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Lessons learned from forty years of sustainable development scenarios

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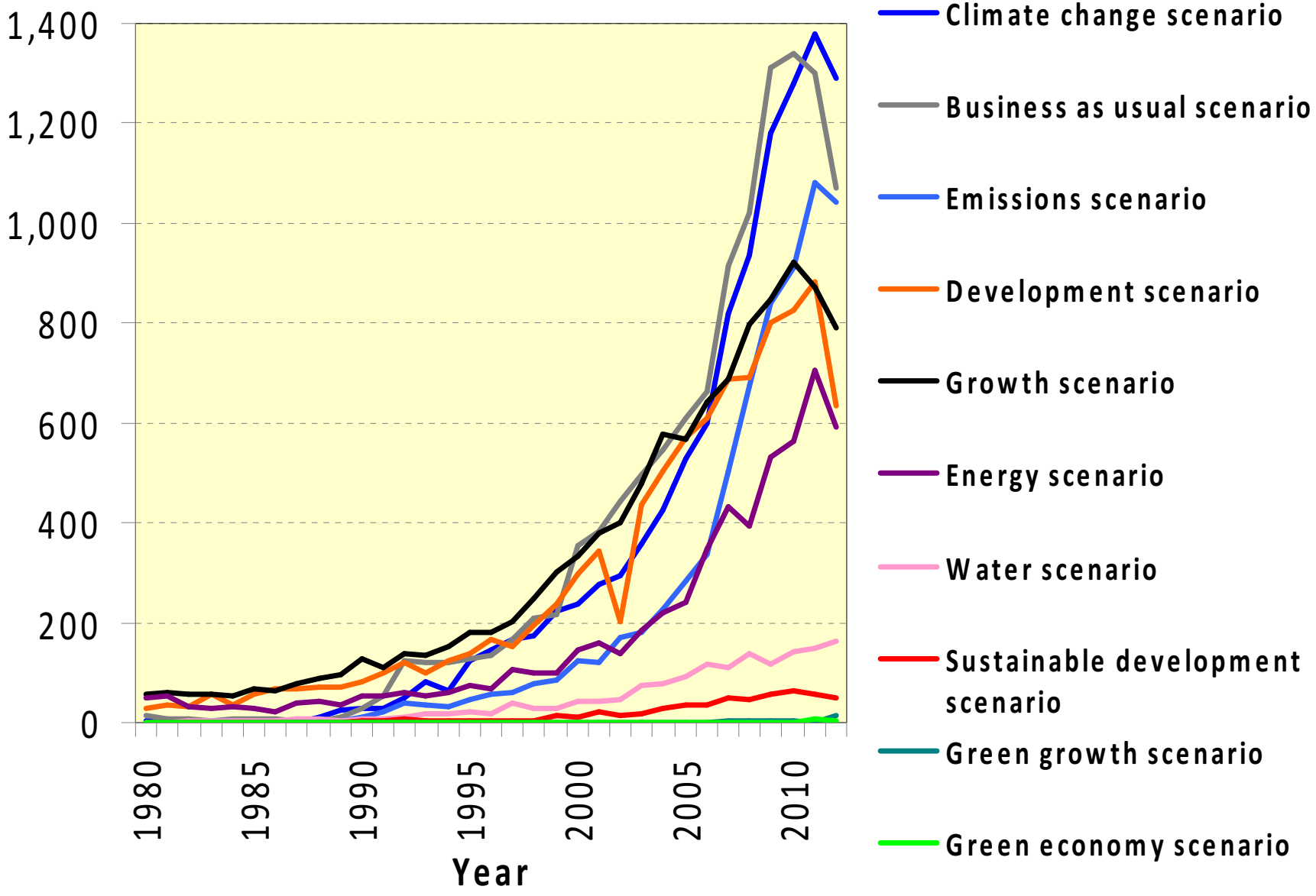
Number of articles on various scenarios



Lessons learned

- Models reflect worldviews and have greatly shaped those of decision-makers.
- No agreement on the role of science in policy making.
- Scenarios have been a powerful interface, but model results are “cherry-picked” by decision-makers.
- Easier to agree on goals/targets than on policies, actions or indicators. No consensus on limits, but almost everyone agrees that technology is important.
- No scenario that considers full range of SD goals suggested by science or by politics. Unresolved trade-offs and synergies.
- Fragmented modelers community focusing on applications. Models looking for applications.
- Problems with increasingly complex hierarchy of assessments.
- Results require a long time.

