



Ministerie van Landbouw,  
Natuur en Voedselkwaliteit

# Food from the oceans

Committee on World Food Security, Wednesday 23<sup>rd</sup>

Ir. Simkje (S.) I. Kruiderink

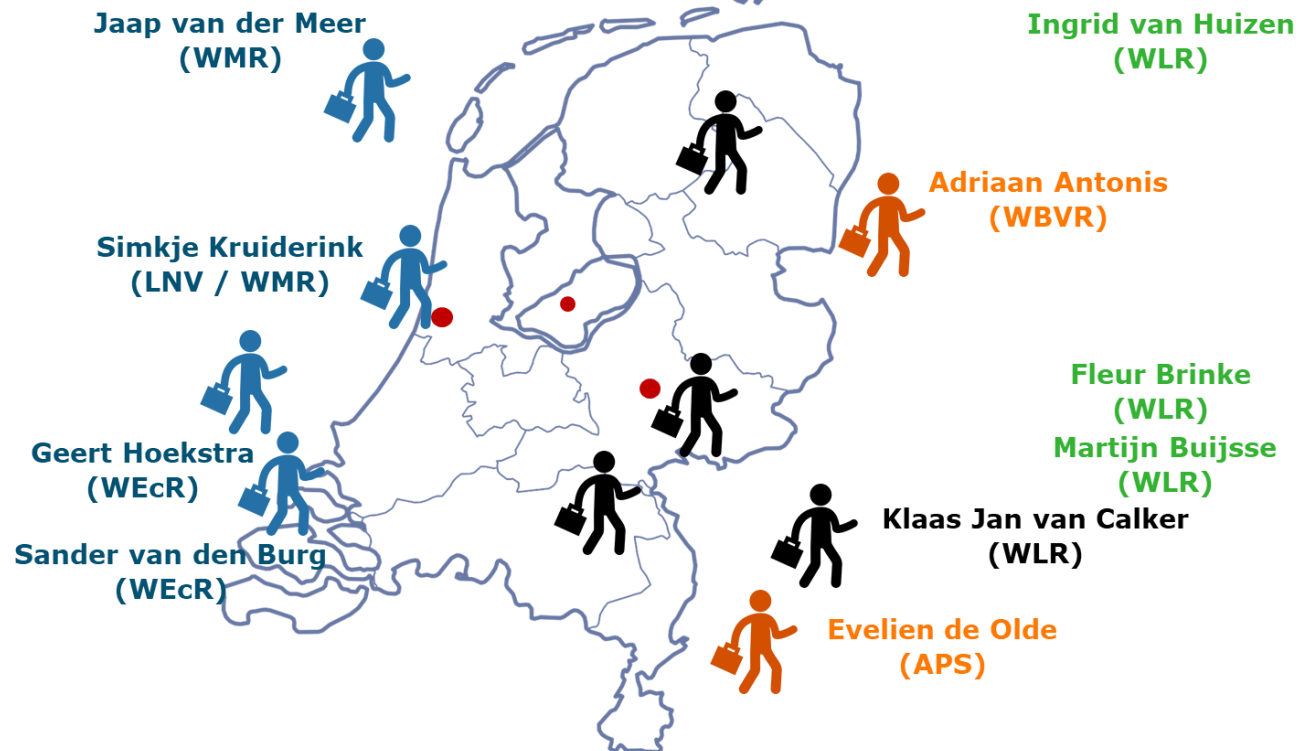


# TEAM C

## for a circular food system

### GOALS:

1. New groundbreaking ideas regarding resource security (circularity)
2. New connections to test concepts in breakthroughs (Finding Answers Together)
3. A translation to education (from curricular to professional)
4. New proposals for research (from fundamental to practical)





# A common "Land and Sea" language for a Circular Food System

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Believing a common "land and sea" language is important to ensure that common due to food production are treated can be made. Trade offs of all food value, include biodiversity and/or climate and whether communities that are made concerning these topics. Making them more complex science.

