System of Environmental Economic Accounting

# Introduction to the Land Degradation Neutrality (LDN) and its indicators, now and the future

12 February 2019

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United Nations Convention to Combat Desertification

Expert Meeting on SEEA indicators for SDGs and post-2020 Agenda for Biodiversity
12-14 February 2019 | Cambridge, United Kingdom

# Land Degradation Neutrality

"A state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems"

*UNCCD COP12 October 2015*

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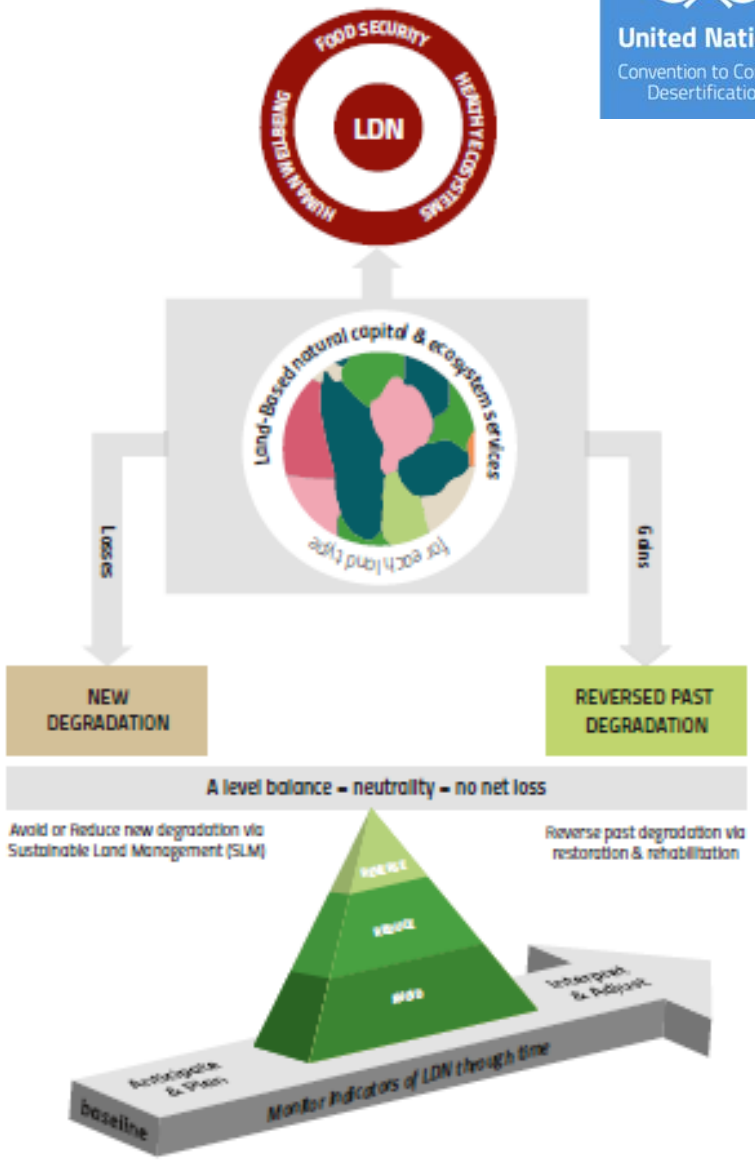


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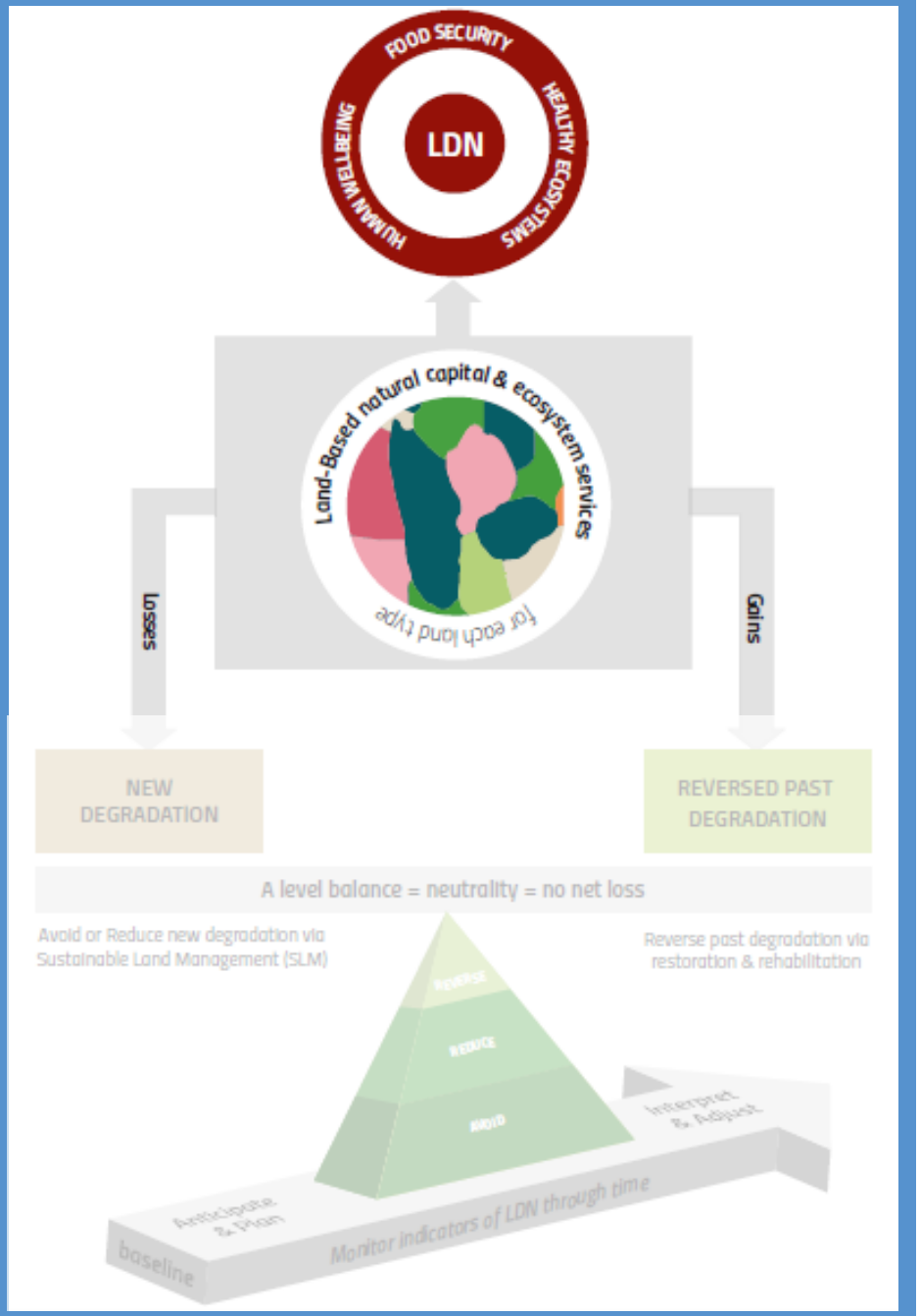
# Vision of LDN

The vision of LDN is **keeping land in balance** in order to ensure **food security**, **healthy ecosystems** and **human wellbeing**.

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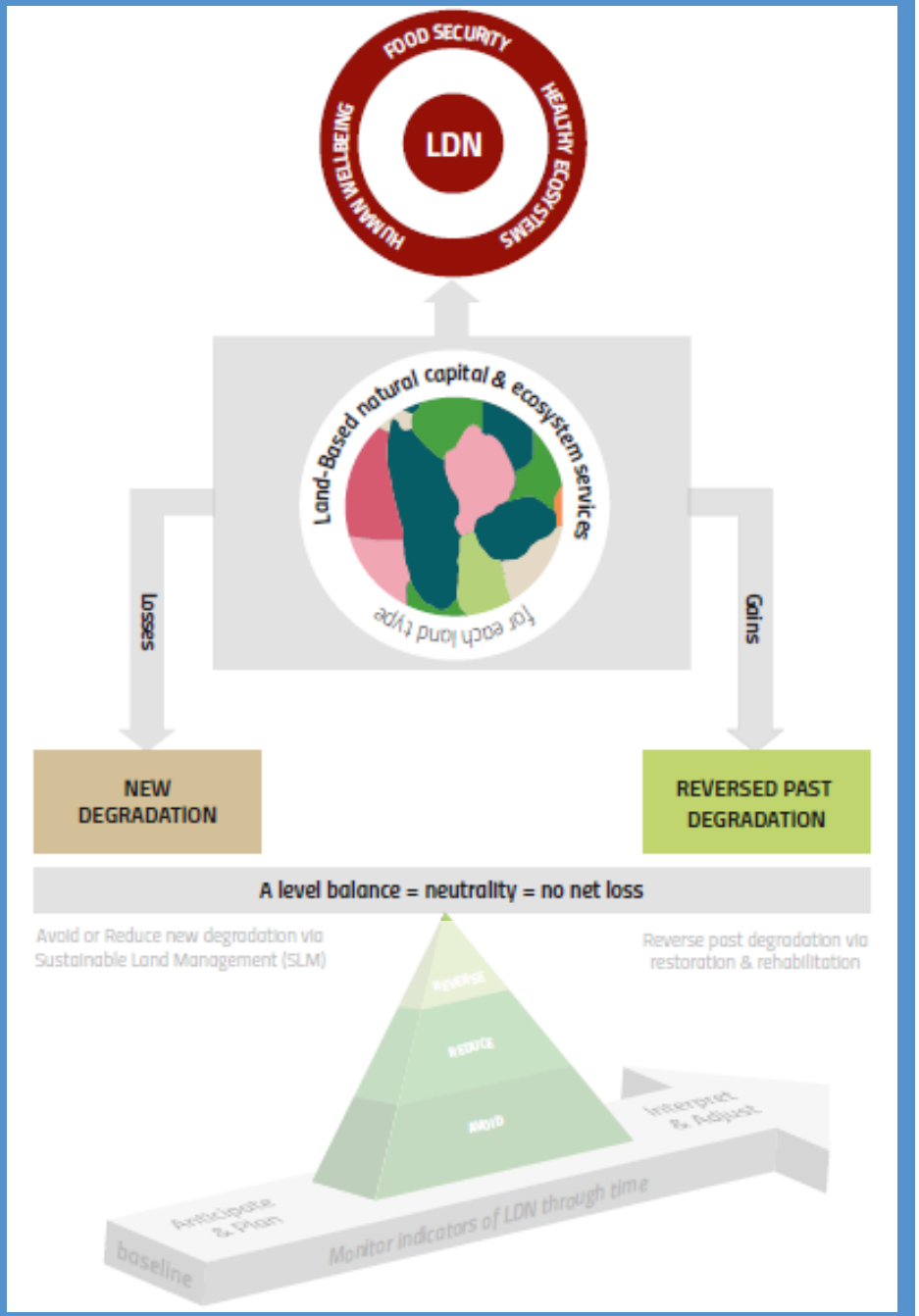
# Vision of LDN

