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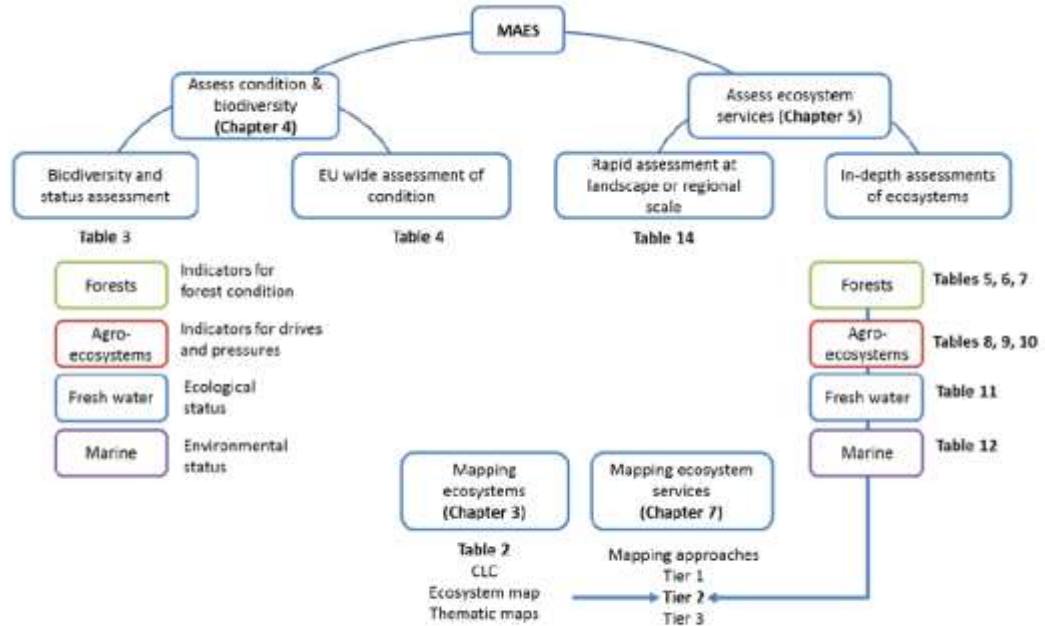
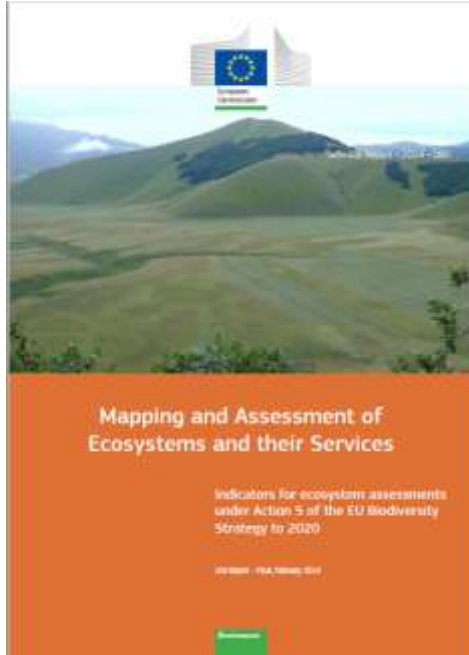
NORWEGIAN INSTITUTE OF
BIOECONOMY RESEARCH

Ecosystem services connected to peatlands and their climate change issues

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MAES; Mapping and Assessment of Ecosystems and their Services



