

Global Bioenergy Partnership

Environmental Indicators of Sustainable Bioenergy Production and Use

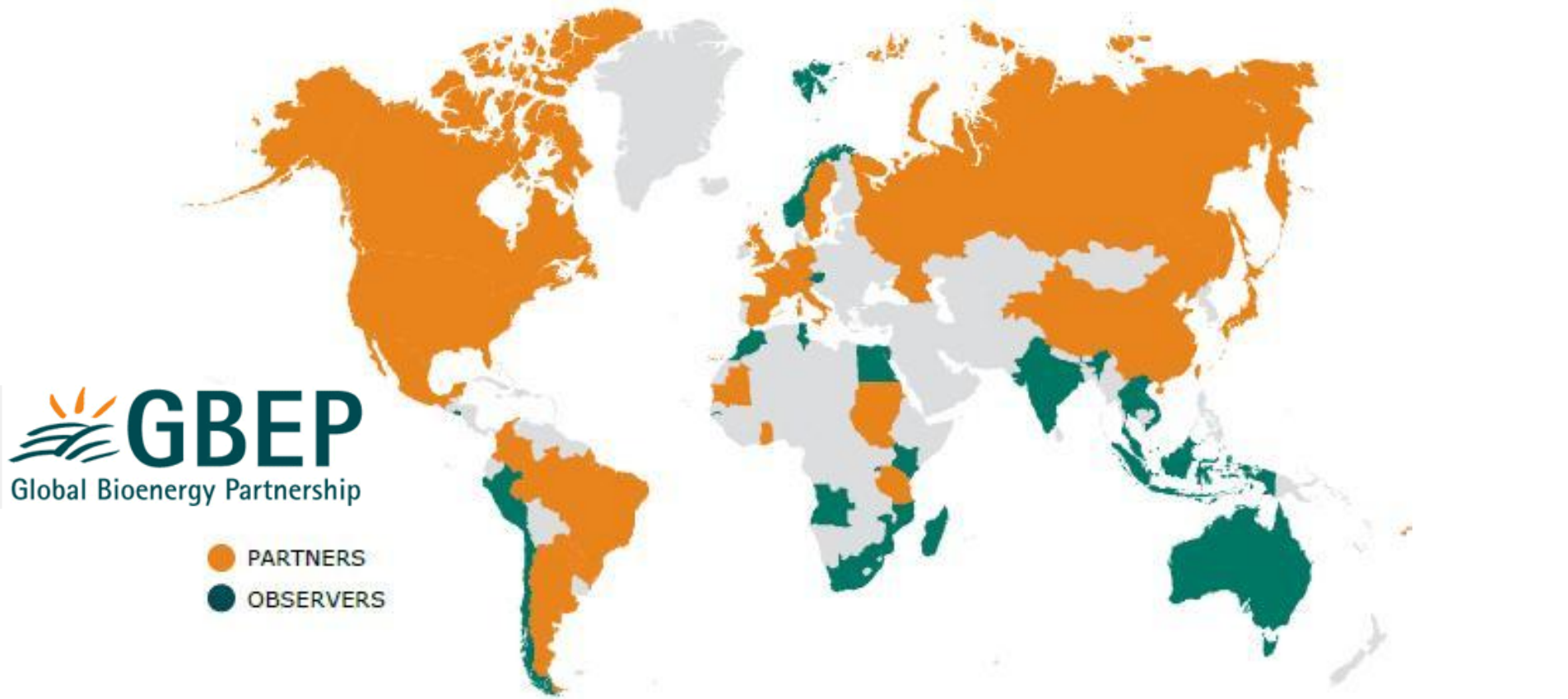
ECOWAS Regional Bioenergy Forum

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GBEP promotes best practices in bioenergy to diverse international stakeholders



Please join us in our work to promote access to clean, renewable energy.



