AGRIWATER

European Perspective on Water Use in Farming

EDUCATIONAL MATERIAL FOR FARMERS

MODULE NO. 6

Co-funded by the
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of the European Union

Summary of Modules

- Current Water Situation in Europe (incl. projections)
- Water Intensity of Crop Production in Europe
- Policy: Agriculture and Sustainable Water Usage
- EU Water Quantity Policy: WFD and CAP
- Summary

Introduction: Agricultural Water Importance

- Agriculture impacts water quality and quantity through fertiliser leaching and water quantity.
  - The decreased water flow will further reduce water quality with climate change as pollutants are less diluted; conversely, excess water in coastal areas can lead to saltwater infiltration into the water table.
- Production is dependent on water
  - Irrigation brings increased crop viability, yield and quality
    - surface water bodies, groundwater bodies, rainwater collection and reclaimed wastewater
    - 6% of farmland in 2016 was irrigated in the EU

Current State of Water in Europe

17% ↓ Renewable Water

Over the last 50 years, there has been a European-wide decrease in renewable water.

Causes:

- Population Increase
- Pressure from Economic Activity
- Climate Change

Climate Change

- Aggregates seasonal and year-long water security
- Higher than average temperatures → and more frequent extreme weather events, including drought
- Water stress is projected to increase by a significant amount by 2030

