



Plantastic Discoveries

# WHAT EXACTLY IS SUSTAINABLE AGRICULTURE?



Plants  
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European Technology Platform

The concept of **SUSTAINABLE AGRICULTURE** is appealing and something many of us would readily endorse.

## BUT DO WE REALLY KNOW WHAT IT IS?

**Sustainable agriculture** is usually understood as an approach to farming that aims to meet current food, feed and raw material needs without compromising the ability of future generations to meet their own needs.



Perhaps when you hear **sustainable agriculture** you think of **environmentally friendly agriculture**.

**BUT IT'S MUCH MORE THAN THAT.**

Sustainable agriculture should produce sufficient healthy and nutritious food without affecting the quality of soil, air and water. It should preserve ecosystems, safeguard animal welfare, generate sufficient income for farmers and improve quality of life in rural areas, support territorial development and contribute to the economy.

It is

**MULTIDIMENSIONAL**

# SUSTAINABLE AGRICULTURE

produces food, feed, raw materials while aiming to

**PROTECT THE ENVIRONMENT** - Minimise negative environmental impacts by conserving natural resources, reducing pollution, and maintaining biodiversity and soil health.



**SUPPORT ECONOMIC VIABILITY** - Ensure practices are economically beneficial for farmers to adopt and maintain over the long-term.



**ENSURE SOCIAL RESPONSIBILITY** - Consider the health and well-being of farming communities, agricultural workers, consumers and society as a whole.



So as you can see, it is not just about environmental protection. The harmonious combination of these environmental, economic, and social dimensions is the foundation of sustainable agriculture.



BUT HOW DO WE KNOW IF WHAT WE ARE DOING IS SUSTAINABLE AGRICULTURE?

WE NEED MEASUREMENTS!



BUT... WHAT EXACTLY SHOULD WE MEASURE?

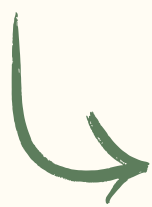


We need **measurements** that properly **capture** ‘**sustainability**’ in each of the **three dimensions**, and to guide those measurements, we can use a set of indicators.

But as you can see, this means that how sustainable an agricultural system is will highly depend on the indicators and methodologies we use to measure and analyse. So sustainability will be inherently depend on how it is measured.

# THE DIFFICULTY OF STANDARDISED INDICATORS

In the EU, and generally, sustainable farming lacks a clear definition. **Sustainable farming does not have a certification or clearly defined guidelines** across its three dimensions.



THERE DOES NOT EXIST A  
'SUSTAINABILITY' ACCREDITATION.

Without a common official definition, creating standardised indicators for sustainable agriculture is challenging. Additionally, the incredible diversity among farms means there's **no “one-size-fits-all” approach to sustainability**, further complicating the establishment of a universal definition.

# CHOOSING INDICATORS

Choosing **relevant** and **comprehensive** indicators that reflect the **local context** and specific sustainability goals is crucial. However, developing these indicators is complex, as sustainability is heavily influenced by environmental, economic, and social factors that vary from one region to another. **What is sustainable in one area might not be in another.**



Adding to the challenge, there is a **lack of consensus among experts** on how to select and balance these indicators.

Furthermore, assessing sustainability at the farm level is hindered by insufficient data and the potential for misleading averages. Comprehensive testing across all farms would be ideal, but it remains impractical.

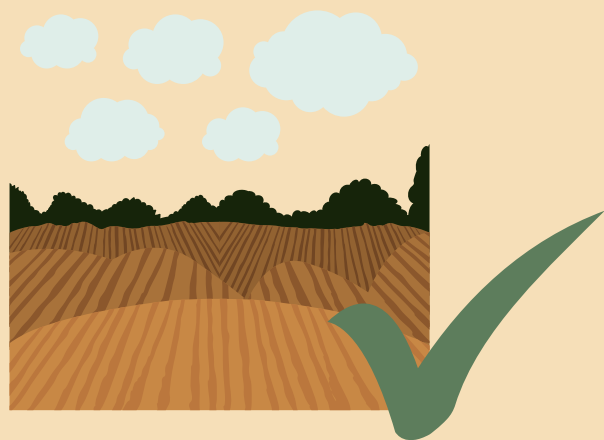


# A CONCRETE EXAMPLE

A key challenge in defining sustainability indicators is that a farming practice can appear more environmentally sustainable when measured per unit of land, but less so when measured per unit of output.