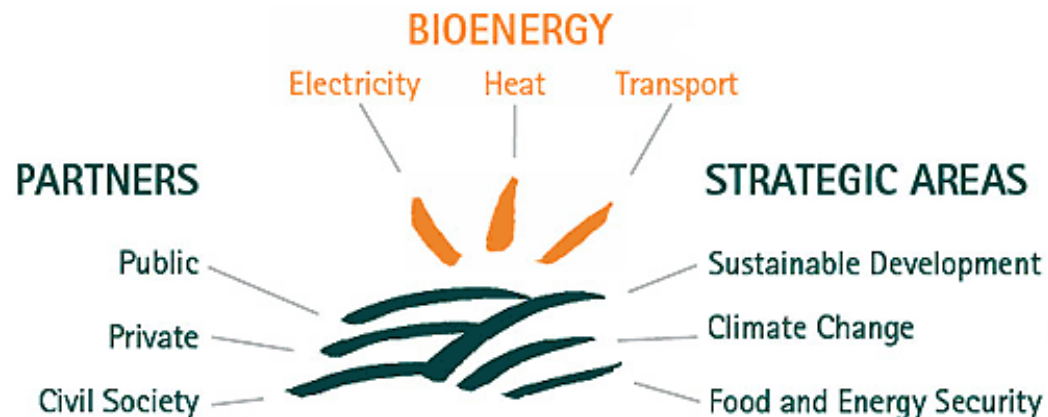
The Global Bioenergy Partnership was founded by the G8 to promote bioenergy development

2005 GBEP founded to promote “**the continued development and commercialisation of renewable energy ... particularly in developing countries where biomass use is prevalent**”.

2007 GBEP creates a **Task Force on Sustainability** to develop criteria and indicators of sustainable bioenergy development.

2011 GBEP releases Version 1 of its **Methodological Framework for GHG Lifecycle Analysis of Bioenergy**

2012 GBEP publicly releases report on **24 indicators of sustainable bioenergy production and use**



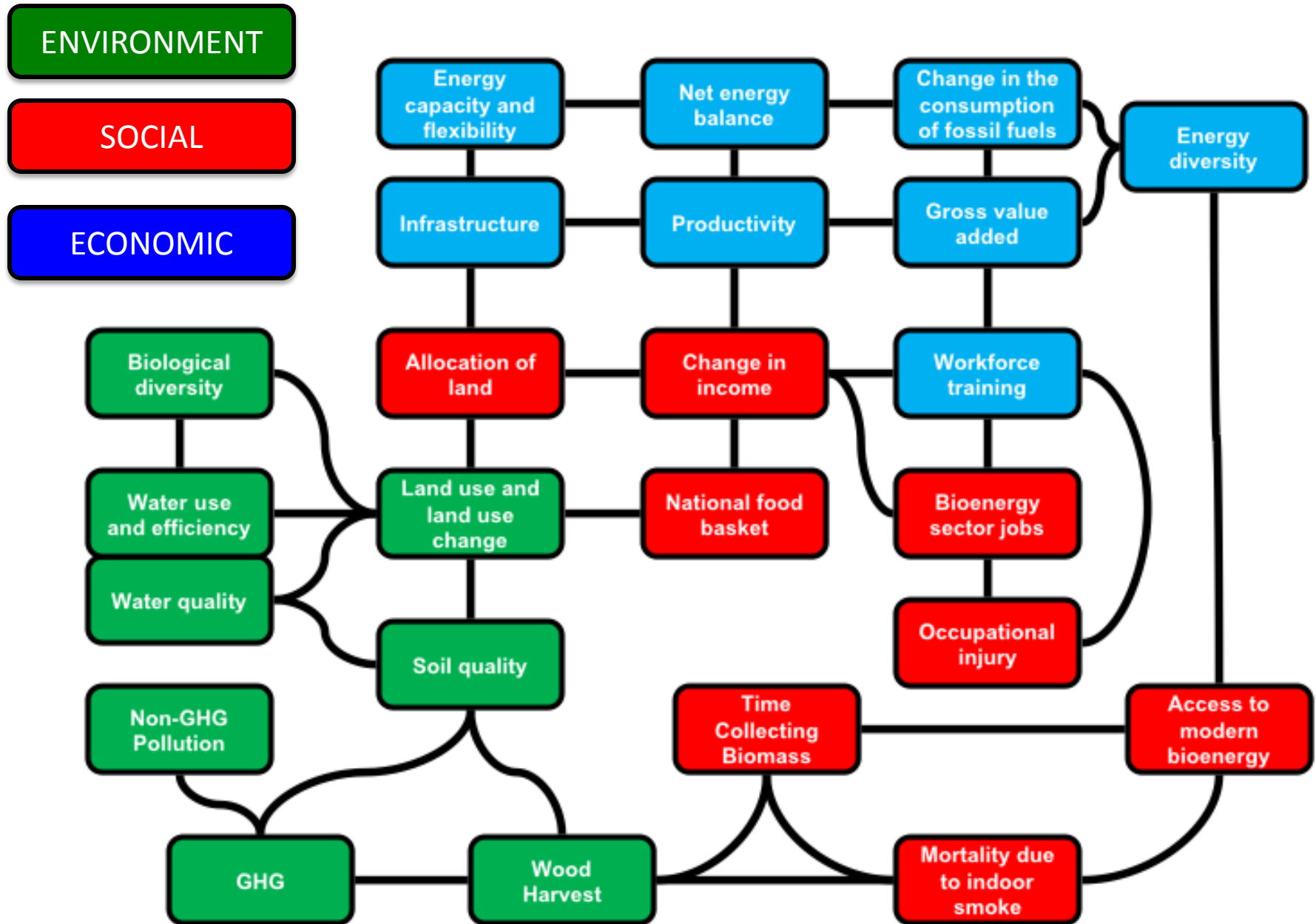
Ambition of the GBEP sustainability indicators

