JustWATER

Water Decision Making Tools for Informed Hydro Politics in Italy

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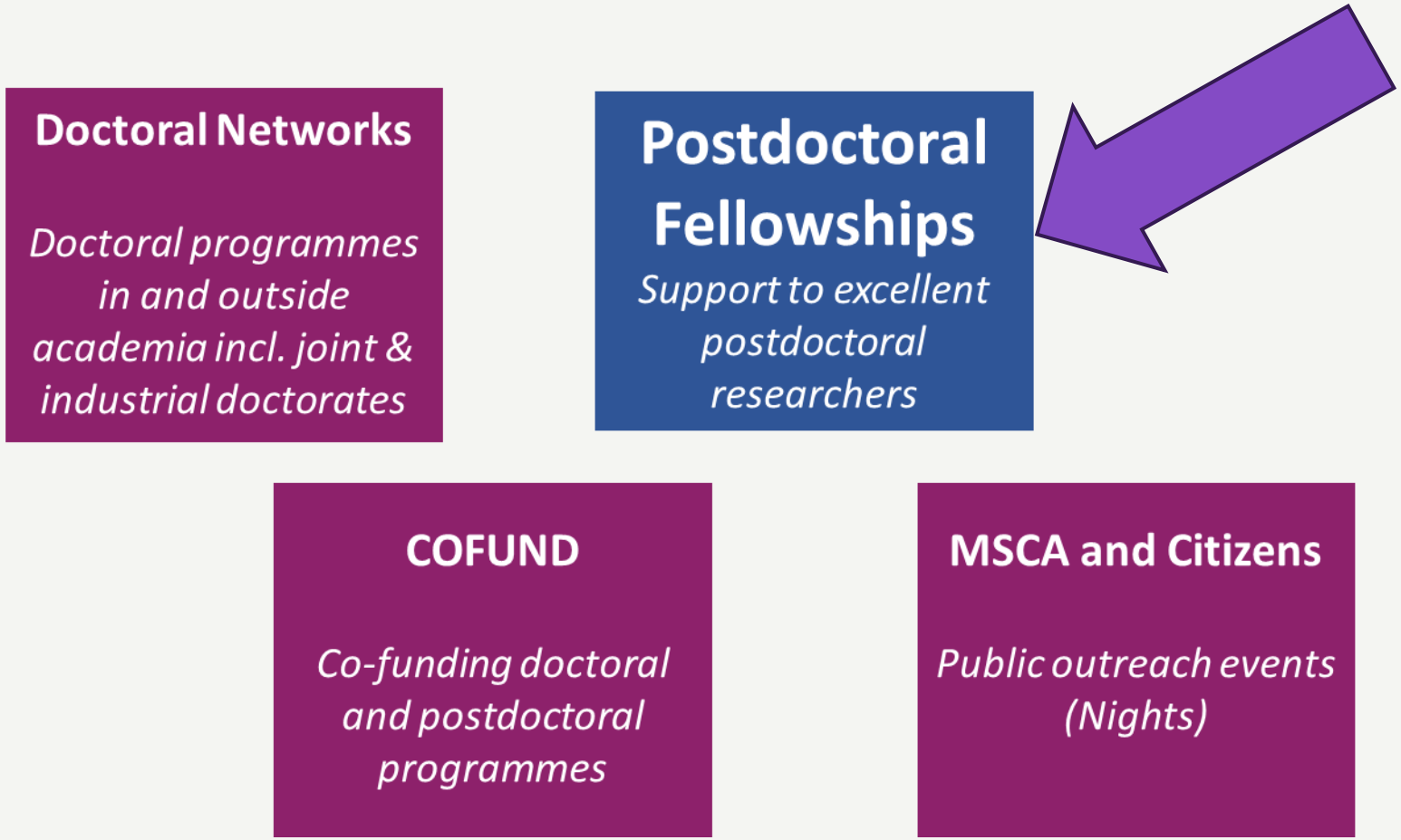
The Marie Skłodowska-Curie Actions (MSCA) under Horizon Europe

Horizon Europe is *the EU's key funding programme for research and innovation with a budget* of €95.5 billion



What is a Marie Curie Post Doctoral Fellowship?

