



# Bringing Science to Society through Co-Innovation and Co-Creation – The Soil-Health and Food Mission

EURAGRI conference, 27-28<sup>th</sup> September 2021

Évora (Portugal)

***Sustainable agriculture: do we agree what it is?***

*Gottlieb Basch*

*University of Évora - MED*



# Outline

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- **Definitions**
- **Dimensions**
- **Conflicts and trade-offs**
- **Approaches towards Sustainable Agriculture**
- **The role of soil and its management**
- **Ways forward**



# Definitions

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## Sustainable Development:

*"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (IISD)*



## Sustainable Agriculture:

*“The management and use of the agricultural ecosystem in a way that **preserves its biological diversity, productivity, regenerative capacity, vitality and functioning**, so that it can fulfill, **today and in the future**, its **ecological, economic and social functions at local, national and global level**, without prejudicing **other ecosystems**”*



## Sustainable Agriculture: (1990 "Farm Bill", USA)

*"The term sustainable agriculture means an integrated system of plant and animal production practices having a site-specific application that will, over the **long term**:*

- *satisfy human **food and fiber needs**;*
- *enhance **environmental quality** and the natural resource base upon which the agricultural economy depends;*
- *make the most **efficient use of nonrenewable resources and on-farm resources** and integrate, where appropriate, natural biological cycles and controls;*
- *sustain the **economic viability** of farm operations; and*
- *enhance the **quality of life for farmers and society as a whole.**"*



# Dimensions

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- **Ecological & environmental**
- **Economic & agronomic**
- **Social**
- **Temporal**
- **Spatial**



# Conflicts and trade-offs

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**Due to different perspectives:**

- **Farmers, retailers, consumers, society...**
- **Present needs vs. next generations' needs...**
- **Differences between local, regional, national & global demands.**



# Conflicts and trade-offs

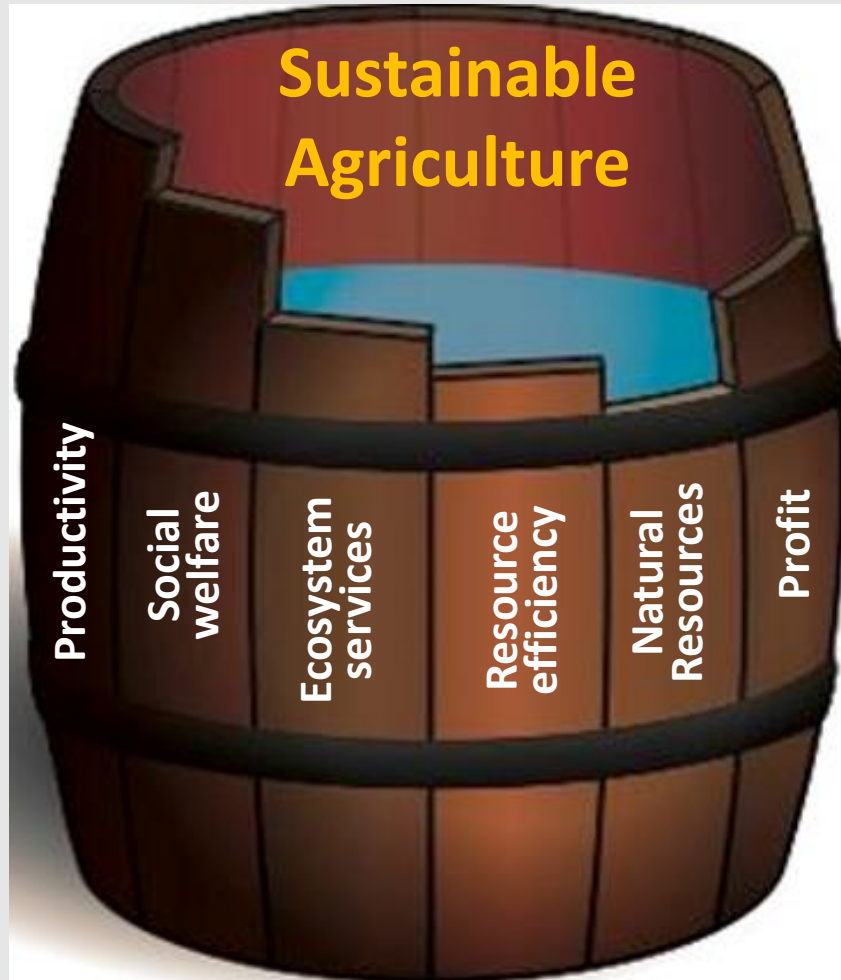
**... and conflicting objectives to be reached concomitantly:**

- **Preserve and improve natural resources & protect the environment**
- **Guarantee economic viability for both producers and consumers (affordable food)**
- **Conserve energy (all along the agricultural value chain)**
- **Improve food quality (safety) while contributing to food security**
- **Zero pollution ambition vs food security and resource efficiency**
- **etc.**





# Conflicts and trade-offs



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# Sustainable Agriculture?

