



Netherlands Environmental Assessment Agency

Rethinking global biodiversity strategies

Sector-based options to reduce biodiversity loss

as a contribution to TEEB

A cooperation between PBL, LEI and UBC

Ben ten Brink PBL, 20-10-2010

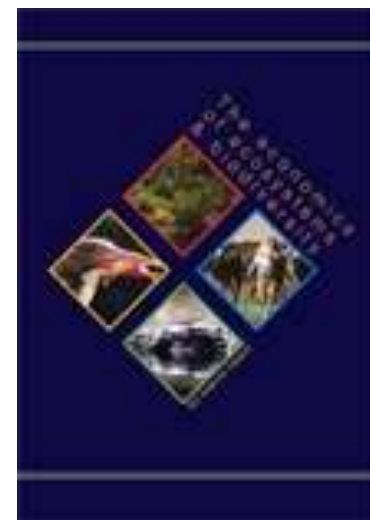


Request from UNEP

1. In 2008 Cost of Policy Inaction (COPI) -> BAU scenario
2. In 2010 Cost of Policy Action (COPA) -> options

Terms of reference:

1. global options
2. Impact on biodiversity & EGS
3. quantitative, geo-referenced, in bio-physical terms
4. as a basis for economic valuation



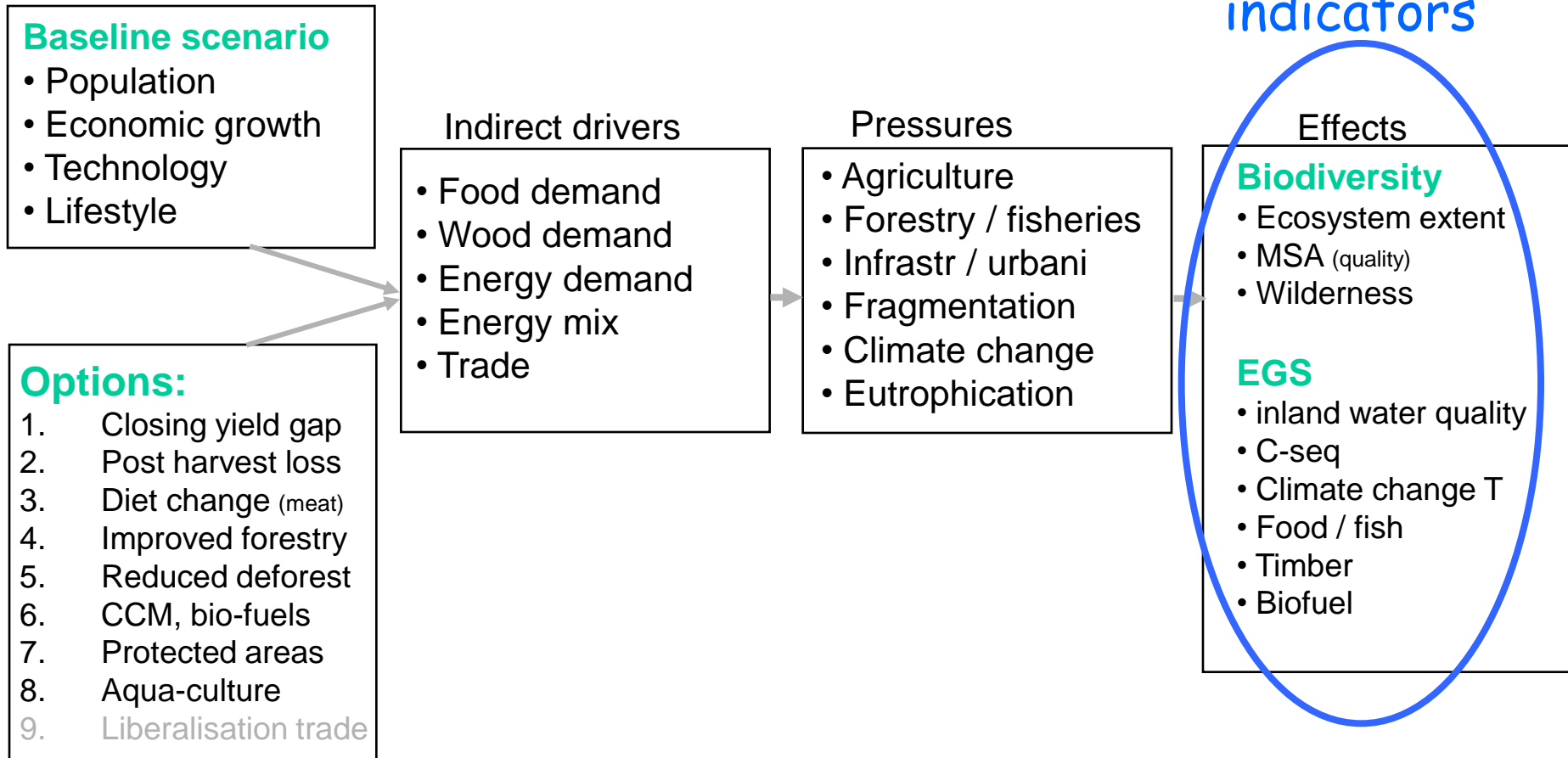
8 options (derived from GBO3)

1. Closing yield gap (production efficiency)
 2. Reducing food chain losses
 3. Diet: Less meat (healthy, none)
 4. Climate mitigation & biofuels (max + 2°C)
 5. Improving forest management (wood plantations + RIL)
 6. Reduced deforestation
 7. Expanding protected areas (20%-50% per biome)
 8. Restoring marine fish stocks & aquaculture
- + Option combination (ambitious but feasible)

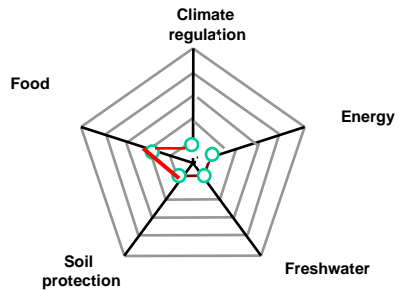
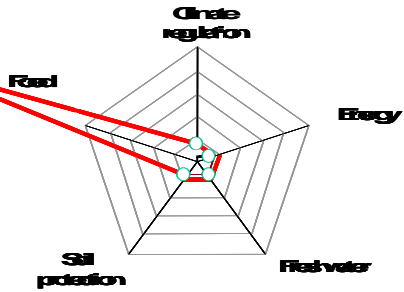
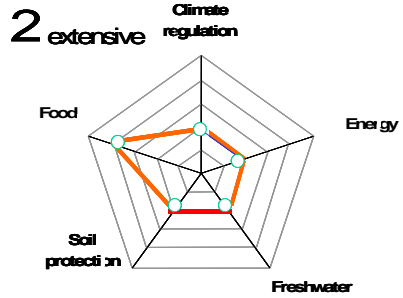
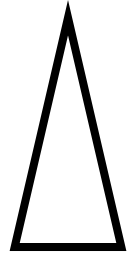
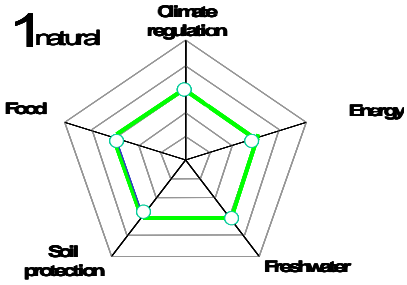
compared to
Business-as-usual

How do we model?