**In LDN, what do we want to maintain?**

In order to achieve healthy ecosystems, food security and human wellbeing, we want to maintain **land-based natural capital and the ecosystem services that flow from it…**

**…for each land type**
(a principle of LDN known as "**like for like**")

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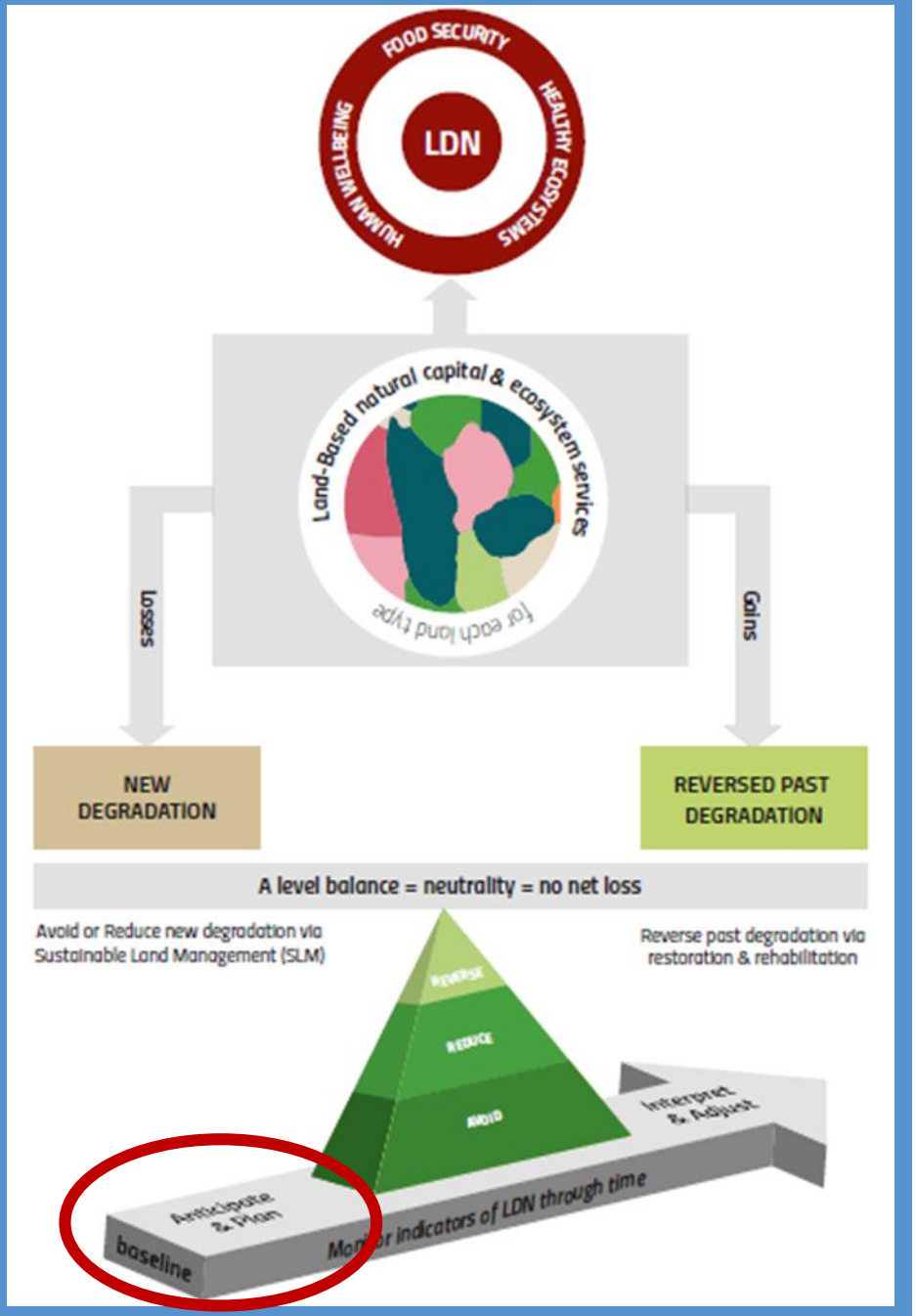
# Mechanism for achieving neutrality

Neutrality = ***no net loss*** compared to the reference state (baseline)

Baseline is NOW (current condition)

**Counterbalancing** future land degradation (anticipated **losses**) through planned measures to achieve equivalent **gains** elsewhere within the same **land type**

“like for like”

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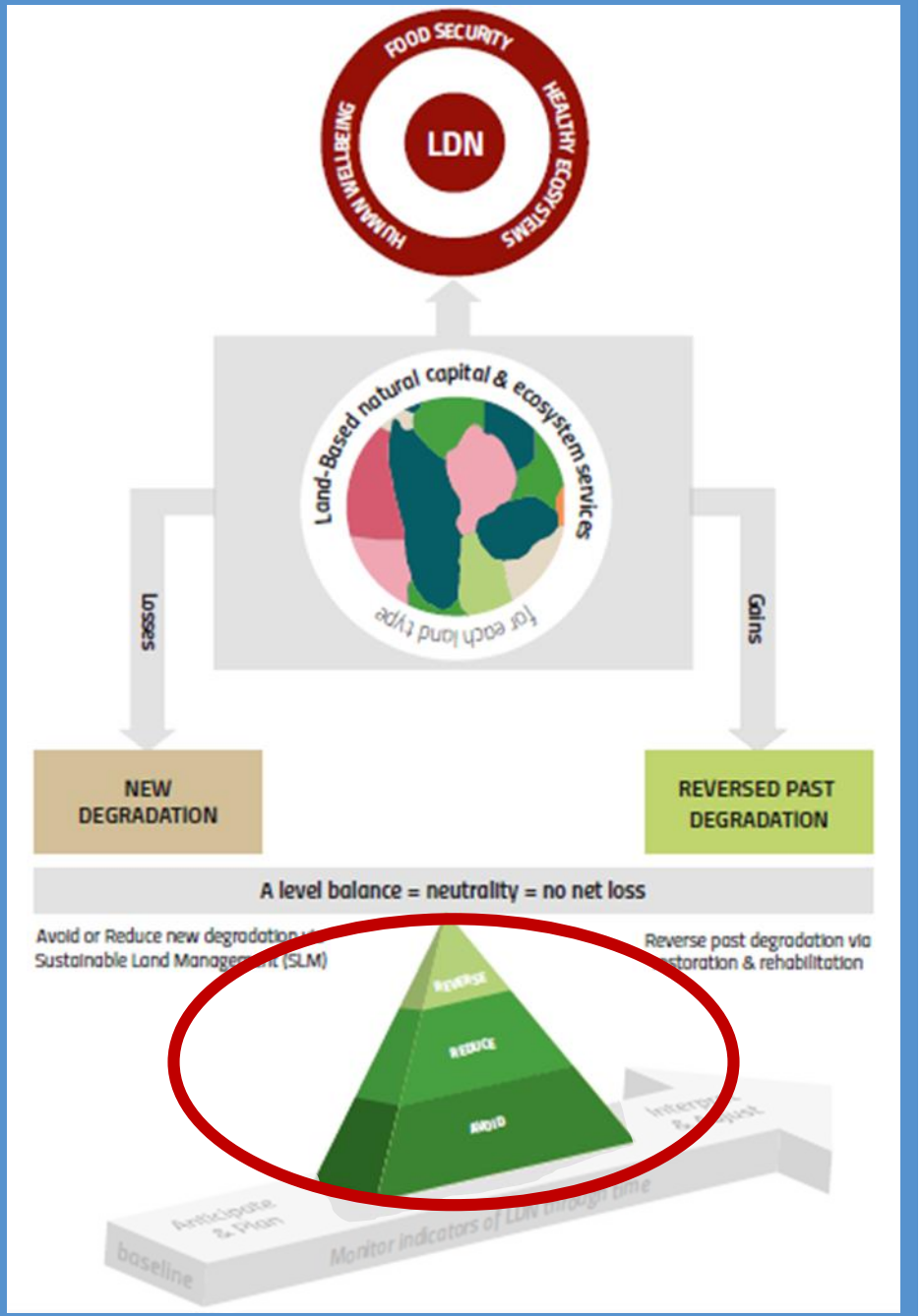
# Integrated land use planning

LDN planning involves anticipating where degradation is likely so that the optimal mix of interventions across the landscape to achieve neutrality can be pursued.