Quick guidance for mapping and assessing ecosystems and their services

Section	Division	Group	Class eng	Indicator/s	Unit
Provisioning	Nutrition	Biomass	Cultivated crops	1. Net primary production; 2. Ecosystem state	1. kg/ha/year; 2. state unit
			Reared animals and their outputs	1. Number of animals; 2. Ecosystem state?	1. n/ha
			Wild plants, algae and their outputs	1. Usage of plant biomass/amount of plan biomass; 2. Ecosystem state	1. kg/ha/year; 2. state unit
			Wild animals and their outputs	1. Usage of animal biomass/amount of animal biomass	1. kg/ha;
		Water	Ground water for drinking	1. Public water supply; 2. Groundwater recharge rate	1. Mill. m3/year; m3/capita 2. m3/ha (?); l/sec
	Materials	Biomass	Fibers and other materials	1. Raw material input per capita; 2. Raw materials consumption per capita; 3. Total biomass	1. t/capita; 2. t/capita; 3. t/ha
			Genetic materials from all biota	1. Species diversity	1. Number of species
		Water	Surface water for non-drinking purposes	1. Total gross fresh water abstraction from fresh surface water?	1. mln m3/year
			Ground water for non-drinking purposes*	1. Groundwater recharge rate	1. mill m3/ha; mln m3/year
		Other	Mineral resources	1. Minerals available for extraction	1. t/ha; t/year
	Energy	Biomass-based energy sources	Plant and animal-based resources for energy	1. Net primary production; 2. Ecosystem state	1. kg/ha, t/yr; 2. state unit
		Mechanical energy	Animal-based mechanical energy*	n.a	n.a.
		Abiotic energy	Abiotic energy sources	1. Abiotic energy potential	GW/ha or %



Section	Division	Group	Class eng	Indicator/s	Unit
Regulation & Maintenance	Mediation of waste, toxics and other nuisances	Mediation by ecosystems	Regulation of pollution and other impacts	1. Green infrastructure; 2. Leaf area index; 3. Ecosystem state ?	1. % of area?; 2. ?
		Mediation of flows	Mass flows	Regulation of erosion and other solid substances	1. Vegetation cover; 2. Average annual soil loss ; 3. relative part of territory with risk of erosion
	Liquid flows		Water flow maintenance and flood protection	1. Water storage capacity 2. Riparian vegetation	1. m3/ha; 2. ?; 4. %
	Gaseous/air flows		Regulation of air flows and atmospheric risks*	Wind speed > 14 m/sec	number
	Maintenance of physical, chemical, biological conditions		Lifecycle maintenance, habitat and gene pool protection	Pollination and seed dispersal	1. Species number and amount of polinators
		Pest and Disease control	Pest and disease control	1.Population of biological disease and pest control agents; 2. Potential habitats to control agents	1. n/ha; 2. ha/ha
		Soil formation and composition	Regulation of soil formation and composition*	1. Soil degradation; 2.Soil organic matter?	1. soil degradation index; 2. %
		Atmospheric composition and climate regulation	Global climate regulation by reduction of greenhouse gas concentrations	1. Organic matter (C) stock total; 2. Ecosystem state	1. total t CO2 eq/ha (t C/ha); 2.
			Micro and regional climate regulation	1. Vegetation cover; 2. Pond area	1. %; 2. ha/ha

Section	Division	Group	Class eng	Indicator/s	Unit
Cultural	Spiritual, symbolic and other interactions with biota and ecosystems	Physical and experiential interactions	Recreation	1. Number/area of ecosystems with recreation potential; 2. Number of facilities; 3. Number of visitors	1. number / ha/ha; 2. number; 3. number
		Intellectual and representative interactions	Scientific and Educational	1. Biotic diversity indicators; 2. Number of publications	1. number
			Cultural heritage	1. Number and significance of cultural monuments etc.; 2. Number of visitors	1. n/ha; 2. number
	Spiritual, symbolic and other interactions with biota and ecosystems	Spiritual and/or emblematic	Aesthetic and spiritual*	1. Evaluation from questionnaires ; 2. Number of arts portraying ecosystem	1. expert score; 2. number
		Other cultural outputs	Existence and bequest*	1. Evaluation from questionnaires	1. expert score



Guidance Manual for TEEB country studies



The [Guidance Manual](#) for "The Economics of Ecosystems and Biodiversity" (TEEB) Country Studies was launched by UNEP and partners during the Trondheim Conference on Biodiversity, 28 May 2013. The [Guidance Manual](#) was developed following requests from countries interested in undertaking a TEEB country study, in order to achieve their development goals whilst at the same time sustainably managing their natural resources.