1. GBEP is the only initiative seeking to build consensus among a broad range of national governments and international institutions on the sustainability of bioenergy.
2. The GBEP sustainability indicators do not feature directions, thresholds or limits and do not constitute a standard; nor are they legally binding on GBEP Partners.
3. Measured over time, the indicators will show progress towards or away from a sustainable development path as determined nationally.

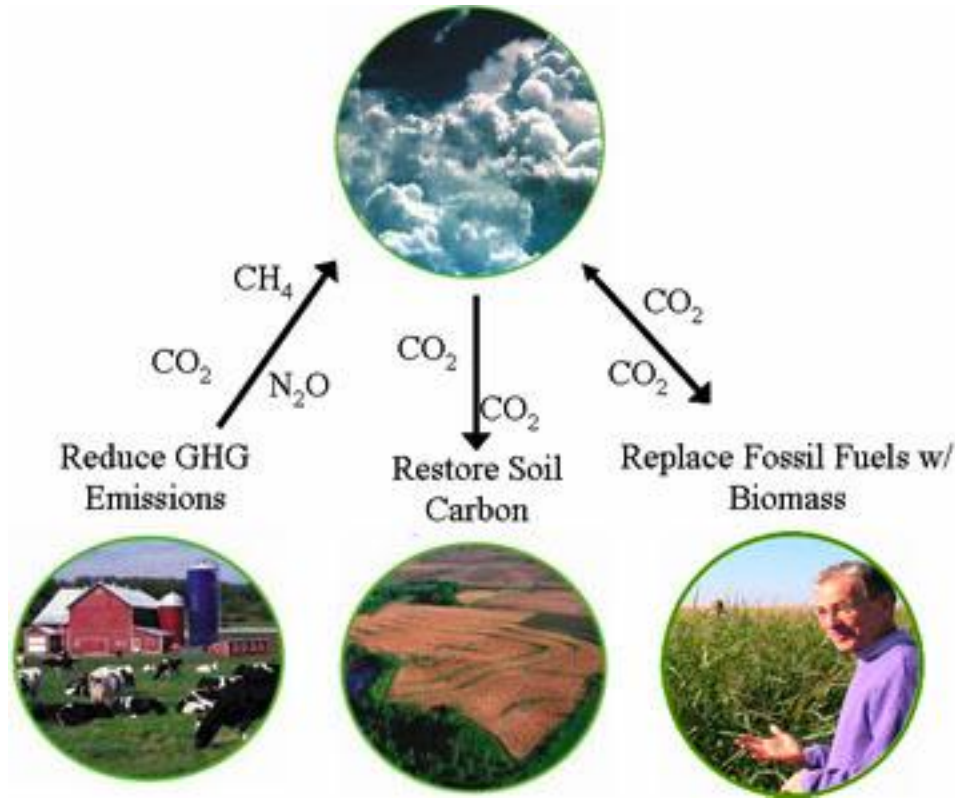
GBEP sustainability themes

ENVIRONMENTAL	SOCIAL	ECONOMIC
Environmental quality	Human health	Energy security
Land Use	Social Welfare	Economic development

