



# Towards Sustainable Development

## Greening EU Development Cooperation

### Module 1

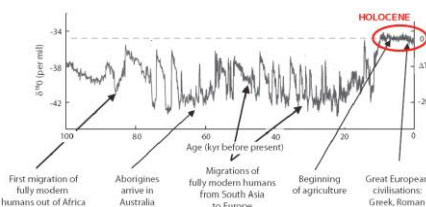
#### Development, environment and climate change: where do they all meet?



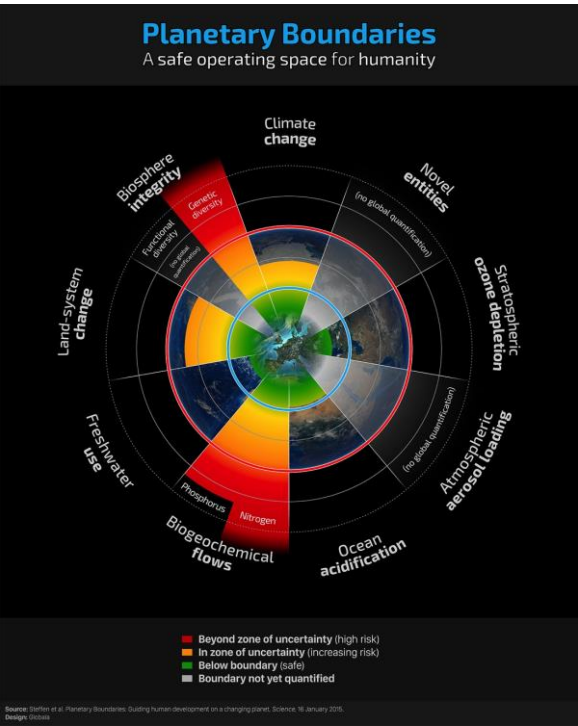
- The Holocene:
  - **Earth's environment has been stable for the past 11,700 years**
- The Anthropocene
  - **Human action is leading to significant environmental change**
- Two underlying drivers of change. In last 100 years:
  - Population: 4x increase
  - Economic activity: 20x GDP

#### It's Official: Earth Enters Anthropocene Epoch, Leaves Holocene

Justin E. First Posted: Aug 31, 2016 03:19 AM EDT



Source: Rockström *et al* (2009a).

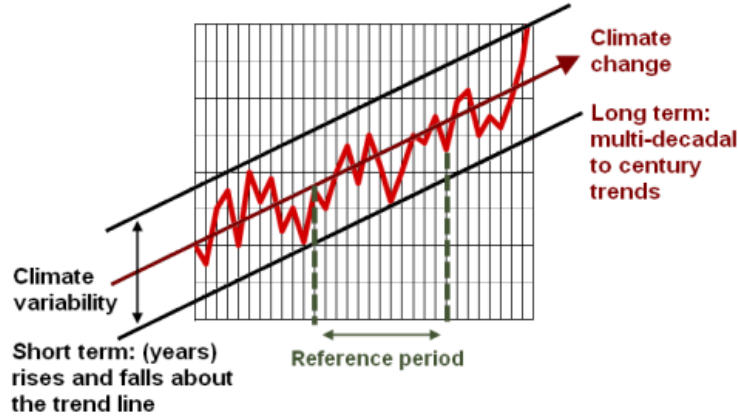


3

Source: Steffen *et al* (2015)