LEITAP – TIMER – IMAGE – GLOBIO - EcoOcean models

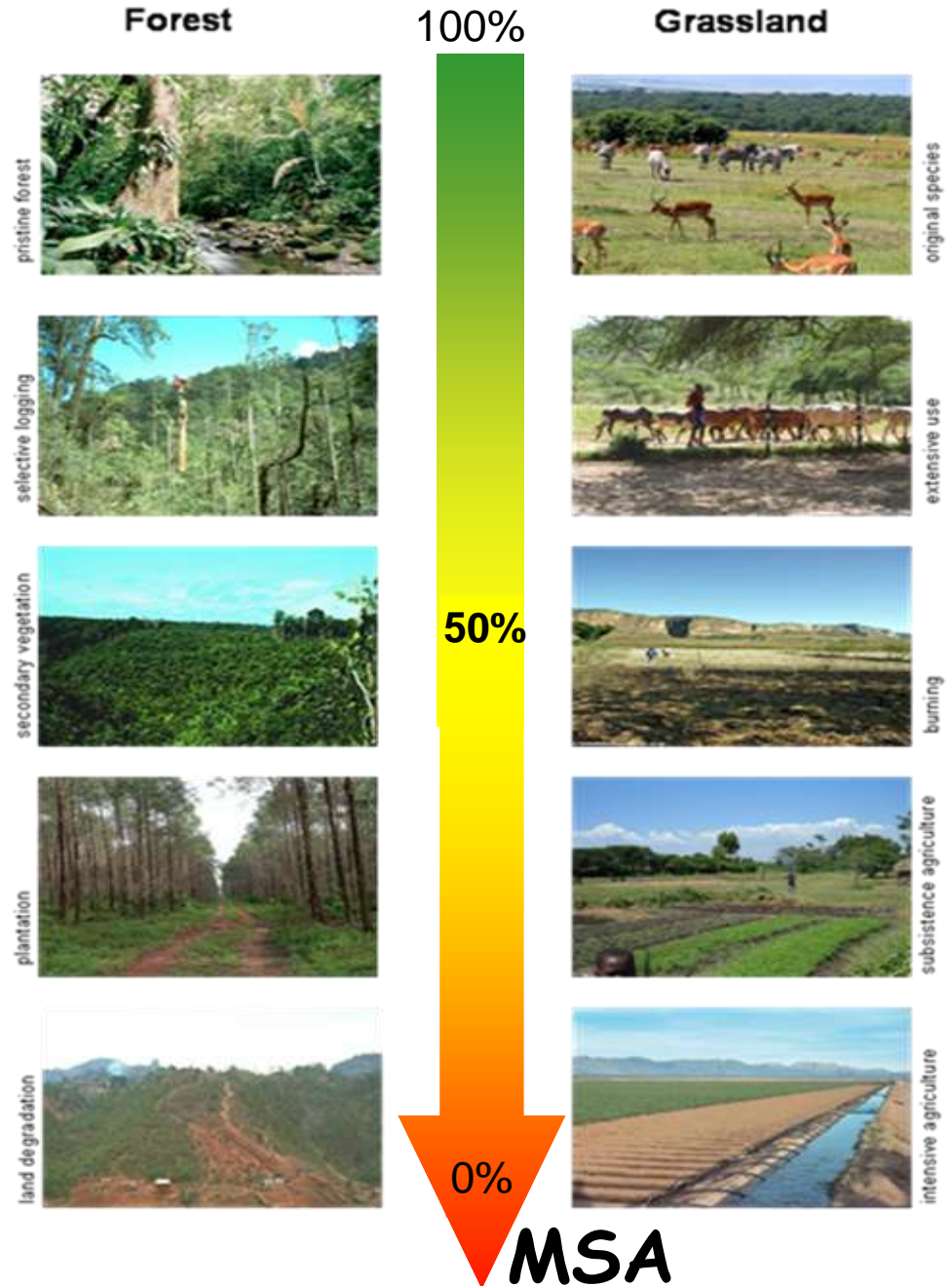


Functions



4 collaps

MSA: A landscape view



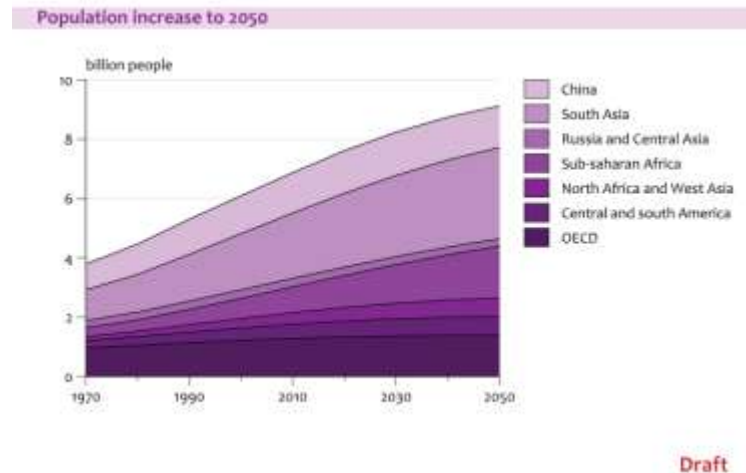
MSA

Baseline scenario: no new policies

Characteristics 2000- > 2050:

- 1.5 x global population
- 1.6 x food productivity
- 1.6 x fish demand
- 1.4 x wood demand
- 2.5 x global energy use
- 3 x income per person

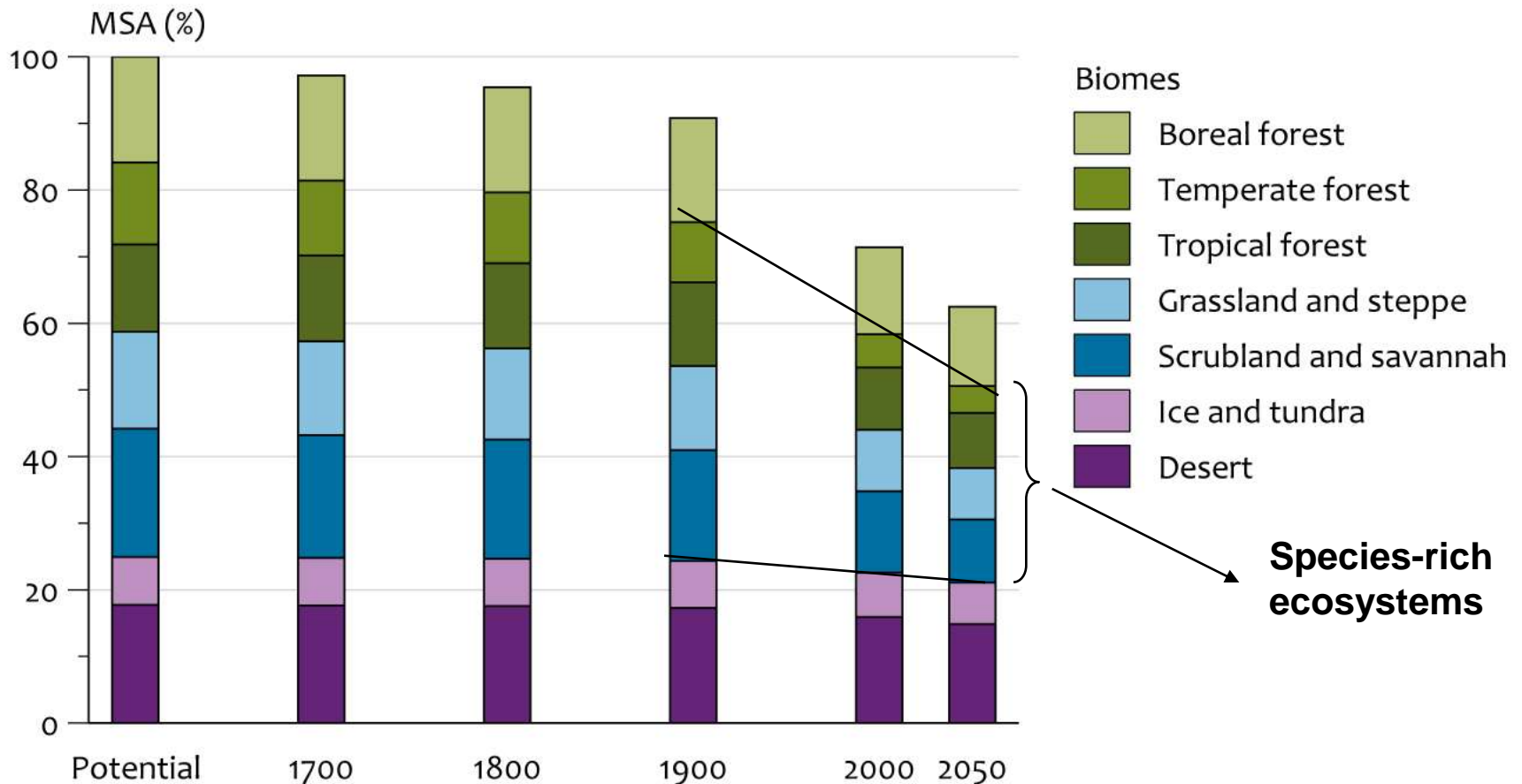
Kyoto implemented



Sources: OECD, IEA, FAO,
Cork et al,

Baseline: 70% → 60% MSA over 2000 - 2050

Global MSA in baseline scenario



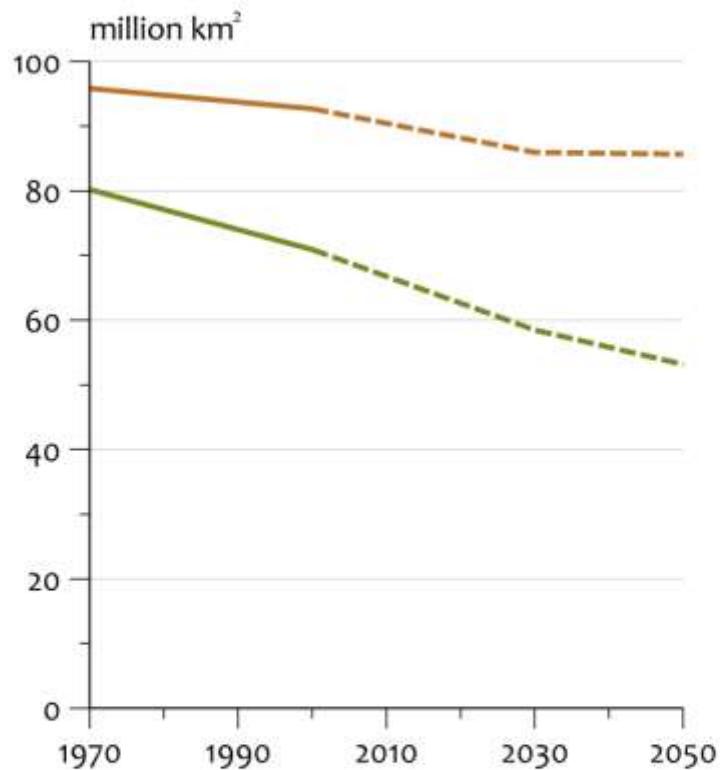
= 1.5 x USA

Baseline: natural area & wilderness 2000 - 2050

Global land use and natural area in baseline scenario

Natural area and wilderness

(Earth total: 130 million km²)