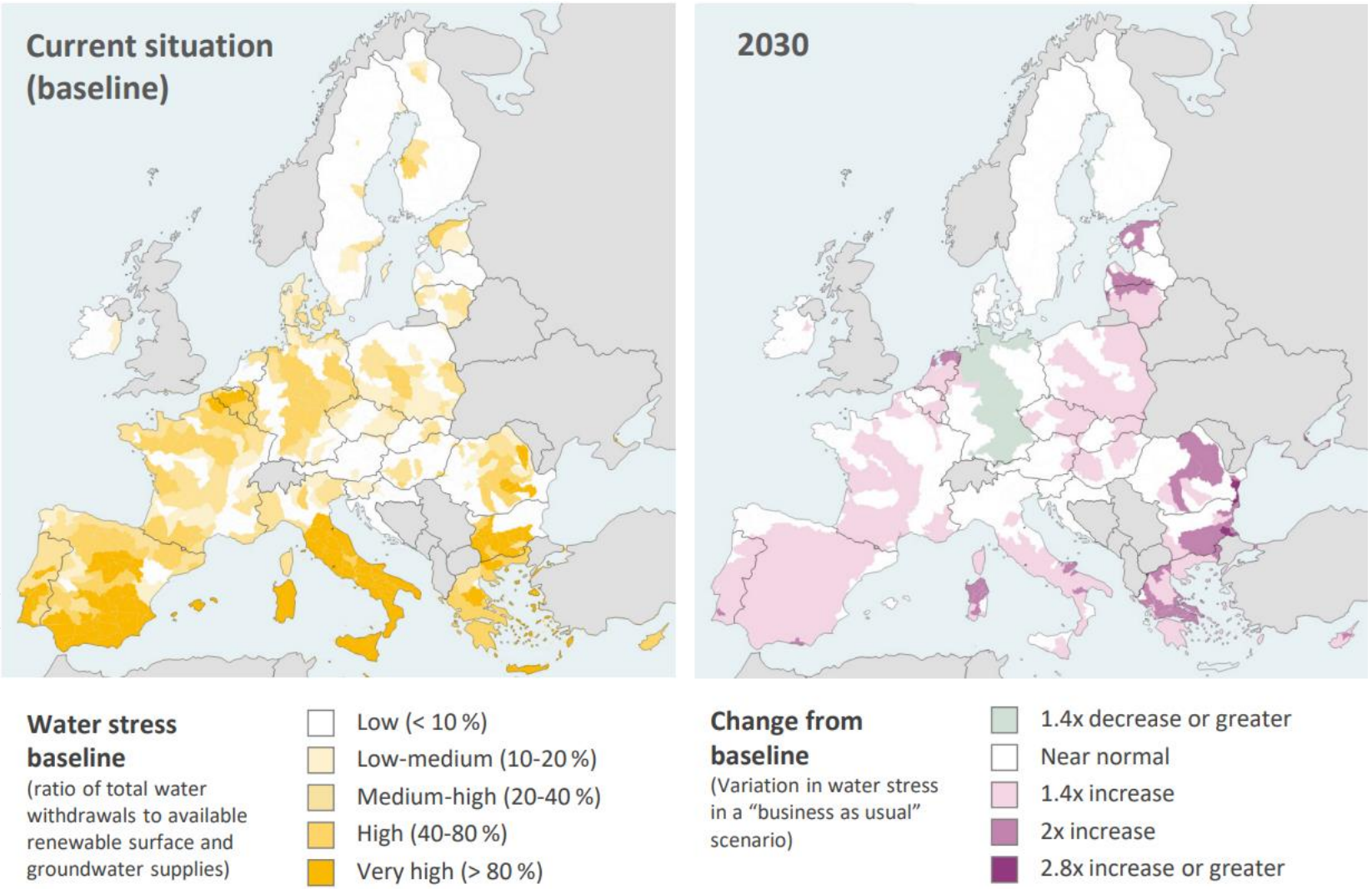
Cost of Climate Change

- If global temperatures increase by 3 °C, it would see droughts occur twice as often.
- Economically losses annually in Europe would increase to €40 Billion/annum

Current State of Water in Europe (Continued)

- Climate change = higher average temperatures, more frequent and extreme weather events, including droughts. Making freshwater scarcer.
- Water stress to increase significantly by 2030.
  - Increase demand for irrigation
- In countries such as Malta, Spain, Italy, Greece, Cyprus, Hungary, and Belgium, precipitation rainfall can not infiltrate into the ground because of agricultural drainage.

Image: World Resources Institute – Aqueduct, accessed on 10/02/2022



Water stress in the EU and future projections

Water Stress has been forecasted to increase in a significant portion of the EU by 2030.

Left (yellow) indicates the stress level by withdrawal from renewable surface and groundwater. In Southern Europe, this is very high; the same can be seen in some western European countries.

Right (purple) predicts that water stress will likely continue or stay the same in most areas by 2030.