MAIN AIM

- to enhance the creative and innovative potential of researchers
- holding a PhD
- wishing to acquire new skills
- through advanced training
- International mobility
- interdisciplinary
- inter-sectoral mobility

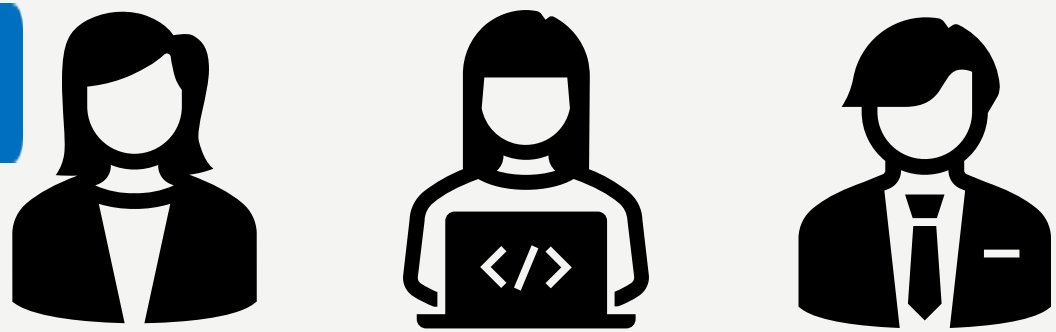
What is a Marie Curie Post Doctoral Fellowship?

THE MOBILITY RULE

Recruited researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of the beneficiary (for European Postdoctoral Fellowships), or the host organisation for the outgoing phase (for Global Postdoctoral Fellowships) for more than 12 months in the 36 months immediately before the call deadline.

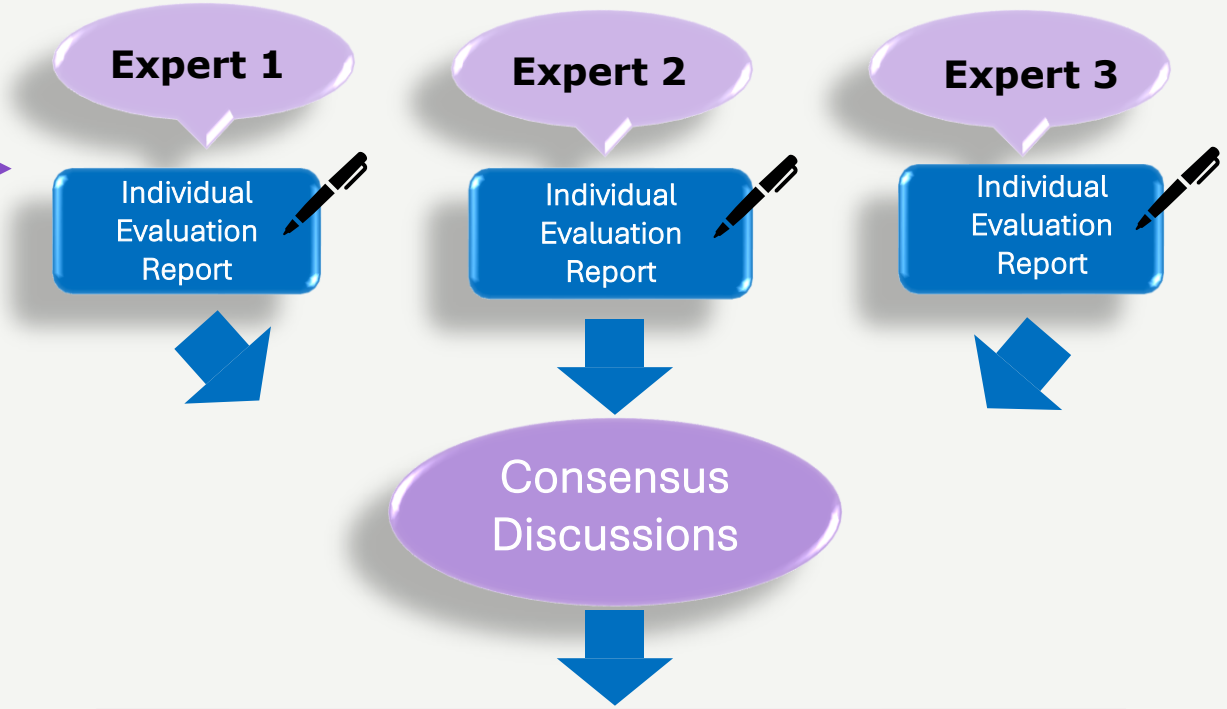
What was the selection procedure for a MSCA in 2022 ?

