

Aquatic ecology for sustainable development in Africa

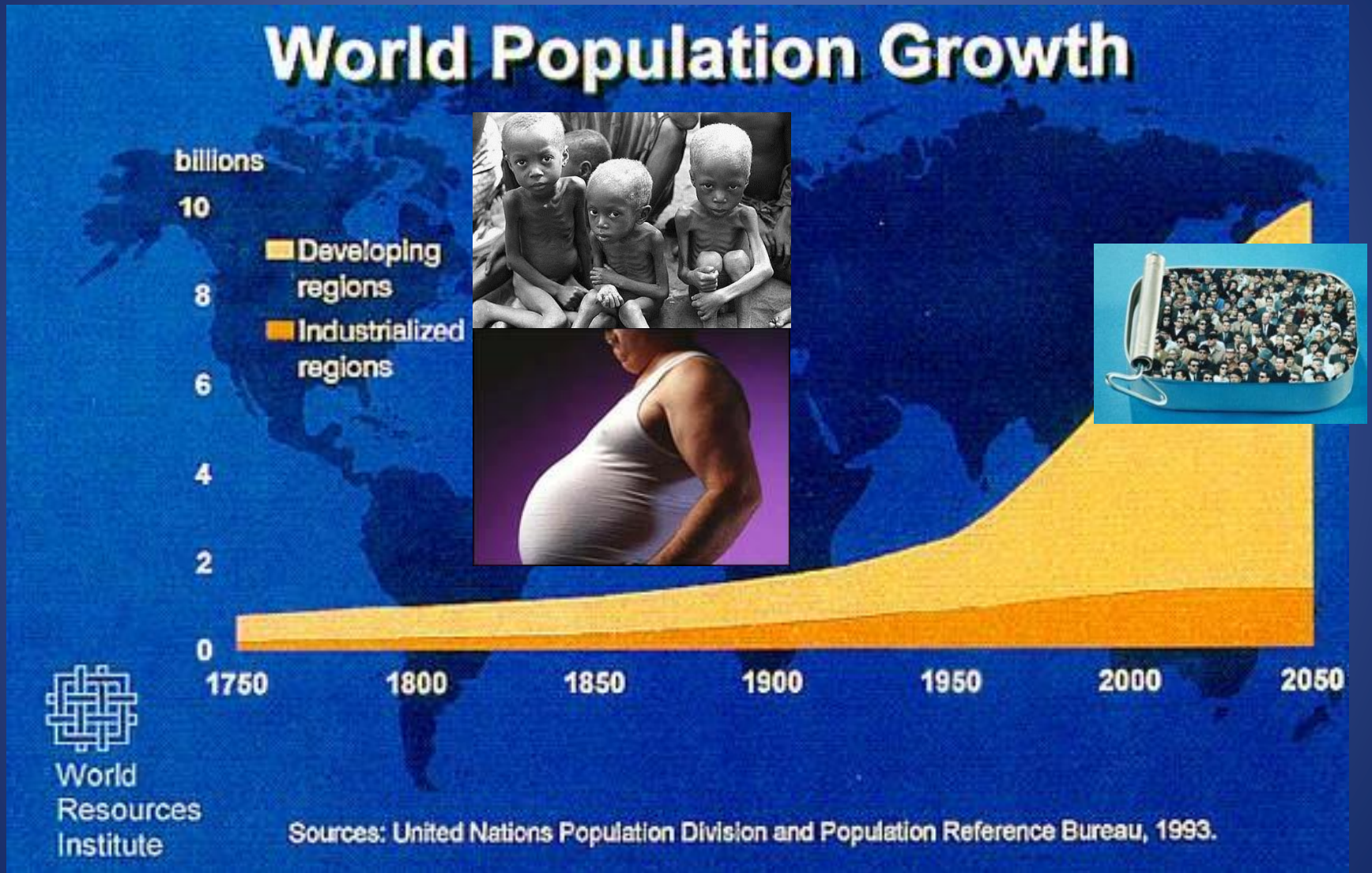
Examples of capacity building

Luc Brendonck



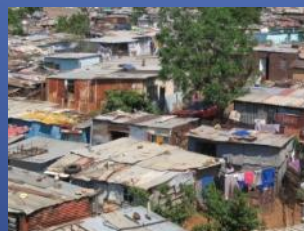
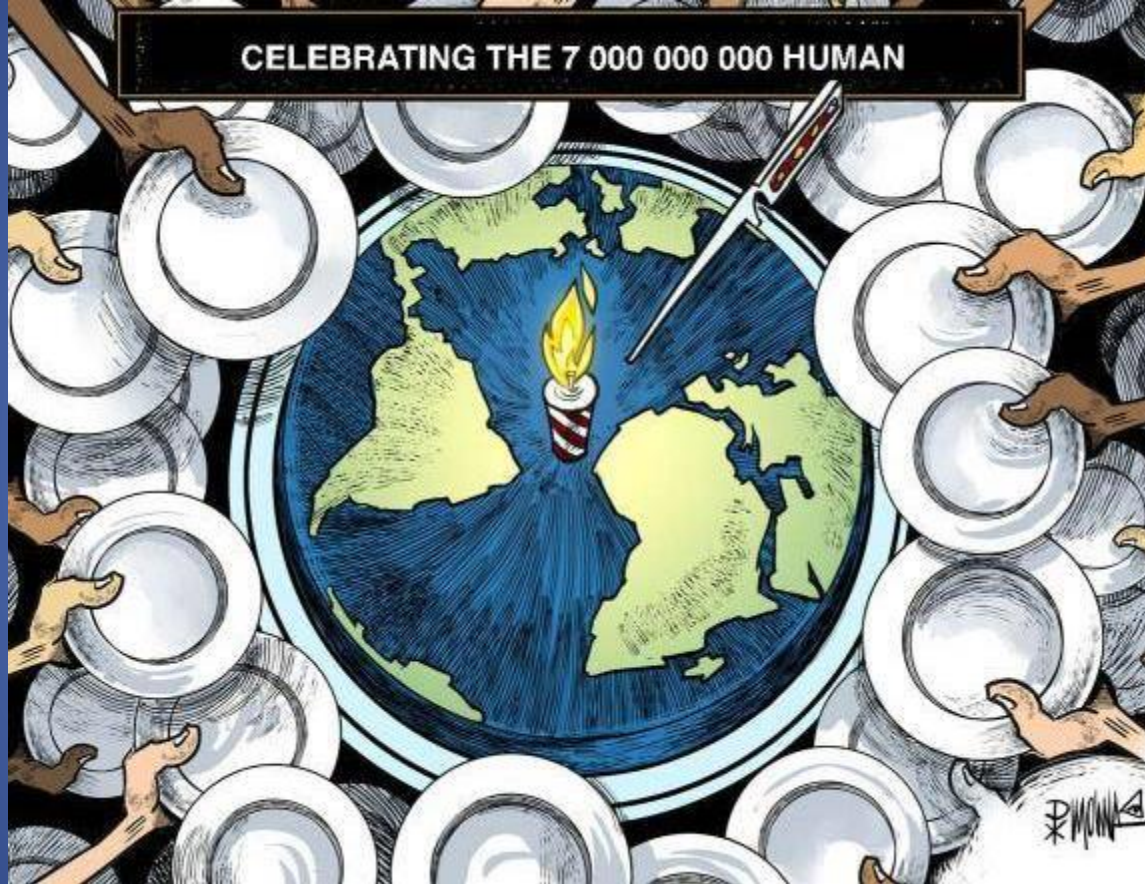
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What is sustainable development?