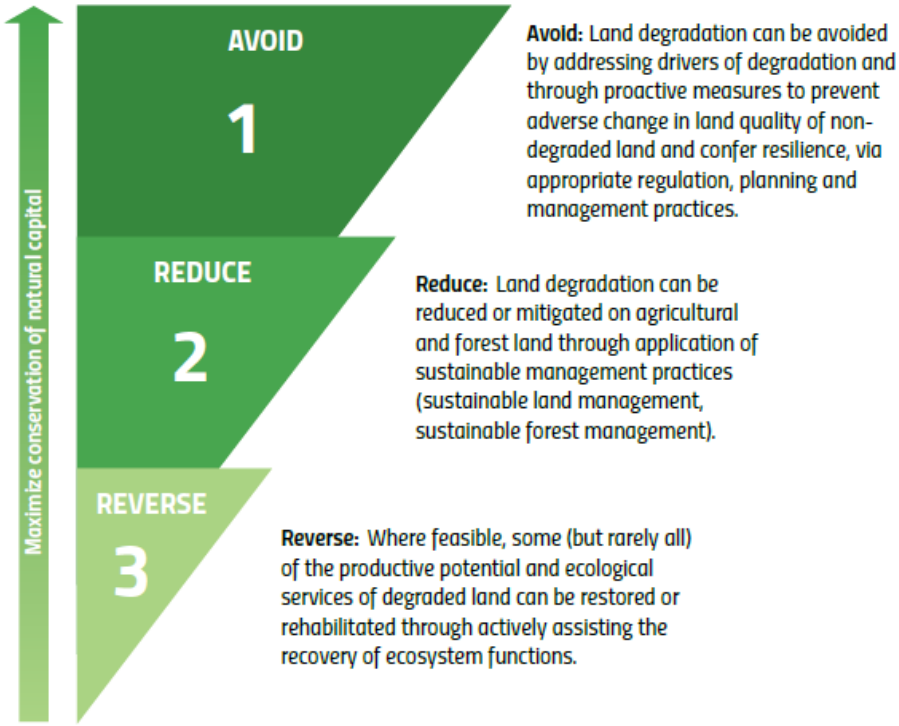
Leverage existing land use planning

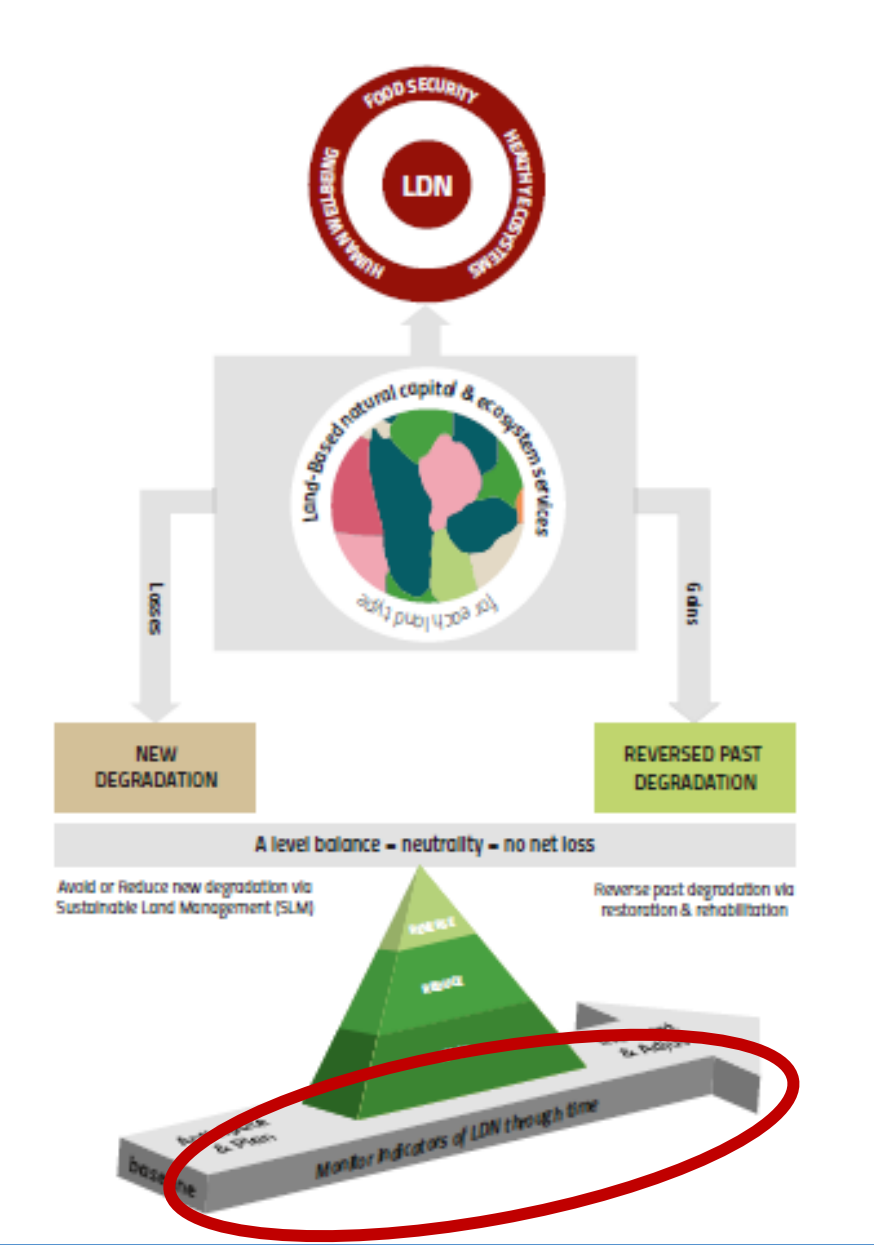



# Response Hierarchy

*Prevention is better than cure*

Avoiding degradation is the highest priority, followed by reducing degradation and finally reversing past degradation



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# Monitoring LDN status

Monitoring LDN is designed to tell us how we are doing so that mid-course corrections can be made in our land use and management planning.

While the indicators used for monitoring can be also be used for the preliminary assessments, it is important to recognize these are two entirely independent processes.

# Mandate for SO 1-4 (from Decision 22/COP.11)

Requests the secretariat to **provide** affected country **Parties with national estimates** of each respective metrics of the progress indicators **based on available data sources**

*and*

urges affected country **Parties to subsequently verify or replace** these national estimates using data sourced/computed nationally/locally


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# Round 1: the indicators, their metrics, and the global default data sets contributed

