PLANGEA

The International Institute for Sustainability (IIS) has been developing a multi-criteria approach to optimise the spatial planning of ecosystem restoration and conservation since 2013. The research resulted in the creation of PLANGEA modelling, a linear programming that integrates multiple criteria, benefits, costs, legal considerations and decision-making across all terrestrial ecosystems.

The modelling works with different scenarios, making it possible to compare results between different goals, targets and objectives. Furthermore, the possibility of performing multi-scale analysis makes it useful to guide the implementation of regional and local goals, offering customised solutions based on the preferences of decision-makers.

Restoring 30% of the world's priority areas will:

Reduce threats to biodiversity by

79%

in the biodiversity conservation maximisation and climate change mitigation scenario, **41%** more than the non-optimised scenario.

Remove

18 $GtCO_2$

from the atmosphere in biodiversity conservation maximisation and climate change mitigation scenario, which is **99%** more than the non-optimised scenario.

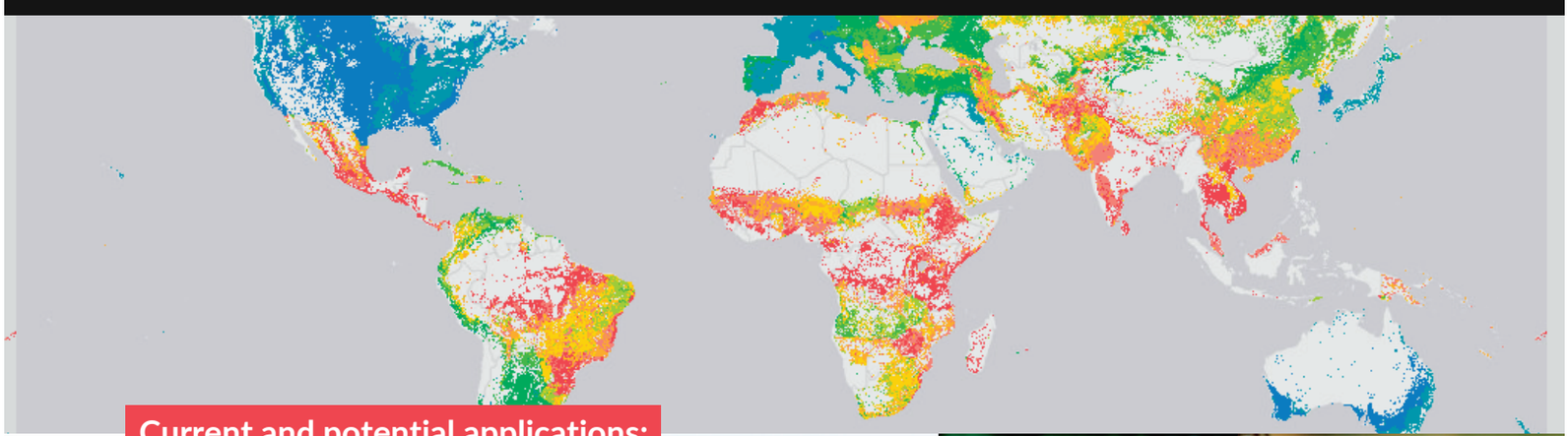
Decrease by

US$ 2.908

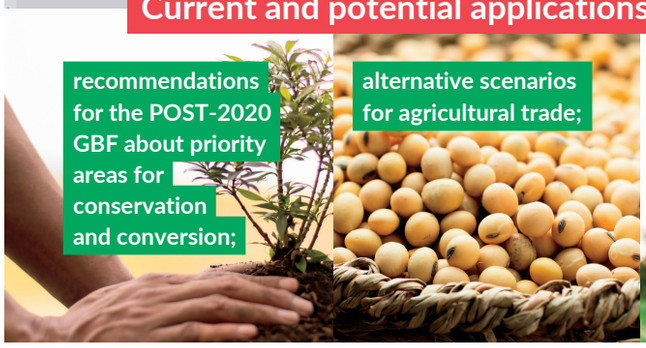
the cost per hectare restored in the cost minimisation scenario, a **68%** saving over the non-optimised scenario.