Overconsumption and overpopulation

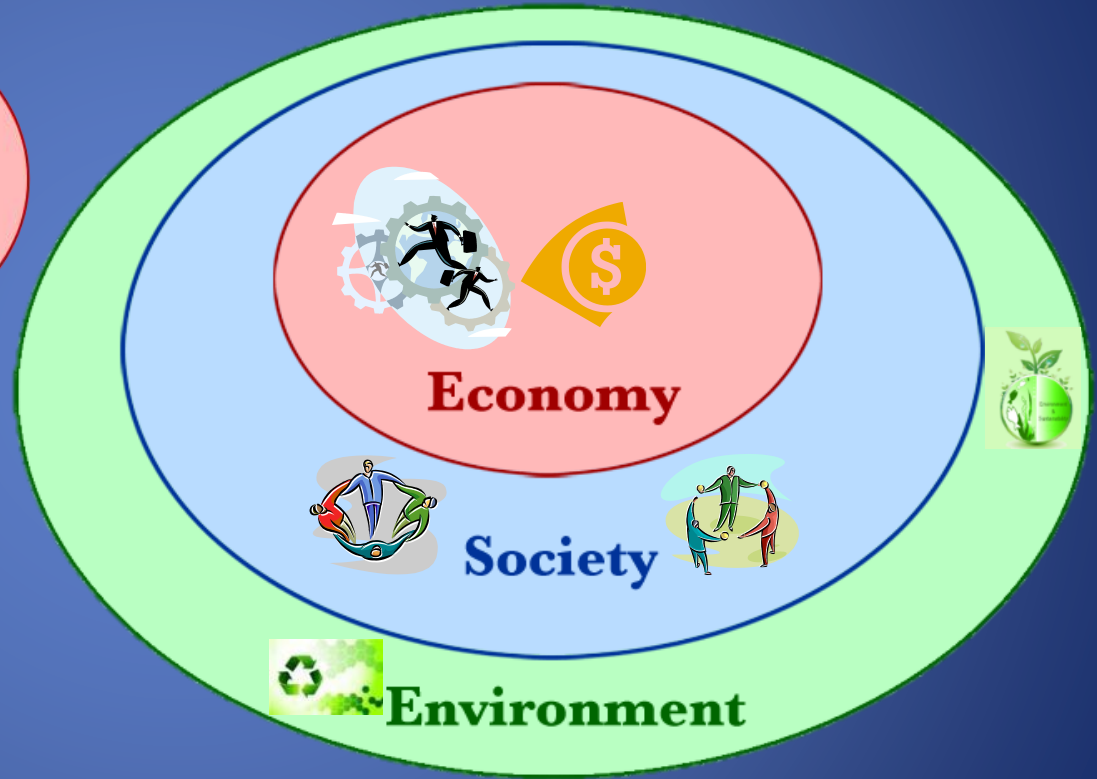
What is sustainable development?



What is sustainable development?



Diagram from the Brundtland report



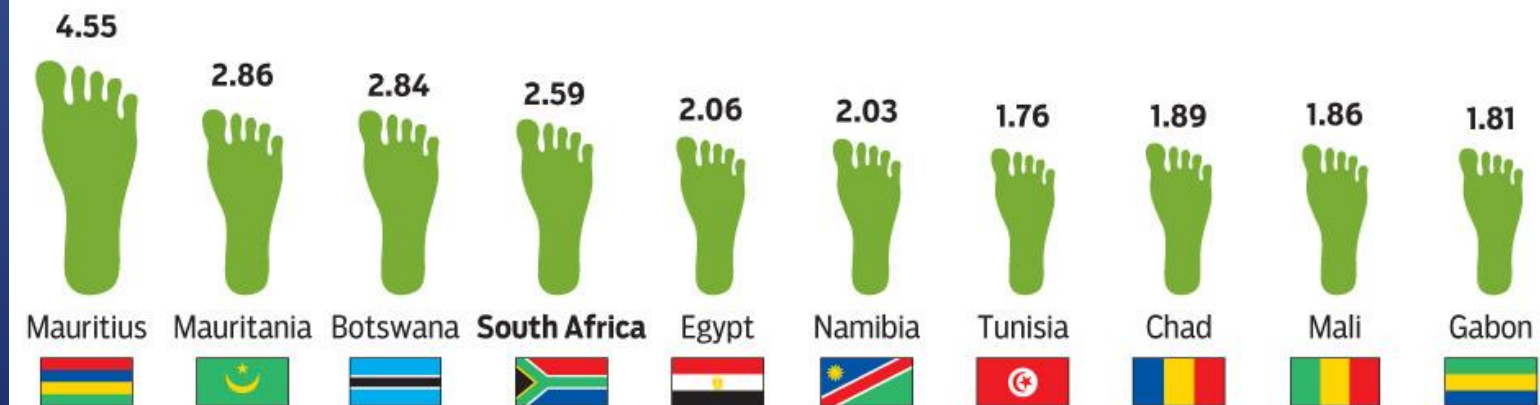
The relationship between the three pillars of development whereby economy and human society are confined by the carrying capacity of the environment

What is sustainable development?