GBEP indicators provide a holistic approach to sustainability



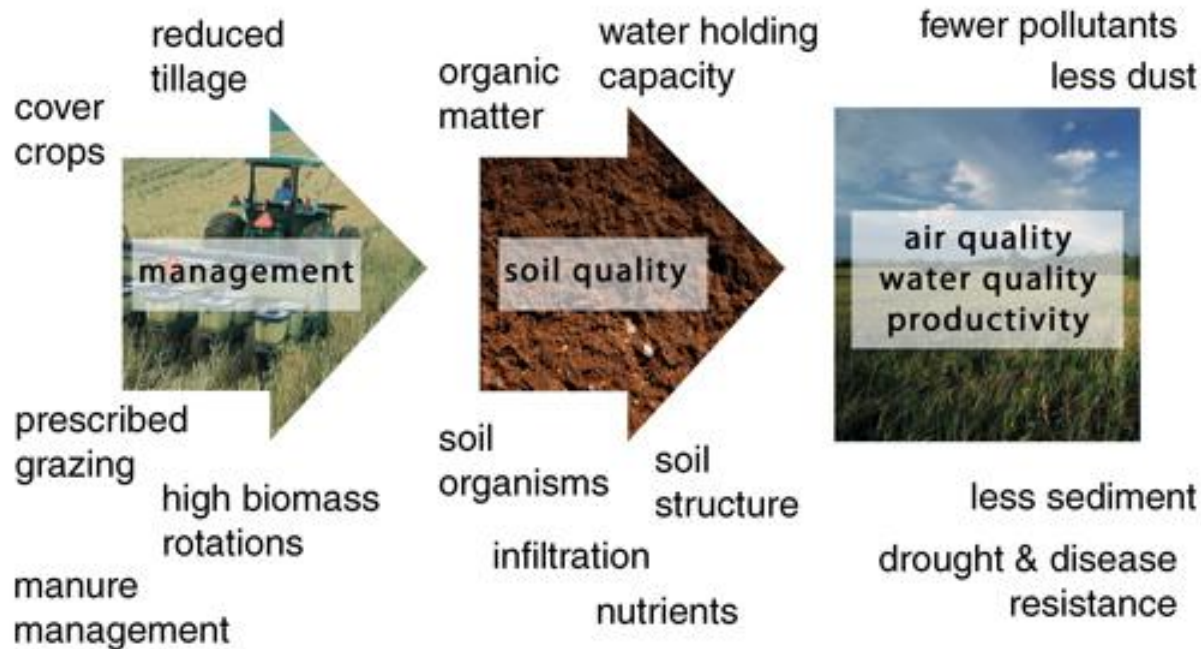
Indicator 1 - Lifecycle Green House Gas Emissions



Lifecycle greenhouse gas emissions from bioenergy production and use, as per the methodology chosen nationally or at community level, and reported using the GBEP Common Methodological Framework for GHG Lifecycle Analysis of Bioenergy 'Version One'

Indicator 2 - Soil quality

Managing soil organic matter is the key to air and water quality.



Percentage of land for which soil quality, in particular in terms of soil organic carbon, is maintained or improved out of total land on which bioenergy feedstock is cultivated or harvested

Indicator 3 - Harvest levels of wood resources



Annual harvest of wood resources by volume and as a percentage of net growth or sustained yield, and the percentage of the annual harvest used for bioenergy

Indicator 4 – Emissions of non-GHG air pollutants, including air toxics



Emissions of non-GHG air pollutants, including air toxics, from
(4.1) bioenergy feedstock production,
(4.2) processing,
(4.3) transport of feedstocks, intermediate products and end products, and
(4.4) use;
and in comparison with other energy sources