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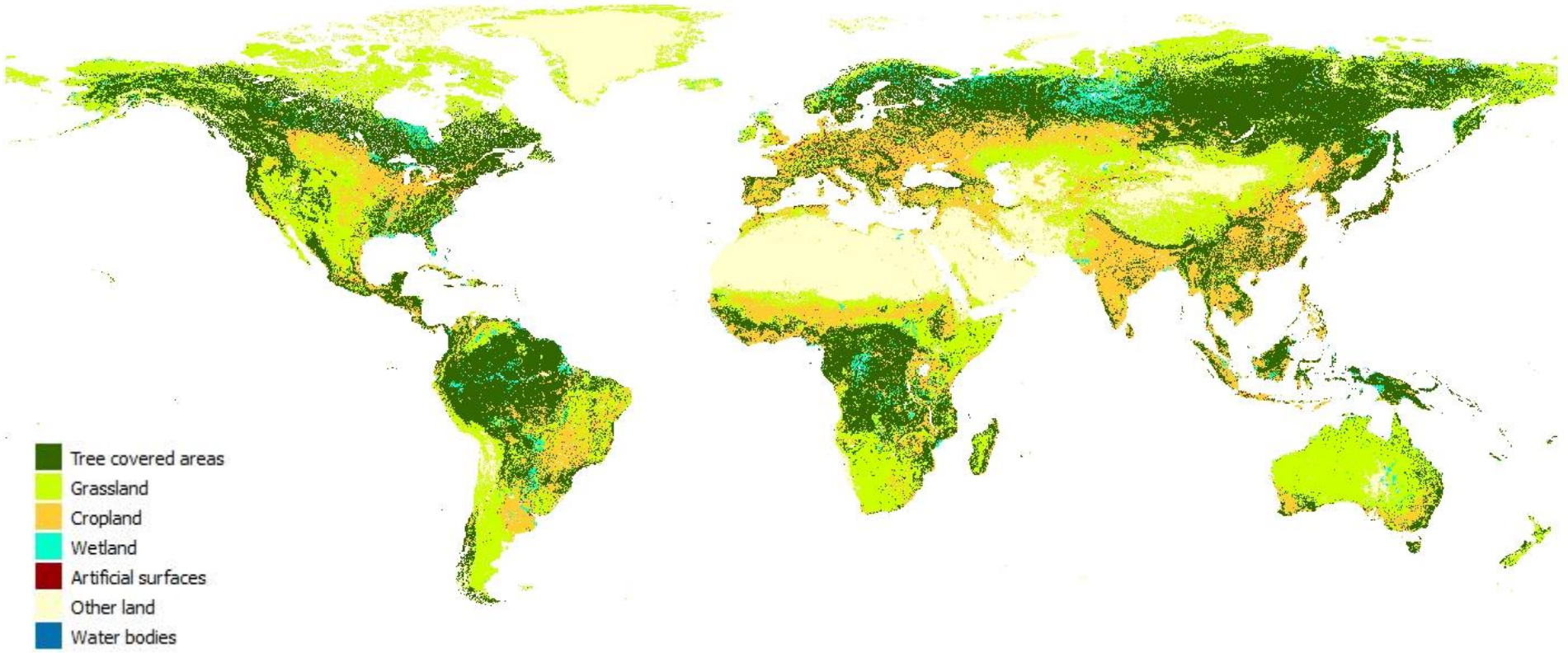
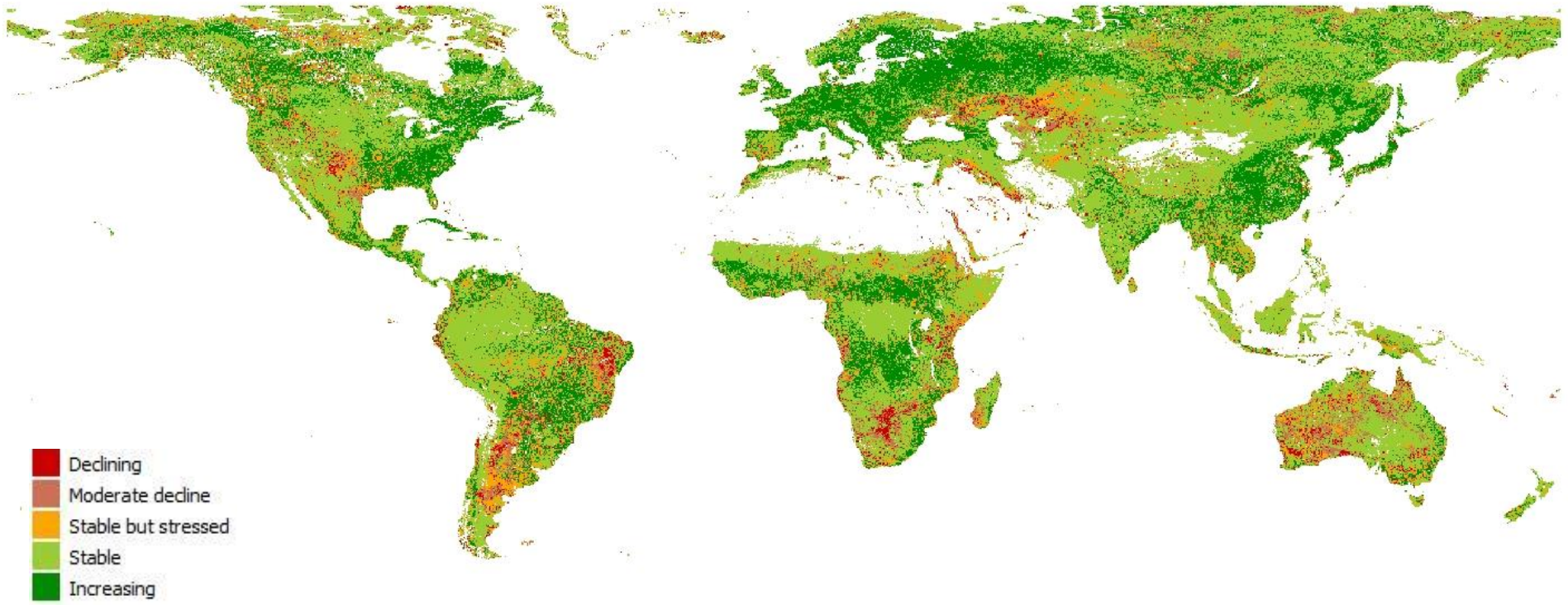
| Indicator | Metrics | Data sources |
|---|---|---|
| SO1-1: Trends in land cover | Land cover change | ESA Climate Change Initiative Land Cover dataset (http://maps.elie.ucl.ac.be/CCI/viewer/)<br>• 300m resolution<br>• Temporal coverage:<br>  • 3 epochs 2000, 2005 and 2010 (v 1.6.1) → Used for LDN TSP<br>  • annual maps from 1992-2015, released in April 2017 (v 2.0.7) → made available to all countries for UNCCD reporting<br>• 22 classes → aggregated to 6 classes for UNCCD reporting |
| SO1-2: Trends in land productivity or functioning of the land | Land productivity dynamics (LPD) | JRC LPD (http://wad.jrc.ec.europa.eu/)<br>• 1 km resolution<br>• Temporal coverage: 1999-2013<br>• 5 classes |
| SO1-3: Trends in carbon stocks above and below ground | Soil organic carbon (SOC) stocks | ISRIC SoilGrids250 (https://soilgrids.org/#!/?layer=TAXNWRB_250m&vector=1)<br>• 250 m resolution<br>• Temporal coverage: Based on legacy soil data points. Change estimates based on land cover data<br>• Continuous data |