Top 10 countries with the biggest ecological footprint per person



Top 10 African countries with the biggest ecological footprint per person

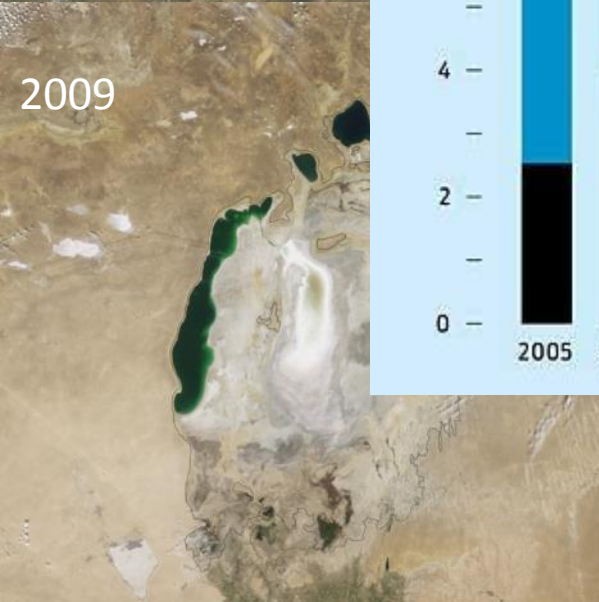
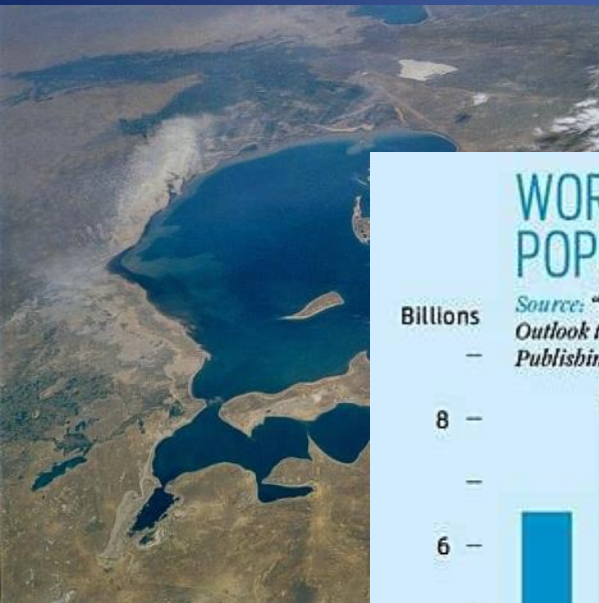