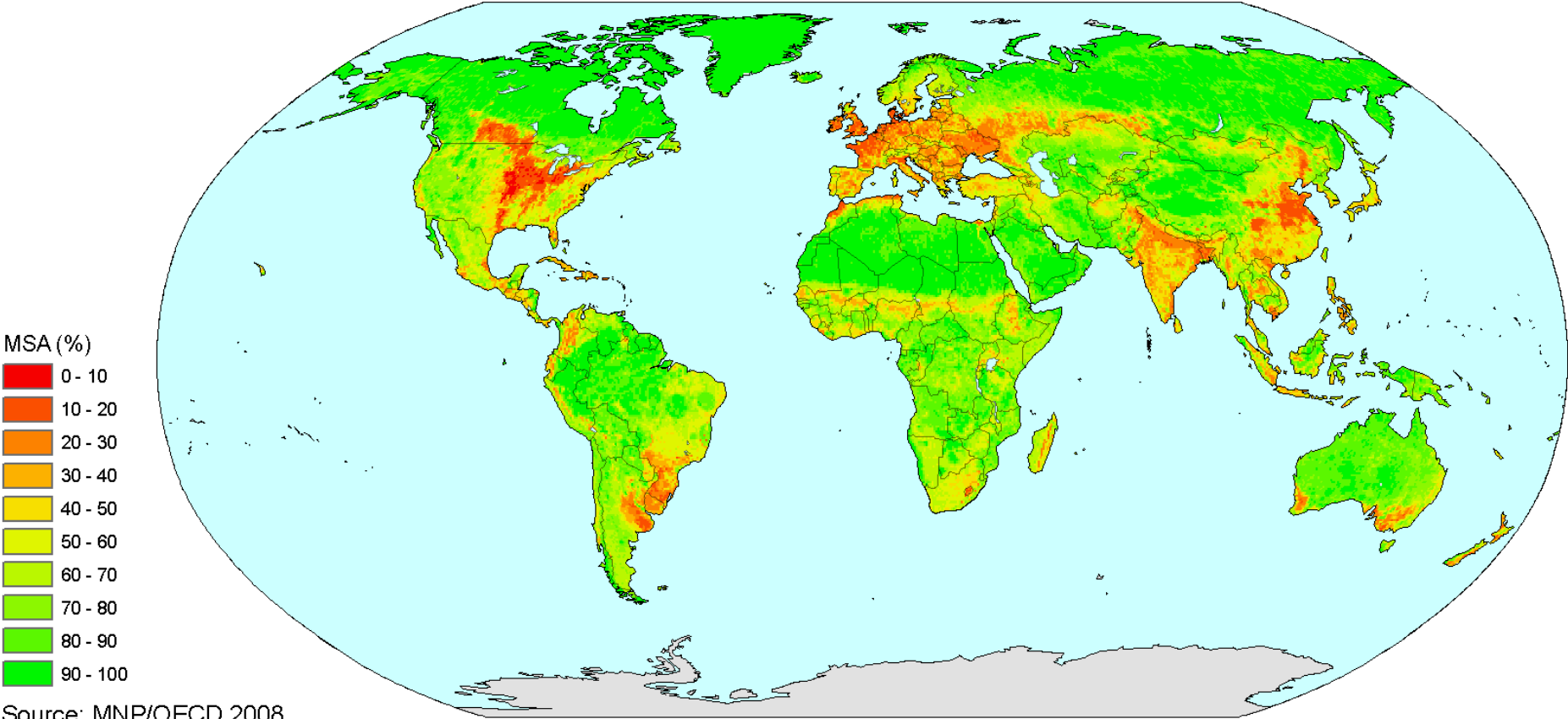
Natural area - 10 million km²

Wilderness area - 15 million km²

— Natural area
— Wilderness

Baseline 2000

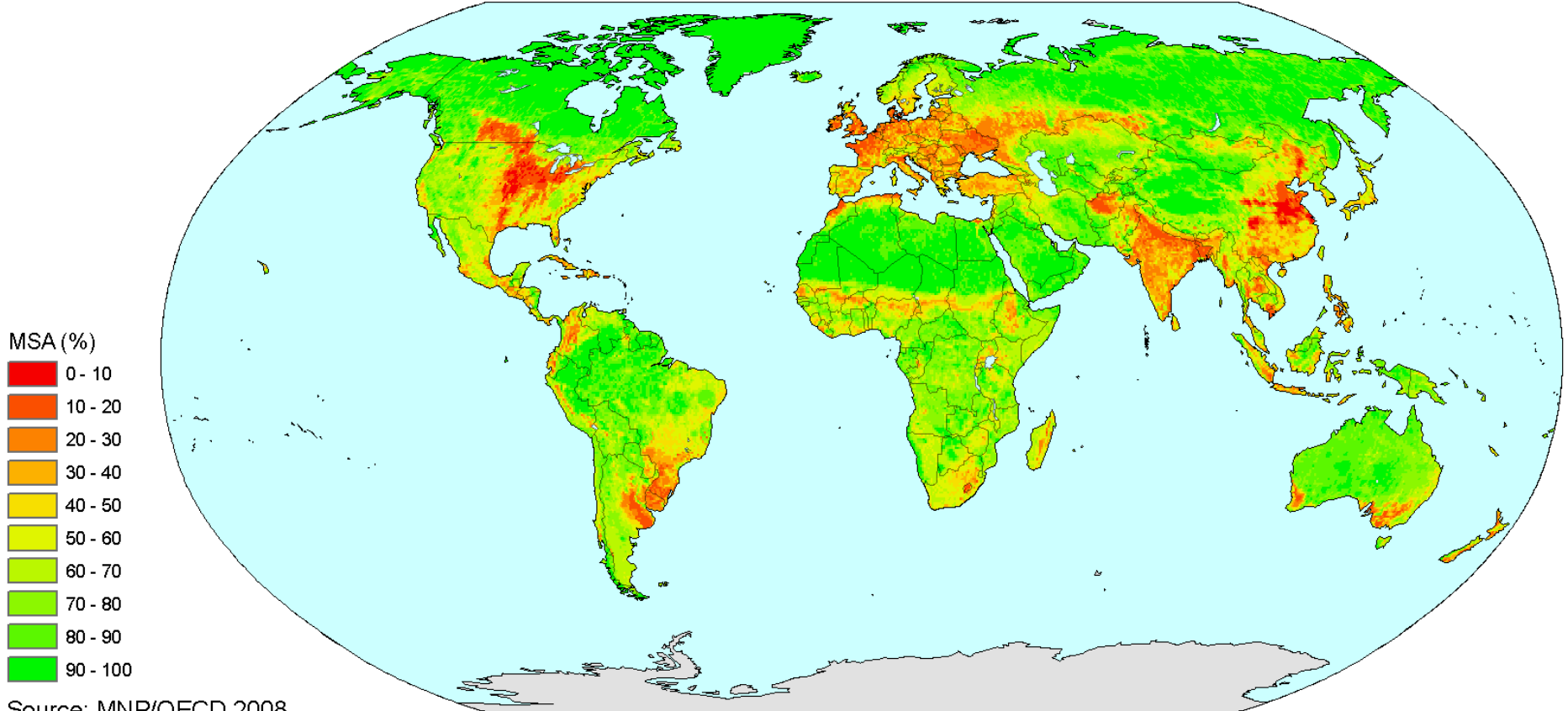
Biodiversity in 2000 (MSA)



Source: MNP/OECD 2008

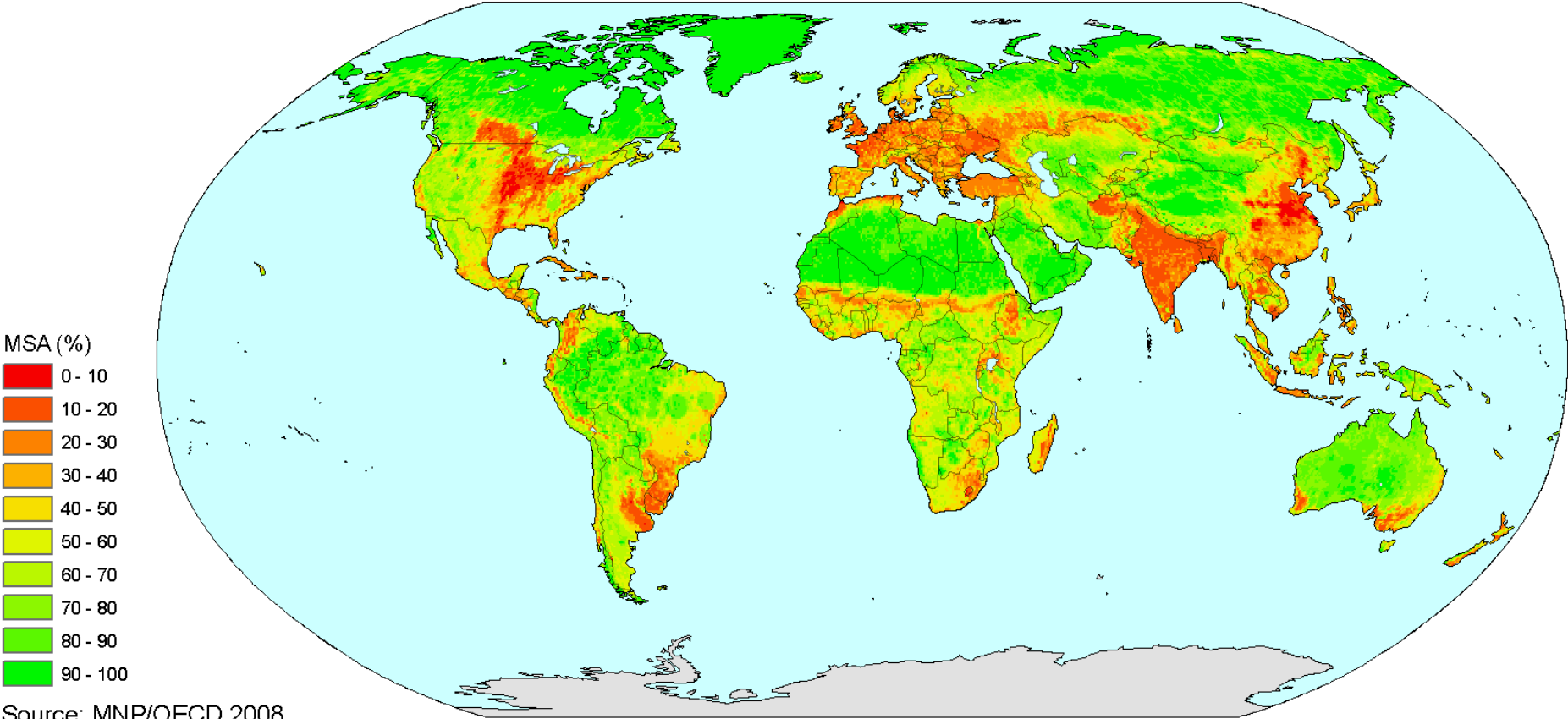
Baseline 2010

Biodiversity in 2010 (MSA)