"These findings can help develop national strategies to implement the new Kunming-Montreal Global Biodiversity Framework adopted at COP-15"

- Neil Burgess, Head of the Science Programme of the UNEP-WCMC



Current and potential applications:



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PLANGEA Web interactive map

PLANGEA Web is a **decision support platform** developed by **International Institute for Sustainability (IIS)** to explore and visualise **priority areas for ecosystem restoration and conservation**, estimating the **benefits and costs** of different land use scenarios. Its user-friendly online interface allows the user to **simulate and visualise** its results applied to **different targets and scenarios** on a **national or global** scale.

On the **PLANGEA Web interactive map**, users can choose from **customisable criteria** to simulate the prioritisation of areas for conservation or restoration on a global or national scale. The optimisation criteria includes the following metrics:

Biodiversity Conservation:

- species' extinction risk;
- ecoregions' risk of collapse;
- impacts on ecosystems' integrity.

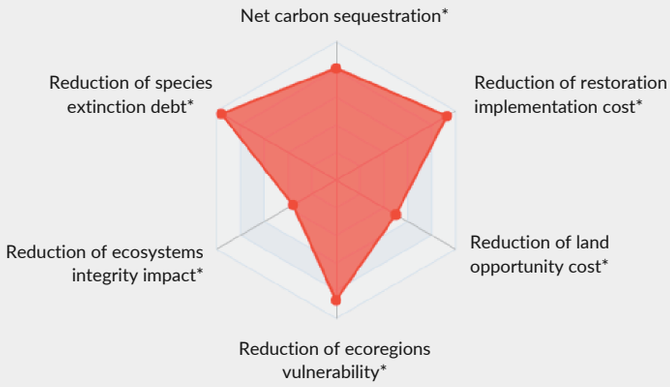
Cost Minimisation:

- restoration implementation costs;
- opportunity costs.

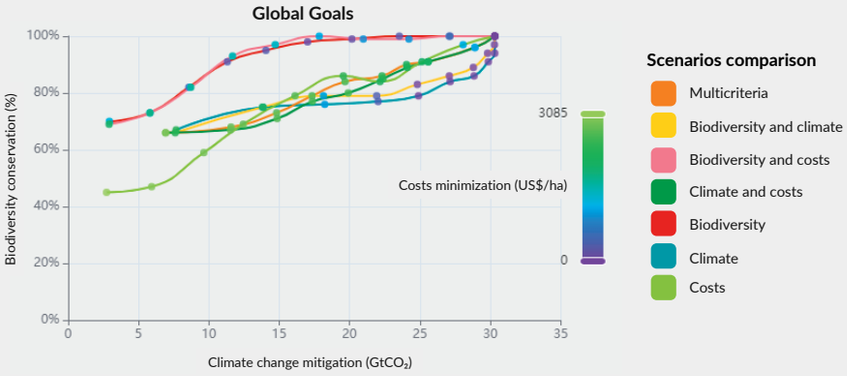
Climate Change Mitigation:

- net values of carbon sequestration (restoration) and emission (conversion).

In addition to the prioritisation map, the platform also presents individual quantification for the multiple benefits considered. The results are presented in maps, graphs, tables, images, and reports for download.



*Percentage values in relation to the maximum potencial benefit



Considering the spatial scale (global), these graphs show the results achieved in each action target, according to the possible scenarios generated from the combination of the optimisation criteria.

Biodiversity Conservation:

Reduction of species extinction debt	96% / 100%
Reduction of ecosystems integrity impact	36% / 100%
Reduction of ecoregions vulnerability	87% / 100%

Climate change mitigation

Net carbon sequestration	81% / 18,24 $GtCO_2$

Cost minimisation

Reduction of land opportunity cost	30% / 206,00 US$/ha
Reduction of restoration implementation cost	65% / 4.082,00 US$/ha

These graphs were generated based on the following parameters:
Prioritisation focus: *Restoration;*
Action target: *30%;*
Spatial scale: *Global;*
Optimisation criteria: *Biodiversity conservation, Climate change mitigation, Costs minimisation.*

The platform undergoes continuous development, allowing the inclusion of new metrics to improve multi-criteria optimisation and accuracy in identifying priority areas for restoration and conservation. For further information and to explore collaborations, **access the QR Code** or visit: **plangea.earth**

Visit
plangea.earth

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