* United Arab Emirates

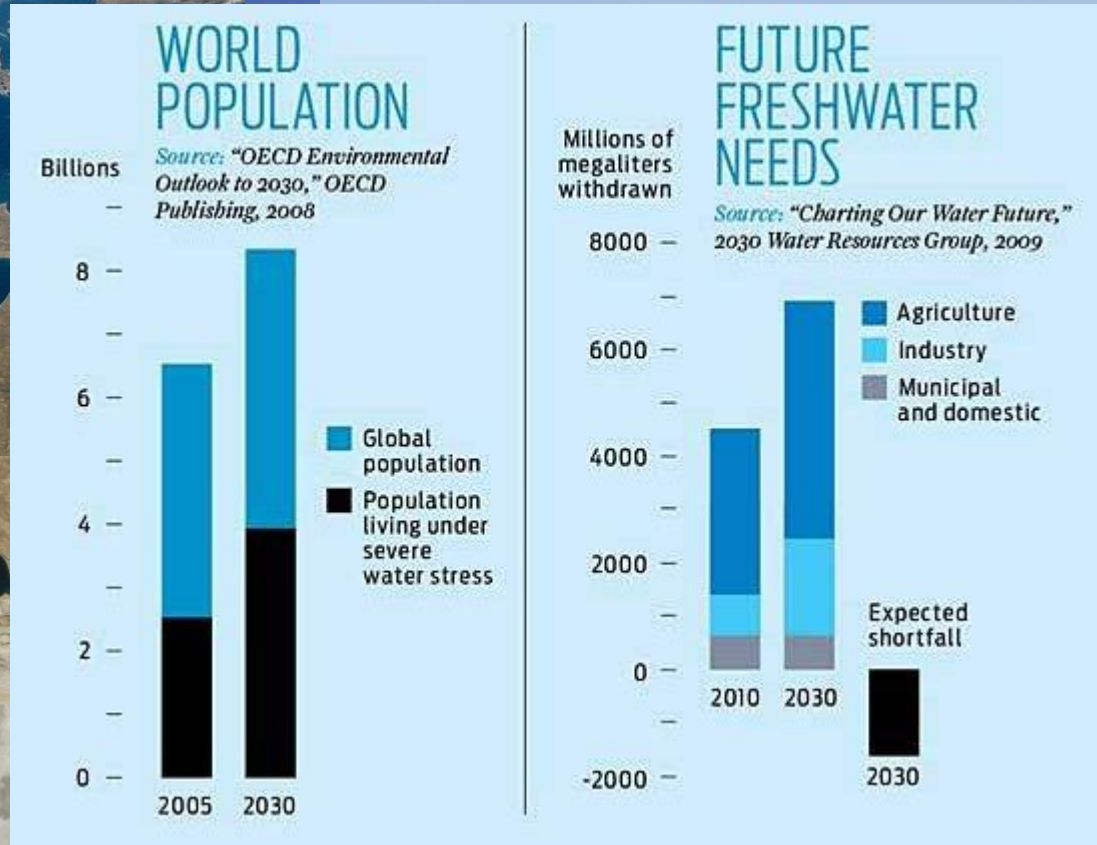
Source: WWF

Graphics24

Symptoms of an unsustainable development – example the Aral Sea

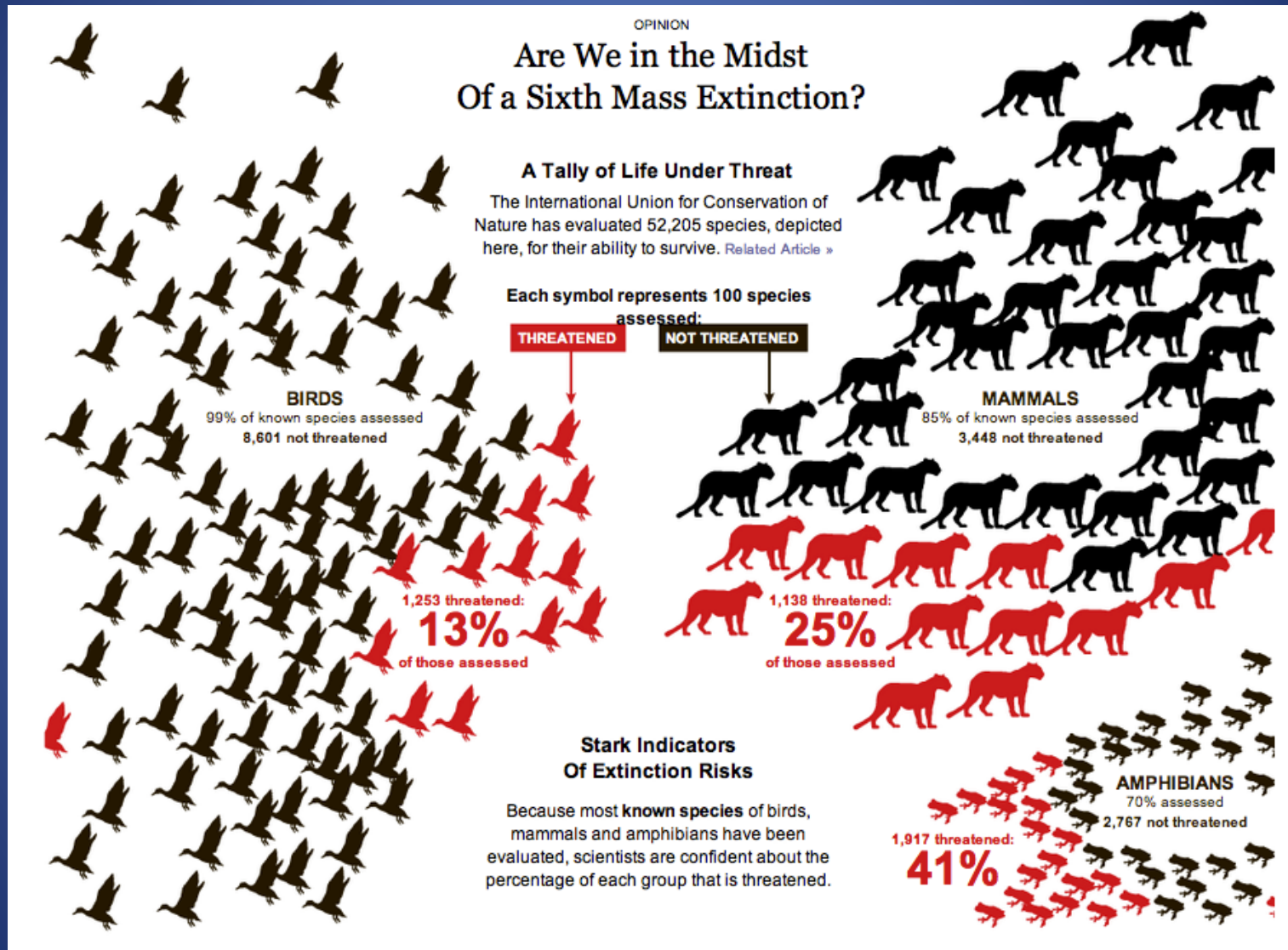


2009



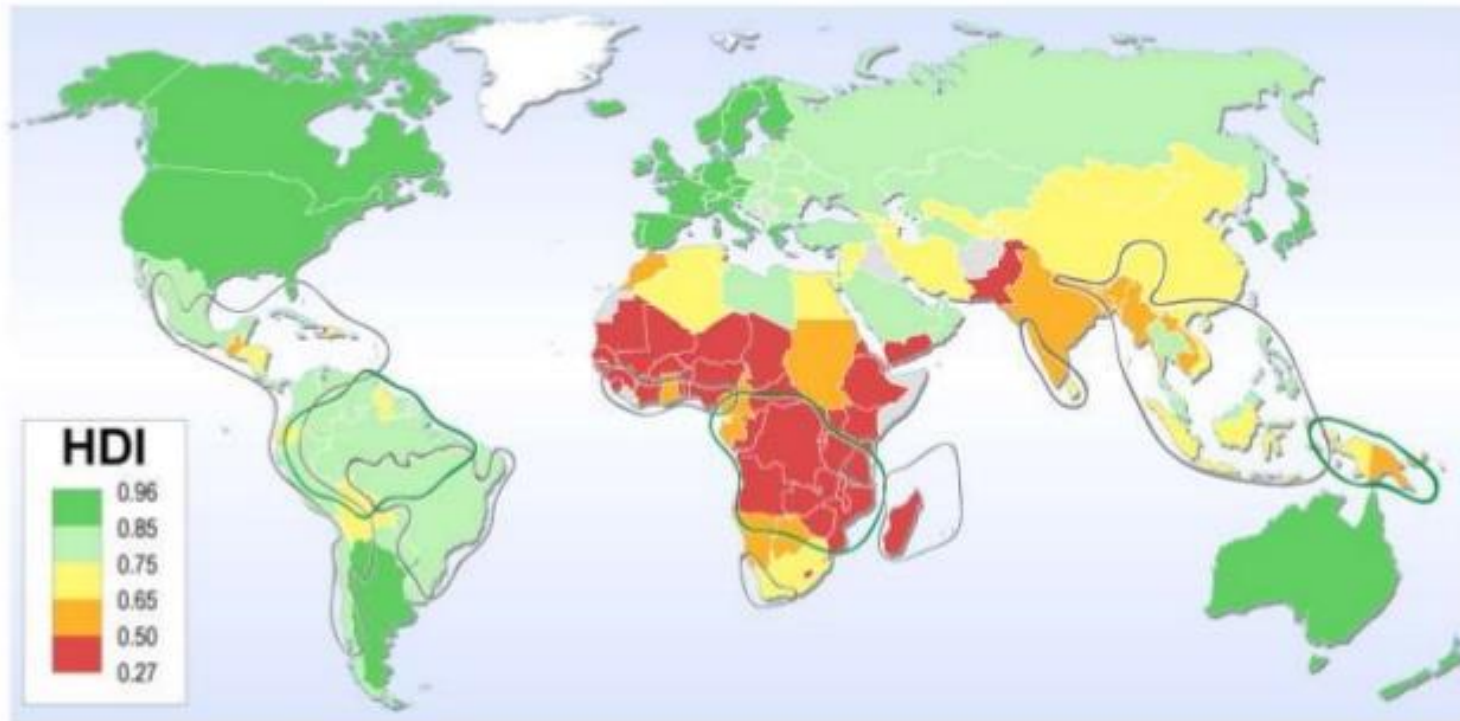
Irrigation and water stress