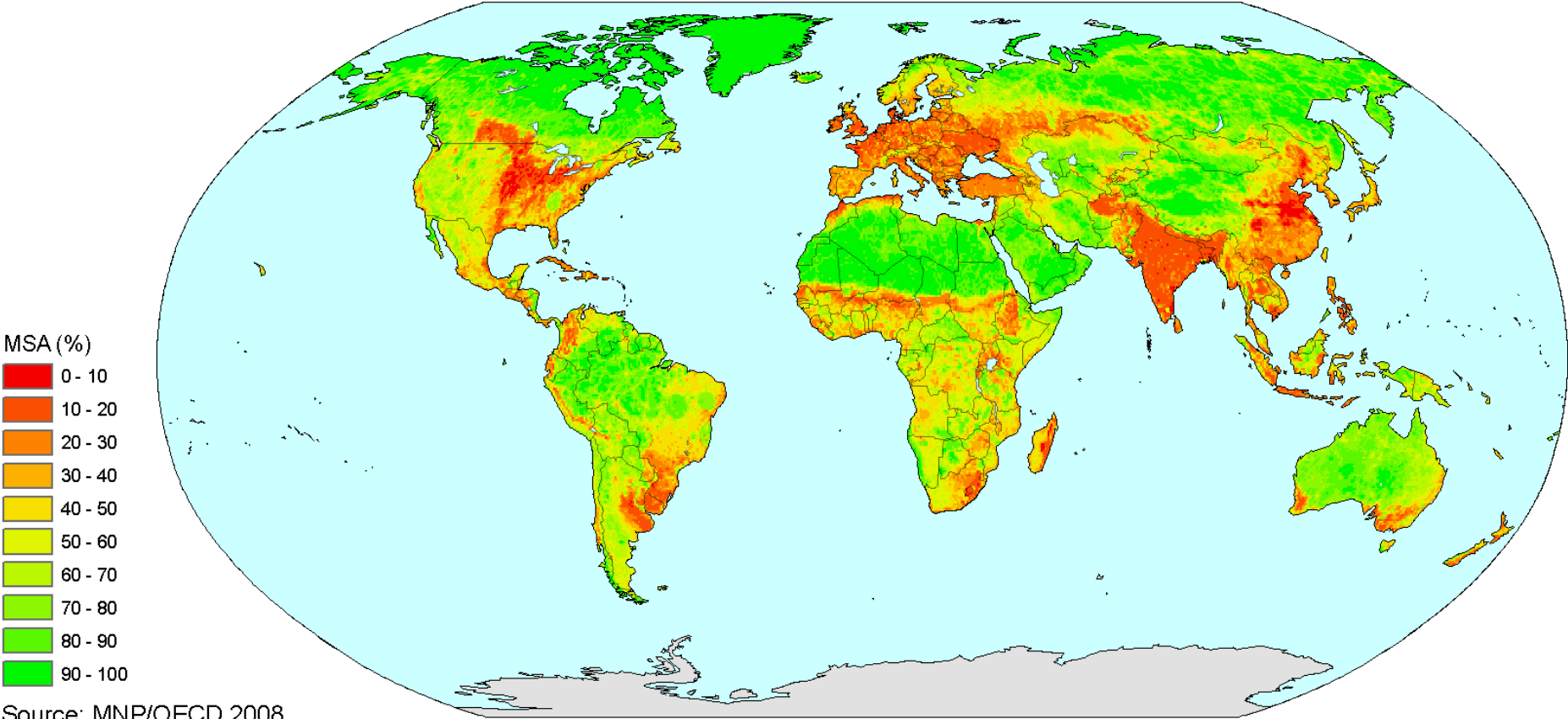
Baseline 2030

Biodiversity in 2030 (MSA)



Baseline 2050

Biodiversity in 2050 (MSA)



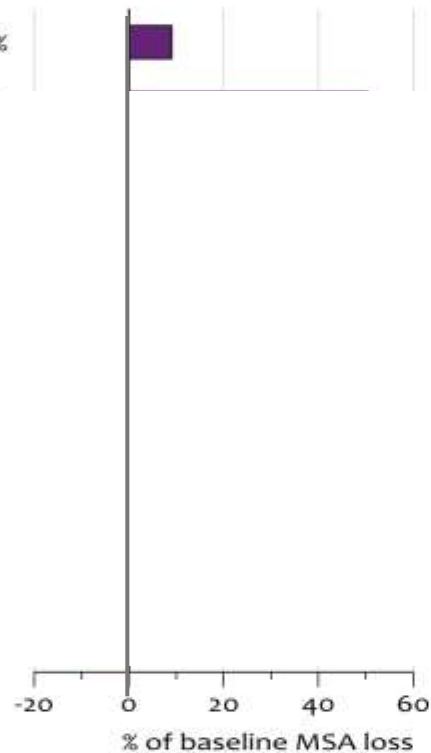
Source: MNP/OECD 2008

Overview prevented loss per option (MSA, NA, wilderness)

Change in global biodiversity per option compared to baseline scenario

Prevented MSA loss, 2000 – 2050

Expanding protected areas – 20%



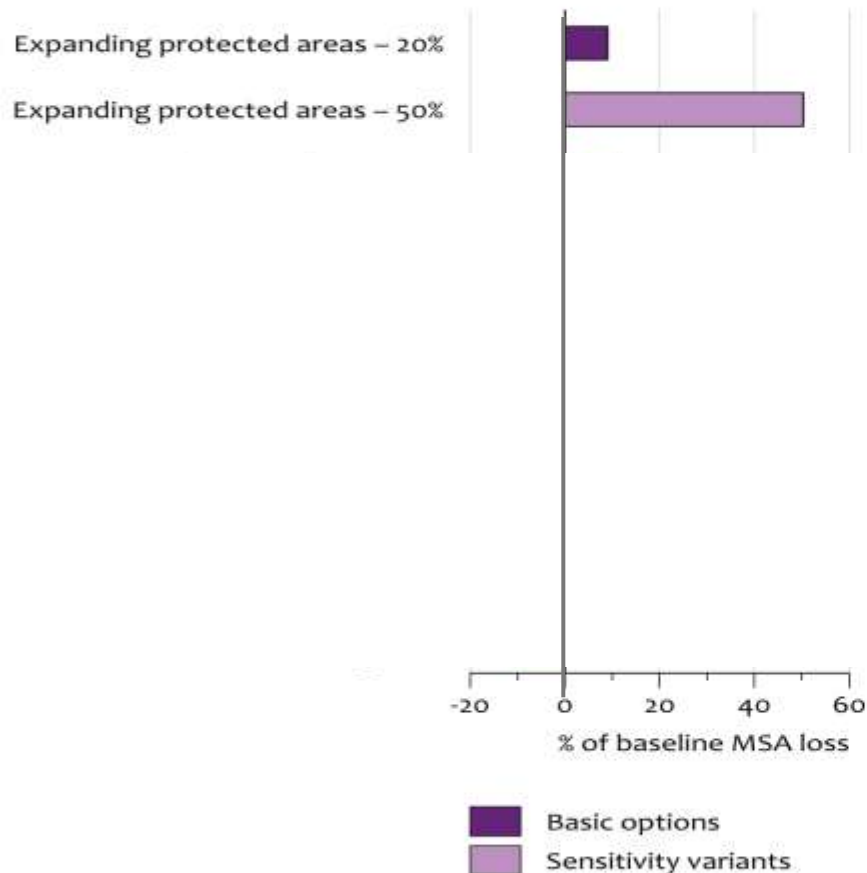
- Basic options
- Sensitivity variants

Change in global biodiversity of options expanding protected areas and reducing deforestation by 2030

Overview prevented loss per option (MSA, NA, wilderness)

Change in global biodiversity per option compared to baseline scenario

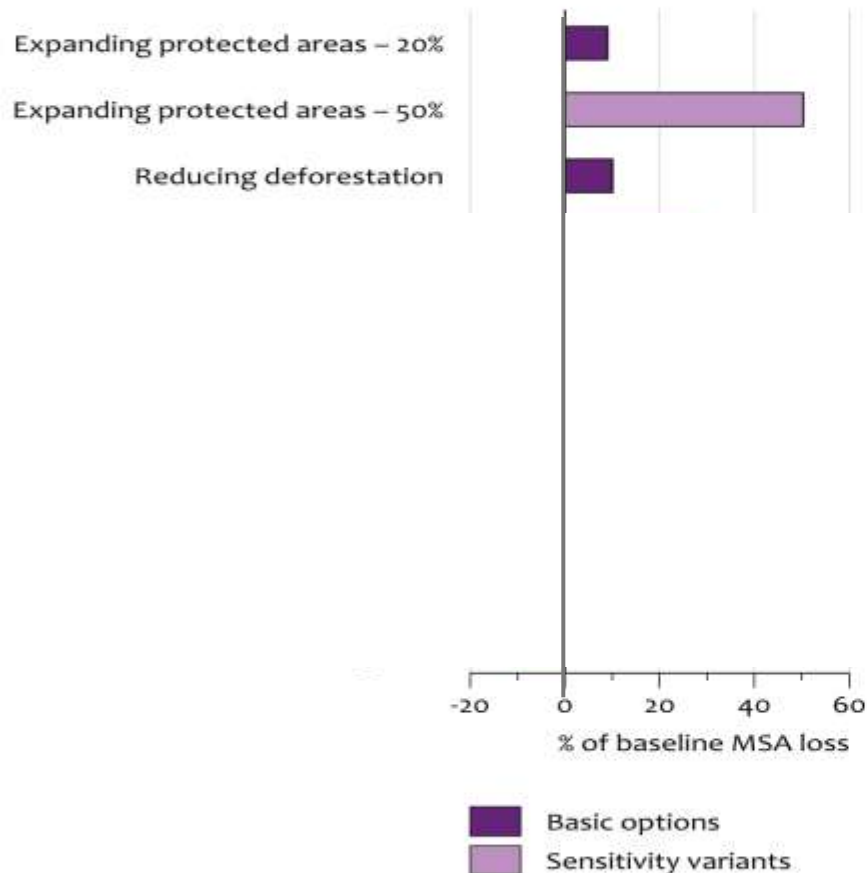
Prevented MSA loss, 2000 – 2050



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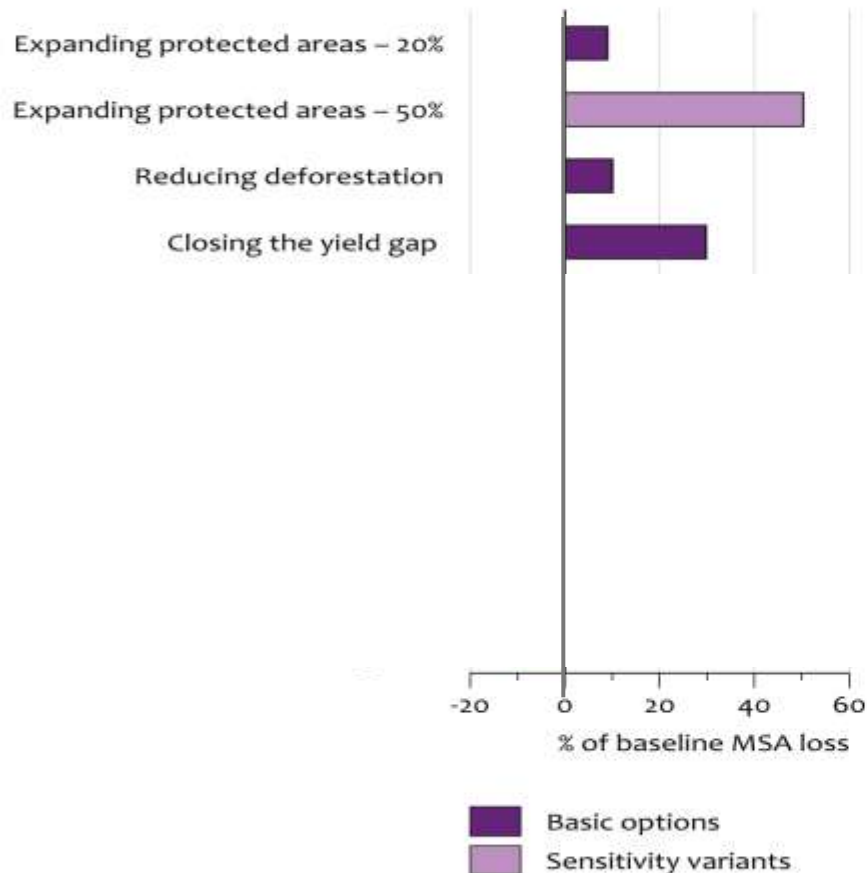