This [TEEB Manual](#) provides both technical and operational guidance on how countries may conduct a TEEB Country Study. It outlines the various steps that may be taken to initiate and implement a country study, communicate its findings, and implement the recommendations of the study.

The [Guidance Manual](#) is part of the TEEB implementation project "Reflecting the Values of Ecosystems and Biodiversity in Policy-making", financed by the European Commission, which will support the implementation of TEEB in five developing countries over a period of three years. It will ensure the methodological coherence of the project. The [Guidance Manual](#) was developed by UNEP, the Helmholtz Centre for Environmental Research (UFZ), Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ) and the Institute for European Environmental Policy (IEEP) among others.

Download the [Guidance Manual TEEB Country Studies](#) [here](#).

To contact us if you have further questions or comments, send an email to teeb@unep.org

RESOURCES

- [Guidance Manual for TEEB country studies](#)
- [Case studies](#)
- [Training Resource Material](#)
- [Glossary of terms](#)
- [Ecosystem Services](#)
- [Useful links](#)

Latest Publications

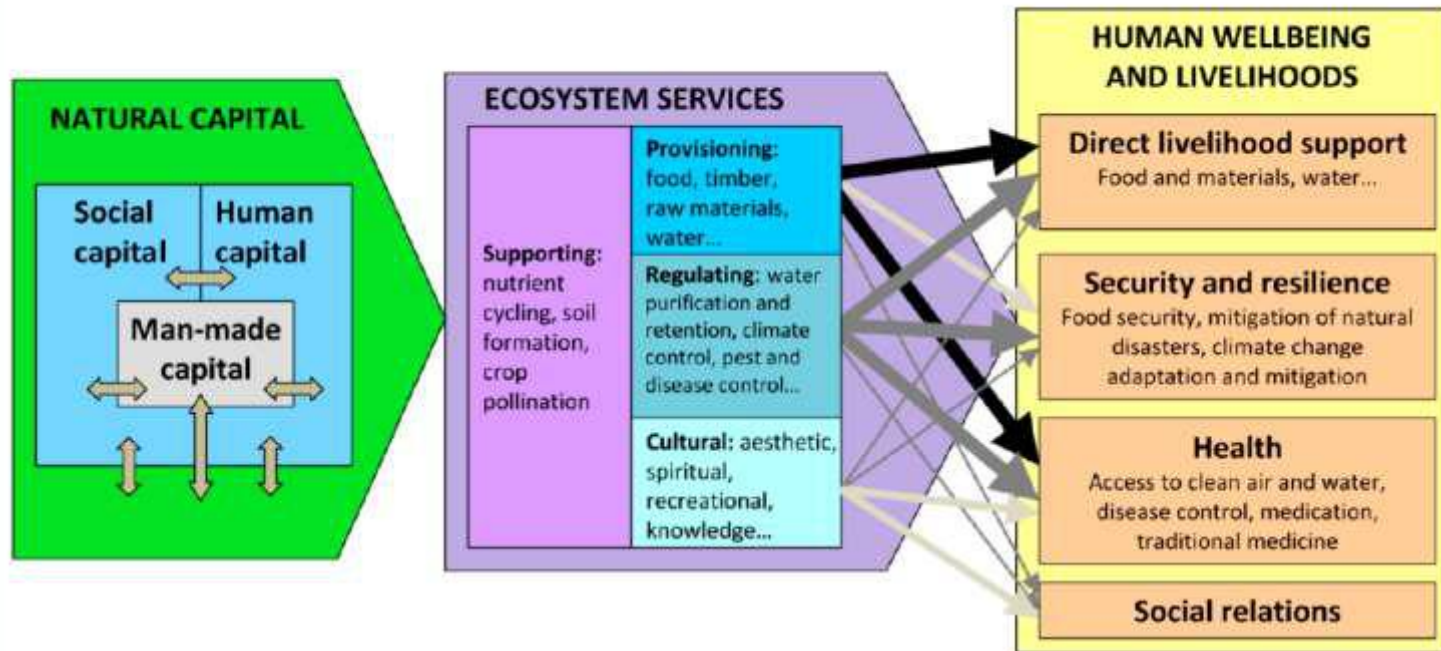


TEEB AgriFood Interim Report

The [Interim Report](#) introduces the key questions, issues and arguments to be addressed by TEEB AgriFood.


[| next >](#)

[| total items](#)



Source: Own representation, building on Laure Ledoux in ten Brink et al. 2012 and MA (2005) www.maweb.org/en/index.aspx and TEEB National.

Key: as in the MA 2005, the colour of the arrows presents the potential for mediation by socioeconomic factors (i.e. substitutability): the darker the arrow the more opportunities for substitution. A light colour implies less potential for substitution. The arrow's width presents the intensity of linkages between ecosystem services and human well-being.

A wide landscape of a bog with a rocky ridge in the foreground and mountains in the distance under a cloudy sky.