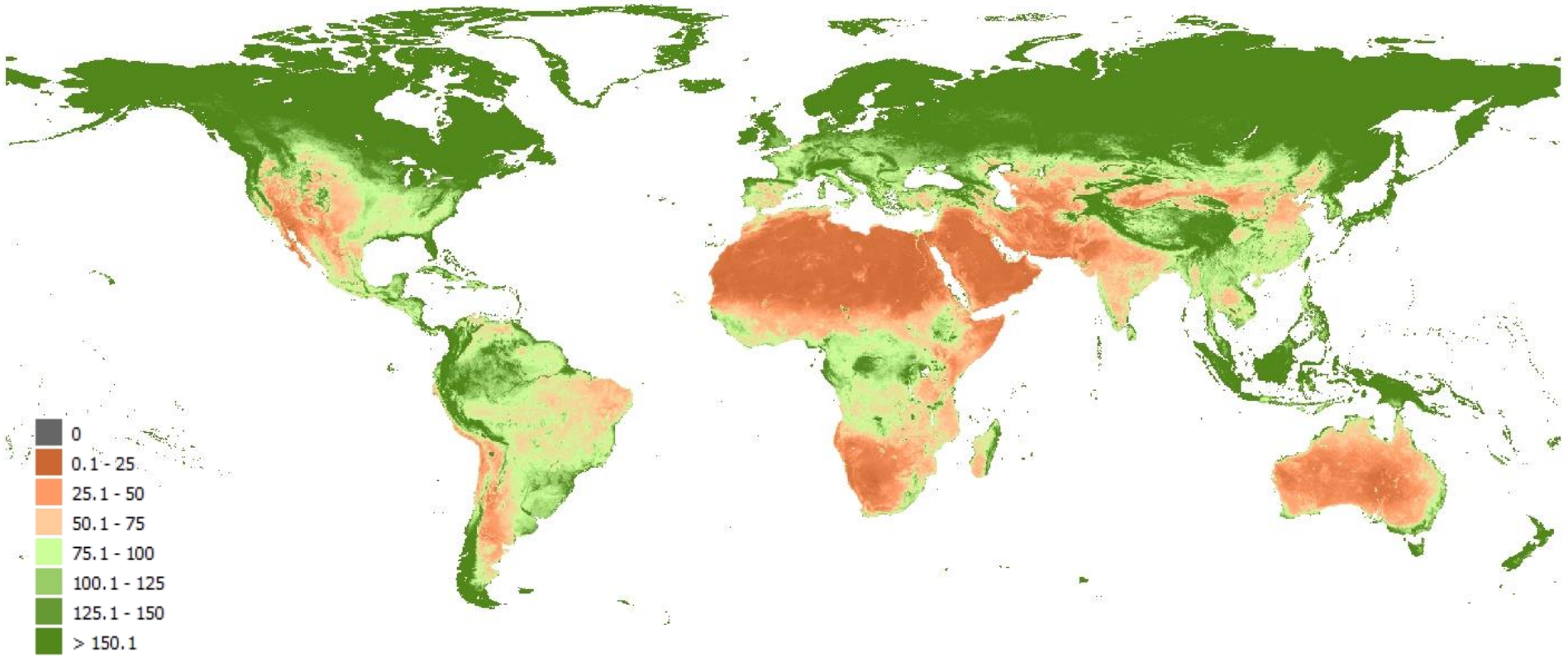
# Default global Land Cover data



# Default Land Productivity Dynamics data



# Default global Soil Organic Carbon stocks data



# Monitoring the LDN indicators


| A Map of Land Types (Land Type "A" = Grassland) | Context* | Metric values at Baseline (t0) | Decisions | Metric values in Future (t1) | Gains vs. Losses (t1 - t0) |
|---|---|---|---|---|---|
| A1 | **A1**<br>**Land Area:** 15,000 ha<br>**Use:** short grazing period<br>**Status:** Not Degraded | **Land Cover:** Grassland<br>NPP=11.7 tDM/ha/yr<br>SOC=54.5 tC/ha | Grazing period extended | Land Cover: Grassland<br>NPP=7.1 tDM/ha/yr<br>SOC=53.9 tC/ha | **Loss:** 15,000 ha significant degradation |
| A2 | **A2**<br>**Land Area:** 25,000 ha<br>**Use:** grazing excluded<br>**Status:** Not Degraded | **Land Cover:** Grassland<br>NPP=12.8 tDM/ha/yr<br>SOC=63.6 tC/ha | Livestock exclusion maintained | Land Cover: Grassland<br>NPP=13.1 tDM/ha/yr<br>SOC=63.8 tC/ha | **No Change in LDN Status 25,000 ha stable** |
| A3 | **A3**<br>**Land Area:** 10,000 ha<br>**Use:** long grazing period<br>**Status:** Degraded | **Land Cover:** Grassland<br>NPP=6.5 tDM/ha/yr<br>SOC=51.1 tC/ha | Long grazing period continued | Land Cover: Grassland<br>NPP=3.9 tDM/ha/yr<br>SOC=40.7 tC/ha | **Loss:** 10,000 ha significant degradation |
| A4 | **A4**<br>**Land Area:** 40,000 ha<br>**Use:** med. grazing period<br>**Status:** Degraded | **Land Cover:** Grassland<br>NPP=10.3 tDM/ha/yr<br>SOC=47.6 tC/ha | Sustainable grazing management introduced | Land Cover: Grassland<br>NPP=10.8 tDM/ha/yr<br>SOC=51.2 tC/ha | **Gain:** 40,000 ha significant improvement |
| A5 | **A5**<br>**Land Area:** 10,000 ha<br>**Use:** short grazing period<br>**Status:** Not Degraded | **Land Cover:** Grassland<br>NPP=11.9 tDM/ha/yr<br>SOC=54.6 tC/ha | Urban expansion | Land Cover: Urban<br>NPP=7.1 tDM/ha/yr<br>SOC=54.3 tC/ha | **Loss:** 10,000 ha significant degradation |

**Land Degradation Neutrality Status (t1-t0):**
**Net Gain:** 5,000 ha

**Metrics**

**Land Cover:** nationally refined land potential class where change in class may be characterized as positive or negative

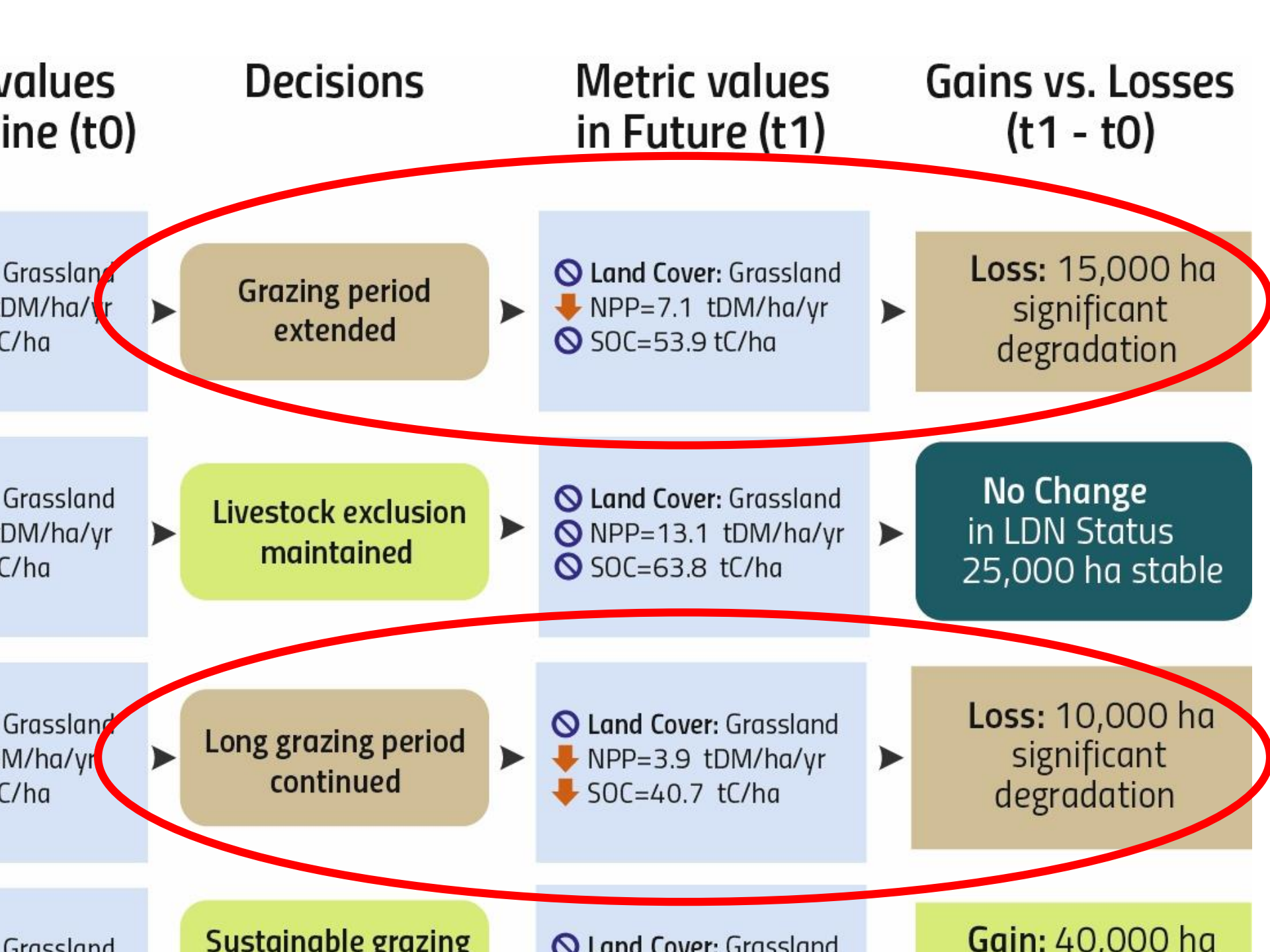
**NPP level** (tDM/ha/yr, where a change in the absolute value may be positive or negative

**SOC stock** (tC/ha, to 30 cm) where a change in the absolute value may be positive or negative

**NPP** = Net Primary Productivity
**SOC** = Soil Organic Carbon
**DM** = dry matter

**Legend**

- No significant change in the metric
- Significant positive change in the metric
- Significant negative change in the metric
- Stable (no change)
- Degraded land or negative change
- Not degraded land or postive change