Image: ECA and EEA, accessed on 10/02/2022

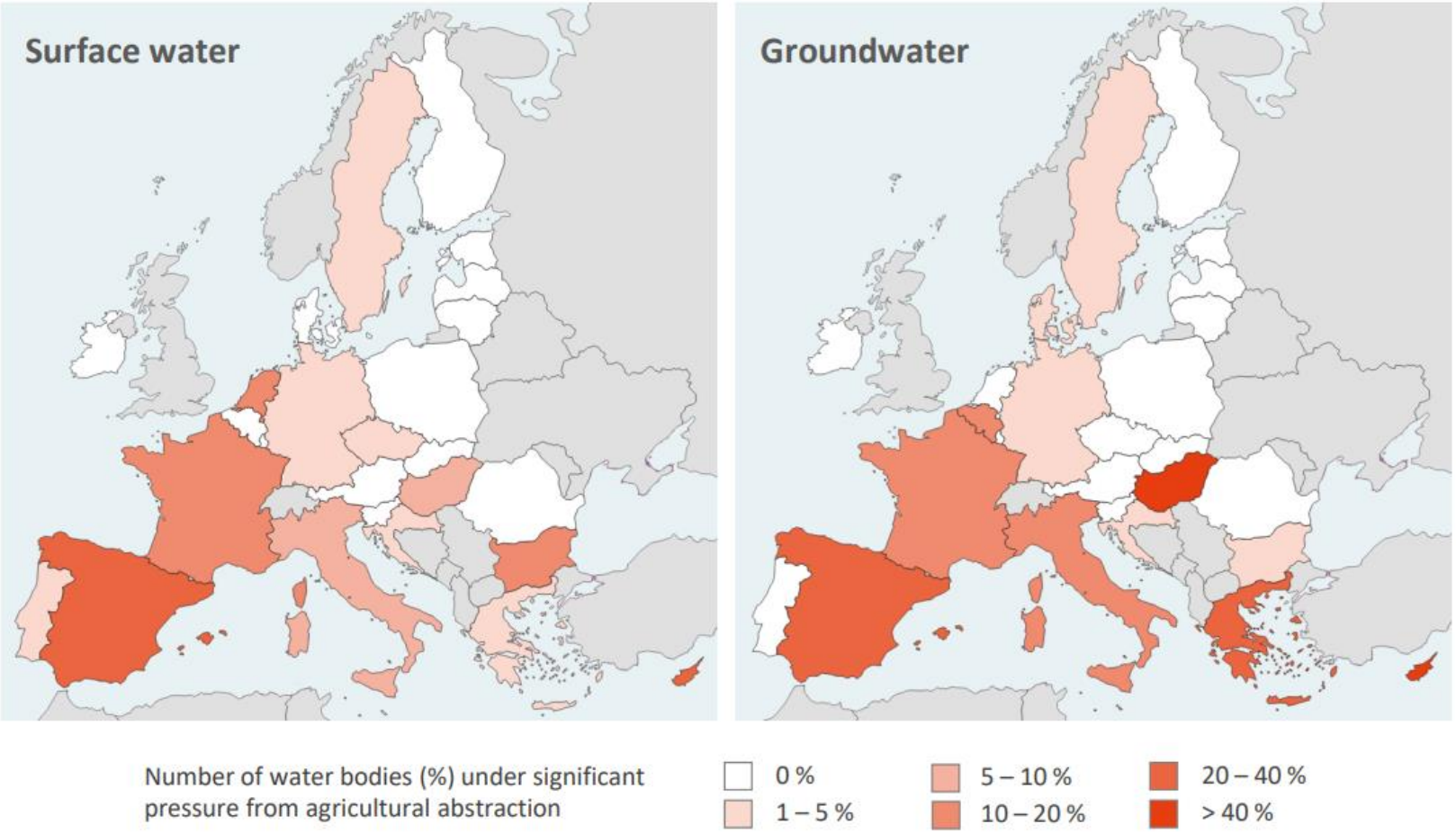


*Image above indicates the percentage of water bodies in each country under stress, with darker colour indicating more stress.

Water bodies under significant stress in the EU from agricultural water abstraction

Agricultural water abstraction accounts for 24% of the EU. At the same time, agricultural water use has decreased by 28% since 1990.

Despite this, water bodies are reported as under significant pressure from agricultural use.

Water Intensity- Southern Europe

- Between 2005 and 2016, water use intensity decreased by 10.5%.
  - Portugal and Spain saw a decrease in total water input, and increased gross value added.
  - Cyprus, Greece, Italy and Malta became more water-intensive in the same period. Despite decreased irrigation, water abstraction and total water input per hectare increased. There was also a gross value loss at this time.
- Southern Europe houses almost 60% of all irrigated areas and accounts for 85% of water abstraction for irrigation in Europe.
- Water Security concerns have seen significant investments in reservoir, irrigation and drainage infrastructure. These measures have also added stress to natural water balances and altered inland and coastal hydromorphology.

Water Intensity- Eastern Europe

- Water Intensity of crop production decreased by 31.5% between 2005 and 2016.
  - Bulgaria, Czechia, Hungary, Romania and Slovakia had significant water intensity decreases with increases in gross value generated.
  - Poland, in the same period, became more water-intensive. Despite halving irrigation abstraction, the total irrigation area doubled.
- In a more temperate and humid region than southern Europe, crops see most water needs to be met through rainfall retained in the root zone.

Water Intensity- Western Europe

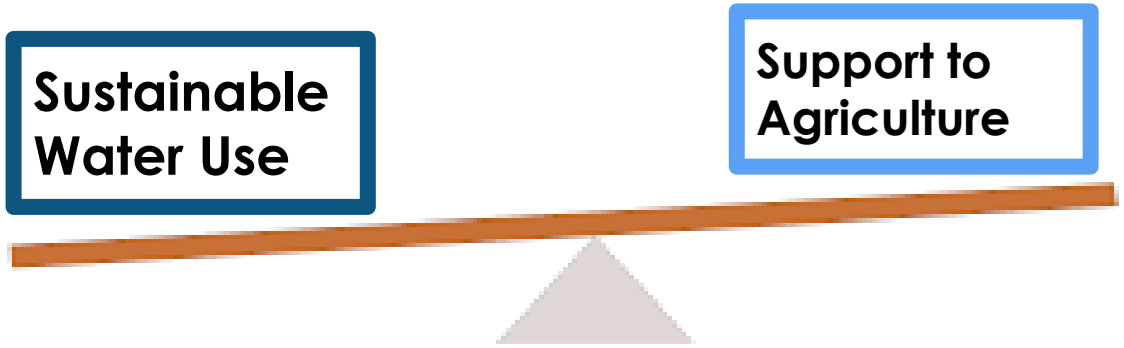
- Compared with other regions of Europe, the west has overall the lowest water intensity of crop production.
  - However, this means there was little to no decline in water use intensity.
  - The Netherlands has the lowest water intensity of crop production.
  - Between 2005-and 2016, water intensity marginally decreased in Germany, Luxembourg and the Netherlands. In the same period, France became slightly more intensive.
- Western Europe has a higher variability of climate conditions than the other regions. Irrigation covers seasonal water deficits to stabilise crop production and improve yield quality.
- More efficient irrigation technologies are more dominant in this region, such as drip and sprinkler irrigation, the Netherlands uses dual irrigation and drainage seasons.