Indicator 5 - Water Use and Efficiency



(5.1) Water withdrawn from nationally-determined watershed(s) for the production and processing of bioenergy feedstocks, expressed

(5.1a) as the percentage of total actual renewable water resources (TARWR) and

(5.1b) as the percentage of total annual water withdrawals (TAWW), disaggregated into renewable and non-renewable water sources;

(5.2) Volume of water withdrawn from nationally-determined watershed(s) used for the production and processing of bioenergy feedstocks per unit of bioenergy output, disaggregated into renewable and non-renewable water sources

Indicator 6 – Water quality



(6.1) Pollutant loadings to waterways and bodies of water attributable to fertilizer and pesticide application for bioenergy feedstock production, and expressed as a percentage of pollutant loadings from total agricultural production in the watershed

(6.2) Pollutant loadings to waterways and bodies of water attributable to bioenergy processing effluents, and expressed as a percentage of pollutant loadings from total agricultural processing effluents in the watershed

Indicator 7 - Biological diversity in the landscape

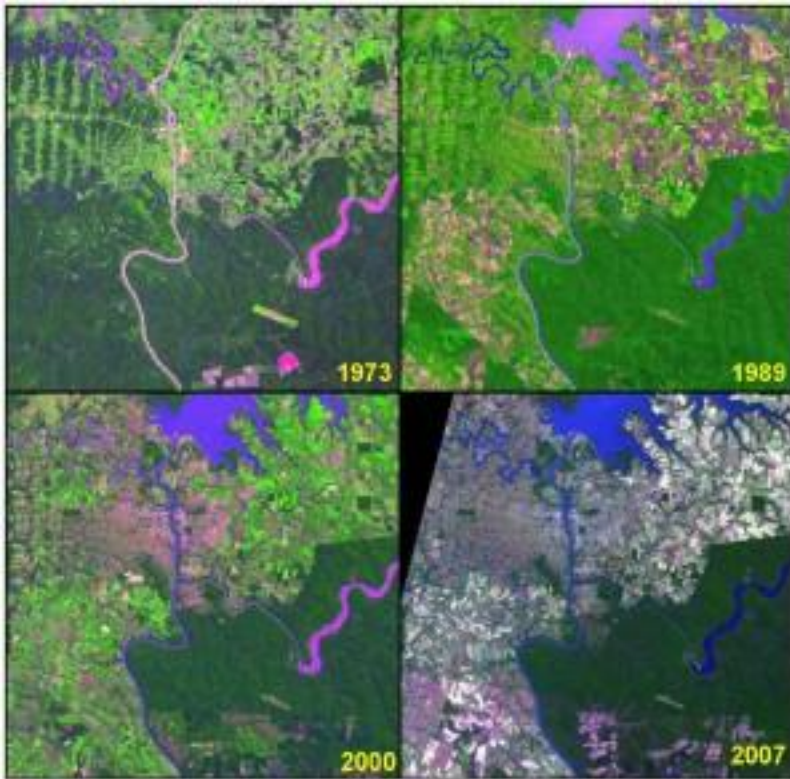


(7.1) Area and percentage of nationally recognized areas of high biodiversity value or critical ecosystems converted to bioenergy production;

(7.2) Area and percentage of the land used for bioenergy production where nationally recognized invasive species, by risk category, are cultivated;

(7.3) Area and percentage of the land used for bioenergy production where nationally recognized conservation methods are used

Indicator 8 – Land use and land-use change related to bioenergy feedstock production*



Land use change near the confluence of the Parana and Iguazu Rivers (Argentina, Brazil, Paraguay).

- (8.1) Total area of land for bioenergy feedstock production, and as compared to total national surface and (8.2) agricultural land and managed forest area
- (8.3) Percentages of bioenergy from: (8.3a) yield increases, (8.3b) residues, (8.3c) wastes, (8.3d) degraded or contaminated land
- (8.4) Net annual rates of conversion between land-use types caused directly by bioenergy feedstock production, including the following (amongst others):
- arable land and permanent crops, permanent meadows and pastures, and managed forests;
 - natural forests and grasslands (including savannah, excluding natural permanent meadows and pastures), peatlands, and wetlands

Evaluating the indicators in concert will provide essential data