values
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Decisions
Metric values
in Future (t1)
Gains vs. Losses
(t1 - t0)
Grassland
DM/ha/yr
C/ha
Grazing period extended
Land Cover: Grassland
NPP=7.1 tDM/ha/yr
SOC=53.9 tC/ha
Loss: 15,000 ha
significant
degradation
Grassland
DM/ha/yr
C/ha
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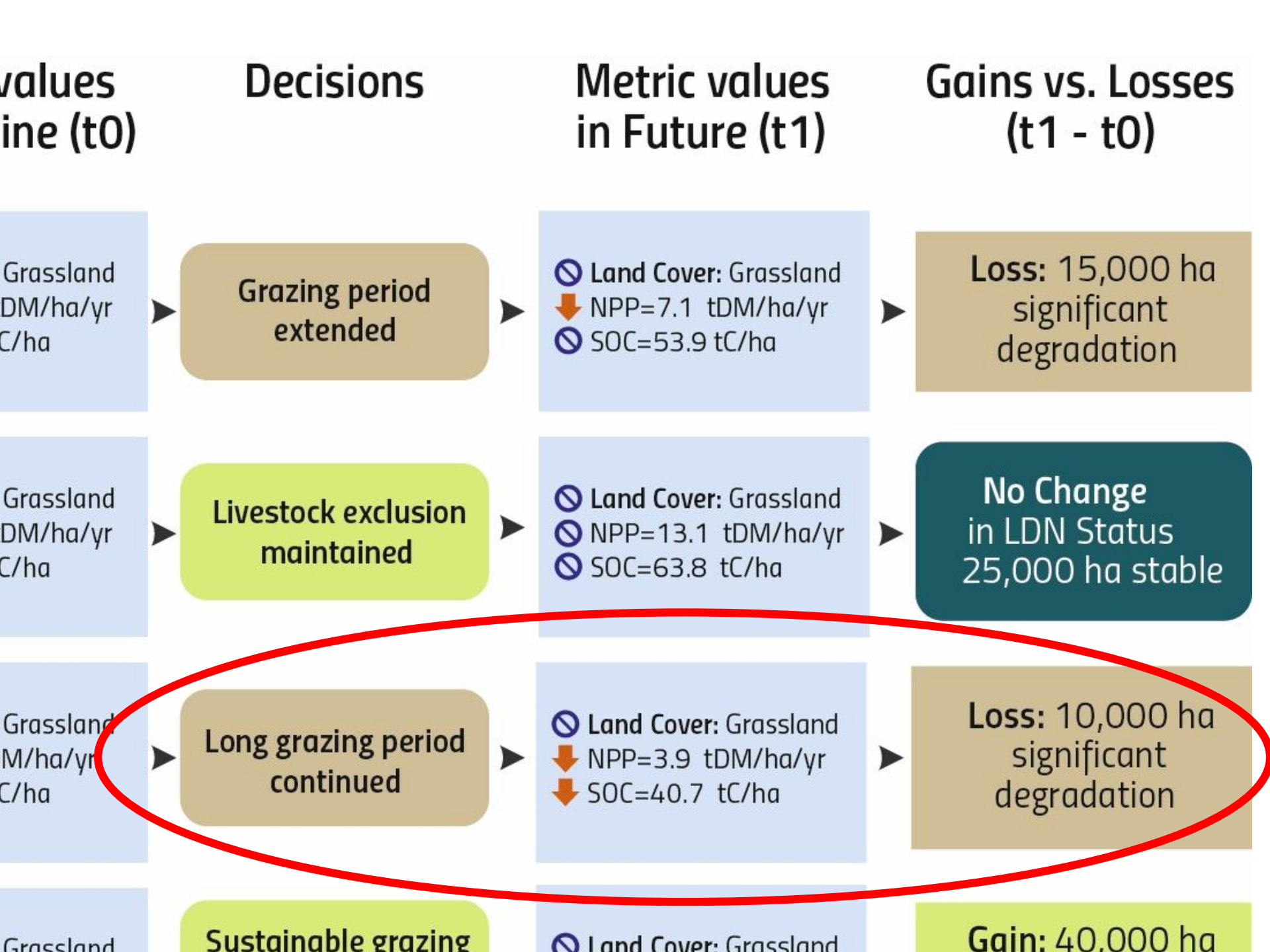
Grassland
Sustainable grazing
Land Cover: Grassland
Gain: 40,000 ha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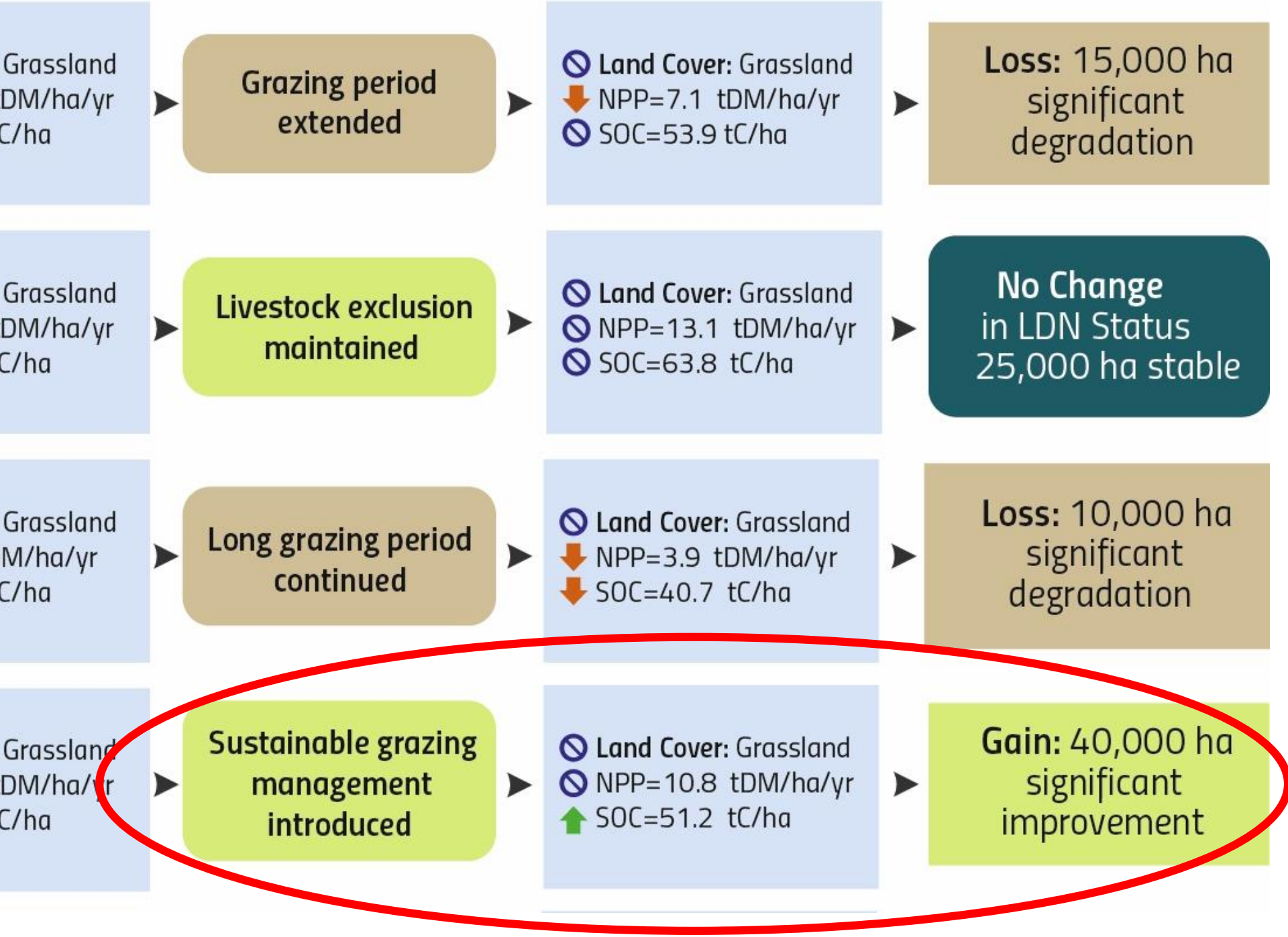
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Gain: 40,000 ha significant improvement

# Proportion degraded land definition

SDG Target 15.3:

"By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation neutral world"

SDG Indicator 15.3.1:

Proportion of land that is degraded over total land area.

→ Upgraded in November 2017 by IAEG-SDG to Tier 2 status

→ (i.e. "Indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries")

# *One out all* out rule

- A location is considered degraded if at least one of the three indicators shows a negative change (i.e. is degraded).
- This is the **'one out, all out'** method of indicator integration
- A precautionary measure - stability or improvements in land condition in any one indicator cannot compensate for degradation in the others.
- Applied because the indicators are complementary – not additive.

# Convergence of UNCCD and SDG reporting

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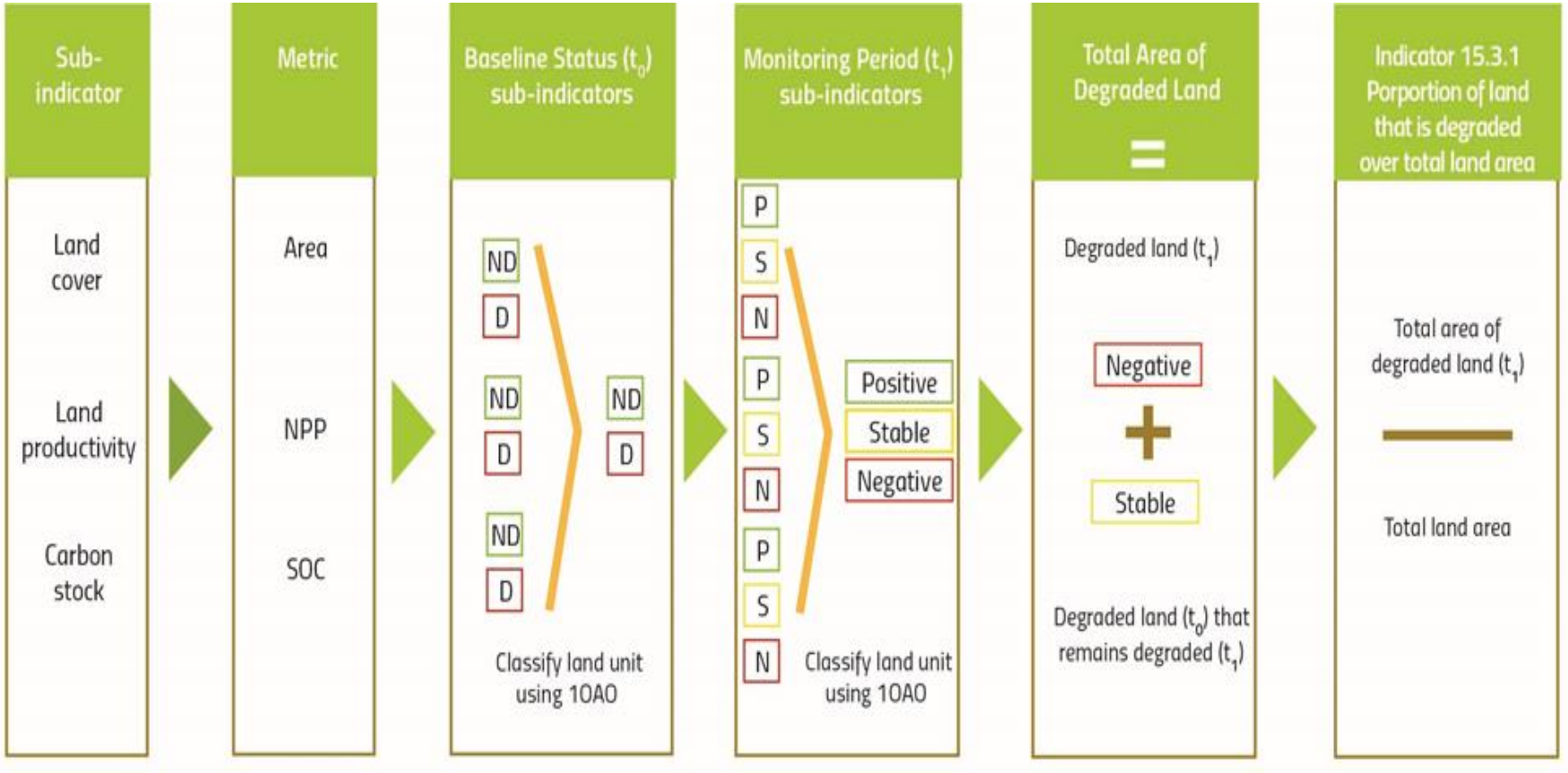
## Deriving SDG Indicator 15.3.1