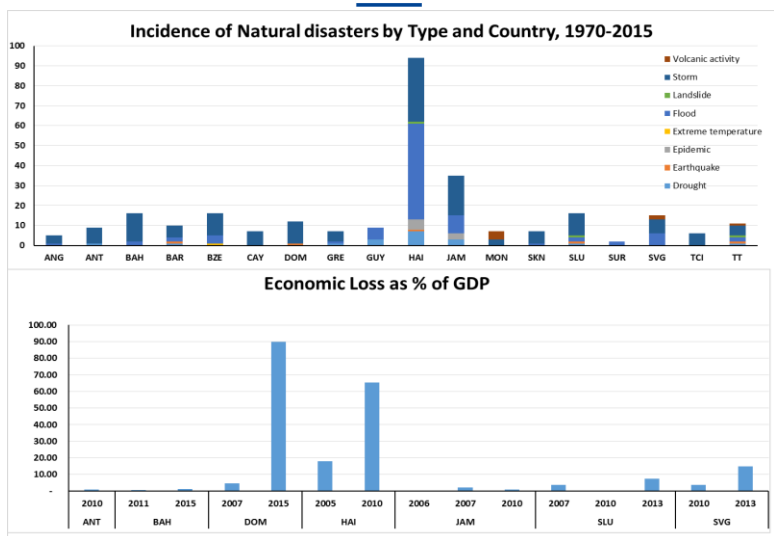
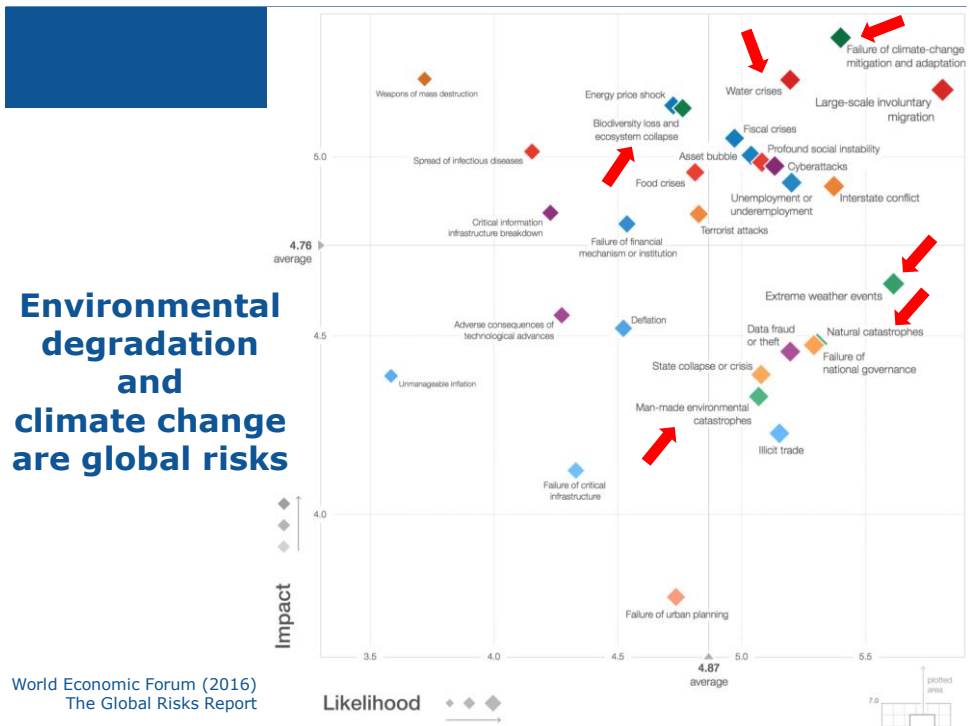


**Climate Change & Variability Concepts**

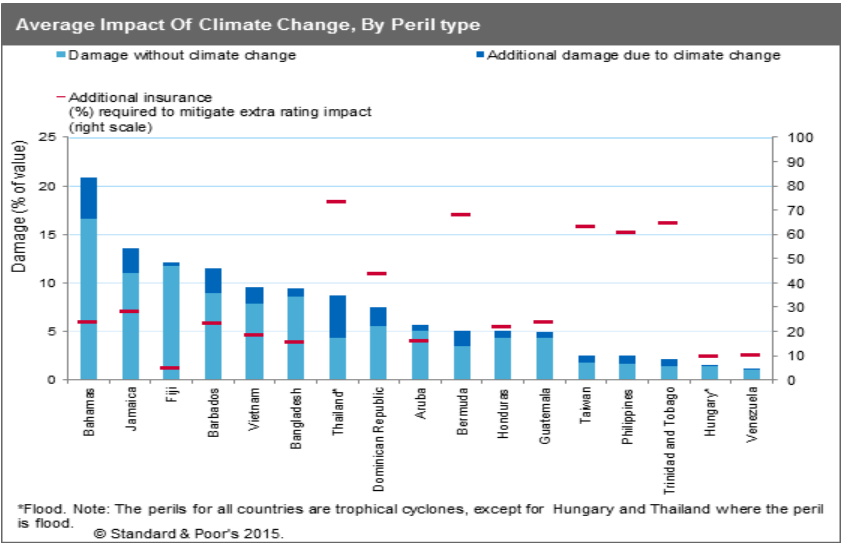


4

Environment Canada (2012)