Proposals in 2022: more than 7200



ALLOCATION OF PROPOSALS TO EXPERTS

- DESCRIPTORS AND KEYWORDS



New for PF-2022 Call !!!

Resubmission restriction for proposals with same researcher and same host scoring <70% in previous evaluation !!

JustWATER: main numbers of the project award

Scoring among the top 6% of 7200 project proposals.

JustWATER is in the top 432 best projects in 2022 in Europe (not known in Italy).

Winning at the first submission round.

First MSCA hosted in Bergamo University.

Budget: 188 590 EUROS

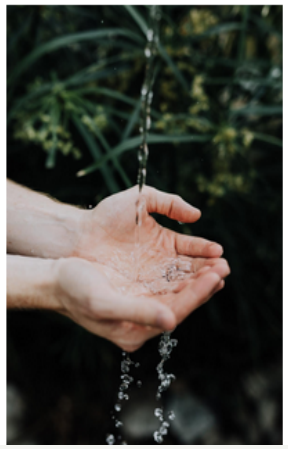
Duration: 24 MONTHS

UNIVERSITÀ DEGLI STUDI DI BERGAMO

Ateneo Studiare Ricerca Terza missione Internazionale Servi

JustWATER ottiene un finanziamento MSCA Postdoctoral Fellowships

HOME / NODE / JUSTWATER OTTIENE UN FINANZIAMENTO MSCA POSTDOCTORAL FELLOWSHIPS



JustWATER è il progetto di ricerca firmato dalla dott.ssa Francesca Greco per il quale l'Ateneo ha siglato il Grant Agreement relativo a un'azione Marie Skłodowska-Curie Postdoctoral Fellowships. Risultato nel 6% delle migliori proposte presentate, JustWATER ha ottenuto un finanziamento di 188.590 euro, incluso il supporto alla ricerca per quanto riguarda la formazione, la strumentazione tecnica e lo staff di supporto. Della durata di 24 mesi, la ricerca si rivolge a due tipologie di target. A livello nazionale fornirà elementi utili ai policy-makers italiani, mentre a **livello internazionale produrrà una replicabilità del modello**

Potrebbe interessar

- Marie Skłodowska-Curie Actions (MSCA)

JustWATER: main objectives

1. building up regional and sub-regional specific GIS maps for the geo-location of a selection of agri-food export chains in Italy, irrigated with depleted groundwater and located in water-scarce areas
2. delivering a country-specific graphic chart of these exports' destination countries
3. performing a socio-economic analysis of virtual water trade flows derived by the maps
4. exposing the Italian water community to the project results
5. exposing the Italian water community to its gender roles dynamics, both in water decision-making and in the agri-food sector at large
6. expanding the professional skills of the researcher in the field of large datasets management and science production in the field of virtual water econometrics, producing a bi-lateral transfer of knowledge with the University of Bergamo, increasing her career opportunities and employability
7. innovating the discipline of virtual water by connecting the hard science of econometrics, physical geography and geo-spatial research with critical hydropolitics, political economy and political ecology

COMPONENTS of a Marie Curie Post Doctoral Fellowship project:

- Excellence Of Match Between The Scientific Supervisor And The Researcher
- Training for key transferable skills
- Fostering innovation and entrepreneurship, (e.g. commercialisation of results, Intellectual Property Rights, communication, public engagement)
- Citizen science
- Promoting Open Science practices (open access to publications and to research data, FAIR data management, etc.)
- Gender equality components
- Qualified Host Organisation