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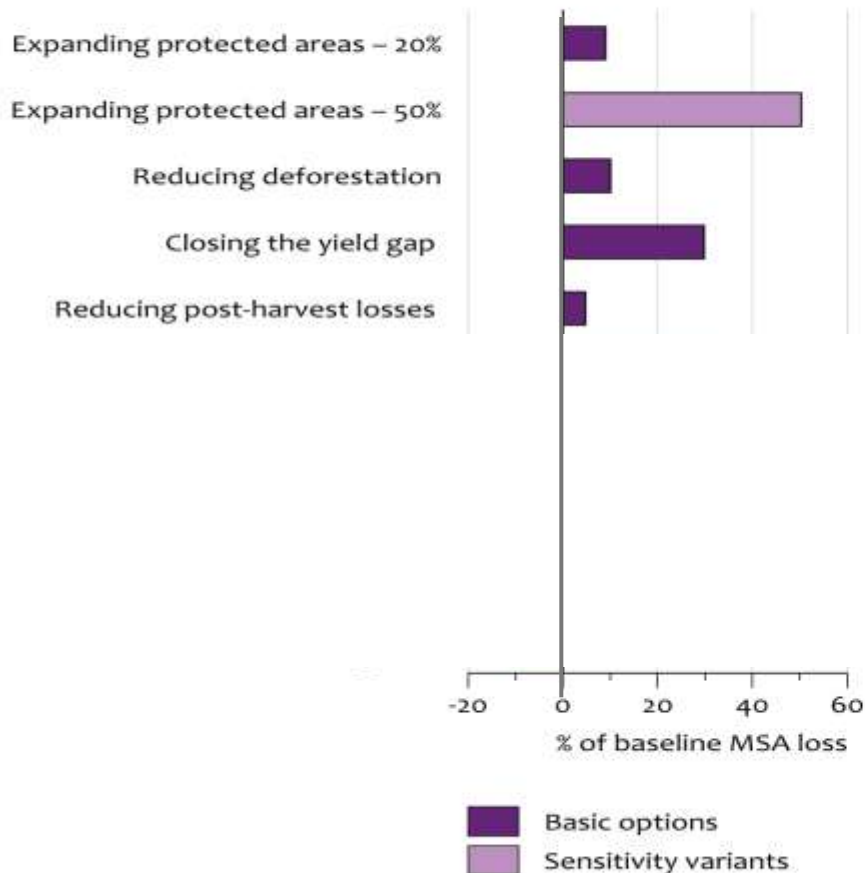
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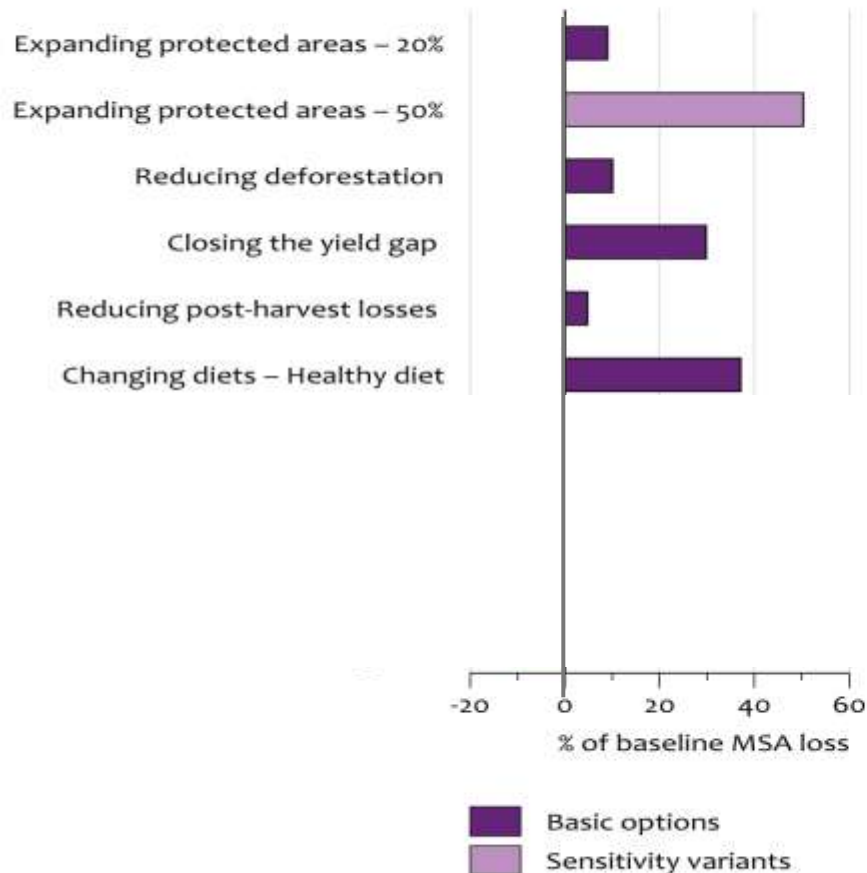


Change in global biodiversity of options expanding protected areas and reducing deforestation by 2030

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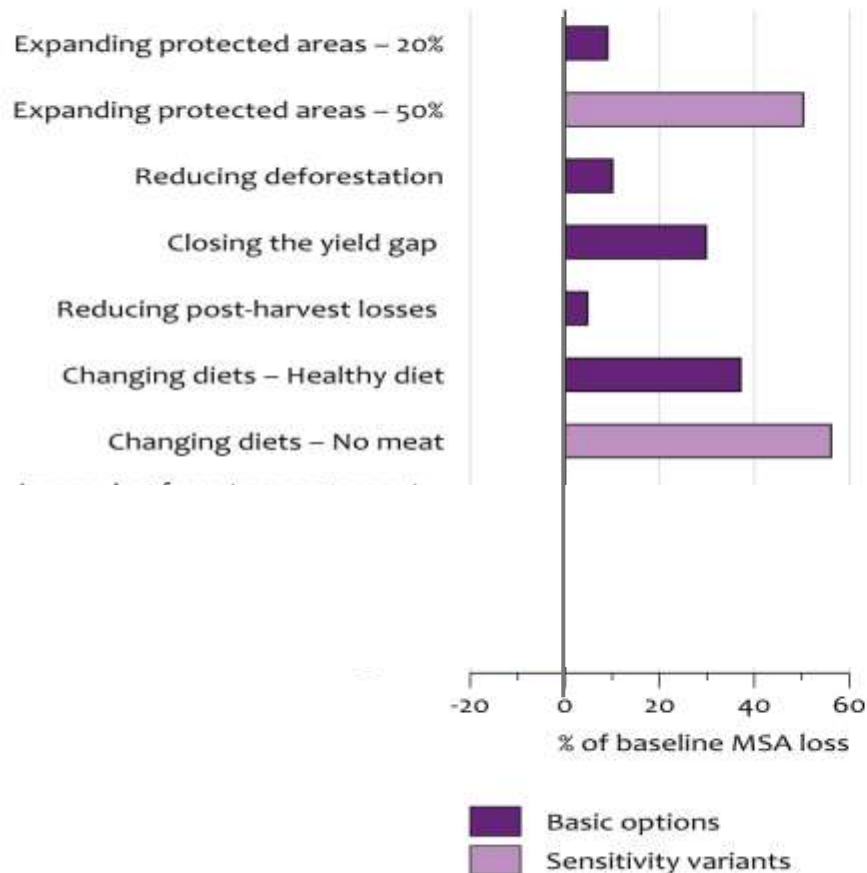
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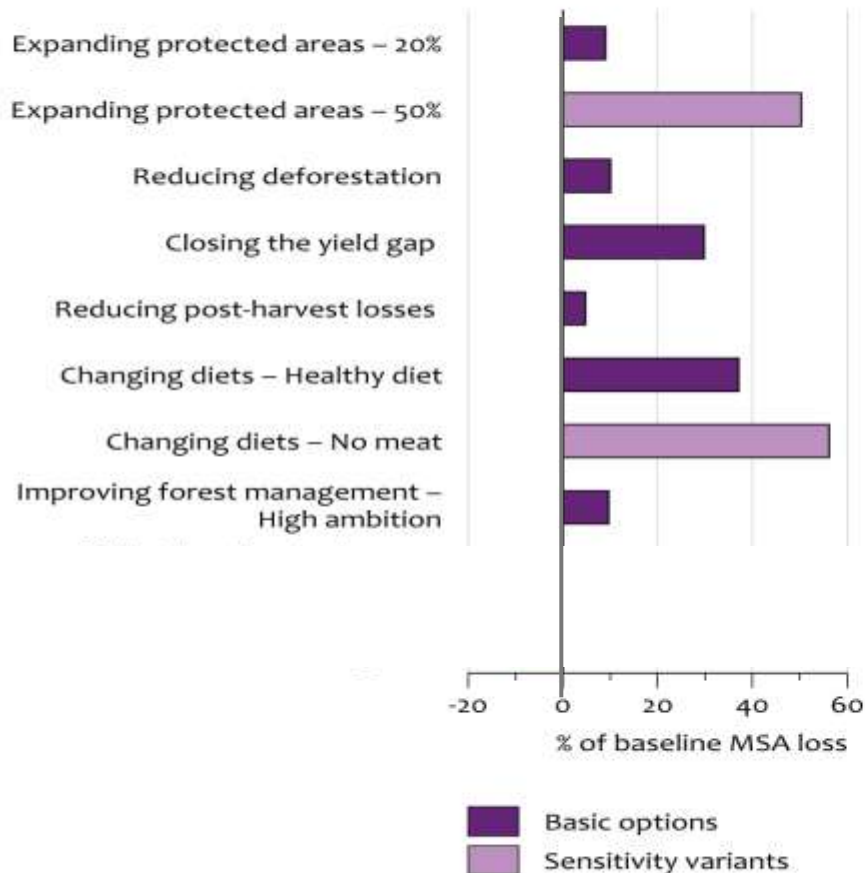