The framework to help appraise the land and sea is missing. Circular bio-based economy thinking focus also harvested from waterways, sea the two (dry and wet) systems also. Without looking at the whole we risk solutions that create problems elsewhere feed, for example, might be a measure for land based agriculture of nutrients et sea can affect both natural ecosystem. The trade off for sea for land, if not viewed in an integrated manner without this broader perspective.

De Boer & van Tierssen (2018) define circular agriculture. An integrated approach however also requires principles for the oceans. For this purpose the food system of Meer (2020) and frequent.

1. Keep the cycle of life going: nutrient balance between land and sea;
2. Improve efficiency (harvest/culture the food web as much as possible)
3. Yield-ecosystem values trade-off (production).

As TEAM C consists of members with background, the team represented an approach with land and sea included principals provide the start for a common language and thinking helping the of resource ecosystem value trade off principle managed food systems, both on land principal ensures that nature is also the trade offs (externalities) of production are "built into the equation".

"Having common terminology for land and sea in order to review trade offs, such as at with nature, is a big step forward in a sustainable food system" (Smitje Kruis)

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# Safety Issues in a Circular Food System

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Considering the recycling of bio nutrients) back into the food system, raise value to the entire system, raise and animal health.

Questions that arise, can be raised the environment and food & feed animals (fit in a circular food system) health and wellbeing, when the to overcome safety issues with relieve environment and improve c.g. slaughterhouse waste? Ant risks when feeding table and kitchen chickens.

Understanding, monitoring and circular food system will be the decades, and thus contribute to including the sea.

A transformation towards a more circular and sustainable food system is hindered by many safety concerns. These concerns can be targeted at different levels: I) animal, II) excreta, III) environment (water, soil, air) and IV) Food & Feed (see Figure 1).

TEAM C has been focusing on cattle, pigs, chicken and insect the role of human excreta in a concerns regarding animal (meat effect of e.g. animals and excrement on biological hazards in food & Researchers, from both inside work together on complex concerns about the health of transition to a new food system population to nearly 10.9 billion pressure on food production, healthy and sustainable food, education, government, enter challenges that require a multi approach. Other knowledge include the Faculty of Veterinary Service, Wubans and RIVM. The concerns and needs from the technology readiness level affects financing from different financial together is the ability to work and a common goal of promoting animal health.

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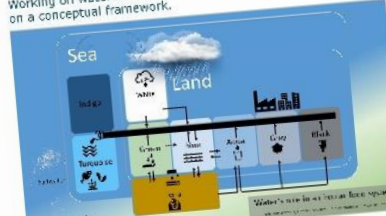
# Water's role in a Circular Food System

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Water is a connecting element in the system "earth" and one of the most essential natural resources. It is also the carrier of life the most essential natural resources. It is also the carrier of life providing nutrients within land as also within and to waterways including the sea.

The global food system harvests from saline (turquoise) as well as with green, white and blue water, much of which is stored as underground in groundwater (terra) reservoirs. Society uses potable (blue) water in their households and deliver process agricultural (grey) and sewage (black). Current linear users of fresh water as well practices is one of the largest (92%) users of fresh water as well as one of the largest polluters of green, blue and turquoise water. In addition to transitioning to a more sustainable and equitable use of limited resources, we will also have to deal with climate change. Pressure on ecosystems and drinking supply will increase as well as aggravating existing problems with surface water. The quality and depletion of limited reserves of groundwater. This means global hydrological cycle will change. In practice this means dealing with more salinization in specific agricultural areas as well as an increase of wetland zones in other areas combined with an increase of mosquitoes and the risk of vector borne diseases.

The transition towards a circular food system requires optimizing the use of earth's natural resources. This implies: minimizing the use of finite resources, encourage the use of regenerative ones, input of finite resources, and stimulate the reuse and prevent the leakage of resource losses in a way that adds the recycling of inevitable resource losses in the least possible highest possible value to the food system e.g. reusing green, grey and black water as well as the nutrients that it carries and damage to nature. In practice this means that it carries and the use of ground water to safeguard the availability for future generations well-managed "common" requires an integrated approach of scientists with different expertise. Working on water's role in a circular food system, TEAM C worked on a conceptual framework.