Bøttemyra – The bucket bog – let live or let die..

Still Bøttemyra – in another light....



What is this?

What is the goods - the ecosystem services from this ?

Provisioning services;

Regulating and maintenance services;

Cultural services;

Provisioning service : torf

Regulating services;

1. Birdlife: depend on the size and structure of the palsa habitat.... on the top:

Owls – Snow owl, long eared owl, skyas

In the sedge/grass: Lapwings, jack snipe, Broad-billed sandpiper- Jänkäkurppa

- Dvärgbeckasin, ducks,

In the pound: Phalaropes

All together about 15 species of birds

2. Carbon storage, GHG storage

3. Water regulator, water temperature regulator

4. Moisture / damp / fog regulator

5. Local heat – hot spots

A photograph of a wetland landscape. In the foreground, there are tall, thin grasses and several white, fluffy flowers on thin stems. A small pond is visible in the middle ground, surrounded by more vegetation. In the background, there are dark, rocky hills under a cloudy sky.

Plant communities....

Saxifraga hirculus yellow marsh saxifrage Myrsildre


Carex parallela Segde Lappstarr.

What is there?...



Dytiscus lapponicus
and/or
Dytiscus marginalis






Regulatory / cultural service;
Matgjemme: storage of food – stone-age refrigerator..
Waypoints....


1. Education & Research
2. Tourism- recreation
3. Aesthetic and spiritual
4. Existence and bequest







The end of a giant – demolished..... By E6

An aerial photograph showing a landscape with a road and wetlands. The road is a light-colored, winding line that runs from the top left towards the top right. Below the road, there are several large, irregularly shaped areas of dark, brownish-green vegetation, which are identified as palsa mire. The surrounding area is a mix of green and brown, suggesting a mix of forest and open land. The text is overlaid on the right side of the image.

The road made in 1933-1935
These palsa mire were documented
prior and after road building by Løddesøl
In 1936 the palsas were dead.

Eurasian crane *Grus grus*

Micro-palsas? ... next generation????....