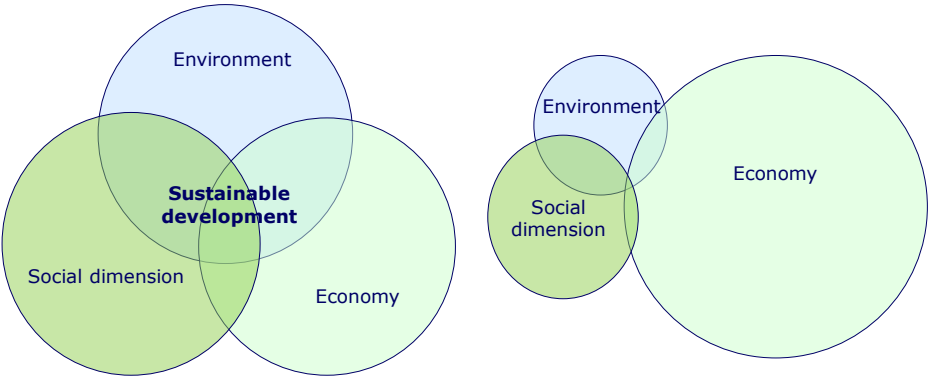


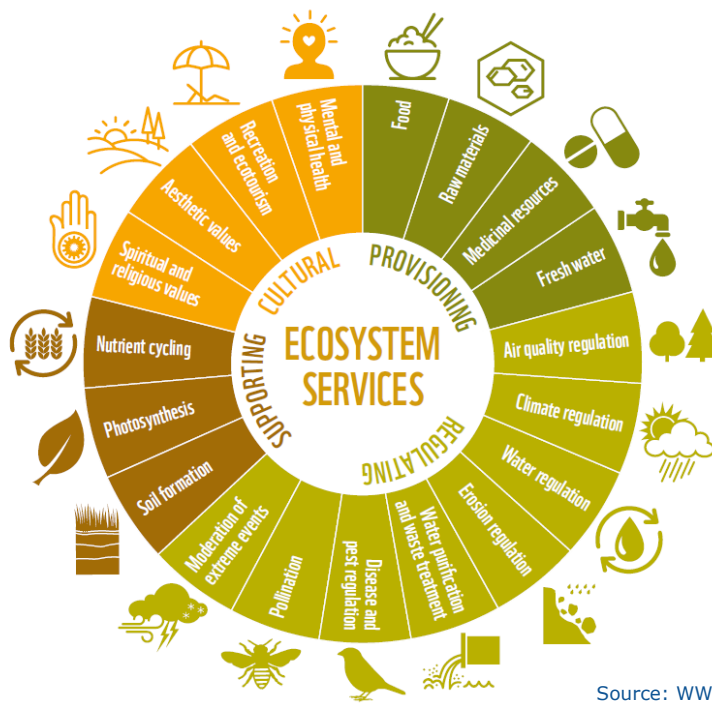
SOURCE: EM-DAT Disaster Database, [www.em-dat.be](http://www.em-dat.be), Université Catholique de Louvain, Brussels, Belgium



# Sustainable Development

which development pathway are we following?





Source: WWF (2016)