Within WUR are projects that have been working on water as a circular food system resource. TEAM C explored the existing knowledge about water in food systems and inventoried circular vision knowledge about the role of water for a successful circular vision (Kringlopland) by Minister Schouten. Highlighting these is a first step towards further developing circular food system thinking that combines food production from land and sea. Knowledge that combines food production from land and sea. Knowledge that combines food production from land and sea. Knowledge that combines food production from land and sea.

**TEAM C**  
This is a project of TEAM C...  
Maurin Buisson  
Adrian Aniels  
Wageningen University & Research



# Circularity in Live Stock and Fish supply chains

# Knowledge Exchange Circular Food Principles

# Implementing Circular Food Systems in the Dutch regions

For global problems like climate change and biodiversity are to be found locally. That is the starting point for public and private actors to collaborate in addressing societal challenges (or safe and affordable food) knowledge transfer from research towards application the need of, and the collaboration with these end users, WUR as ever before.

For collaborating in the regions... circular food systems... North-Netherlands and South-Netherlands. The regions are also characterized by the presence of an... (for the Ministry of Agriculture, Nature and Food)

Regional partners groundbreaking ideas can be... research proposed in addition to developing better... WUR encourages "Living labs" where solutions... food systems are explored.

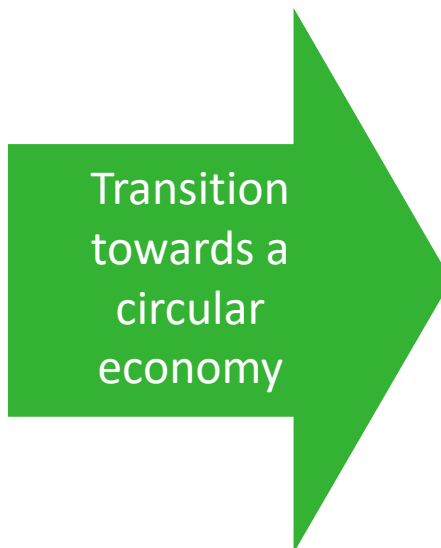
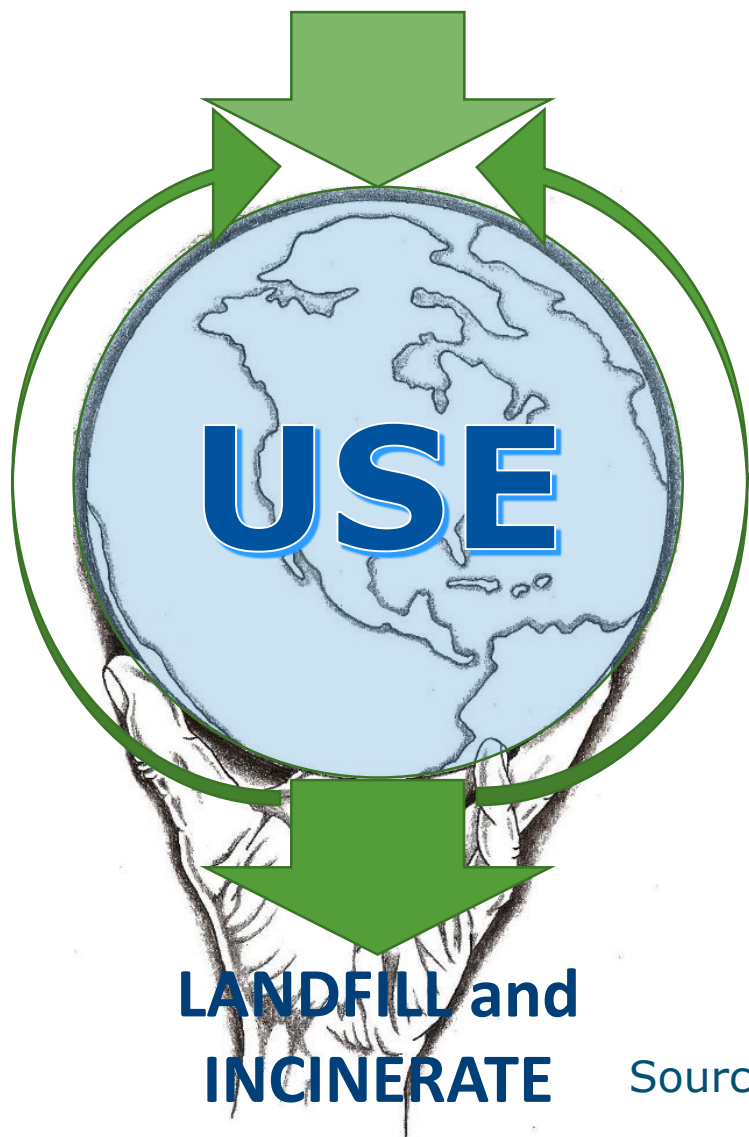
Wageningen, government, entrepreneurs and... exploring the transition to circular... work and work at experimental fields. As a... WUR, they offer many knowledge...  
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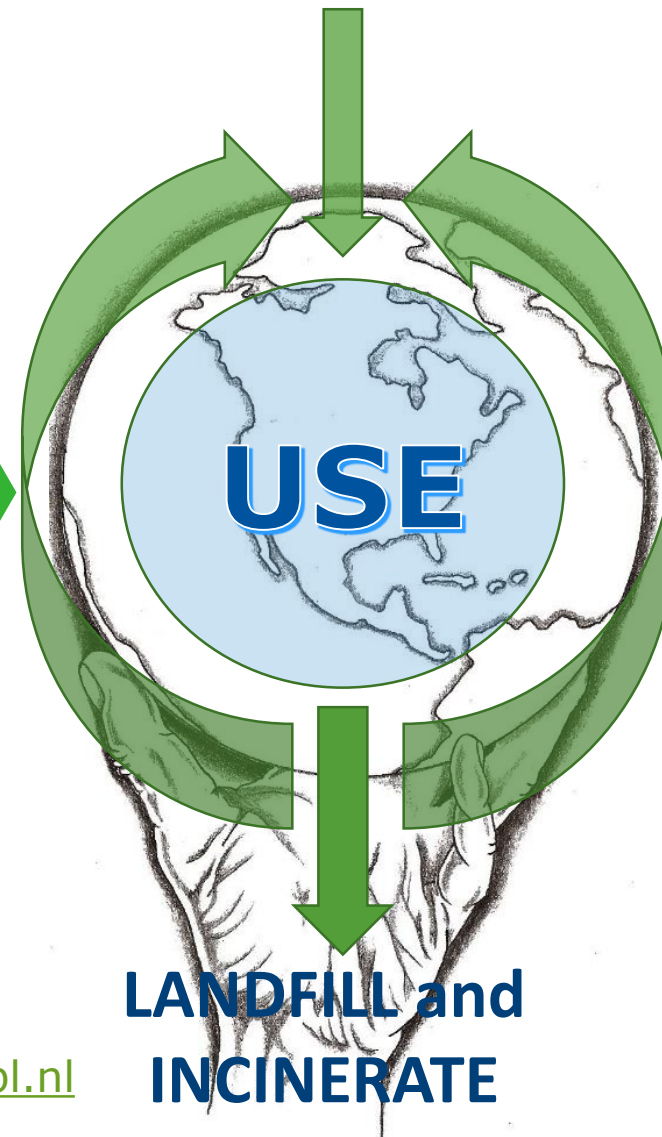
The animal farming sector on the sandy soils of Limburg and Brabant is the main example of intensive agriculture which is one of the major pillars in the caring years driven by changing governmental policy and regulations. What will this region look like in 2030? Both on the landscape level as well socio-economically and how can actors respond to this? Additionally the province of Zeeland has very specific land and aquatic resources linked to the food system. Research is needed concerning the interactions of land and sea and the food system linked to the efficiency of nutrients used. Research is needed concerning the efficiency of nutrients used. Research is needed concerning the efficiency of nutrients used.