Water Intensity- Northern Europe

- During 2005-2016 water intensity of crop production decreased by 13.3%.
  - Denmark, Latvia, Lithuania, Sweden and the United Kingdom became less water intensive, despite increased total water input per hectare.
  - In Denmark irrigation abstraction doubled and goss added value significantly increased.
  - Estonia saw an increase in water intensity in the same period, without added gross vale.
- Northern Europe's humid climate conditions see long term availability of surface and groundwater.
- Water scarcity is less frequent and seen mostly in urban areas. Rainfed agriculture is more dominant that irrigation.
- Climate change will increase the average precipitation and temperature in the region creating more favourable agricultural expansions but increases likelihood of droughts and water shortages.

Balancing Agriculture and Sustainable Water

- Current EU water policy favours farmers over sustainable water use
  - The policy promotes greater water use than efficient use.
- Water Framework Directive targets good quantitative status for all EU water bodies by 2027
- The CAP offers tools to help reduce pressure on water resources
  - payments for greener practices and financing greener infrastructure



EU Water Framework Directive (WFD)

Target

- Target: water abstractions should not lower groundwater levels so that it causes deterioration or non-good water status
- In 2015 the quantitative status of groundwater bodies was 9% - this is considered poor.

Country Snapshot

- Malta, Spain, Italy, Greece, Cyprus, Hungary and Belgium have groundwater abstraction of 20-40%
- Rainfall in Belgium, despite good precipitation, water infiltration is next to none because of agricultural drainage.