Symptoms of an unsustainable development – the biodiversity crisis



The biodiversity crisis – potential consequences for Africa

The African Context: Human Development Index and Biodiversity



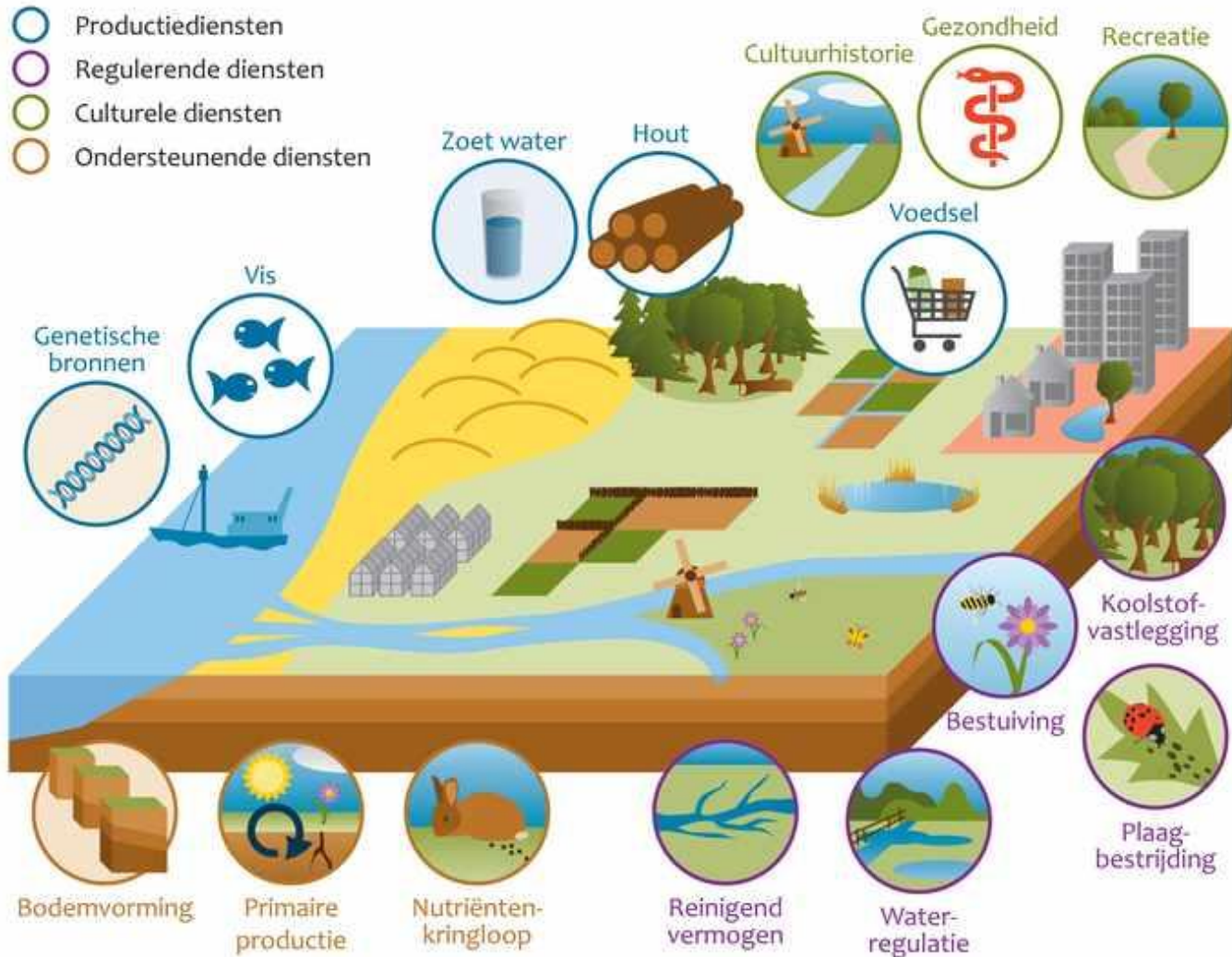
Selected terrestrial biodiversity hotspots