## NATURAL RESOURCES



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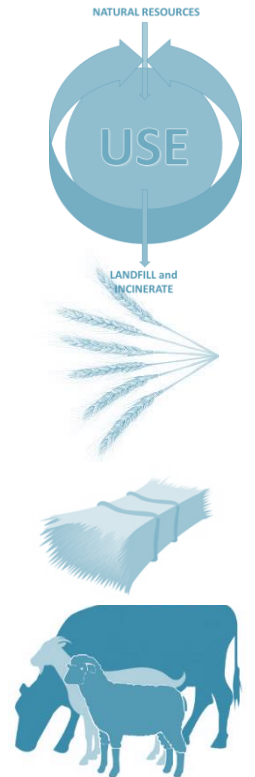






# Perspectives of a circular food system

- P0: Safeguard natural resources (e.g. soil, water, air and biological resources).
- P1: Plant biomass is the basic building block of food and should be used by humans
- P2: By-products from food production, processing and consumption should be recycled back into the food system
- P3: Use animals for what they are good at



## Acknowledgements:

Professor Imke de Boer (Animal Production Systems)

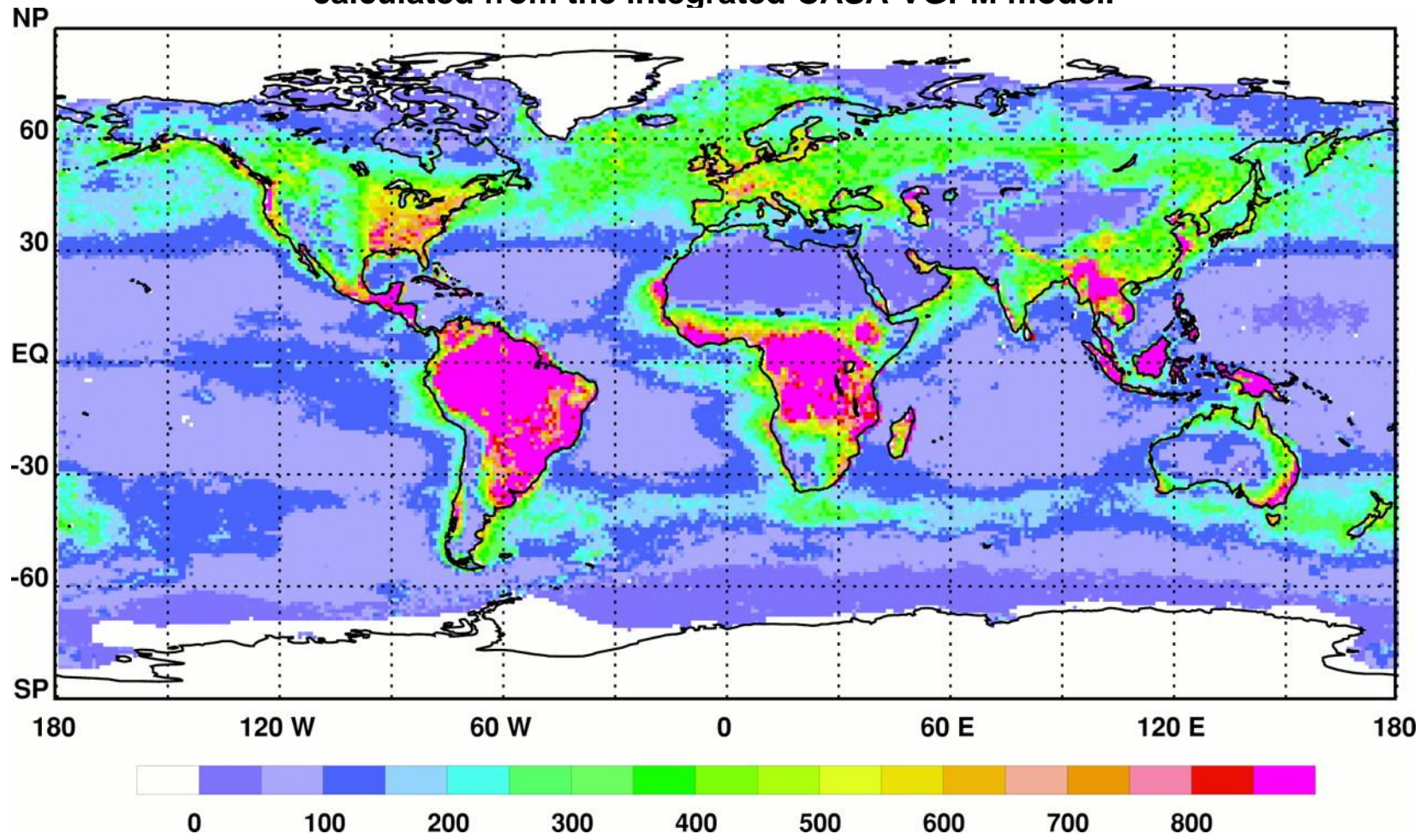
Professor Martin van Ittersum (plant production systems)