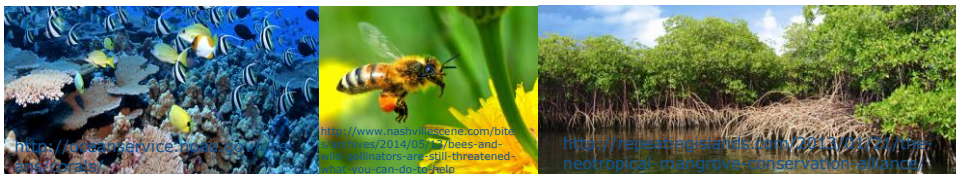
## Ecosystem Services - Rwanda

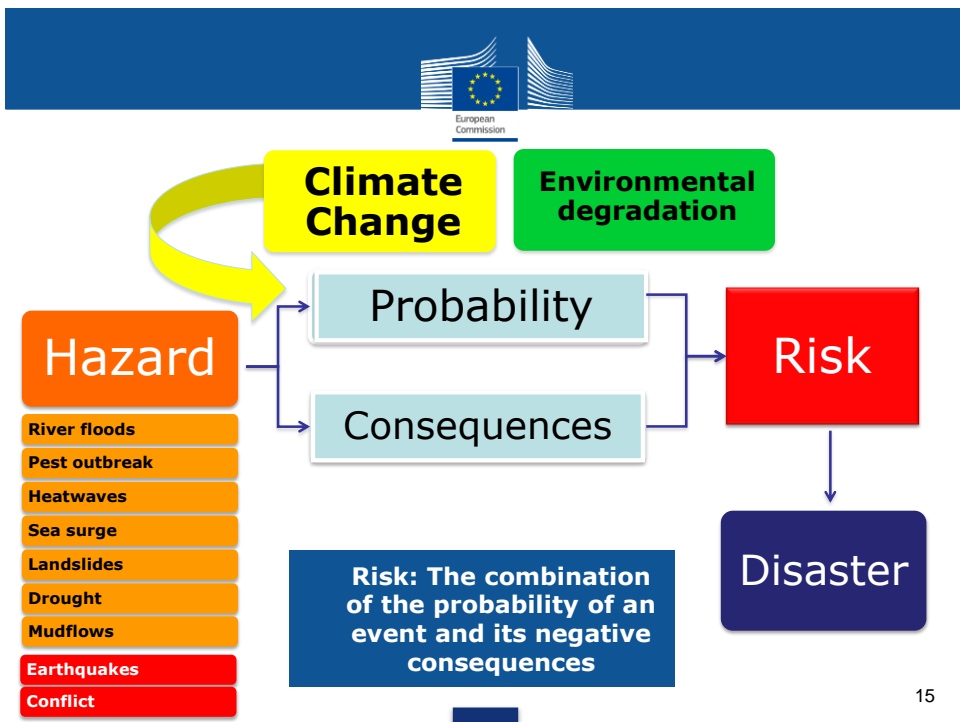
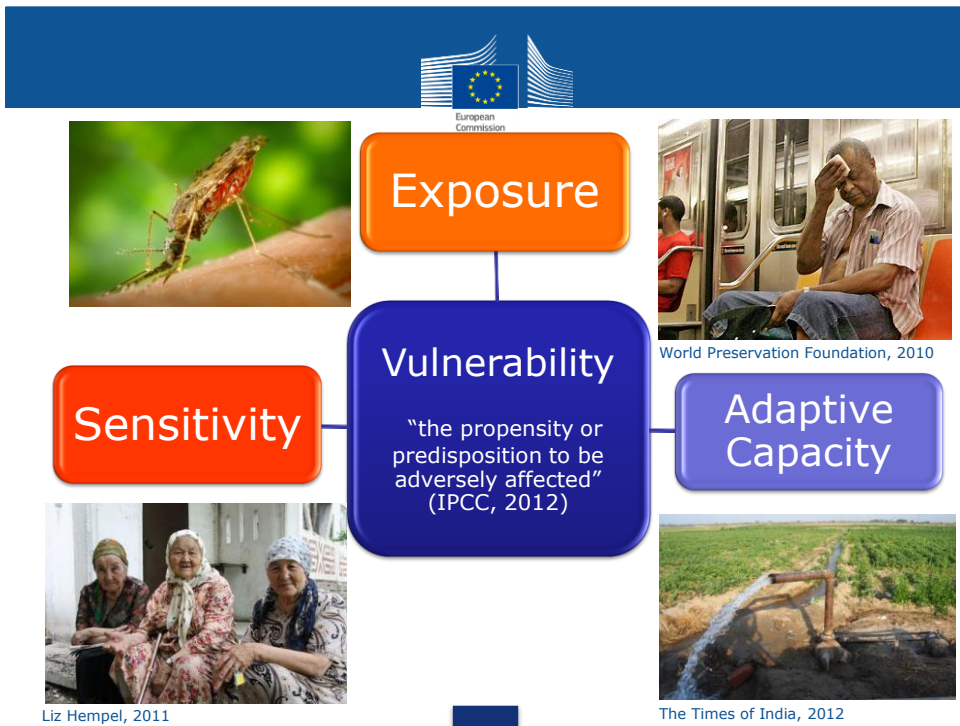
- ✓ Due to environmental degradation, poverty has increased and soil loss of 15 million tons/yr, costing the country 2% of its GDP annually – equivalent to the reduction in the country's capacity to feed 40,000 people per year
- ✓ Cost of electricity increased up to 167% per unit cost following degradation of Gishwati forest and Rugezi wetland

Source: UN PEI (2015)



- Source: World Bank (2011)