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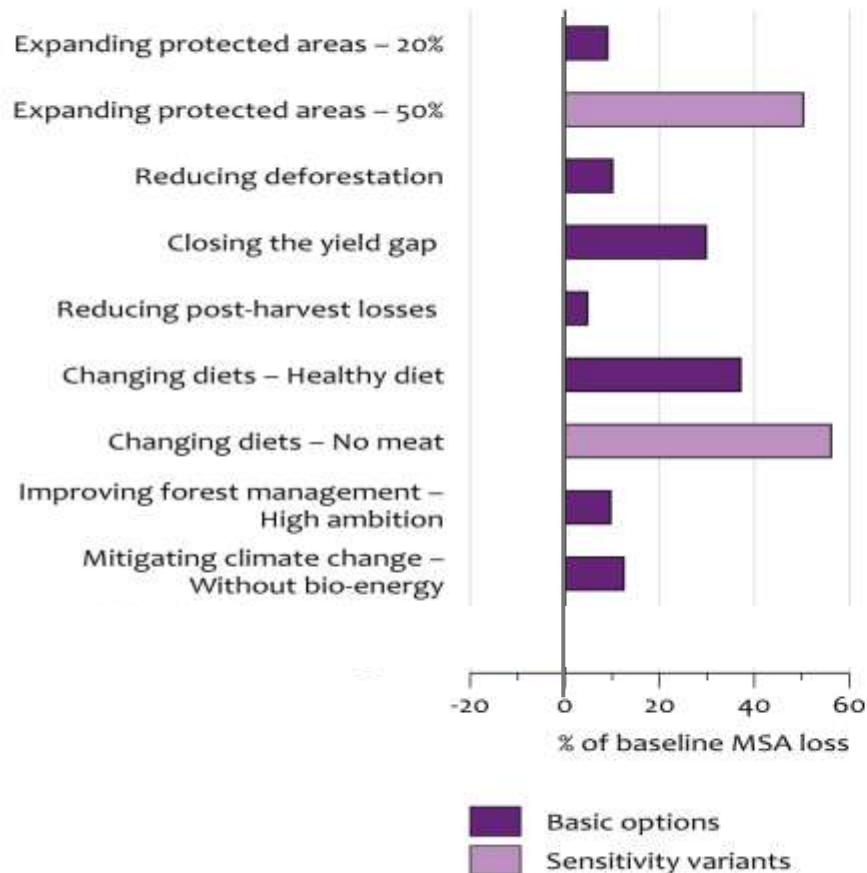


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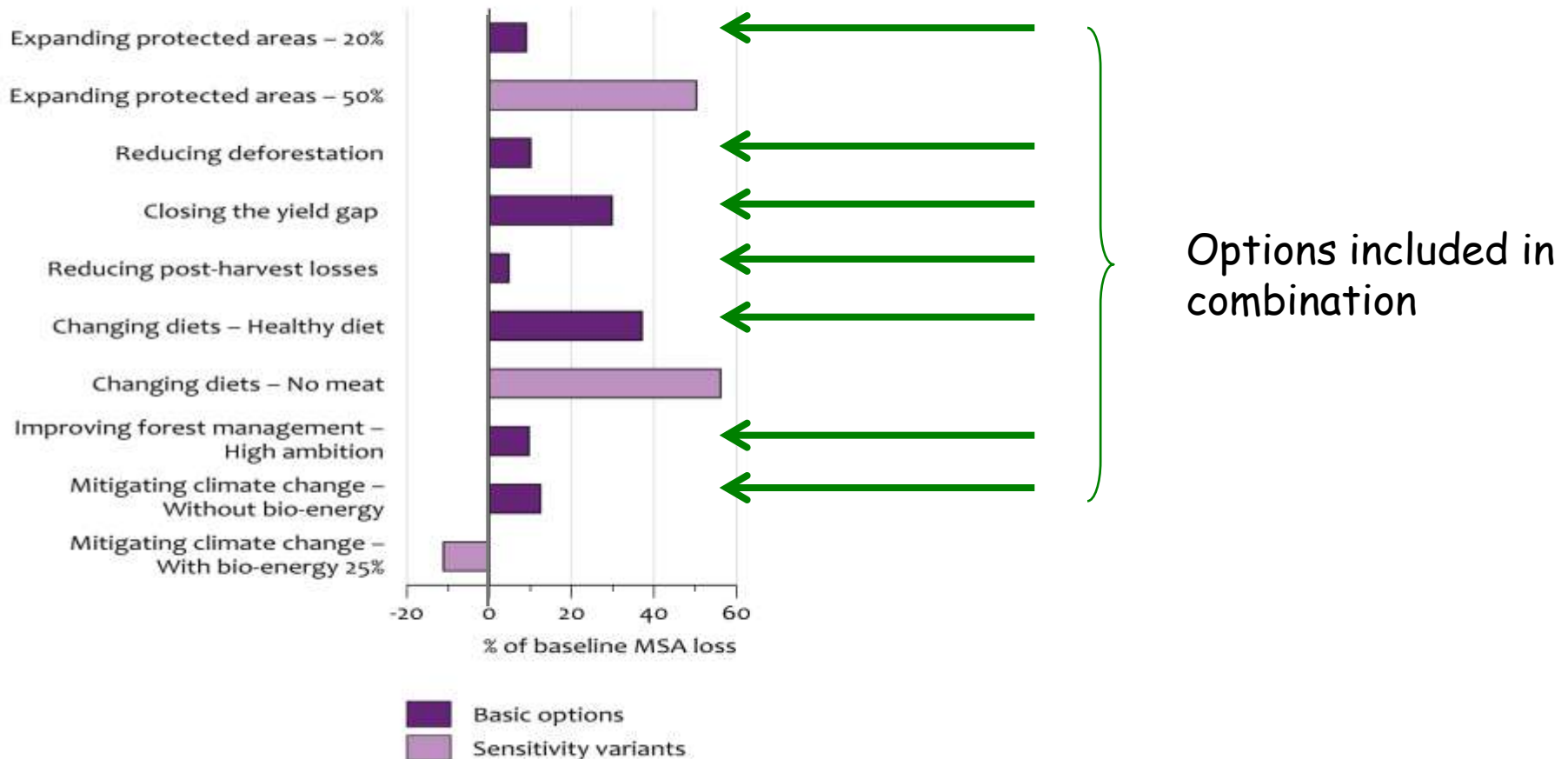


Change in global biodiversity of options expanding protected areas and reducing deforestation by 2030

Option combination

Change in global biodiversity per option compared to baseline scenario

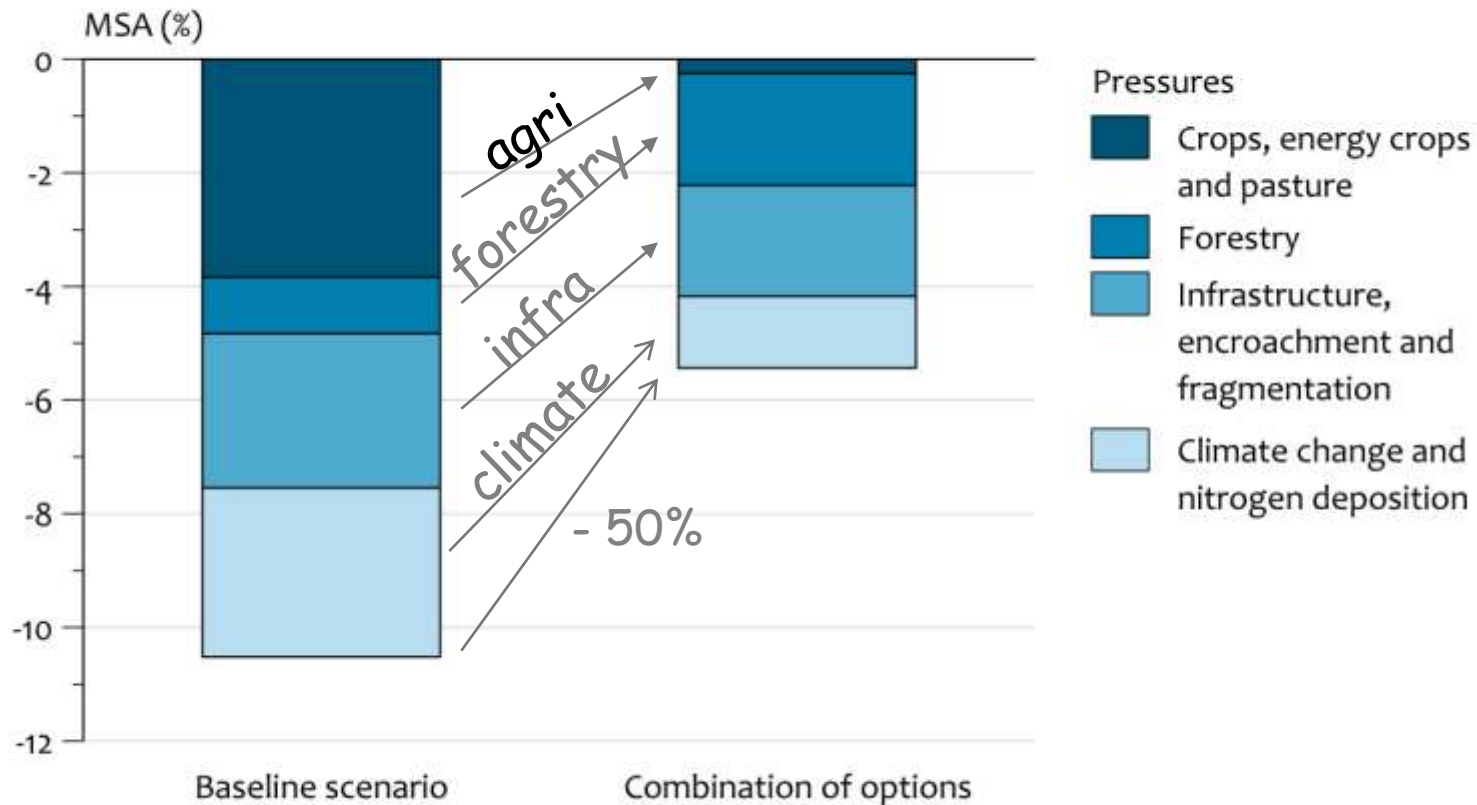
Prevented MSA loss, 2000 – 2050



Change in global biodiversity of options expanding protected areas and reducing deforestation by 2030

