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# Paludiculture worldwide:
# Is there a need to differentiate the concept?

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# Rewetting of peatlands

- abandon the site →natural development
- implement paludiculture →regular management

  →→ provision of ecosystem services with different focuses

# Paludiculture,
# productive use of wet peatlands*

Agricultural or forestry use of wet and rewetted peatlands
→ spontaneously grown or cultivated biomass from wet peatlands is used under conditions in which the peat is conserved or even newly formed
→ allows the re-establishment and mair
wet peatlands

**Tan/Lupascu/Wijedasa 2020: Paludiculture as a sustainable land use alternative for tropical peatlands: A review**

- Paludiculture or wet agriculture is a sustainable land use alternative on peatlands.
- Paludiculture should be carbon-neutral or negative in the long-term.
- Wet and rewetted peatlands represent two different management pathways.
- Vegetation selected for paludiculture should be sourced from native species.
- Paludiculture in the tropics is heavily influenced by socioeconomic considerations.

# To make it short:

**Peat preservation + agriculture/forestry = Paludiculture!**

**→ sustainable use of peatlands**

# What are the main requirements for paludiculture?

- **Site conditions** (e.g. fen peatlands in temperate zone)
  - permanent wet conditions in which the peat is conserved or even newly formed

  →low net emissions of greenhouse gases and nutrients compared to drained situation
- **Agriculture**
  - Paradigm shift from drainage to rewetted peatlands
  - Vegetation: spontaneously grown or cultivated plant species

    →productive use of biomass

# Plants that thrive in temperate wet peatlands

Gramineous, mosses or arboreal vegetation


Reed Canary Grass


Common Reed


Cattail


Sedges


Black Alder


Peat Mosses

DPPP - Greifswald Mire Centre (greifswaldmoor.de)

# Benefits from paludiculture

## Several ecosystem services can be achieved by paludiculture,e. g.:

- production of biomass
- carbon sequestration and storage
- biodiversity, water and nutrient retention, local climate cooling,

## Productive use of wet peatlands – what does this mean

- Individual economic interest is at the forefront of any form of management of land - including peatlands:
  →sale of biomass-products from paludiculture
  →direct payments (EU) and/or premiums for Ecosystem Services
  →contractual nature conservation
  →or the sum of these income options



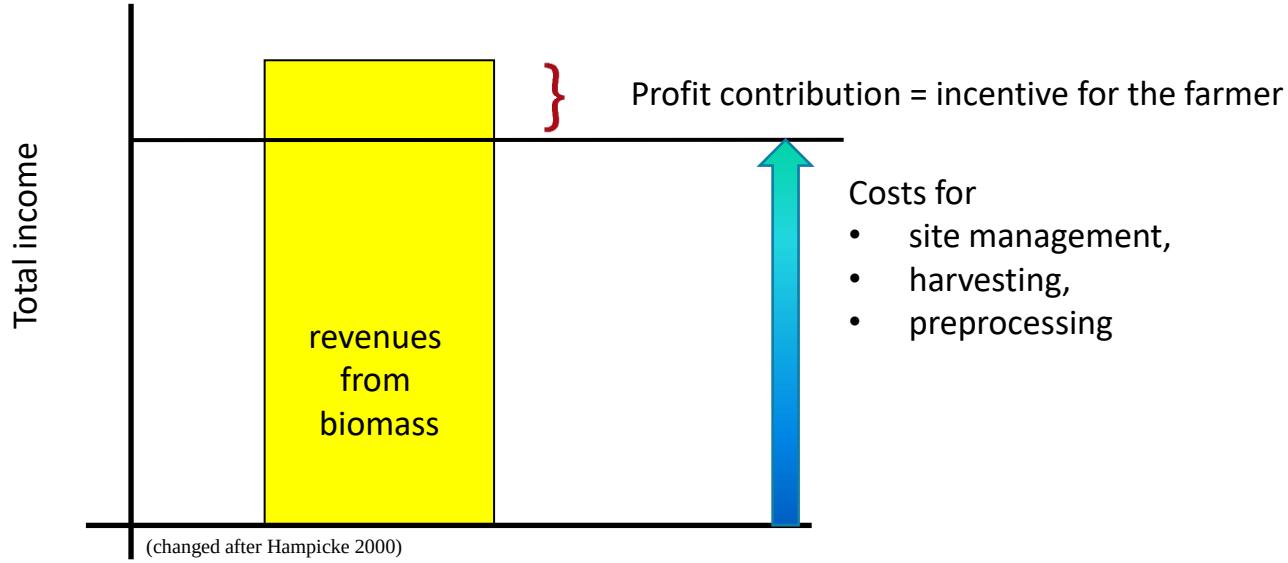





Moor Futures
Ihre Investitionen in Klimaschutz.