Selected major wilderness areas

Sources: UNDP 2004, Conservation International 2004

GAUGE

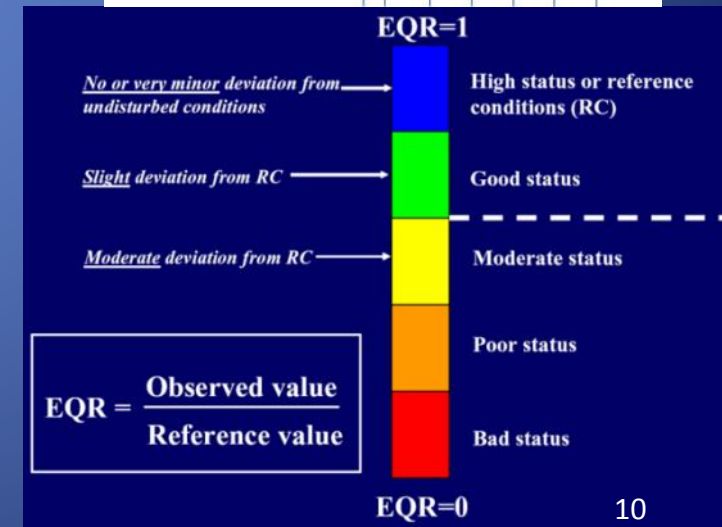
Importance of biodiversity for ecosystem services



Determination of environmental flow – “the ecological reserve”

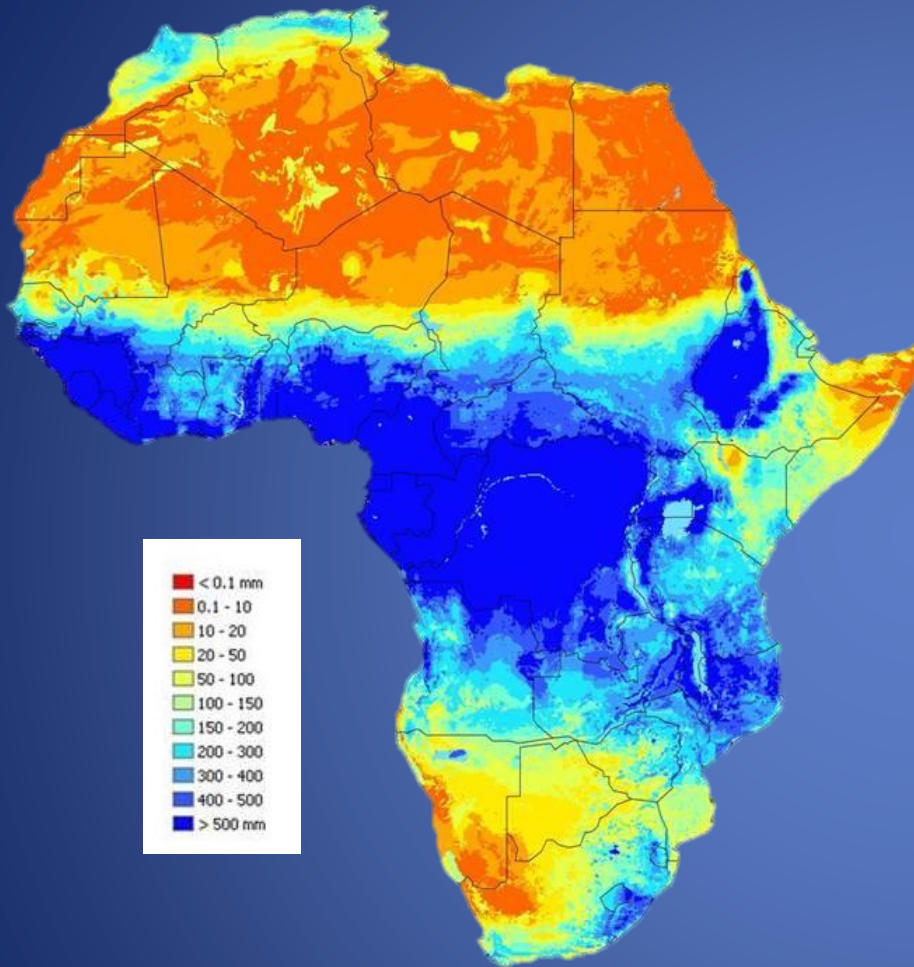


MACRO-INVERTEBRATEN		Totaal S.E.	0-1	2-5	6-10	11-15	16 +
		BIOTISCHE INDEX					
TK1	TK1	> 1 S.E.		7	8	9	10
	TK1	1 S.E.	5	6	7	8	9
TK2	TK2	> 1 S.E.		6	7	8	9
	TK2	1 S.E.	5	5	6	7	8
TK3	TK3	> 2 S.E.		5	6	7	8
	TK3	2-1 S.E.	3	4	5	6	7
TK4	TK4	~ 1 S.E.					
	TK4	~ 1 S.E.	3	4	5	6	7
TK5	TK5	~ 1 S.E.					
	TK5	~ 1 S.E.	2	3	4	5	
TK6	TK6	~ 1 S.E.					
	TK6	~ 1 S.E.	1	2	3		
TK7	TK7	~ 1 S.E.					
	TK7	~ 1 S.E.	0	1	1		

