What is sustainability?

How can we determine if production and consumption of food is sustainable?

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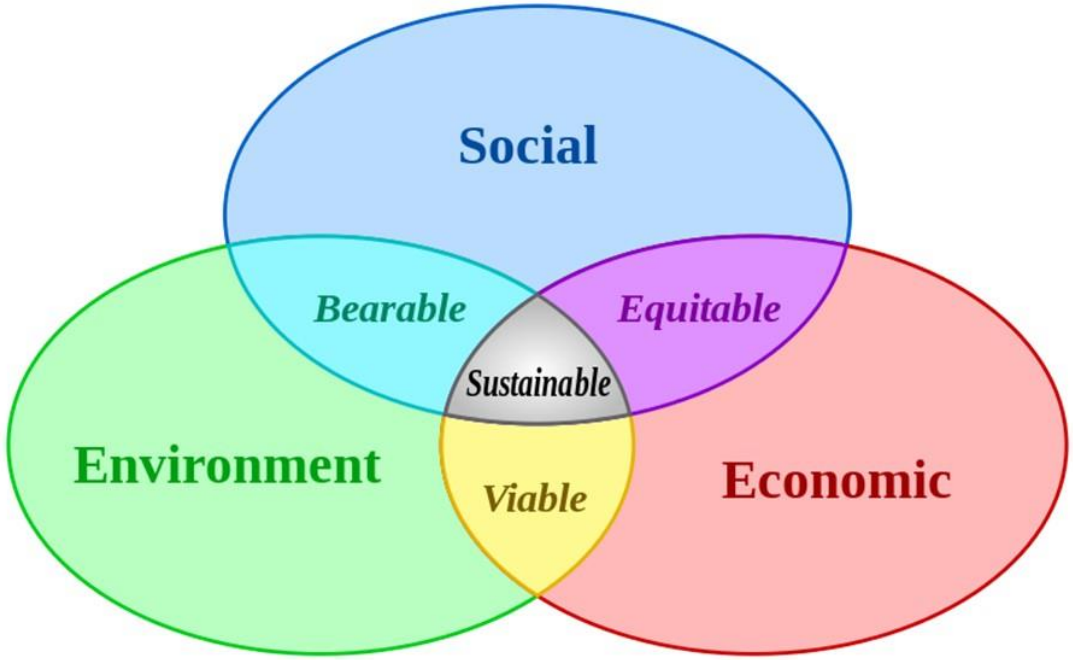
1. Sustainability it not just about the environment



- The scope of sustainability was revolutionary in that not only environmental, but also economical and social issues are considered.
- If we only fulfil one or two of these, but ignore the third, we do not have sustainable development.

2. Definitions

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

  The Brundtland Commission: Our Common Future. 1987.

- "Sustainable development aims at the continuous improvement of the quality of life and well-being for present and future generations."

  EU Commission 2008." Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan

Historical perspective

Harvesting, 19th century

Icelandic wastelands

- We have had farming and fisheries in Norway for many centuries, and still have in many parts.
- Is this then proof that our agriculture and fisheries are sustainable?
- No, the farming and fishing methods have changed so much that we cannot conclude anything about current farming and fishing

Definition sustainable production and consumption

- **UN development goal 12. Sustainable production and consumption.**
  Sustainable consumption and production is about promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services, green and decent jobs and a better quality of life for all.

Other definitions

- **Sustainable Production** is the creation of goods and services using processes and systems that are: Non-polluting. Conserving of energy and natural resources. Economically viable. Safe and healthful for workers, communities, and consumers.

  Lowell center for sustainable production

Sustainable production and consumption on the policy level:

European Sustainable Consumption and Production Policy document: No definition is given, but:

"The great challenge faced by economies today is to integrate environmental sustainability with economic growth and welfare by **decoupling environmental degradation from economic growth and doing more with less**".

" It is now time to move towards an energy and resource **efficient** economy"

"The challenge is to **improve the overall environmental performance** of products throughout their life-cycle, to boost the demand for better products and production technologies and to help consumers in making informed choices."

3. Consumers opinions

- Cerri et al (2019) investigated 388 scientific studies about consumers views about sustainability food consumption and found that most people think that organic and local food is most sustainable.

4. Relative and absolute perspectives

Absolute sustainability is difficult: A lot of research has been made but still no practical definition of sustainable food production and consumption has been made.

Relative sustainability is easier:
It is much more easy to establish if “something” is more sustainable than “something else” than find if something is sustainable in itself.

We can approach the problem by looking at

- Specific technologies or management practices, and
- by defining the most important sustainability topics

5. Management practices and technology

Organic farming	Using animal manure
Integrated farming	Using recycled phosphorus
No till farming	Using renewable fuels
Crop rotation	Precision agriculture
Harvesting and storage techniques that reduce waste	Draining fields
Fishing equipment that reduce waste and energy use	Landing bycatch
Reduce the use of concentrated feed for ruminants	

Example a: Phosphorus

Phosphorus is a limited resource. One of the major sources is phosphate rock mined in Morocco and its occupied territory.
This is not sustainable.

Recycling Phosporus from human and animal waste products is sustainable, like that done by VEAS.

