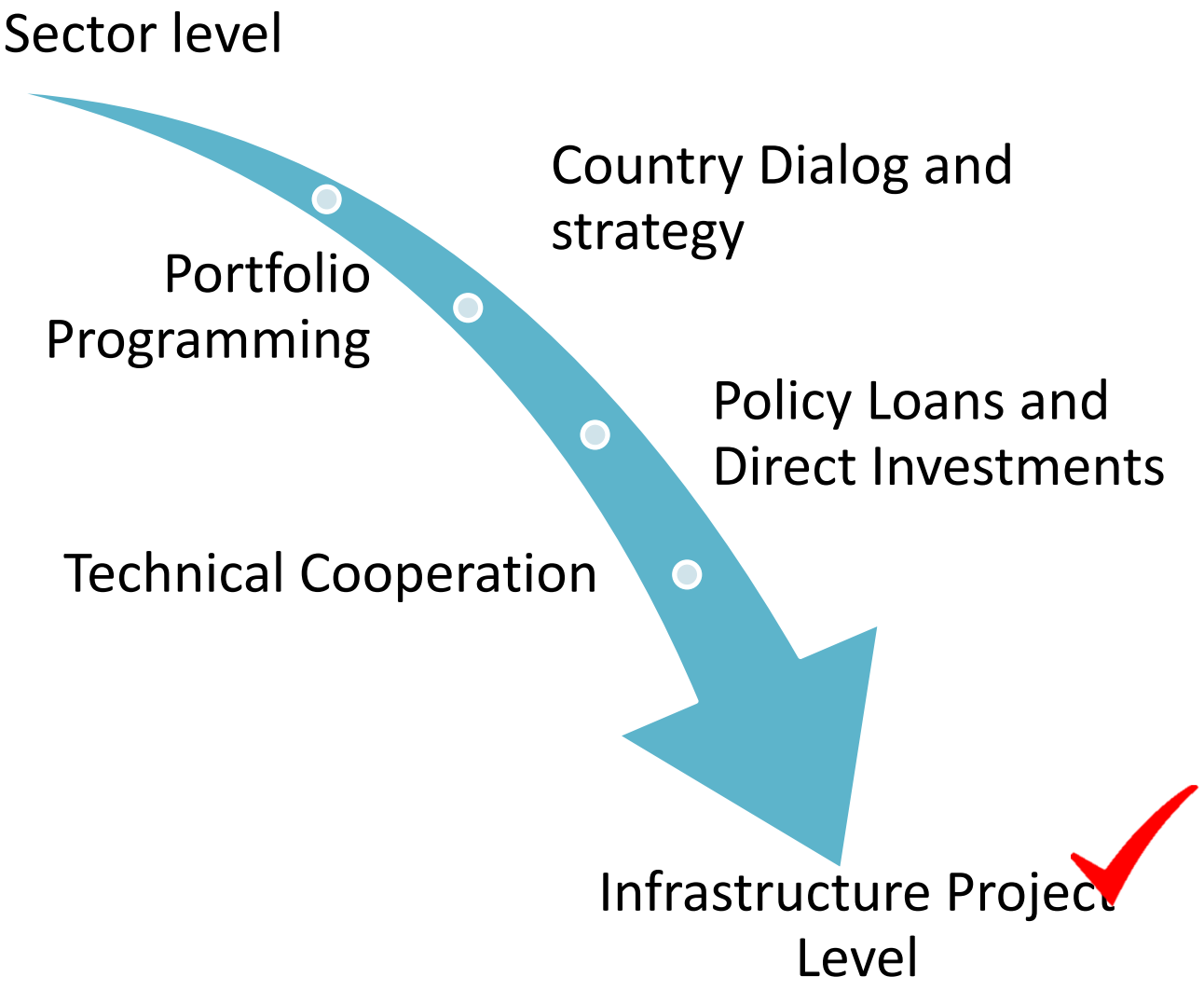




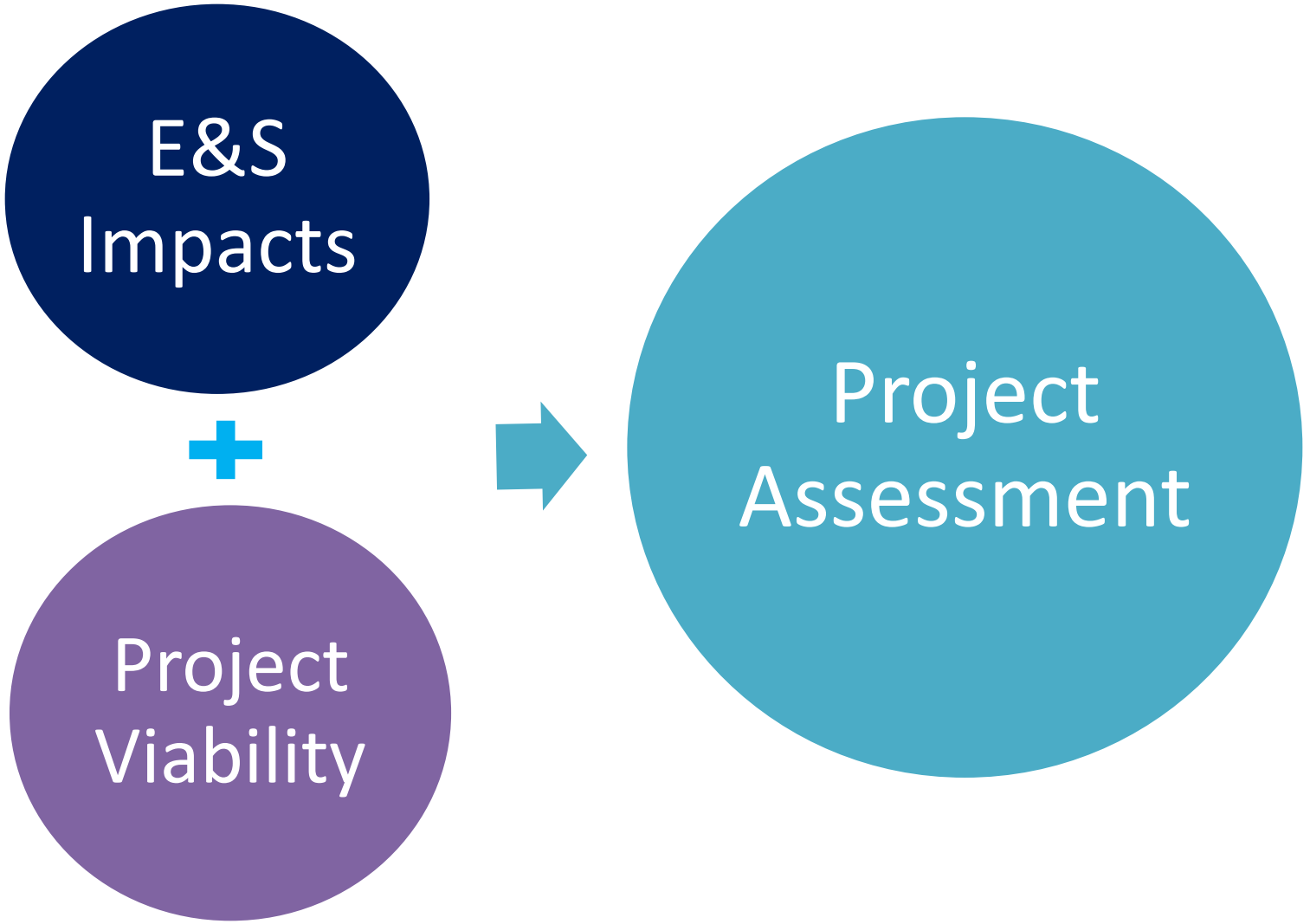
TOTAL = US $33.565 BILLION

How Can We Manage the Risks in Our Infrastructure Projects?