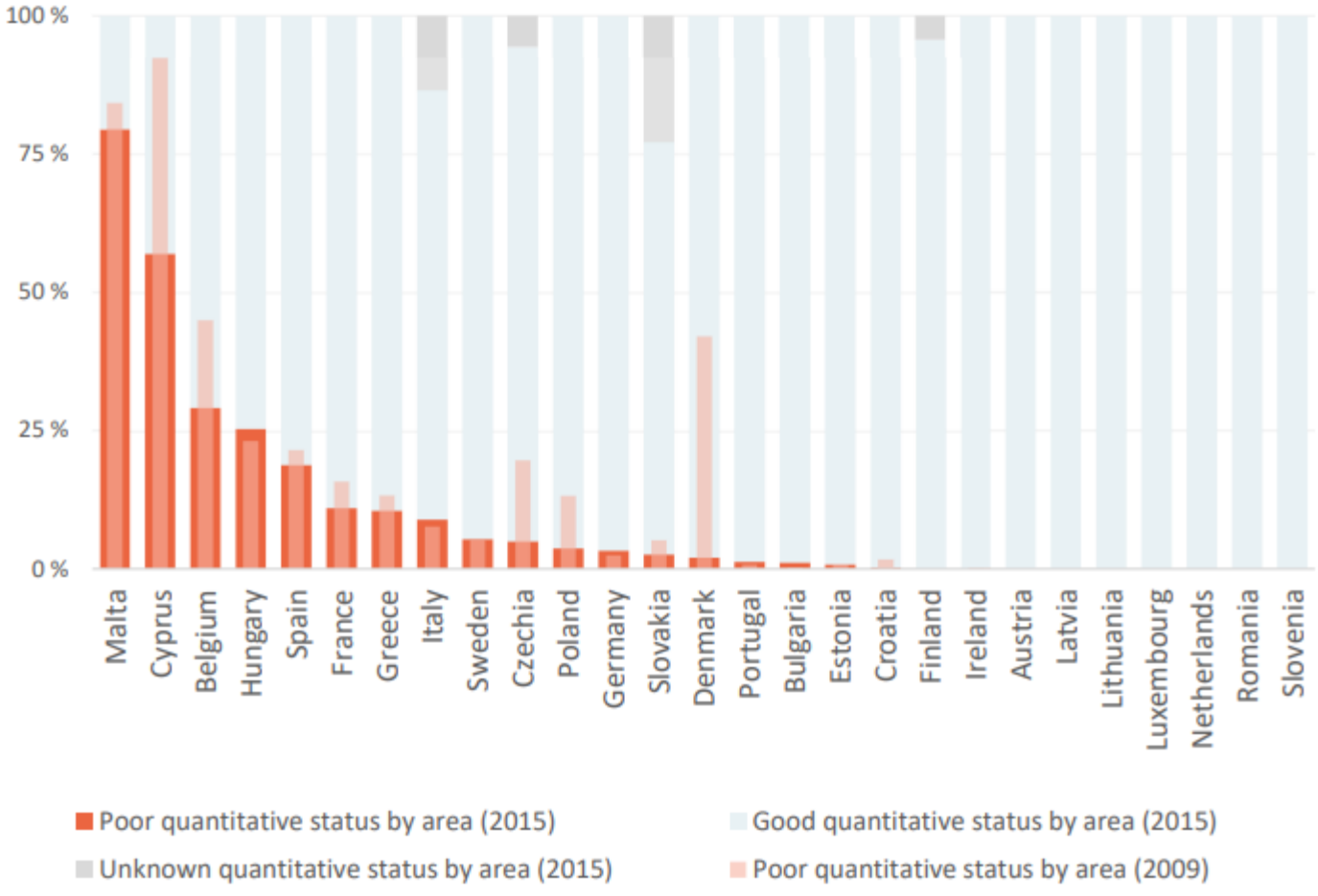
Benefits

- Although the WFD has not reached its target as of 2022, it has contributed to higher levels of water body protections than without this policy.
- 2019 review of the WFD stated that it ís essentially fit for purpose' with recommendations and changes to improve the policy.

Status of Groundwater Bodies in Europe

This graph represents the 2015 groundwater status of European Countries.

This graph represents the WFD's poor status, indicating that there is not sufficient water.



Graph Source:ECA based on EEA, 2018, 'Groundwater quantitative and chemical status'.

The European Common Agricultural Policy (CAP) & Water

Policy Objectives '14-'20

- Sustainably managing natural resources (including water)
- Viable food production
- Balanced territorial development

Objectives after 2020

- Fostering sustainable development and efficiently managing natural resources such as water, soil and air.

Paths of Support for Water

- Common Market Organisation- Fruit, vegetable, wine, and olive oil productions receive investment support for water impact measures
- European Agricultural Fund for Rural Development- support practices and investment with water use impact
- Reusing treated wastewater is part of circular economy support.
  - In May 2020, regulation enabled the reuse of "more than 50% of total water volume… for irrigation from wastewater treatment plants… resulting in 5% water stress reduction".

Audits and Review Takeaways- WFD and CAP

- There are different levels of incompatibility between the WFD and CAP policies.
  - Despite this, member states must have an individual responsibility to manage water.
  - Every country has positives and negatives to water management
- In the ECA review for 11 EU states:
  - In 8 countries, water is significantly cheaper if used in agriculture
  - In 6 countries, payment for water abstraction is not necessary
    - There are also large amounts of illegally extracted water in some countries!
  - Unlicenced water extractions accounted for up to 12% of water in Hungary, Bulgaria and France.

Audits and Review Takeaways- Irrigation and Recycling Waste Water

- 6% EU Farmland irrigated in 2016 = 24% of all water abstraction

Recommendations:

- No funding for irrigation in dry areas where water is scarce.
  - Some subsidies to support water-intensive crops (rice, nuts, fruit, vegetables.
- Recycling wastewater can save freshwater
- National/regional investment for reusing wastewater for irrigation is essential
  - 0.4% of water abstraction recycled and reused in the EU (2015)
- 2020 EU adopted regulation, sets minimum requirements for water quality, monitoring, risk management and transparency, and will apply from June 2023.
  - Enable potential reuse of up to 50% of wastewater.

Summary

- Climate change, crop demand, and agricultural production impact water availability above and below ground.
  - Water stress is increasing while water availability is decreasing
  - Infrastructure, agricultural practice and region impact factors to conserve water resources differently
- Decreasing water intensity and decoupling total water input and gross value added in crop production is a positive movement of agriculture to modernisation and restructuring the agricultural sector in countries.
- CAP and WFD both make accommodations to support sustainable water management.
  - The agriculture sector represents the most significant water use industry with the highest potential to change to improve water availability in the EU.

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AGRIWATER

CONTACT

Association of Private Farming of the Czech Republic

Ms Veronika JENIKOVSKÁ
Samcova 1177/1
110 00, Prague 1
Czech Republic
info@agriwater.eu

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