# What has been the response of countries?

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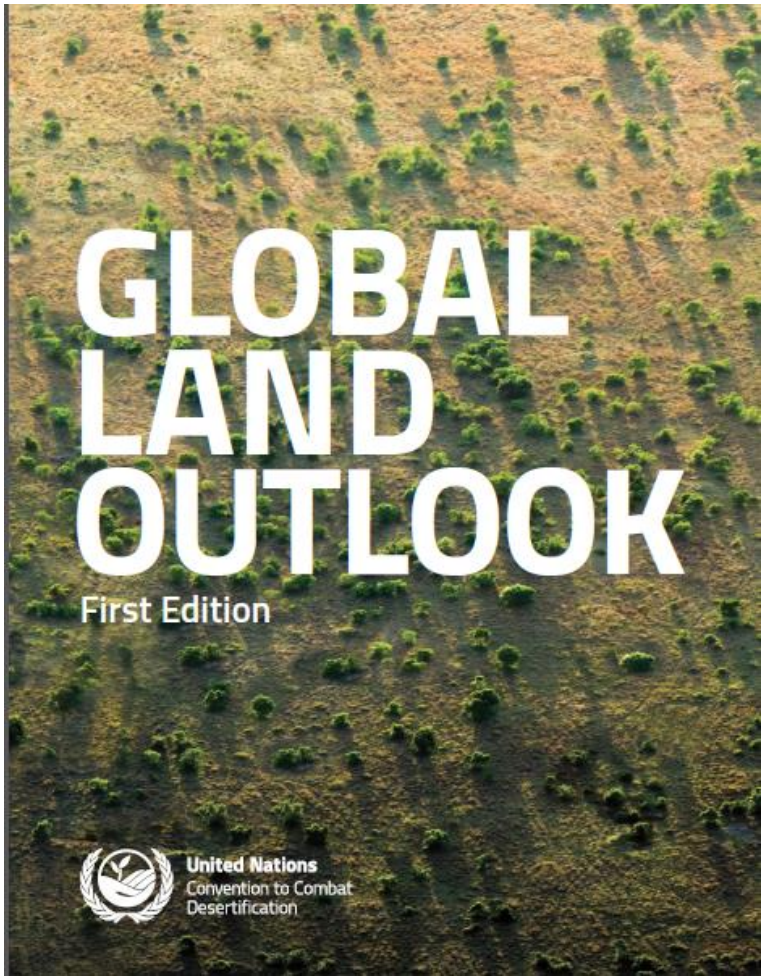
120 countries have committed to set LDN targets

25 countries target adopted by Governments

140 countries have submitted official reports, many with data on LDN indicators

# Monitoring SDG 15.3.1 will not be enough

- **Land is finite in quantity. Competing demands for its goods and services are increasing pressures on land resources in virtually every country.**
- **1/3 of the land is degraded mostly in the last 20 years**
- **Over 1.3 billion people trapped on degrading agricultural land.**
- **Consumption of natural resources doubled in 30 years**
- **3 planets to meet 2050 natural resource demands**




**…we need to be contributing at the point where land use planning decisions are made**

# Land can be an accelerator for all SDGs

**Conservation, sustainable management and restoration**

A focus on the conservation, sustainable management and restoration of the land base is the central tenet of a more secure future

**Land use planning at landscape level**

Multiple partners working together at a landscape scale to achieve food and water security, biodiversity conservation, climate mitigation and adaptation and sustainable cities


**Creating the enabling environment**

Addressing massive global economic inequality, lack of tenure security, unequal gender relationships, particularly in agriculture, and the need for long-term work for small farmers

**Increased efficiency and the reduction of waste**

A focus on efficient agriculture to reduce pollution and resource use, renewable energy sources, and sustainable levels of production and consumption

# …yet many of the SDGs

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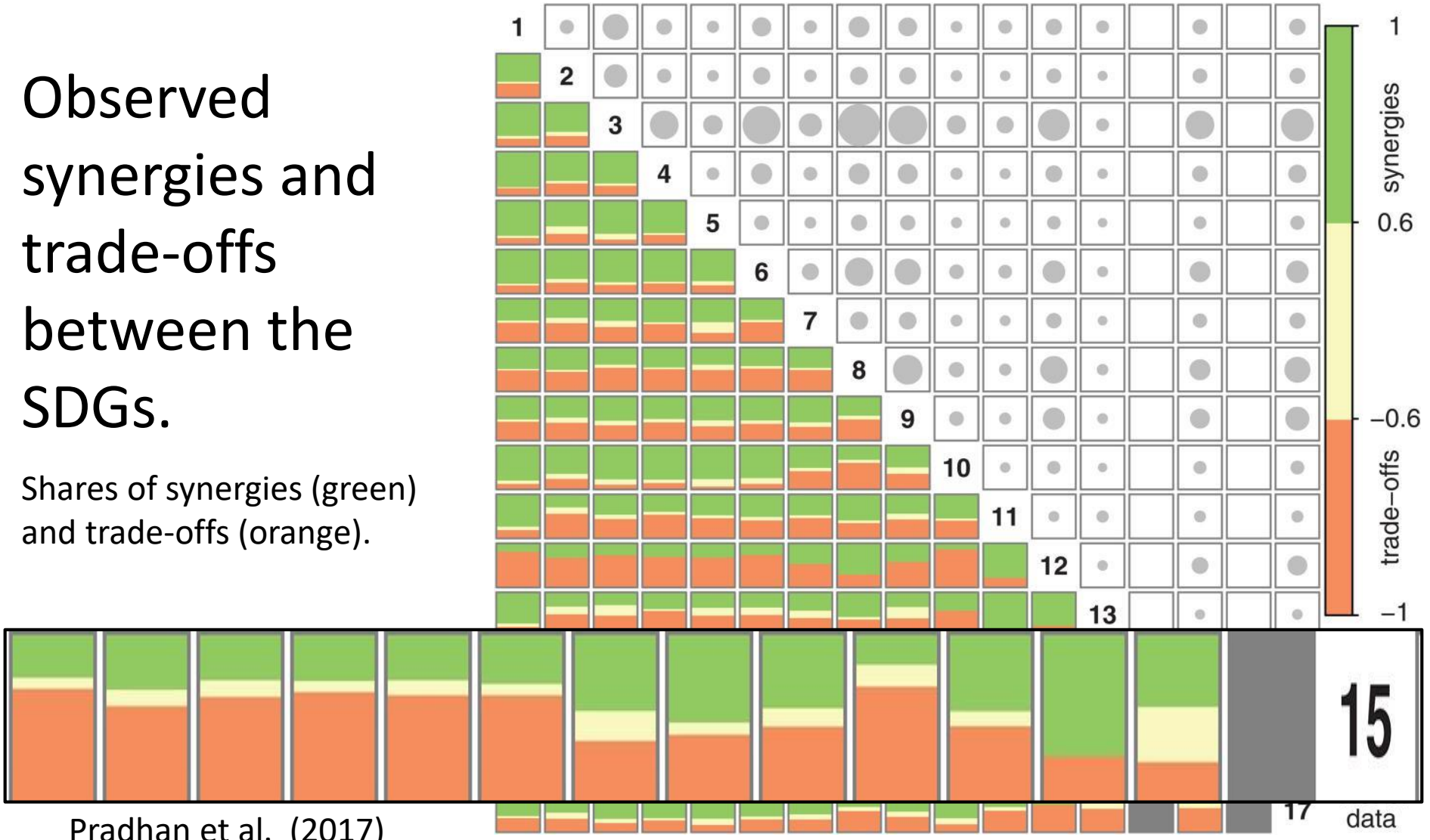
# …compete for the same land resources

# Synergies also mean trade-offs

Observed synergies and trade-offs between the SDGs.

Shares of synergies (green) and trade-offs (orange).