Bank Intervention Points

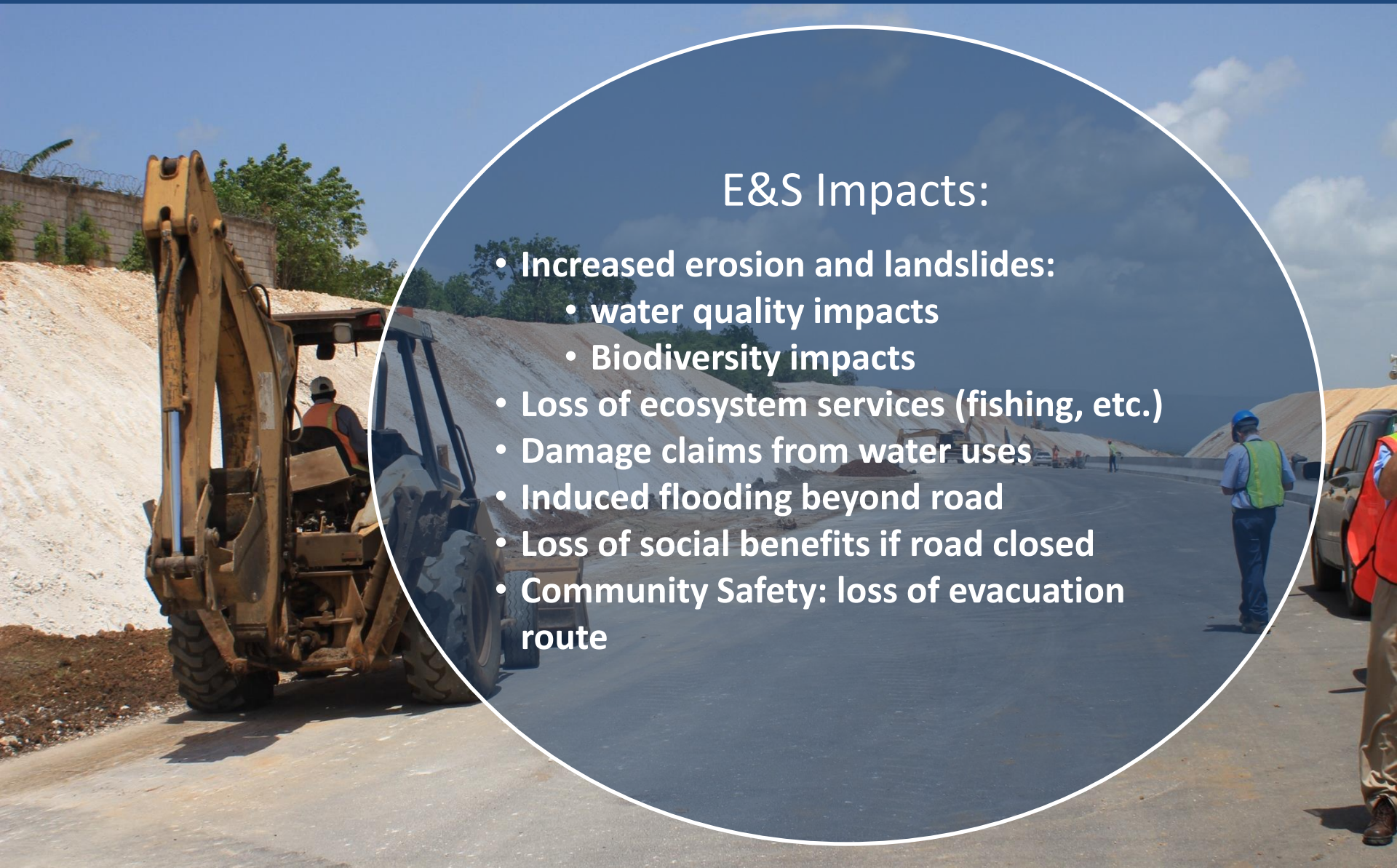


Two Aspects of IDB Project Review



Road Project and Changes in Temperature and Precipitation

Road Project and Changes in Temperature and Precipitation



E&S Impacts:

- **Increased erosion and landslides:**
  - **water quality impacts**
  - **Biodiversity impacts**
- **Loss of ecosystem services (fishing, etc.)**
- **Damage claims from water uses**
- **Induced flooding beyond road**
- **Loss of social benefits if road closed**
- **Community Safety: loss of evacuation route**

Road Project and Changes in Temperature and Precipitation

Project Viability:

- **Durability of road materials (increased construction & maintenance costs)**
- **Increased slope instability**
- **Road damage from flooding and landslides**
- **Repayment risks**
- **Loss of developmental impacts from inability to provide revenue or reliable connectivity.**
- **Cancellation of community CSR projects**

Road Project and Changes in Temperature and Precipitation

Hydropower Plant and Changes in Precipitation Patterns

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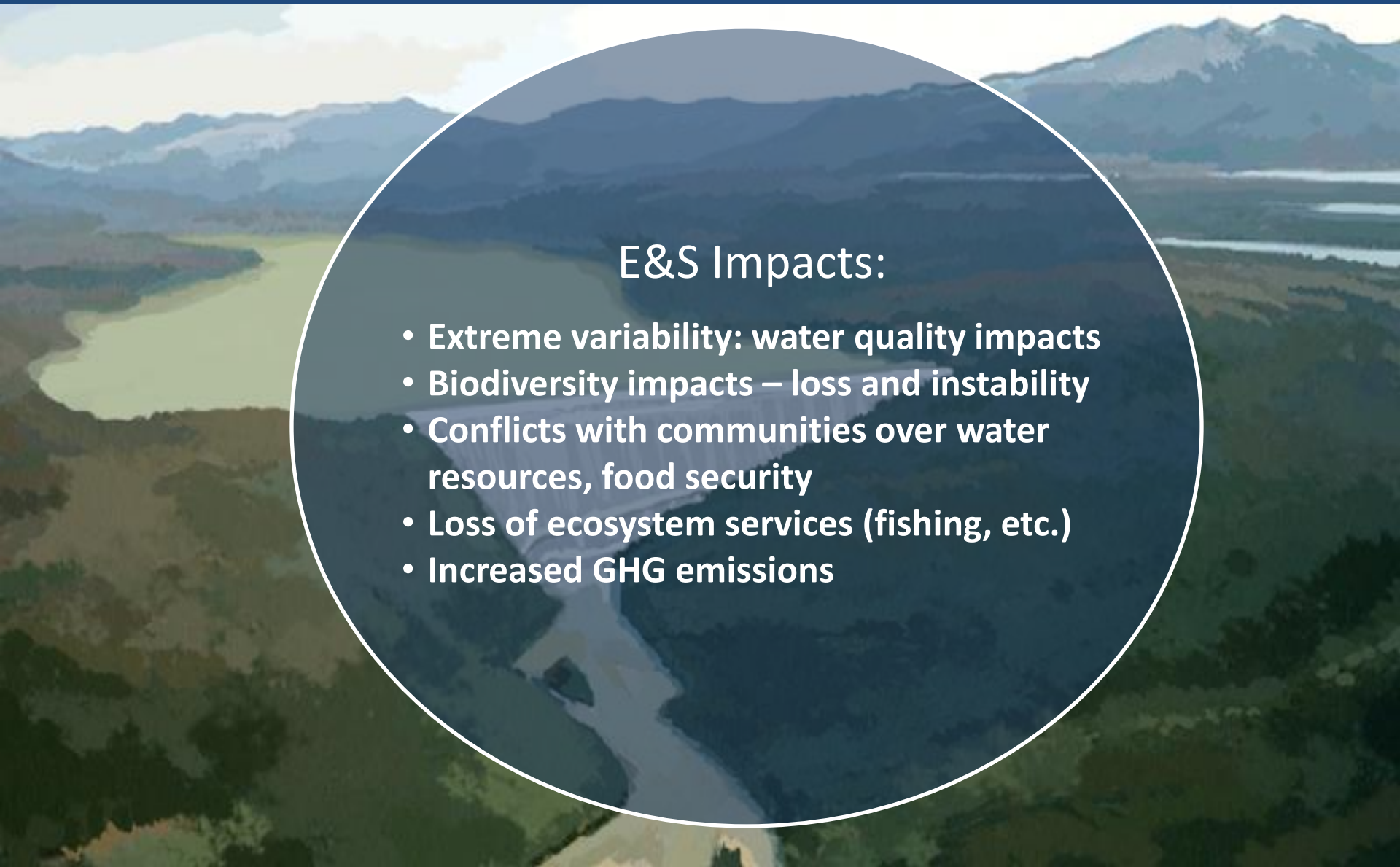

