



**POLITECNICO
DI TORINO**

RESEARCH ACTIVITIES ON CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT: A FOCUS ON AGRIFOOD



Politecnico di Torino - ITALY

Ranking

Ranked among the first 25 European
technical Universities
Engineering/Technology/Computer Science

Teaching staff

193 Full professors
370 Associate professors
241 Assistant professors

Students (A.Y. 2014/2015)

33,461 students
34% students from outside Piedmont
16% international students
5,616 first year students(A.Y. 2015/2016)
205 Specialization Master students
73 enrolled in Lifelong Learning courses
700 PhD students

Water footprint



*Coping with
water scarcity
in a globalized
world - CWASI*

ERC-2014-CoG
project 647473

Food production is by far the biggest
form (about 90%) of societal water
consumption and entails the most
critical impacts of human societies on
the water cycle.

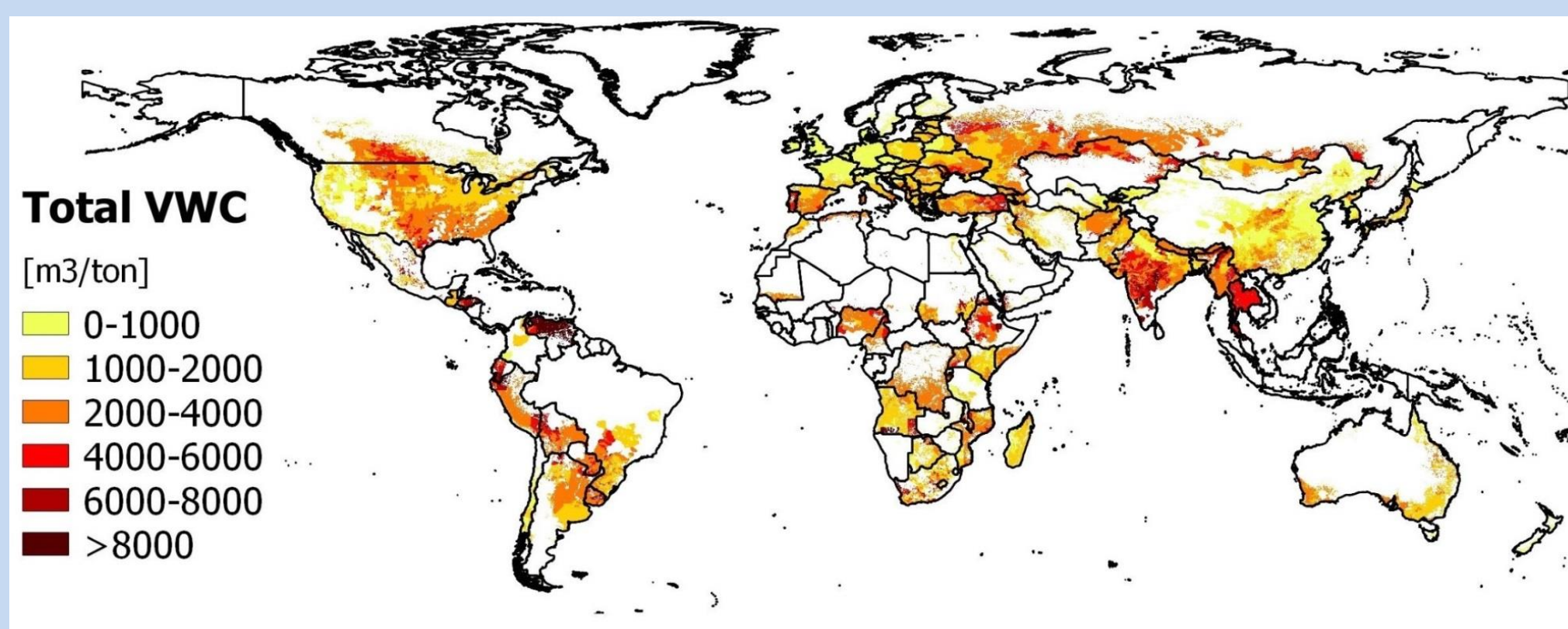
The **water footprint** of a product is the overall volume of
freshwater used to produce the good, measured at the place
where it was actually produced.



$$WF = \frac{\text{Crop water requirement}}{\text{Crop yield}}$$

The water amount hidden behind food depends on:

1 the **place** where it has been produced



*Each region has its
own water
footprint,
depending on
climate, agricultural
practices, soil,
fertilizers used.*

2 the **food** produced



A pizza:
1260 liters



A kilo of bananas:
790 liters



A glass of wine:
110 liters

Global trade virtually transfers large amounts of water resources,
a phenomenon that has been named the “**globalization of water**”.
The research project focus on the effects of the globalization of
water on the vulnerability to a water crisis of the global water
system.