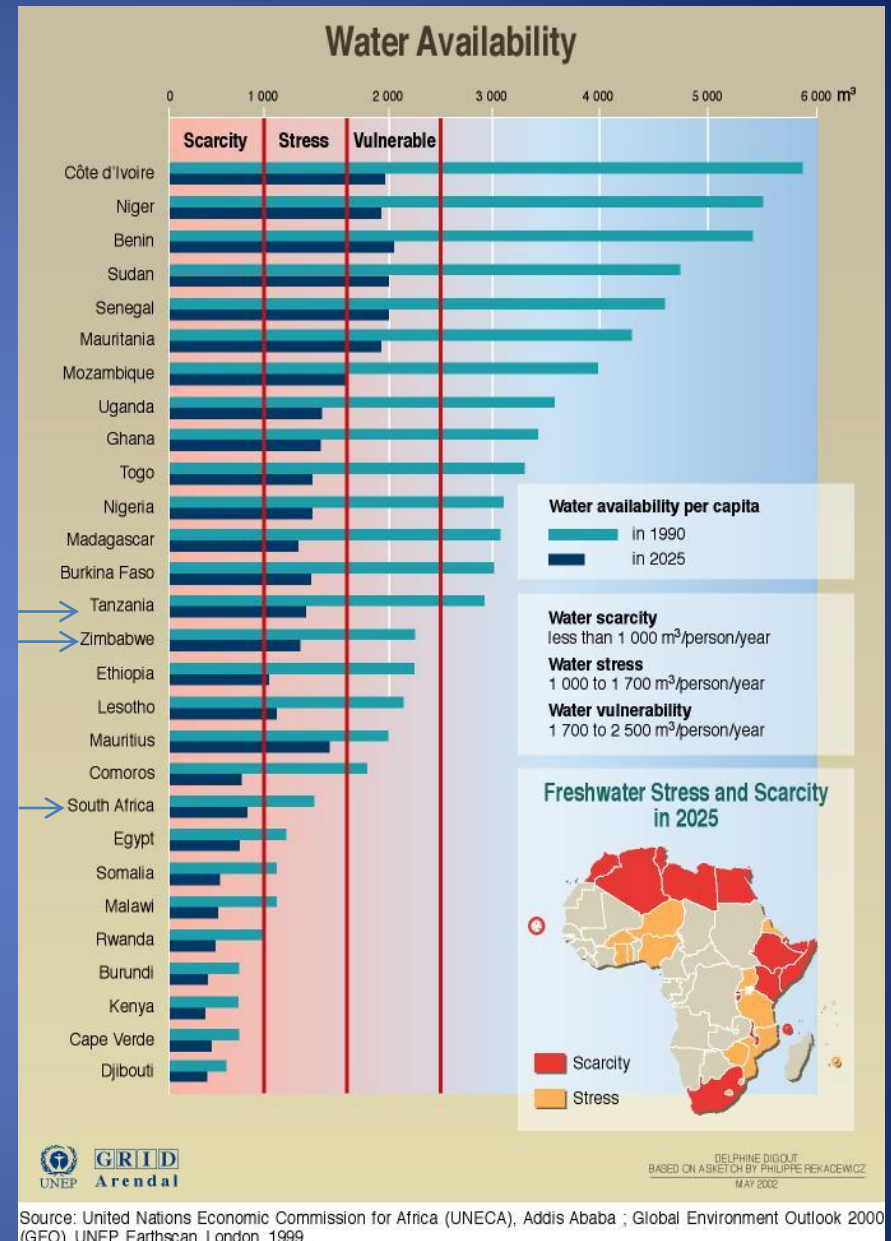


Standard tool in European Water Framework Directive

Water stress in Africa



Yearly availability of freshwater
(average 1989-2010)



Less than half of the people in Sub-Saharan Africa have access to safe water

Capacity building : training and research

VLIR-UOS SI



VLIR-UOS NSS interactions



VLIR-UOS IUC



VLIR-UOS EI (TEAM)

VLIR-UOS IUC

VLIR-UOS IUC

VLIR-UOS STI

VLIR-UOS IUC

VLIR-UOS IUC

VLIR-UOS TEAM



Capacity building : training and research

VLIR-UOS NSS:
bringing together
complementary
expertise



UWC: VLIR-UOS IUC
water cycle, ground
water



NM-AIST: VLIR-UOS IUC
water and people, land use



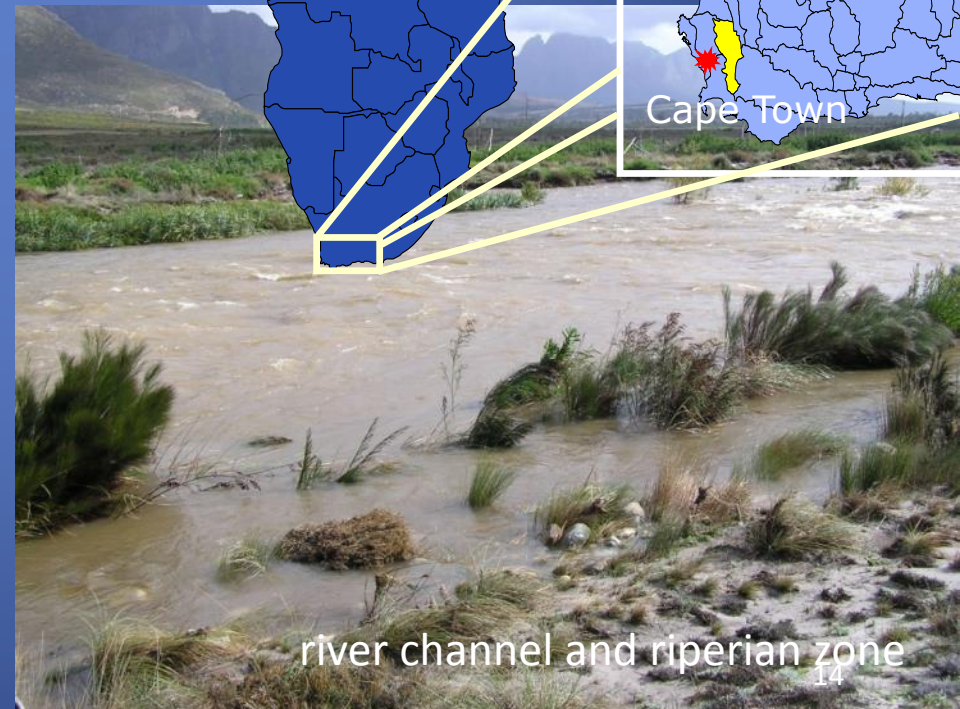
UNZI: VLIR-UOS IUC
fisheries biology, aquatic
ecology

Case studies in South Africa:

Ecology for the sustainable construction of dams



Flood release



river channel and riparian zone

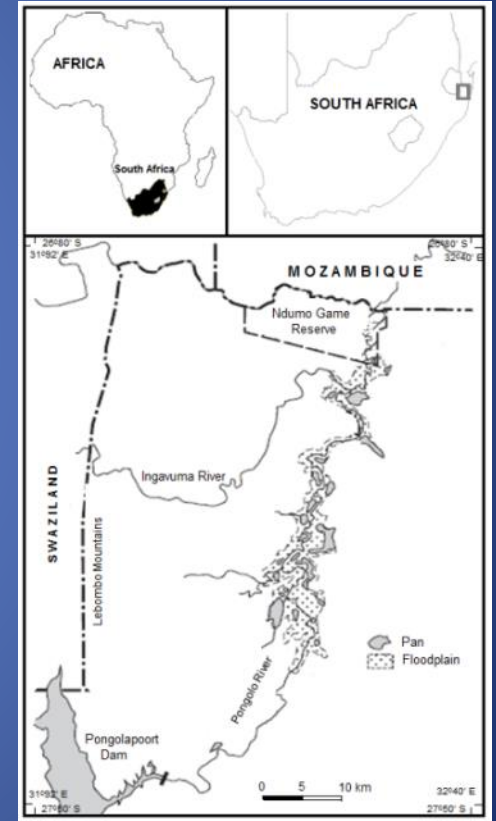
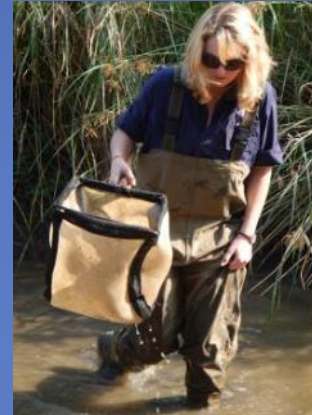
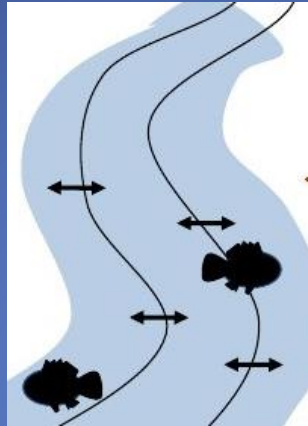
Case studies in South Africa:

Sustainable abstraction of ground water



Case studies in South Africa:

Determining environmental flows in the Pongola floodplain



Case studies in Zimbabwe:

Sustainable fisheries by delineating protected areas



Case studies in Zimbabwe:

Impact of sugar cane plantations on water and plant quality



Case studies in Zimbabwe:

Hydroecology as a management tool



Case studies in Tanzania:

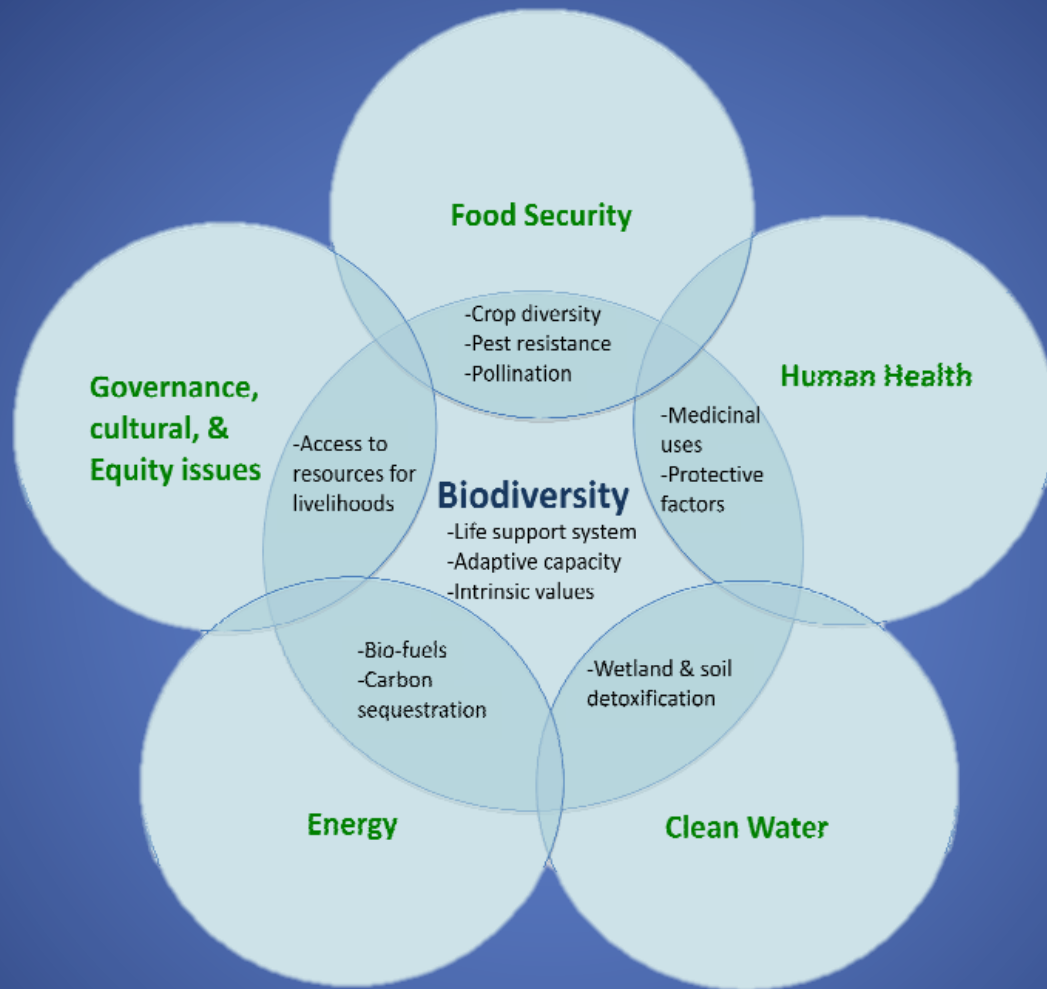
Construction of wetlands for water sanitation



Impact of land use on water quality and biodiversity in Upper Pangani



Conclusions



Biodiversity benefits for sustainable development targets

Thank you!



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