Match between scientific supervisor's skills and researcher's interests

HYDRO HEGEMONY

WATER AND POWER

GEOGRAPHY

WATER POLITICS

WATER AND NATION STATE BUILDING

WATER RIGHTS

TRANSBOUNDARY WATER

WATER DIPLOMACY IN CENTRAL ASIA

WATER AND MULTINATIONAL CORPORATIONS

VIRTUAL WATER & WATER FOOTPRINT

SHARED AQUIFERS

HYDRO HEGEMONY

WATER AND POWER

GEOGRAPHY

WATER POLITICS

WATER AND GENDER

TRANSBOUNDARY WATER

WATER DIPLOMACY IN JORDAN&CYPRUS

Ad hoc training: the professional growth of the researcher

So from here the transition from
- my background in international relations, then in development studies and finally in human geography will be fully complemented thanks to ad hoc training in QGIS, Geo-Python and other statistical softwares.

I will be able to use new tools:

- softwares in georeference
- advanced use of Geo Python
- avanced statistical data softwares

I had already started doing these trainings during my PhD but it will definitely be provided with my trainings on a series of long-term courses.
I WILL GROW PROFESSIONALLY:
Training will bring me from the place where I am now to a place where I have not yet arrived.
So my professional growth will also be activated through a progress in my training as a researcher

I will be trained on specific softwares in order to grow professionally

Open Science

Open science practices:
citizens, civil society and end-users will be able to access the outputs free of charge

- thanks to the project's website and the set of

- open-**source publications foreseen in the Work Packages of the project**.

- The main datasets which are needed for this research are already open-science*

*The datasets of Water Footprint Network24 and the Italian database CWASI (University of Turin) are already available to the public and published open-source. In particular, the latter is an output of a HORIZON action and it is, in its turn, following the open-science policies foreseen by a EU-funded project, called "CWASI project"25.

Citizens Science

24 hours Hackathon in Bennett University - Bennett University

(example of Hackathon)

The objective of the MSCA and Citizens action is to bring research and researchers closer to the public at large, with a focus notably on families, pupils and students.