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Life Cycle Assessment (LCA)

LCA identifies and quantifies energy and materials used, as well
as releases to the environment and their potential impacts
throughout the whole life cycle.



**In EU, agricultural production of FOOD, FIBRE and
FUELS accounts for...**

90% of ammonia emissions, impacting air quality

50-60% of nitrogen load in freshwater bodies affecting water quality

10% of greenhouse gas emissions (including 80% of methane
emissions) contributing to climate change



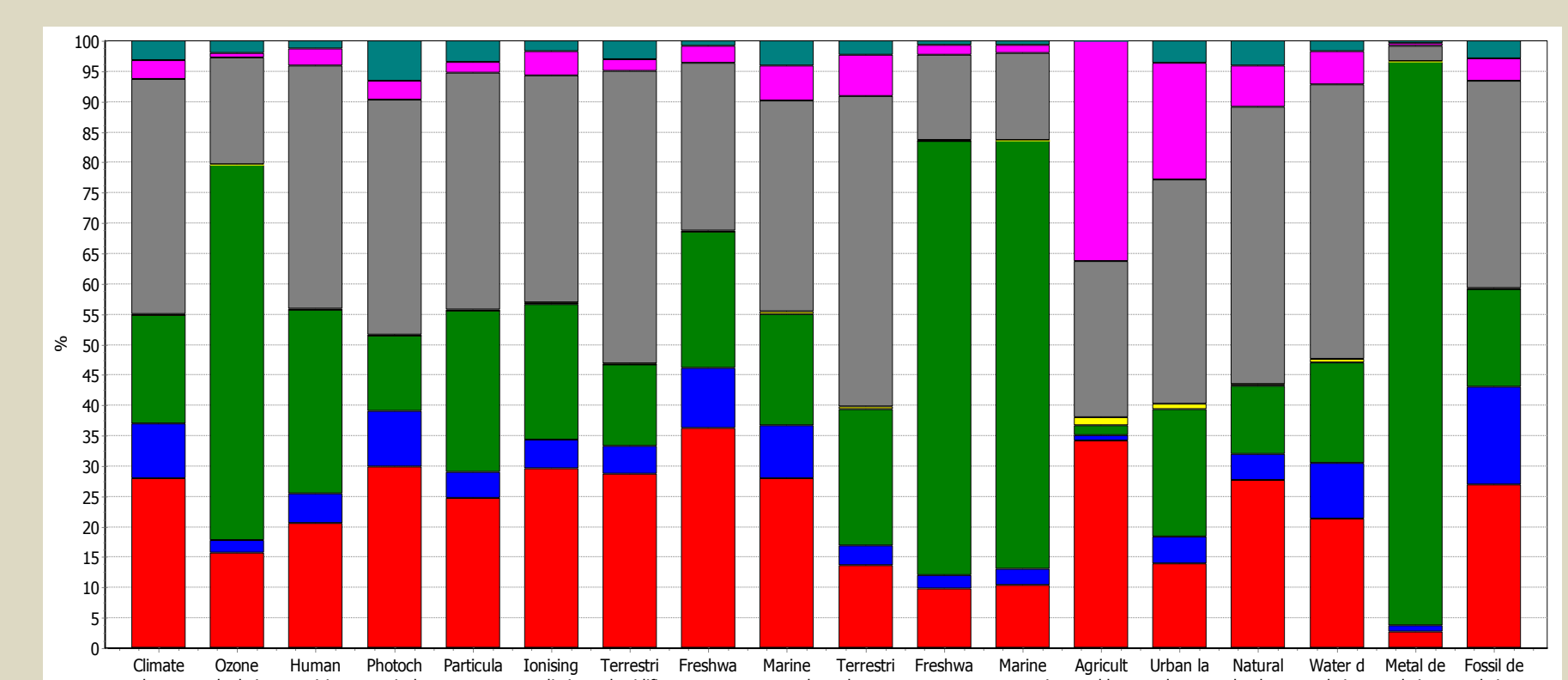
**SAFE FOOD CONTROL PROJECT
(EU funds 6.5 M€):**