Effects of an ambitious combination of options

Pressures driving global biodiversity loss, 2000 – 2050

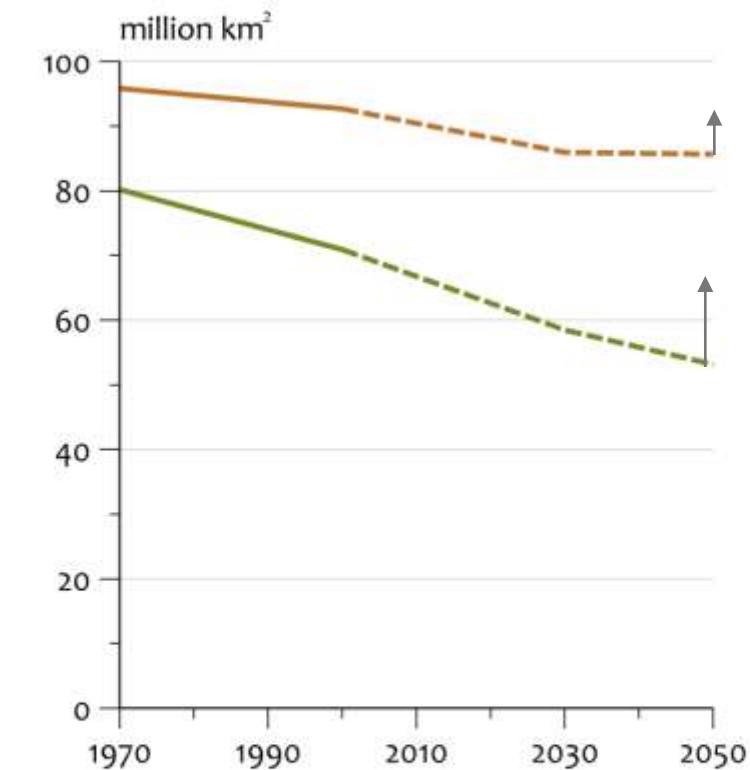


Baseline: natural area & wilderness 2000 - 2050

Global land use and natural area in baseline scenario

Natural area and wilderness

(Earth total: 130 million km²)