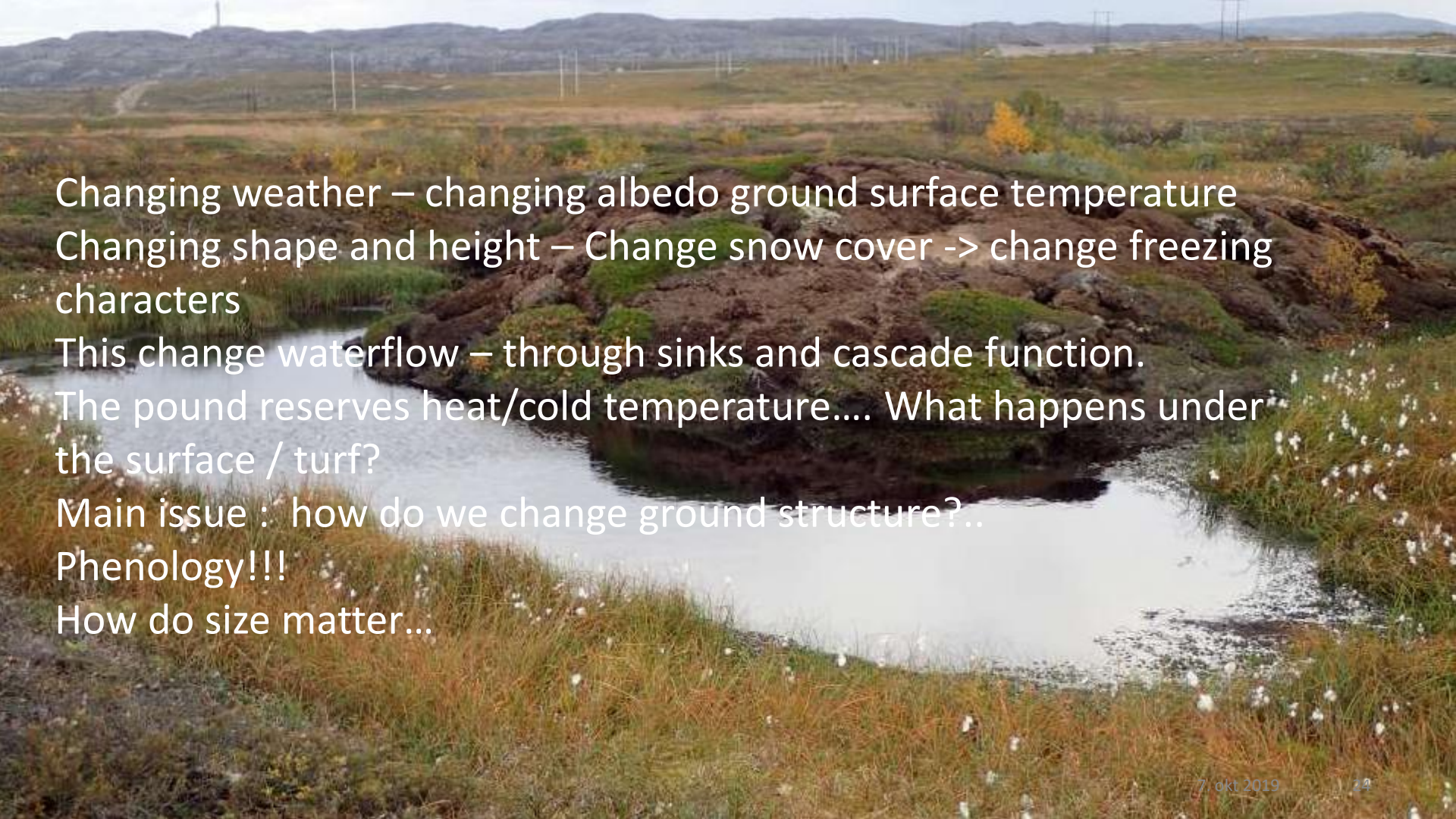


A wide landscape view of a valley. In the background, a dense forest covers rolling hills under a cloudy sky. The middle ground shows a flat, open area with sparse vegetation. The foreground is dominated by a field of dead, grey, skeletal trees and shrubs, interspersed with patches of green and brown ground. The overall scene suggests a natural landscape undergoing some form of ecological transition or disturbance.

Keep the hydrology!!







Changing weather – changing albedo ground surface temperature
Changing shape and height – Change snow cover -> change freezing characters
This change waterflow – through sinks and cascade function.
The pond reserves heat/cold temperature... What happens under the surface / turf?
Main issue : how do we change ground structure?..
Phenology!!!
How do size matter...