E&S Impacts:

- **Extreme variability: water quality impacts**
- **Biodiversity impacts – loss and instability**
- **Conflicts with communities over water resources, food security**
- **Loss of ecosystem services (fishing, etc.)**
- **Increased GHG emissions**

Hydropower Plant and Changes in Precipitation Patterns

Project Viability:

- **Decreased generation capacity – loss of profits, penalties under power provider agreements;**
- **Repayment risks**
- **Loss of developmental impacts from inability to provide increased power access etc.**
- **Cancellation of community CSR projects**
- **Higher maintenance costs**

Hydropower Plant and Changes in Precipitation Patterns

Tourism Project and Increased Storm Intensity and SLR

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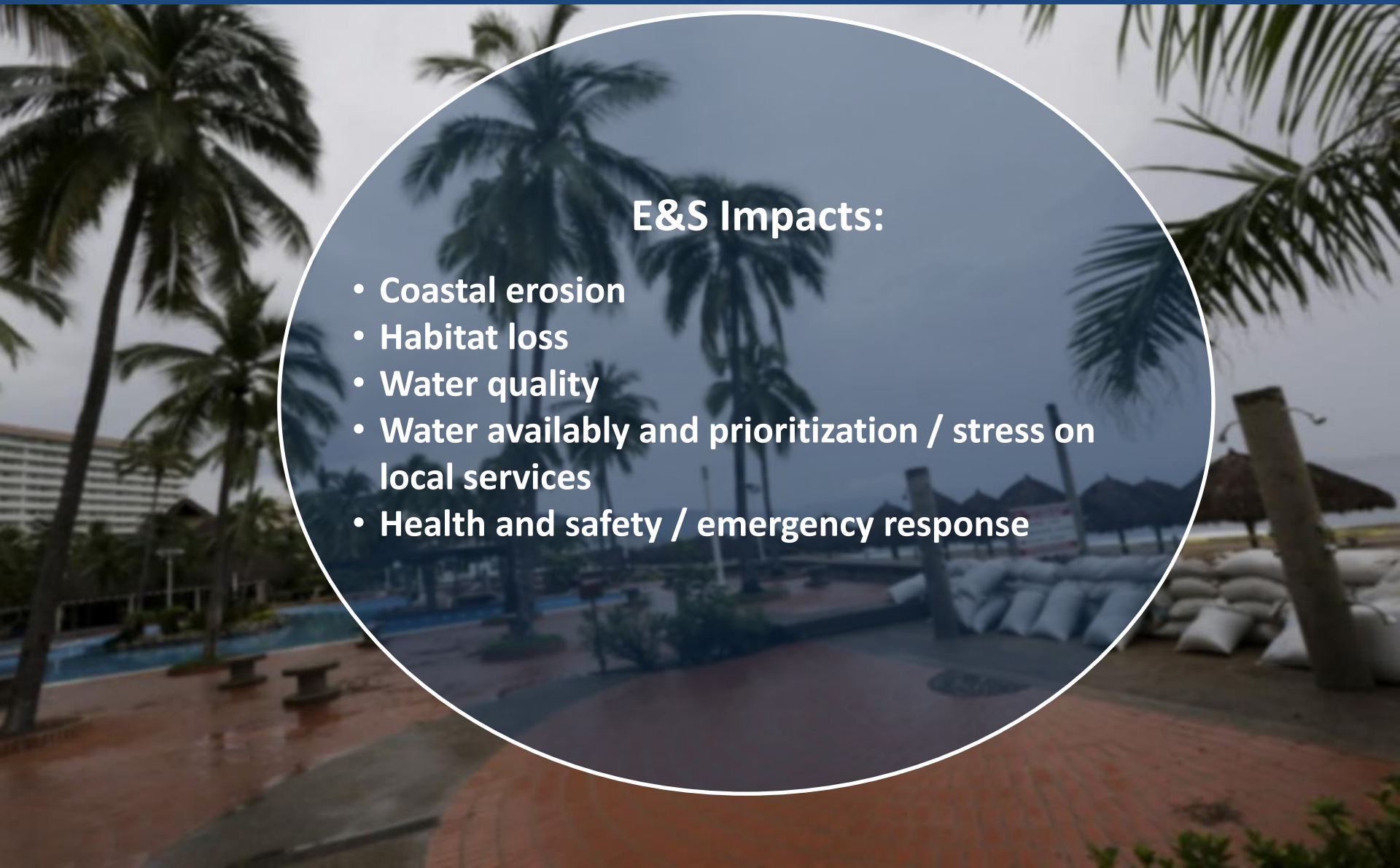