See Mansholt Lecture from Louise O. Fresco (Executive

Board President WUR



**Figure 1 Global annual NPP (in grams of C per square meter per year) for the biosphere, calculated from the integrated CASA-VGPM model.**

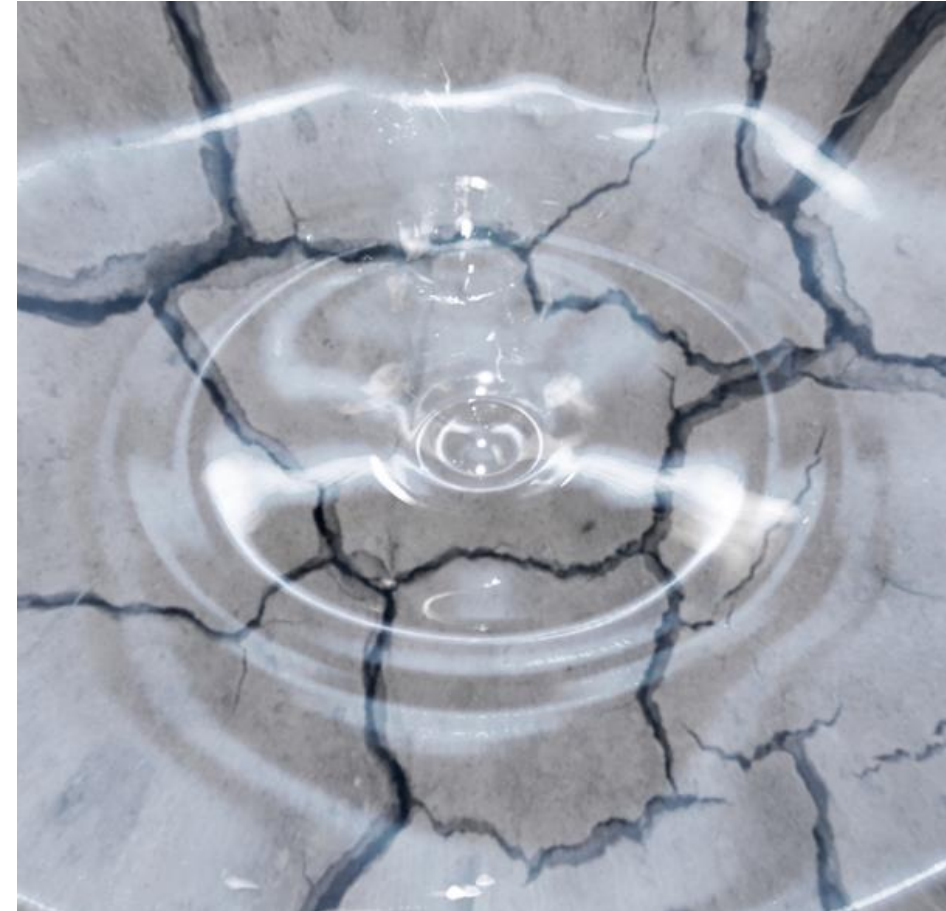


Christopher B. Field et al. Science 1998;281:237-240



# Safeguard natural resources (P0) → water

- Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such (\*)
  - Essential and connecting element
  - In every living organism
  - In the air, in ice caps, in the ground, in seas and oceans
  - Earth covered for 71% with water
- Water's role in our food system









# How food connects all the SDGs