Way forward

- Science-policy-business interface: better institutional solutions needed (ground rules, central banks, UN forum)
- Minimum level of scientific consensus: better institutional arrangements needed
- Sustainable development goals and targets: scenarios to capture full range suggested by science (support SDG)
- Scenario modelers to reclaim their independence from donors and politics.
- More resources for model/methodology development.
- Rethink complex hierarchy of assessments
- It's time to remake the science-policy interface with new technologies!

Chapter headings

1. Introduction
2. Scenario analysts, scientists and policy makers – making a good team?
3. The art of global scenario and model development since 1970
4. Alternative futures – pathways to a better world in 2050
5. Highlights from sustainable development scenarios for Rio+20
6. Issues for consideration

Vision		Theme	Types of goals, targets, and outcomes	IIASA-GEA	PBL	SEI	OECD	RITE-ALPS	FEEM	GSG
To develop	People	Poverty	Eradicate hunger by 2050		X					X
			Eliminate poverty by 2050			X				
		Access	Universal access to improved water source and basic sanitation by 2050		X		X			
			Universal access to electricity and modern cooking fuels by 2030 {or 2050}	X	X	{X}				
		Health & education	Decreased impact of environmental factors on DALY		X					
			Universal primary education by 2015						X	
	Economy	Income	GDP per capita > US$10,000 PPP in all regions by 2050			X				
			Income convergence; catch-up of Africa by 2050						X	
		Resources	Primary energy use less than 70GJ per capita by 2050						X	
			Primary energy use per capita is only 13% higher in 2050 than in 2010, and 48% higher in 2100					X		
			Use of renewables increase by 3.1 times from 2010 to 2050					X		
			Water demand increases from 3,560 km^3 in 2000 to only 4,140 km^3 in 2050				X			
		Security	Limit energy trade, increase diversity and resilience of energy supply by 2050	X						
			Population weighted average of energy security index increases only by 2.3					X		
To sustain	Life support	Resources	Limit the increase in the number of people under severe water stress to an additional +2 bln {or +1.4 bln) from 2000, reaching 3.7 bln {or 3.1bln} in 2050				X	{X}		
			People under severe water stress <2 bln until 2050 {or 2.9 billion in 2100}					{X}		X
			Reduce number of people living in water scarce areas vs. trend scenario		X					
			Reduce the area for energy crop production to almost zero by 2020. From 2010 to 2050, limit increase in cropland area for food production to +15%, and reduce the irrigated area for food production by 5%					X		
			Cumulative fossil fuel use limited to <520 Gtoe from 2010 to 2050					X		
			Slow and later reverse deforestation and land degradation							X
			Slow overfishing and later restore fish stocks							X
		Air pollution	Keep PM2.5 concentration below 35 µg m^3 by 2030		X					
			Reduce NO_x, SO_2 and black carbon emission by 25% vs. baseline by 2050				X			
			Reduce SO_2 by 42% and black carbon by 21% by 2050 vs. 2010					X		
			Reduce premature deaths due to air pollution by 50% by 2030	X						
	Nature	Climate change	Limit global average temperature change to 2°C [or 2.8°C] above pre-industrial levels with a likelihood of >50% {or 60%} by 2100	X	X	{X}	X	[X]		X
			Atmospheric GHG concentration stabilization below 450 ppm [or 350ppmv] {or 550ppmv} CO_2-eq. by 2100		X				{X}	[X]
			Limit ocean acidification to keep aragonite stable, with pH=8.0 in 2150					X		
		Biodiversity	By 2020: Prevent extinction of known threatened species and improve situation of those in most decline; halve the rate of biodiversity loss; halve the rate of loss of natural habitats and reduce degradation and fragmentation by 2020; conserve at least 17% of terrestrial and inland water. By 2050: stabilize biodiversity at the 2020/2030 level		X					
			CBD Aichi protected area targets of 17% of terrestrial and inland water areas and 10% of coastal and marine areas by 2020		X		X			
		Phosphorus and nitrogen cycles	Phosphorus removal in wastewater treatment increases from 0.7 Mt in 2000, 1.7 Mt in 2030, to 3.3 Mt in 2050				X			
			Reduce Nitrogen and Phosphorus use where possible, but without harming the ability of the agricultural system to meet the hunger target		X					