# Economics of paludiculture

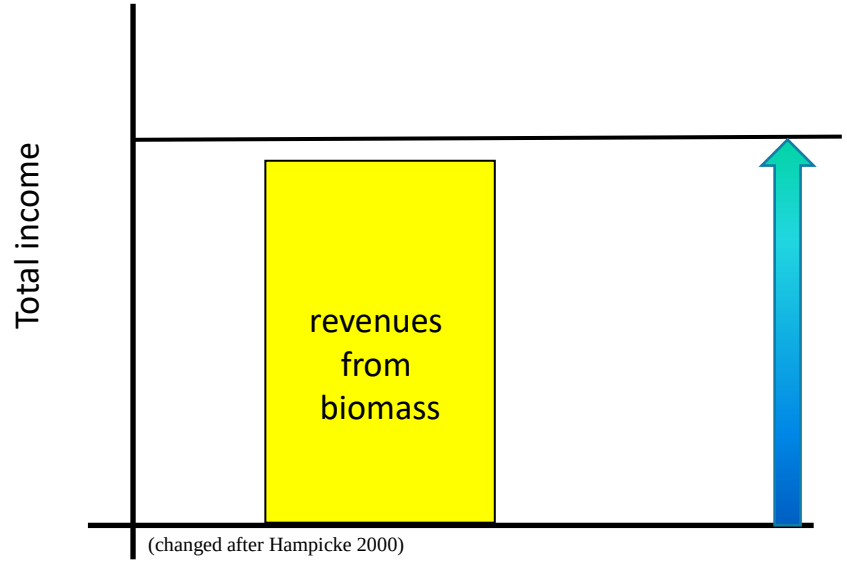
**only biomass production is paid**




Other Ecosystem Services as a free by-product

# Economics of paludiculture

## subsistence farming

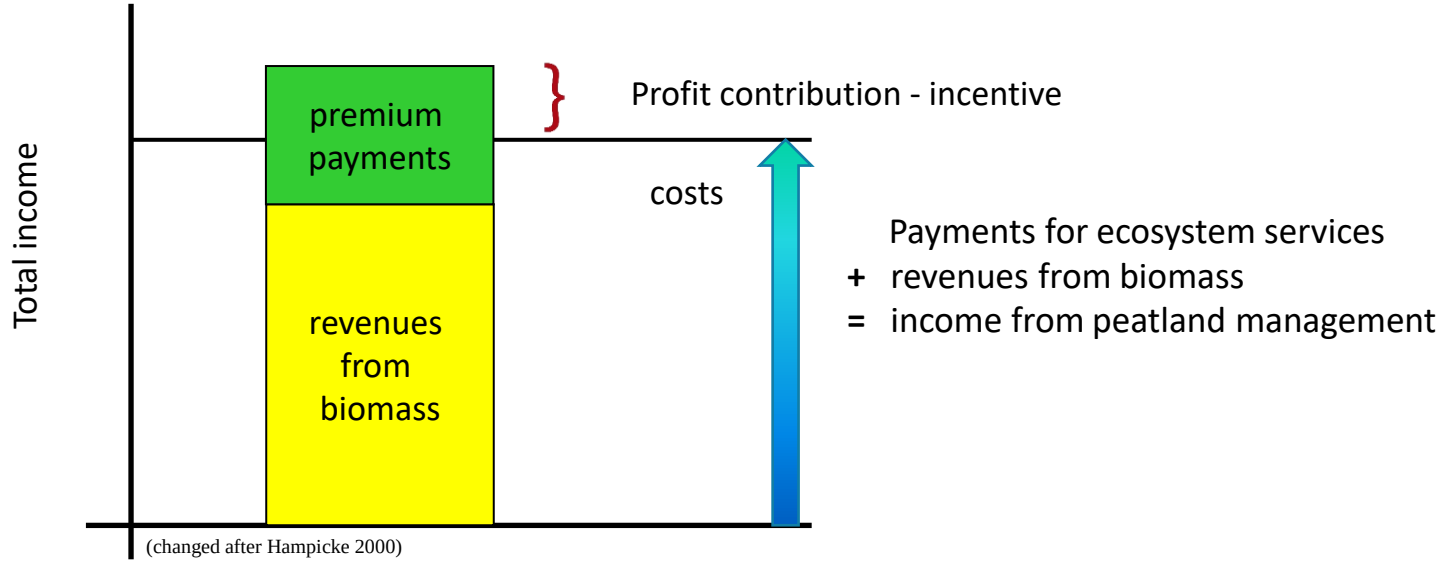



Costs are more or less covered
by revenues from biomass
No return on capital employed

It is necessary to generate income from other sources


# Economics of paludiculture

## combination of different sources for income generation




combination of different incomes makes Paludiculture profitable

On the long run:

→independent Paludiculture economy must be developed

# Ecosystem Services provided by paludiculture should be rewarded

→ Markets for services must be developed
→ A certification system should be established
→ A regular monitoring of compliance with the framework conditions demanded by paludiculture must be installed

# Threats for reaching the main goals

People always try to optimize and improve the economic situation, which stimulates higher GHG emissions

**Site conditions and management**

- wetland plants often have a large water level amplitude
  → higher yield could be produced with lower water tables
- lower water tables allow conventional machinery for harvesting
  → no investment in adapted machinery necessary

**Water supply / medium water tables**

- wrong prioritization of water use can cause summer droughts

→not enough water to maintain peat conserving conditions

**Nature conservation**

- prefers moist meadows instead of wet grasslands or reeds because of higher biodiversity values

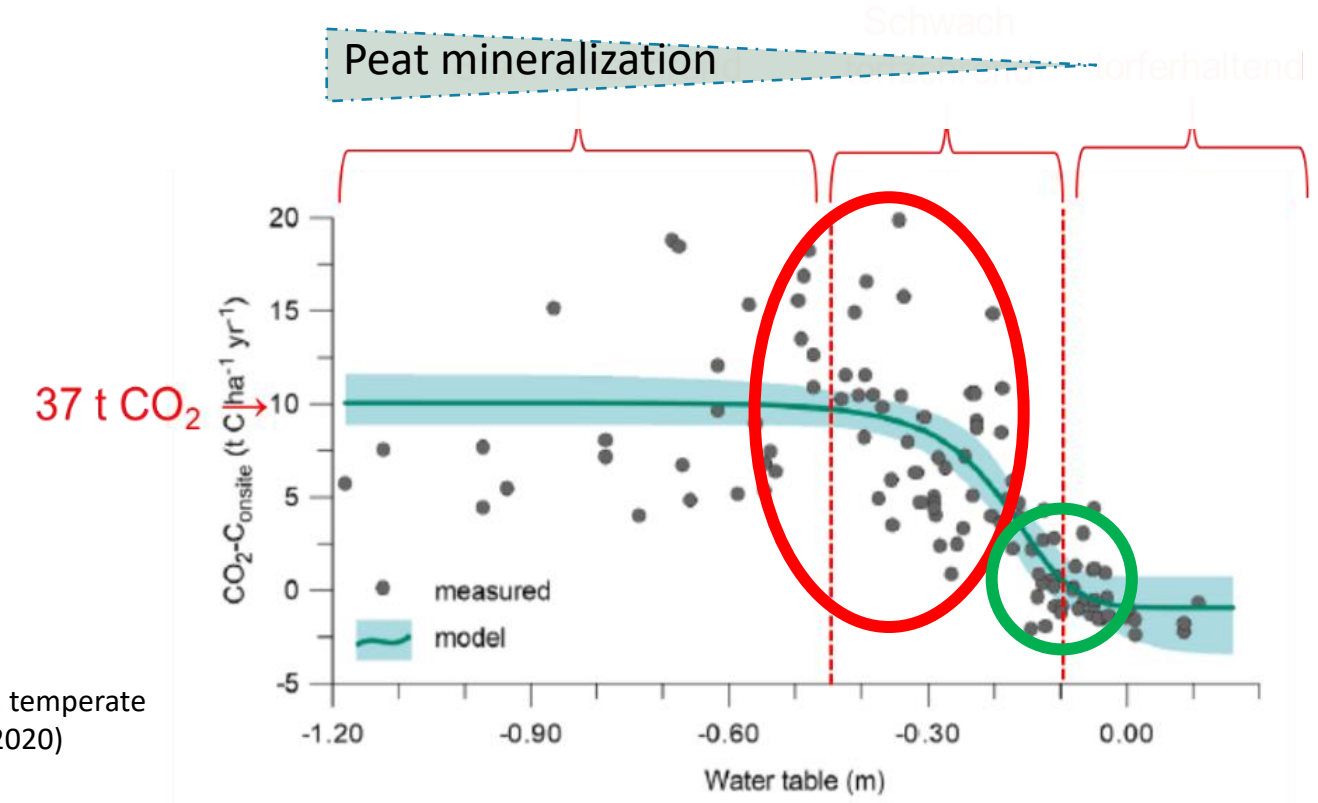
→higher GHG emissions

# Paludiculture light?

- Insuffcient rewetting

→ eg. subsurface irrigation:

GHG emissions may even be higher, as a good water supply of the aerated topsoil leads to higher mineralization rates




$CO_2$-C Emissions from organic soils in temperate zone (changed after Tiemeyer et al. 2020)