Development of systems and technologies for the
production, conservation, transformation and
enhancement of Piedmont quality agrifood

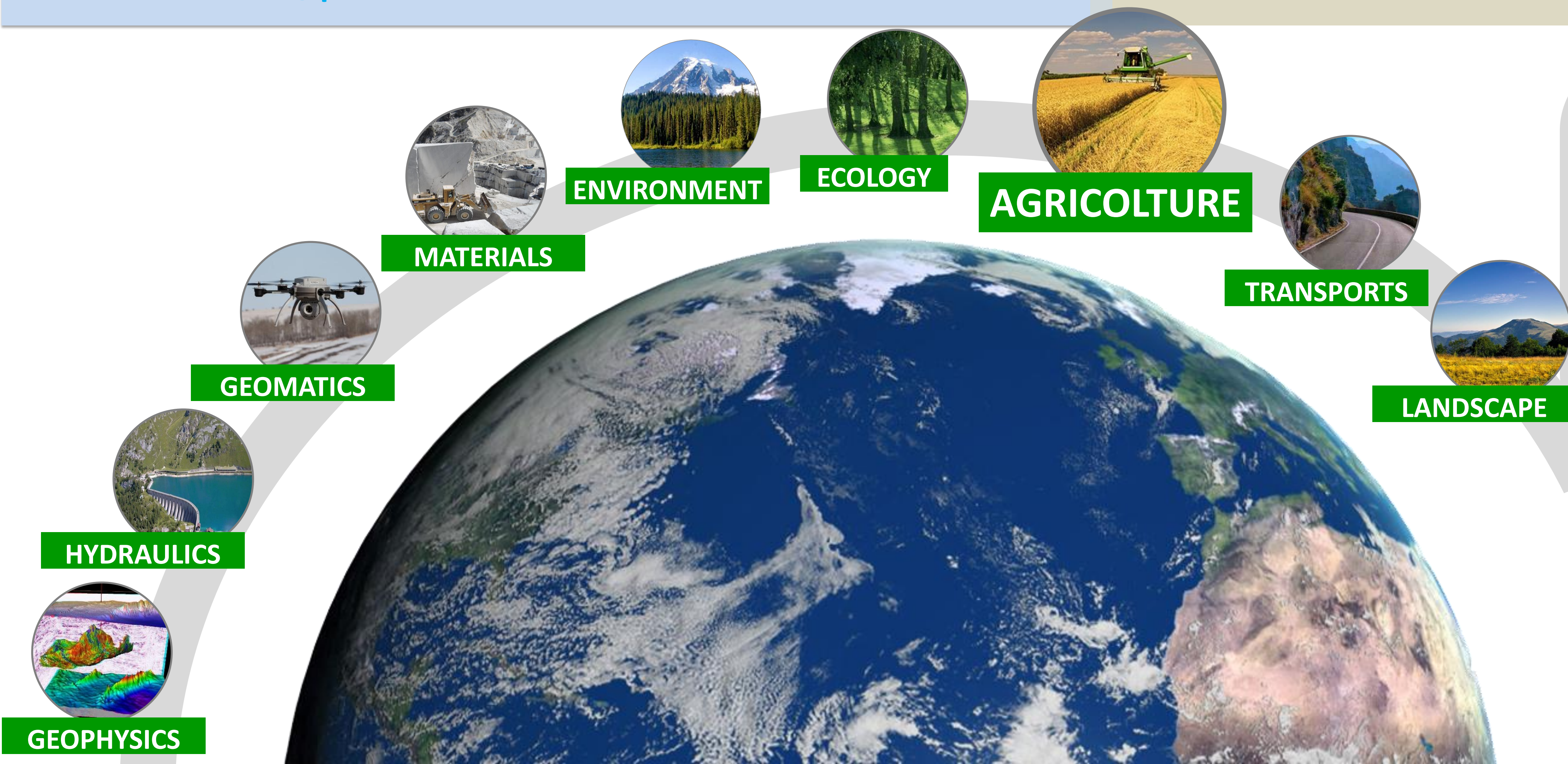
Case study: LCA of borettane onions



The cultivation of 1 kg of onions
generates 110 g CO₂eq., 70% caused by
fertilizers production.



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**Politecnico di Torino accounts 11
Departments, which coordinate
research on many different fields,
such as Environmental Engineering,
Energy Engineering, Chemical
Engineering, Architecture and
Ecodesign.**



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UN CLIMATE CHANGE CONFERENCE 2016
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