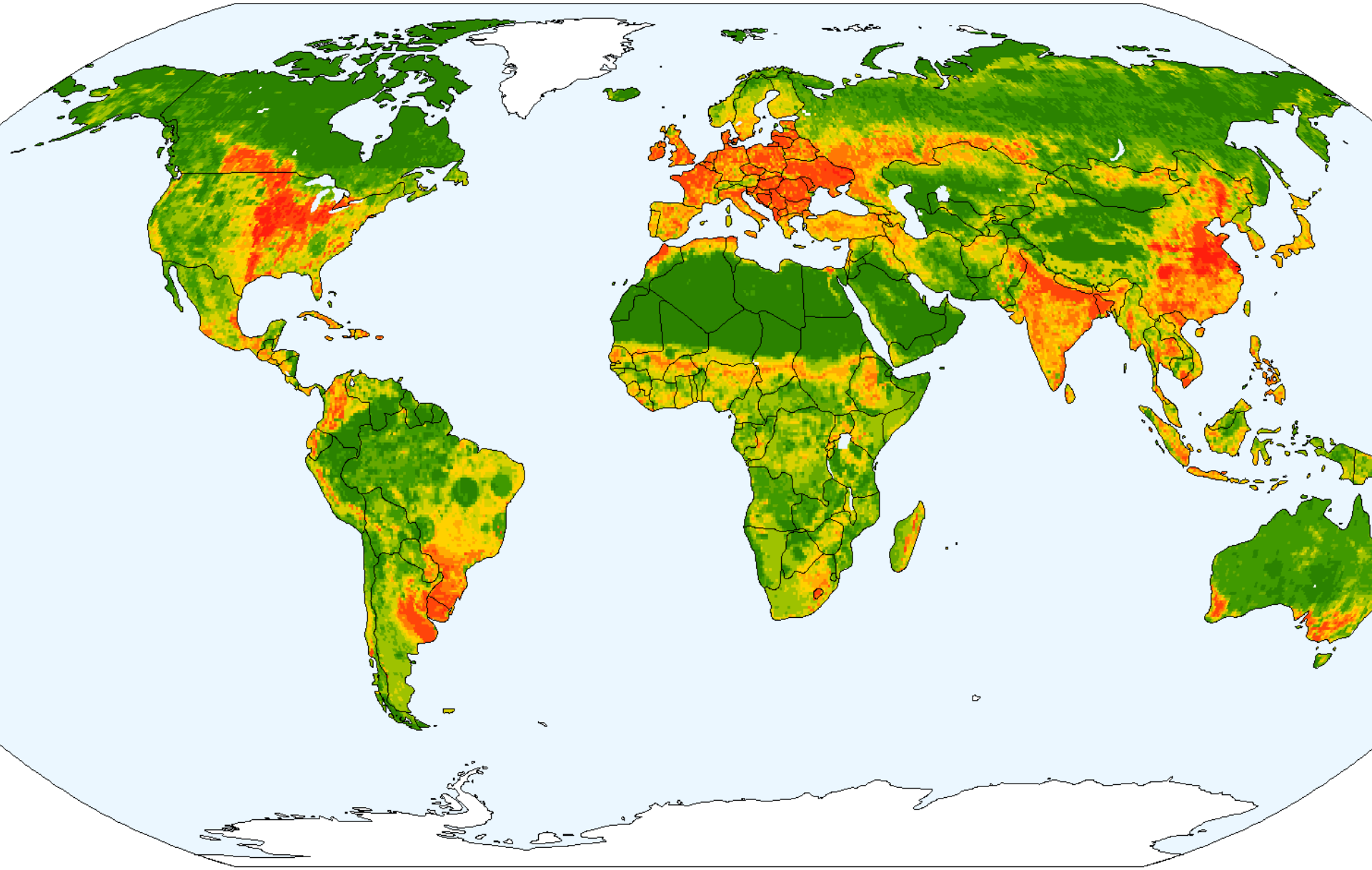


Natural area 10 million km² less

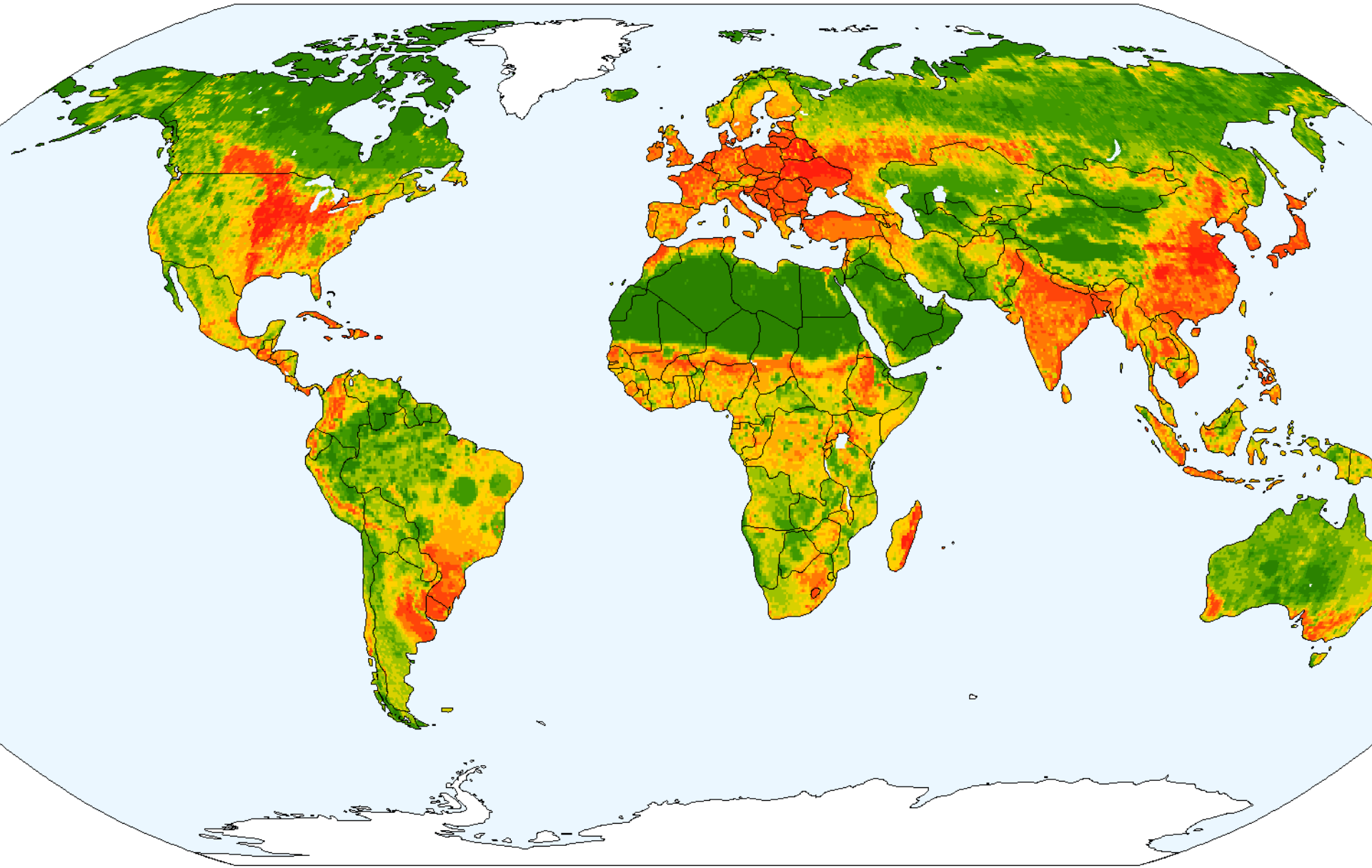
Wilderness area 11 million km² less

- Natural area
- Wilderness

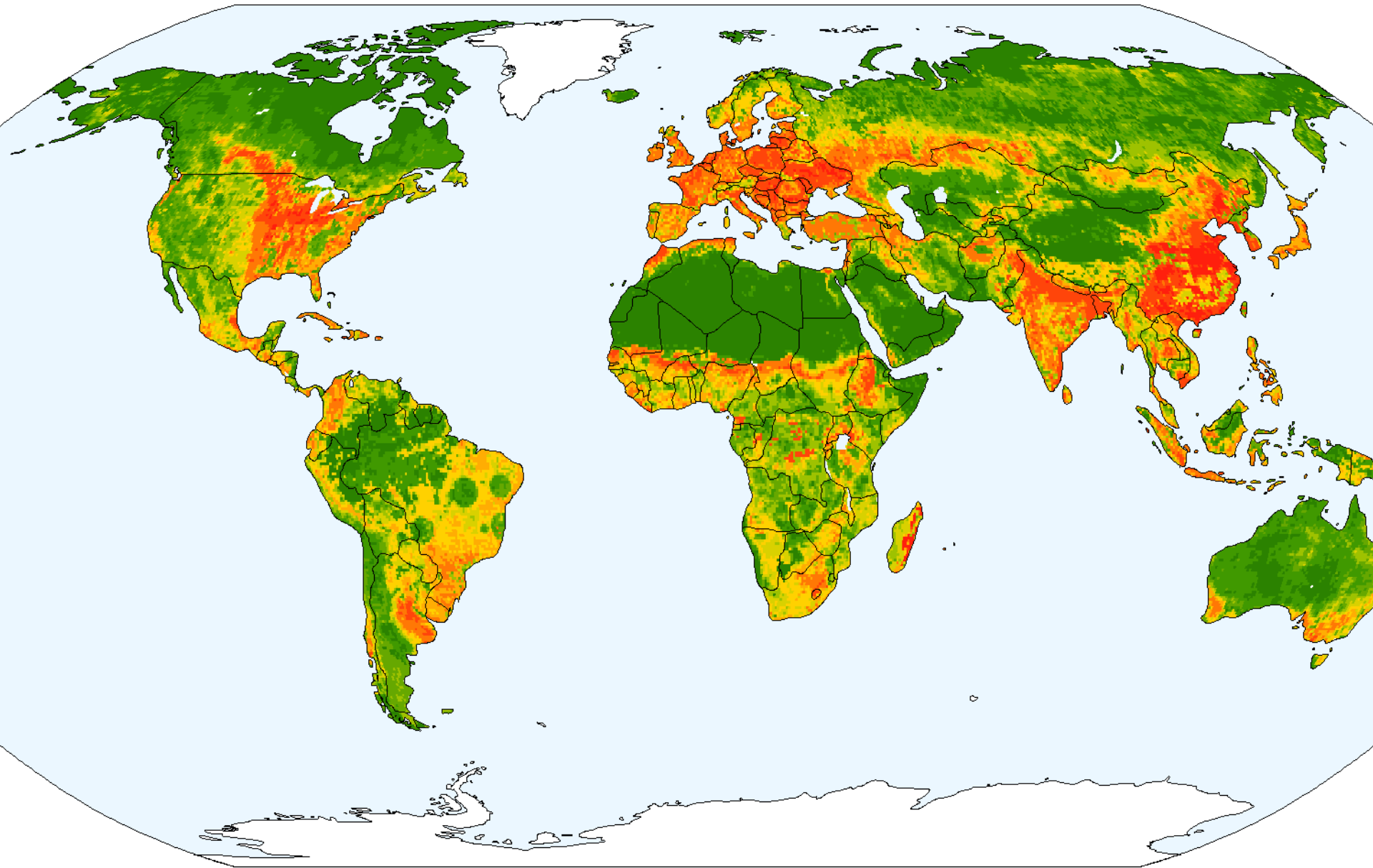
2010



2050 baseline



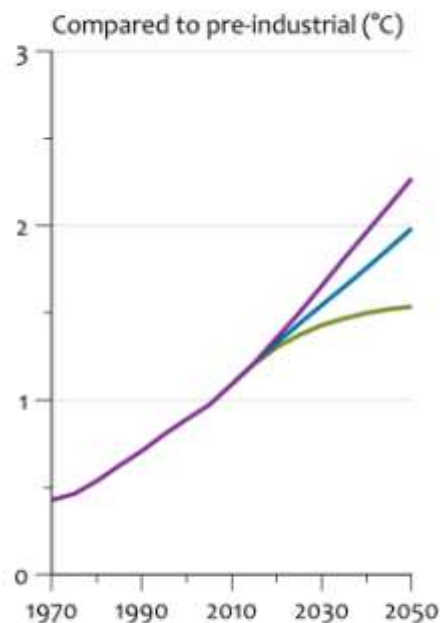
2050 option combination



Contribution of 20% to climate change mitigation

Global greenhouse gas emissions, concentration and temperature change

Temperature change



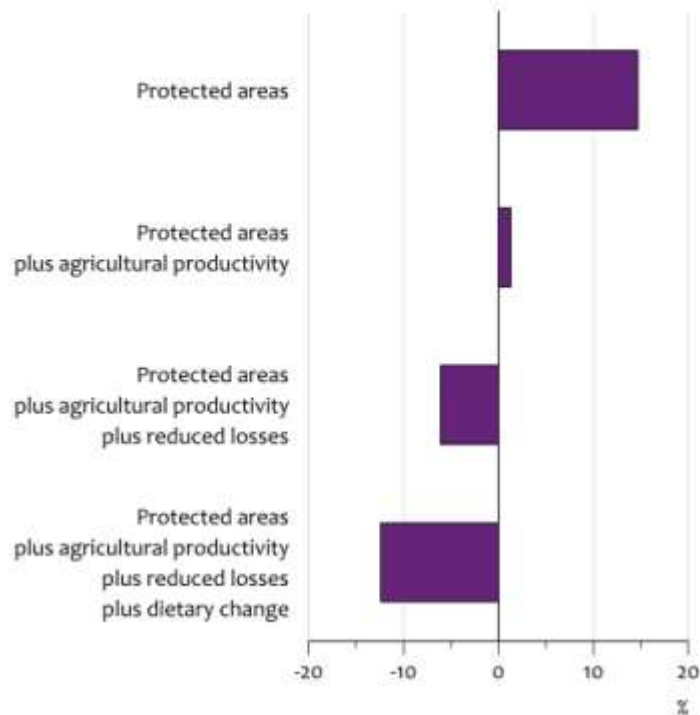
← Less conversion effect
← Energy change effects

- Baseline scenario
- Combination of options
- Without climate mitigation
- With climate mitigation

Contribution to food availability

Change in land prices and food consumption compared to baseline scenario, 2030

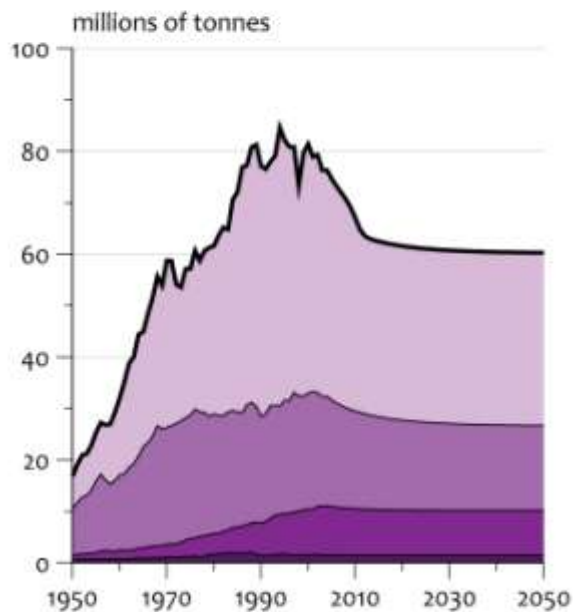
Stepwise introduction of options;
Global land prices



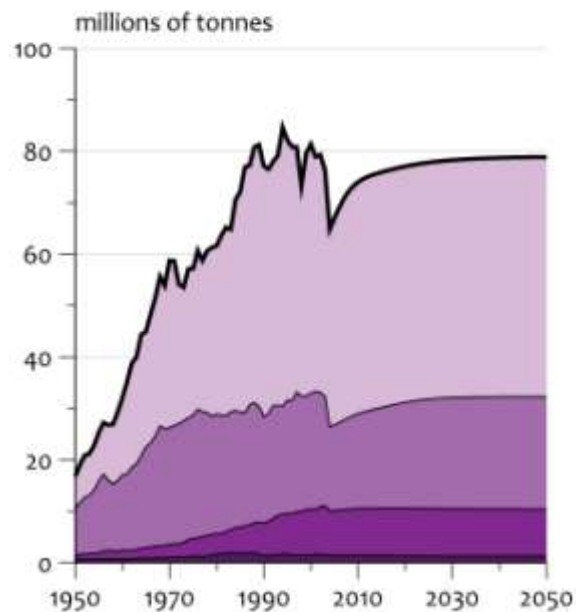
Fish catch increases by 30% compared to baseline

Marine catches per region

Baseline scenario



Reducing marine fishing efforts – High ambition



Conclusions



1. Ambitious option package can half loss by 2050, but not halt
2. Autonomous socio-economic growth is huge:
 - PA alone not sufficient to significantly reduce loss
 - Integrated sector-based approach required
3. Productivity increase is key (if not..)
4. Combine land demanding with land relieving options (price effects)
(PA, plantations, bio fuels, REDD) (productivity, reduce food loss, diet)
5. Align with climate change, MDGs, food & wood & energy policies
6. This is just a start: many more options to explore (IPBES?)



Thank you