# Paludiculture, quo vadis?

Weak implementation of rewetting measures

- farmers and landowners can accustom themselves stepwise
- still conventional like management of peatlands is feasible

If Paludi-light is implemented as a first step, further steps have to be taken subsequently:

→multiple step approach would be costly, tediously and tiring

→farm operating concepts cannot change with the wind every year

→reaching same level of Ecosystem Services provision at much higher costs

# Paludiculture – must the concept be differentiated?

## No!

- The Paludiculture concept is open for
  - new plant species and
  - new adapted management schemes

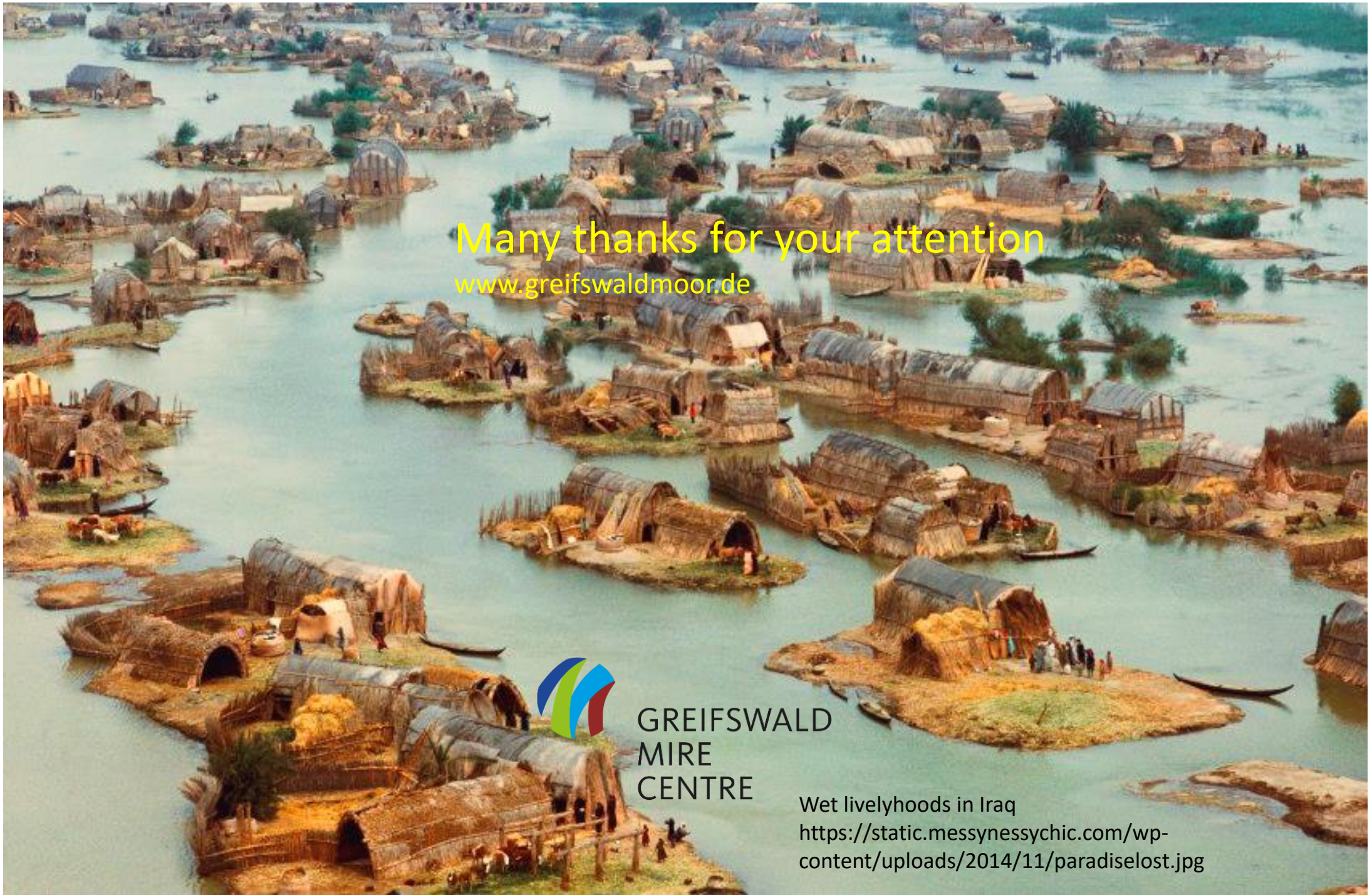
The decisive conditions must be maintained

- high watertables → stop peat loss & low emissions (GHG, nutrients)
- Productive utilisation of biomass

The real need is to concentrate on

- reaching 100% rewetting of degraded peatlands as soon as possible

→ **implementation of Paludiculture is an excellent solution!**




Wet livelyhoods in Iraq
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