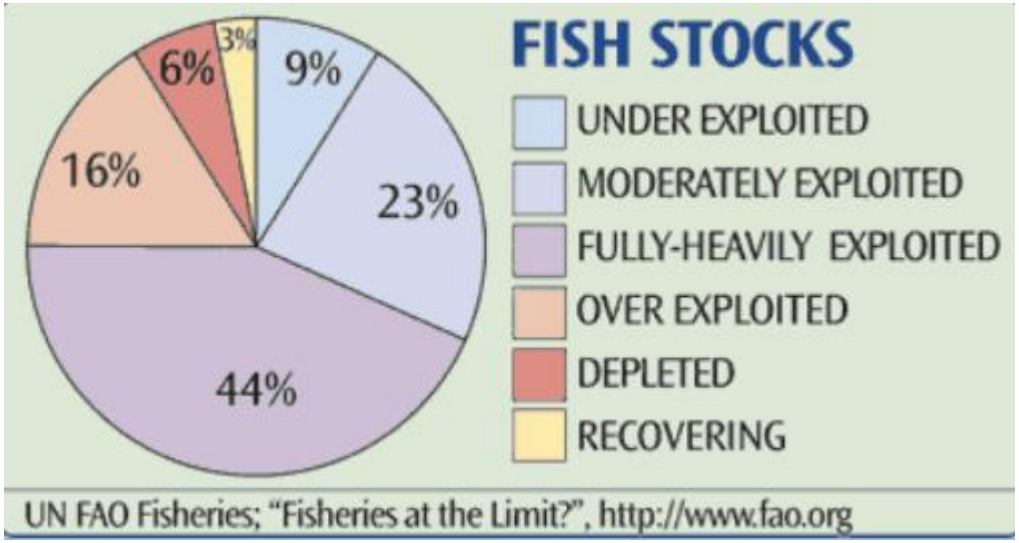
b. Energy

Fossil fuels are not renewable, thus the use of oil, diesel, petrol, natural gas and coal is not sustainable.

Biogas is made from renwable materials and can be produced in a sustainable way.

Some other renewable fuel, such as palm oil diesel is probably not sustainable.

c. Harvesting from nature



- A sustainable harvesting from nature must entail that the resource is not diminished.
- In the past, we did not have the capacity to deplete fish stocks, but now we have exploited many of the planets fish stocks.
- Anchovy from South America is used in our aquaculture but the stock is now struggling.

d. Soil productivity

Sustainable farming requires that soil quality is maintained.

But, «normal» crop (e.g. cereal) farming in Norway degrades the soil through e.g. soil mineralisation.

The use of crop rotation can, together with other measures stop this degradation.

6. Food sustainability topics (UN)

- **Dietary choices and habits:**
  While substantial environmental impacts from food occur in the production phase (agriculture, food processing), households influence these impacts through their dietary choices and habits. This consequently affects the environment through food-related energy consumption and waste generation.
- **Food waste:**
  Each year, an estimated 1/3 of all food produced – equivalent to 1.3 billion tons worth around $1 trillion – ends up rotting in the bins of consumers and retailers, or spoiling due to poor transportation and harvesting practices
- **Obesity and overweight:**
  2 billion people globally are overweight or obese.
- **Reducing the resource base for food supply:**
  Land degradation, declining soil fertility, unsustainable water use, overfishing and marine environment degradation are all lessening the ability of the natural resource base to supply food.
- **Pollution and resource use:**
  The food sector accounts for around 30 per cent of the world's total energy consumption and accounts for around 22 per cent of total Greenhouse Gas emissions

7. UN sustainability goals

UN sustainability targets and indices for sustainability

- 169 targets, and 232 indicators defined.

Example of target:

Target 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

- Index of this target:

Proportion of agricultural area under productive and sustainable agriculture

UN 12 sustainability targets

- **12.1 Make plans for sustainable production and consumption. (**Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries)
- **12.2 Use resources more efficiently.** By 2030, achieve the sustainable management and efficient use of natural resources
- **12.3 Half food waste,**
- By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses
- **12.4 Better management of chemicals and waste.**
  By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment
- **12.5 Reduce waste generation:**
  By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

- **12.6 Encourage companies to be more sustainable.**
  Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle
- **12.7 Promote sustainable public procurement.**
  Promote public procurement practices that are sustainable, in accordance with national policies and priorities
- **12.8 Give people information needed to take sustainable choices.**
  By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature
- **12.A Support developing countries science and technology.**
  Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production
- **12.B Encourage sustainable tourism.**
  Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products
- **12.C Reduce subsidies for fossil fuels.**
- Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

9. Proposed criteria for relative sustainability in FoodProFuture

Pr unit benefit, e.g. kg protein consumed:

- Less resources use, e.g. diesel, electricity, land, water
- Low pollution leading to less climate impact, eutrophication, acidification, toxic impact, etc
- Minimize damage to natures` resource base (the ability of natural processes to support food production: rain for crops, plankton for fish,….).
- Maximize biological diversity.
- Minimize damage to other ecological services (clean water, clean air).
- Maximize consumers health and well-being.
- Maximize economic livelihood Maintain local communities.

Thank you for your attention

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