E&S Impacts:

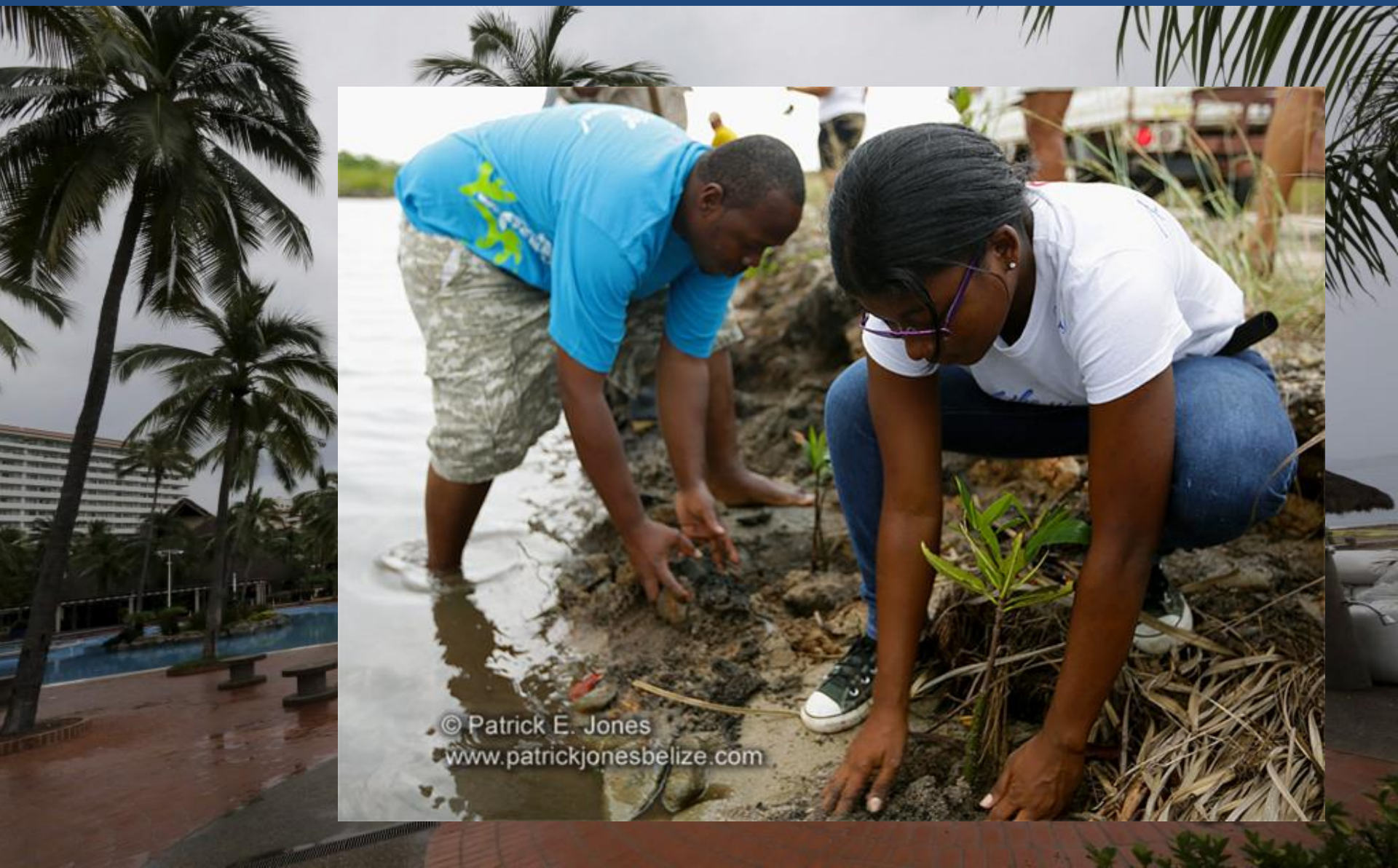
- Coastal erosion
- Habitat loss
- Water quality
- Water availably and prioritization / stress on local services
- Health and safety / emergency response