## Same probability, different consequences



## Same consequences, different probability





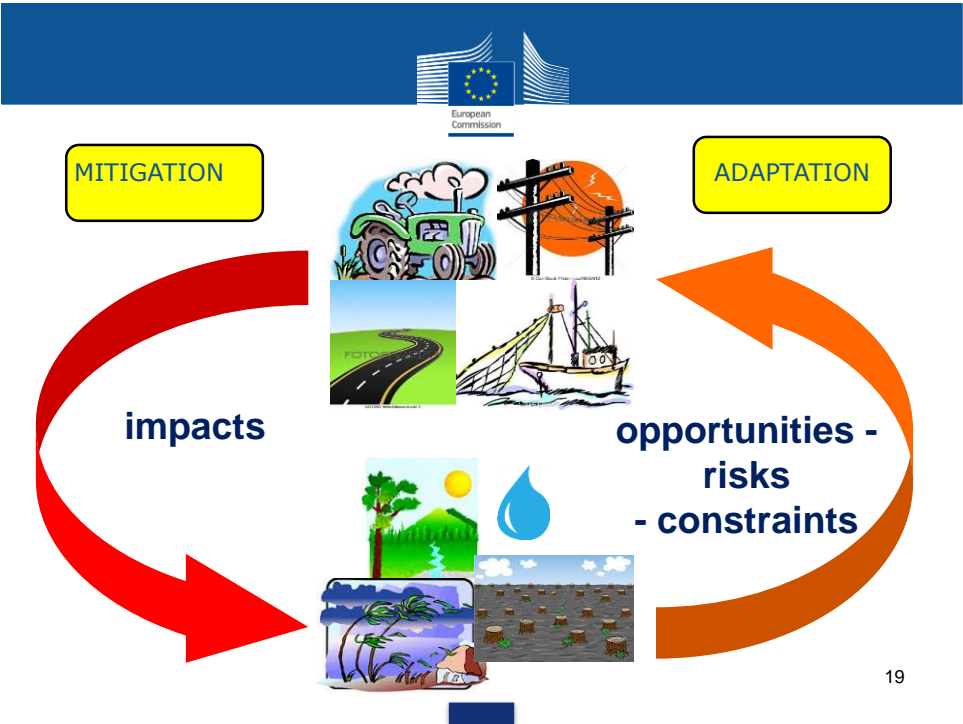


Risk assessment matrix

Likely severity					Probability				
					Such an incident effectively occurred				
People	Assets	Environment	Reputation		Never but conceivable	Once somewhere	Sometimes in our industry	Once recently in our company / local setting	Yearly with us
Lésion	Damage	Effect	Impact		A	B	C	D	E
Negligible	Negligible	Negligible	Negligible	0	1	2	4	7	11
Light (FAC)	Light	Light	Light	1	2	4	8	16	33
Minor (MTC, LTI<8)	Minor	Minor	Limited	2	3	7	12	67	99
Serious (PPD, LTI)	Important	Localised	Local	3	4	15	35	118	337
1 a 3 fatalities, PTD	Serious	Important	National	4	24	78	130	379	716
Multiple fatalities	Extensive	Massive	International	5	72	150	430	809	1525

- Intolerable : remove hazard / risk
- Demonstrate risk control
- ALARP zone: normal control measures on the work place

Source: Palerm et al (2005)



## References

- Environment Canada (2012) Climate change concepts.  
<http://www.cccsn.ec.gc.ca/?page=scen-intro> Accessed 11/06/2013
- Palerm, J; Teurlai, JL and Martell, M (2005) HSE and Social Management Systems, Seminar for Vinccler Oil and Gas, 21-22 April, 2005, Caracas, Venezuela.
- Rockstrom et al (2009) Planetary Boundaries: exploring the safe operating space for humanity. *Ecology and Society*, **14**(2):32.
- Steffen et al (2015) Planetary boundaries: Guiding human development on a changing planet. *Science*, **347**(6223).
- TEEB (The Economics of Ecosystems and Biodiversity) (2010) Mainstreaming the economics of nature. A synthesis of the approach, conclusions and recommendations of TEEB.
- UN PEI (2015) Mainstreaming Environment and Climate for Poverty Reduction and Sustainable Development. A Handbook to strengthen planning and budgeting processes. 2<sup>nd</sup> Edition.
- World Bank (2011) The changing wealth of nations: measuring sustainable development in the new millennium, Washington D.C.
- World Economic Forum (2016) The World Risks Report 2016.
- WWF (2016) Living Planet Report 2016. Risk and resilience in a new era.