Pradhan et al. (2017)

Source: Figure 2 doi:10.1002/2017EF000632

# The top synergies among SDGs are not surprising

Pradhan et al. (2017)



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Source: Figure 3 doi:10.1002/2017EF000632

# …and the top trade-offs should not be surprising either

Pradhan et al. (2017)



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Source: Figure 3 doi:10.1002/2017EF000632

# A clear need for data and tools to help navigate the inevitable SDG trade-offs

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# Next steps

## Leverage the contributions of shareholders and stakeholders to support the Steering Committee and 3 Working Groups

- **WG1: to build capacities at the (sub) national level**
- **WG2: to develop minimum data quality standards-specifications**
  - technical support for setting quality standards
  - global consultation to revise Good Practice Guidance
- **WG3 to work to establish a federated collaborative platform**
  - help pilot big data analytics tools/integrate in-situ data

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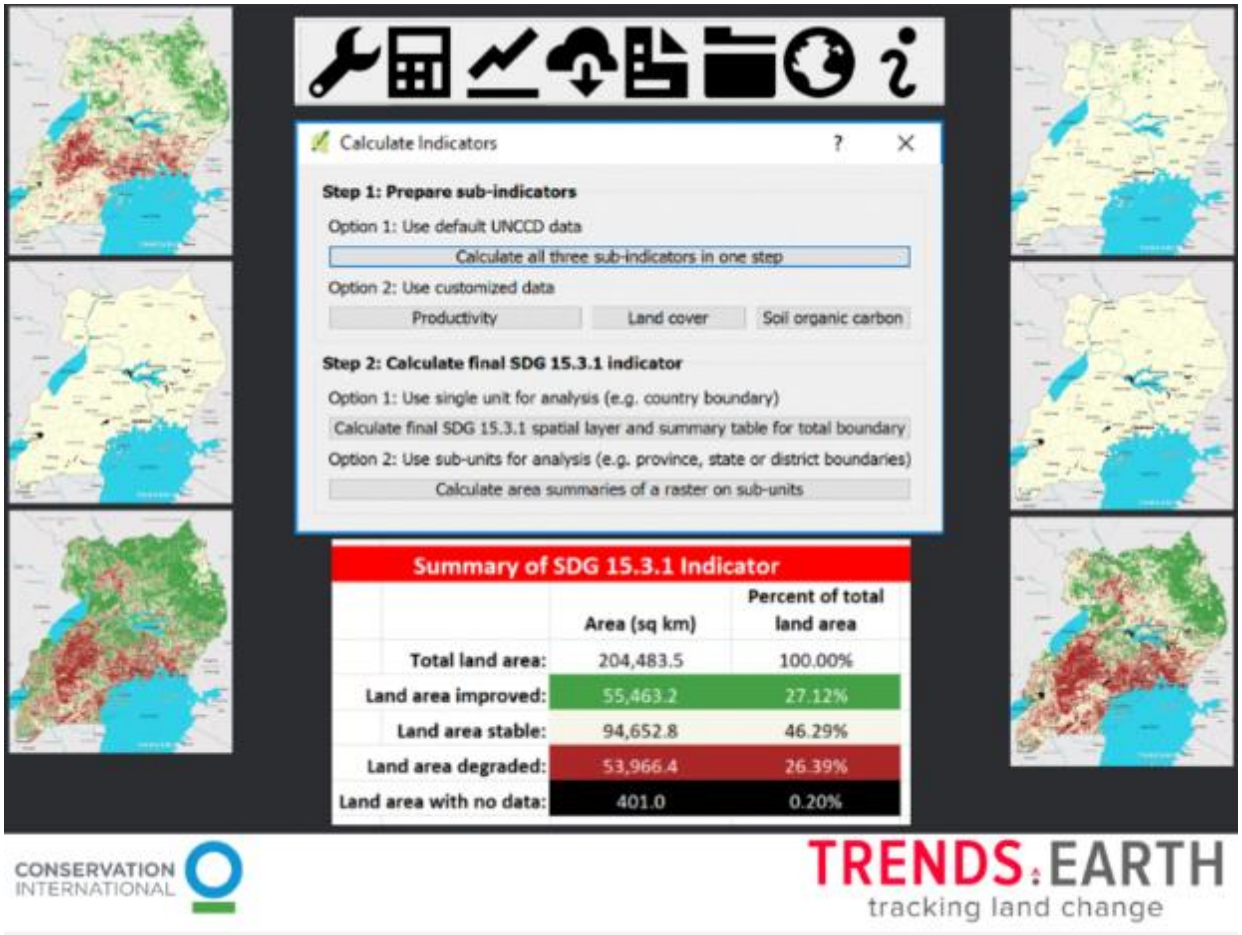
# With the right tools…

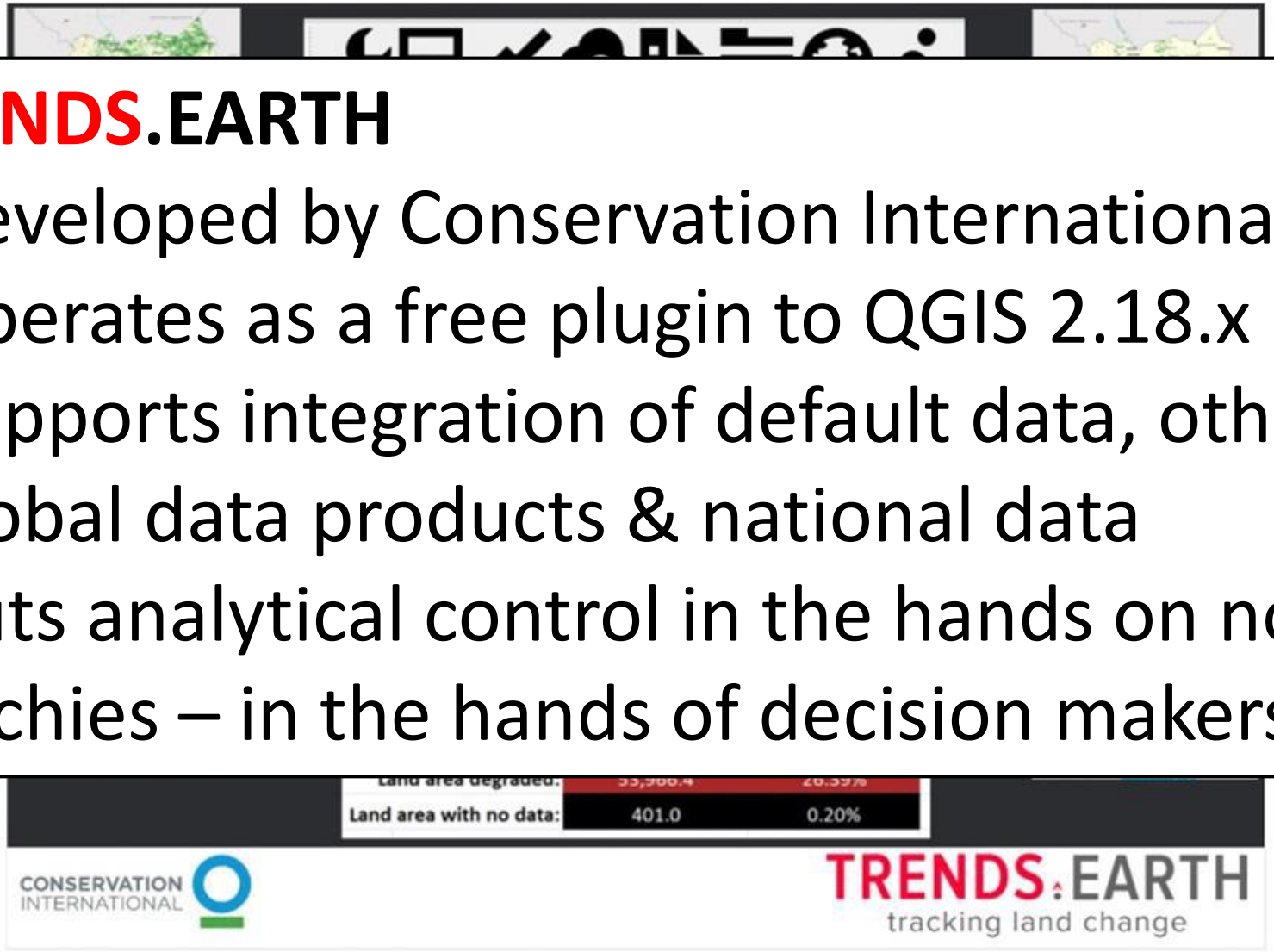



TRENDS.EARTH
tracking land change
from Conservation International

# …the competing tensions of "standards" and "ownership" can be reconciled

LAND DEGRADATION NEUTRALITY

# Tools and momentum




## TRENDS.EARTH

- Developed by Conservation International
- Operates as a free plugin to QGIS 2.18.x
- Supports integration of default data, other global data products & national data
- Puts analytical control in the hands on non-techies – in the hands of decision makers

# Thank you!

**Web: www.unccd.int**

**Twitter: @UNCCD**

**Facebook: www.facebook.com/UNCCD**

# Further information


- Orr, B.J., A.L. Cowie, V.M. Castillo Sanchez, P. Chasek, N.D. Crossman, A. Erlewein, G. Louwagie, M. Maron, G.I. Metternicht, S. Minelli, A.E. Tengberg, S. Walter, and S. Welton (2017). **Scientific Conceptual Framework for Land Degradation Neutrality. A Report of the Science-Policy Interface.** http://www2.unccd.int/publications/scientific-conceptual-framework-land-degradation-neutrality

- UNCCD/Science-Policy Interface (2016). **Land in Balance: Scientific Conceptual Framework for Land Degradation Neutrality. Science-Policy Brief** 02- September 2016. http://www.unccd.int/Lists/SiteDocumentLibrary/Publications/10_2016_spi_pb_multipage_eng.pdf

- Cowie, A.L., Orr, B.J., Sanchez, V.M.C., Chasek, P., Crossman, N.D., Erlewein, A., Louwagie, G., Maron, M., Metternicht, G.I., Minelli, S. and Tengberg, A.E., (2018)**. Land in balance: The scientific conceptual framework for Land Degradation Neutrality**. Environmental Science & Policy, **79**, pp.25-35. https://www.sciencedirect.com/science/article/pii/S1462901117308146