Tourism Project and Increased Storm Intensity and SLR

Project Viability:

- Physical losses (repair costs)
- Loss of Power/Water supplies
- Decreased guests: loss of profits short- and long-term
- Repayment risks
- Loss of developmental impacts from inability to provide jobs, local revenue, etc.
- Higher insurance costs
- Cancellation of community CSR projects

Tourism Project and Increased Storm Intensity and SLR



What Can Be Done?

- Really understand – qualify and quantify – risks
- Revise design: stronger / more flexible to change
- Add adaptation and risk reduction features
- Prepare to respond
- Proper risk allocation

Guidance methodologies and data

Guidance methodologies and data

Climate Change Risk Management Options for the **Tourism Sector**

Climate Change Risk Management Options	How the Option Addresses Hazard	Relative Cost	Implementation Feasibility
Hazard and Impact to Sector **Sea Level Rise**	**Destruction of or damage to tourist structures and dependent structures (transportation, utilities, etc.) and loss of beach area to erosion**		
Elevate structure(s)	Elevates and protects infrastructure from major impact	$–$$	Easy to implement during design/construction; moderately difficult to implement after construction
Promote development of natural protective features, such as wetlands and mangroves, in vulnerable areas; limit destruction of such areas where they currently exist	Mitigates storm surges that may be enhanced with rising sea levels	$–$$	Moderately easy to implement; could require social and political will
Harden vulnerable coastline and protect coastal infrastructure using seawalls and breakwaters	Reduces inundated areas	$$$$	Difficult to implement; could result in adverse impacts
Replenish beaches as a near-term solution	Temporarily counteracts loss of beaches from erosion	$$	Moderately difficult to implement; requires capacity, political and social will, could have adverse impacts
Identify and develop alternative inundation safe transportation routes	Provides transportation routes	$	Easy to implement
Re-site structure(s) or consider sea level rise risk in the siting and design of new structures; implement setbacks	Reduces exposure	$–$$	Moderately easy to difficult to implement, depending on site conditions; could require political will
Hazard and Impact to Sector **Storm Surge**	**Destruction of or damage to tourist structures and dependent structures (transportation, utilities, etc.)**		
Elevate structure(s)	Reduces exposure	$–$$	Easy to implement during design/construction; moderately difficult to implement after construction
Use breakaway walls[1]	Reduces damage potential from water	$$	Moderately easy to implement
Re-site structure(s) or consider sea level rise risk in the siting and design of new structures	Reduces exposure	$–$$	Moderately easy to difficult to implement, depending on site conditions; could require political will
Develop road closure map	Allows tourists to be moved safely	$	Easy to implement
Hazard and Impact to Sector **Hurricane Winds**	**Destruction of or damage to tourist structures and dependent structures (transportation, utilities, etc.) exposed to high winds**		
Use hurricane straps for houses/structures	Reduces damage potential from wind	$–$$	Easy to implement
Shuttering	Reduces damage potential from wind	$$	Easy to implement

Guidance methodologies and data

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Useful Links

- IPCC Fifth Assessment Report (AR5) Working Group Contributions:
  https://www.ipcc.ch/report/ar5/
- Series: Turn Down the Heat, The World Bank:
  http://www.worldbank.org/en/topic/climatechange/publication/turn-down-the-heat
- Climate Change Data and Risk Assessment Methodologies for the Caribbean:
  https://publications.iadb.org/handle/11319/6453?scope=123456789/1&thumbnail=false&order=desc&rpp=5&sort_by=score&page=0&query=climate+change+data+risk+assessment&group_by=none&etal=0
- Addressing Climate Change within Disaster Risk Management: A Practical Guide for IDB Project Preparation:
  https://publications.iadb.org/bitstream/handle/11319/6910/Addressing%20Climate%20Change%20within%20Disaster%20Risk%20Management.pdf

IDB
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Thank You

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