For example, in some cases organic farming can be considered more sustainable than conventional farming when measured

PER UNIT OF LAND



but not when  
measured

PER UNIT OF OUTPUT.



This illustrates the complexity of selecting appropriate indicators.

All in all, there are no one set of indicators that everybody uses to measure 'sustainable' agriculture.



# WHAT'S IN PLACE

In the EU, we have the **Common Agricultural Policy (CAP)**. The CAP focuses on promoting specific practices believed to support sustainability. While this approach aims to encourage positive practices, it is primarily practice-oriented, emphasising the adoption of certain methods. It does not always include data on the outcomes or effectiveness of these practices in achieving sustainability goals.

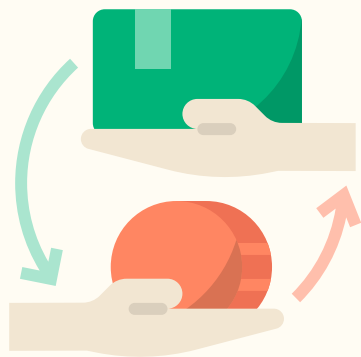


Based on these, eco-schemes can be put in place by national governments to incentivise these practices but these schemes are **focused on environmental sustainability not sustainability as a whole**. And these schemes, are **voluntary**.

Moreover, in the EU, there is the **Product Environmental Footprint (PEF)** initiative, which provides a comprehensive method for measuring the environmental impact of products throughout their entire life cycle. The PEF aims to create a standardised approach to assess and compare the environmental performance of different products, promoting more sustainable production and consumption. But its application to agriculture and food systems is very limited, mainly due to lack of good data, and the complexity of the method. Also, the PEF **just considers the environmental sustainability dimension.**



**Third-party initiatives** from agricultural businesses, associations, and networks offer sustainability assessments with their methodologies, considering all three dimensions. However, their indicators and evaluation methods may vary. And these programmes, are **voluntary!**

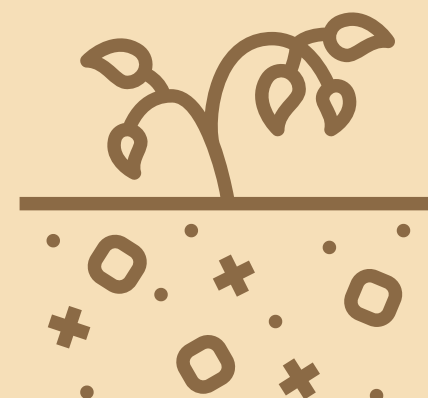
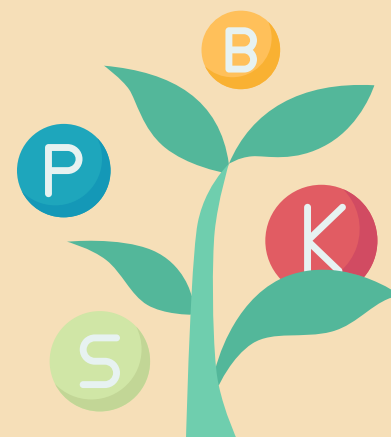


## TRADE-OFFS ARE ANOTHER CHALLENGE

Improving one sustainability indicator might negatively impact another.

For example, increasing protein content in crops through nitrogen fertilisers enhances food's nutritional quality, benefiting human health by addressing protein deficiencies. This improved nutrient density can also offer economic advantages, potentially increasing crop value and farmer income.

However, this can negatively impact other sustainability indicators on environmental health. Crops with higher protein content need more nitrogen fertilisers, which can lead to nutrient runoff, causing water pollution and greenhouse gas emissions. Also, excessive fertiliser use can degrade soil health over time.



**Understanding these trade-offs and synergies is essential for developing balanced approaches.**

Given all this complexity and the lack of consensus on what defines sustainable agriculture, you might be wondering:

## HOW CAN I, AS A CONSUMER, CHOOSE TRULY SUSTAINABLE PRODUCTS?



This is a challenging question, and one we'll explore in a future #PlantasticDiscoveries post. Stay tuned for more insights on how you can make informed, sustainable choices!

# ASK US

🌱 Got questions about plant science & breeding? We've got answers!  
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[Methodologies for Assessing Sustainability in Farming Systems](#)

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[List of potential agricultural practices that eco-schemes could support based on CAP](#)