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“...a journey, not a destiny”

*Farmer from Iowa*



# Approaches towards Sustainable Agriculture

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- **Biodynamic Farming**
- **Organic Farming**
- **Bio-intensive/ French-intensive Farming**
- **Permaculture**
- **Agroecology**
- **Alternative Agriculture**
- **Low-till and No-till Farming**
- **Regenerative Agriculture**



# Approaches towards Sustainable Agriculture

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- **Nature Farming**
- **Low-input Sustainable Agriculture (LISA)**
- **Integrated Pest Management (IPM)**
- **Biointensive IPM**
- **Holistic Resource Management (HRM)**
- **Integrated Farming Systems (IFS)**
- **Nonorganic Sustainable Farmers**
- **And probably several more...**

# Approaches towards Sustainable Agriculture???



**Soil sterilization with vapour –  
to avoid the use of pesticides...**

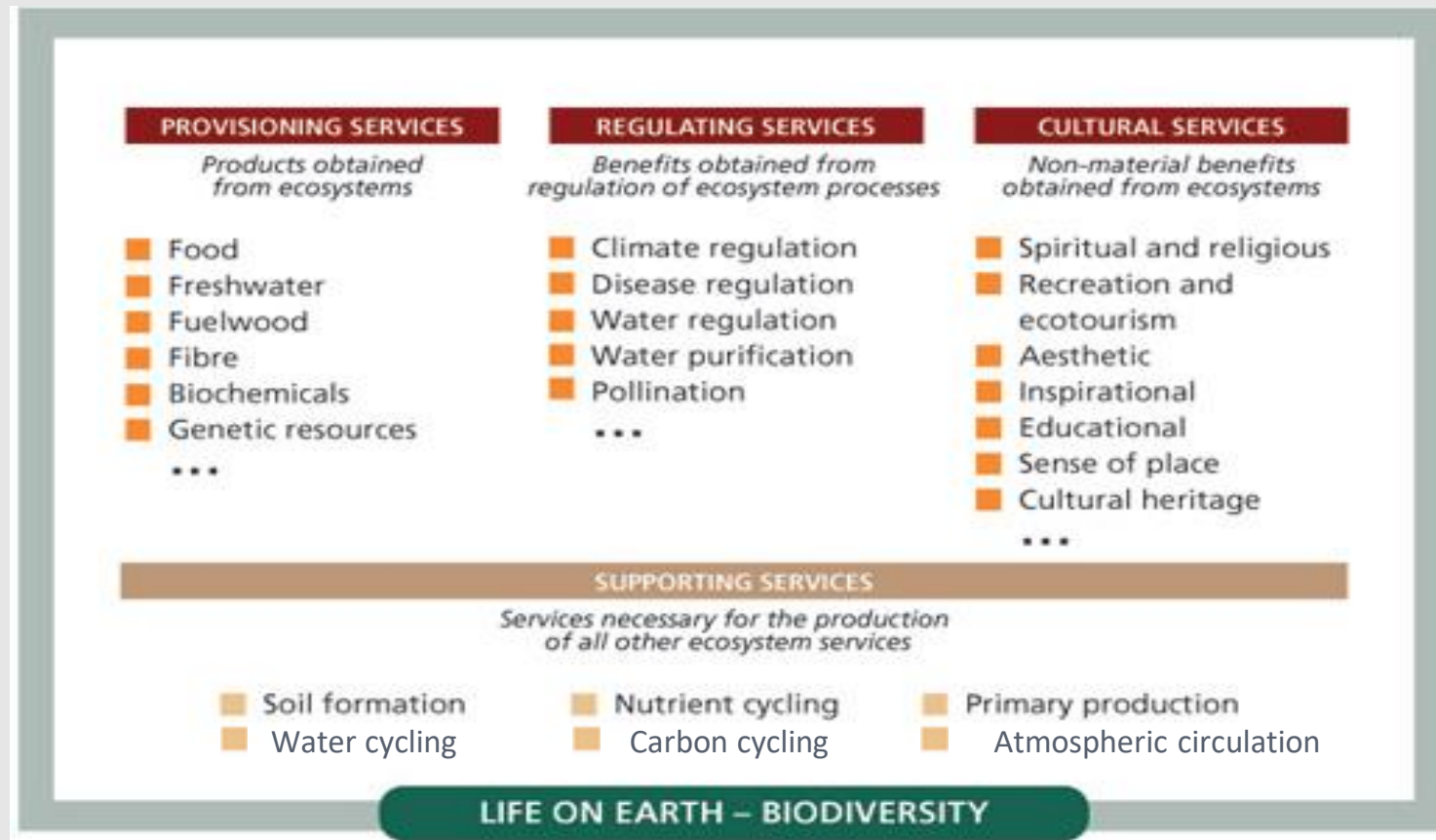
**Width: 4m**

**Working speed: 26-40m/h**

**Fuel consumption: 1000 l 8h<sup>-1</sup>**

# The role of soil and its management...

## Ecosystem Services



Source:  
The Millennium  
Ecosystem  
Assessment (2005)





# The role of soil and its management...



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# The role of soil and its management...

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## Core goals of the Green Deal and F2F

- Increasing the EU's climate ambition for 2030 and 2050
- From 'Farm to Fork': designing a fair, healthy and environmentally-friendly food system
- Preserving and restoring ecosystems and biodiversity.





# Ways forward – to make agriculture sustainable holistically

- **Improve literacy about soils and true, holistic sustainability (farmers, consumers, civil society as a whole);**
- **Recognize the root causes of soil degradation, mainly of erosion, soil organic matter and biodiversity decline and promote proven and result-based mitigation measures;**
- **Rational, science-based and unbiased judgement of technologies, practices and external inputs;**
- **Link the support for EU agriculture to the delivery of clearly defined and monitored ecosystem services;**
- **Recognize that a crusade against or the rejection of chemical or synthetic modern inputs does not make agriculture ‘per se’ “SUSTAINABLE”.**

# Ways forward: respect soil as a living biological system



Earthquake



Wild fire



Hurricane



Tsunami



Tornado







# Ways forward: respect soil as a living biological system











# “The nation that destroys its soil destroys itself”



*Franklin D. Roosevelt, 1937*



**Thank you**

**So don't treat soil like "dirt"**



**No thanks**