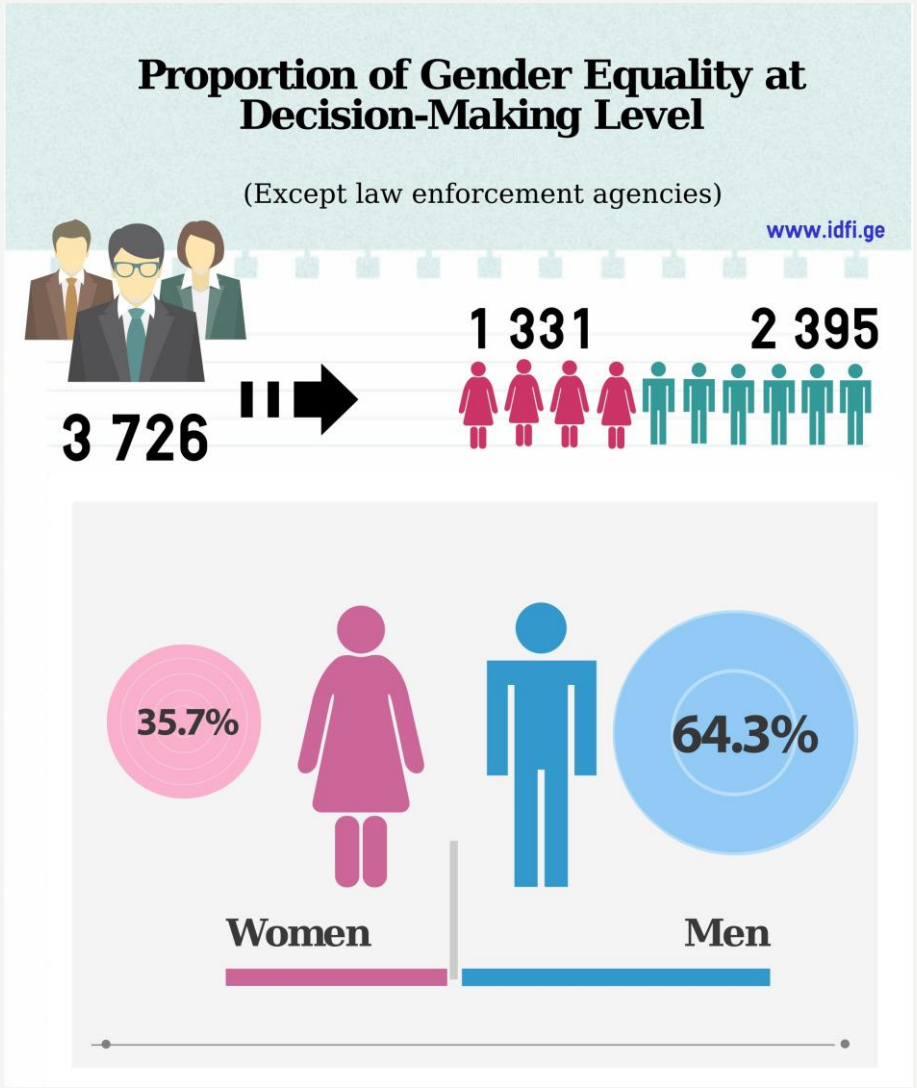
Gender Component / 1

JustWater is completely mainstreamed for gender, covering alongside diversity and minority issues, such as migrant issues and human rights of migrant workers.

The project provides

- an analysis of the gender dimension of the Italian water community alongside **s**ex-disaggregated data on farm ownership and the agricultural workforce.
- While global virtual water datasets are gender-blind – as they exclusively refer to water embedded in crop production without discussing social aspects – this research will address the social dimension in a gendered way, given the significant gender imbalances in land ownership and water management roles (WWDR 2018). **This is an absolute novelty in the virtual water literature**

(example of image output)



Gender Component / 2: first sex-disaggregated workshop ever performed within the Italian water community

JustWater will provide

- a literature review on the current

status of women involved in water studies in all disciplines and

fields of work (NGOs, Academic, Governmental, Private sector)

- an experimental session on gender in the Italian Water Panorama, based on women and men's water experts' perceptions on different topics, within the main final workshop of the project

Research topic: water and its use for export-led irrigation in Italy

THE PROBLEM

- **Striking a balance between water supply and water demand is one of the greatest human challenges at the global level (1)**
- **In the last three decades, the intensification of surface and groundwater use has led to alarming levels of water depletion in major aquifers(2)**
- **threatening the survival of natural ecosystems around the world rivers and water bodies(3)**

Intensified water use has been mainly caused by the increase in agricultural irrigation

1 WWDR 2022 World Water Development Report 2022, UNESCO, Paris, 2022.

2 Gleeson T, Wada Y, Bierkens MFP & van Beek LPH Water balance of global aquifers revealed by groundwater footprint. Nature 488, 197–200 (2012); Dalin C., Wada, Y., Kastner, T., & Puma, M. J.. (2017). Groundwater depletion embedded in international food trade. *Nature*, *543*(7647), 700–704. 3

3 Famiglietti, J. The global groundwater crisis.Nature Clim. Change4(11), 945–948 (2014); Rockström, J. (2003). Water for food and nature in drought–prone tropics: Vapour shift in rain–fed agriculture. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, **358**(1440), 1997– 2009.; Vörösmarty, C. J., McIntyre, P. B., Gessner, M. O., Dudgeon, D., Prusevich, A., Green, P., Glidden, S., Bunn, S. E., Sullivan, C. A., Reidy Liermann, C., & Davies, P. M. (2010). Global threats to human water security and river biodiversity. *Nature*, **467**(7315), 555

Theoretical framework

INTERDISCIPLINARITY

Virtual water is by nature an interdisciplinary domain

The researcher will build upon and expand
-- my research in human geography[15], political ecology[16] and international political economy[17] to establish a novel theoretical framework for the study of virtual water.

The connection between virtual water theories and political ecology has been neglected, as virtual water literature has focused mainly on the global scale of analysis and its relation to the national scale[5].

The majority of the virtual water scholarship has disconnected virtual water analysis from the local scale,
which is where very often political action is taken and power relations are played out.
JustWater politicises the concept of virtual water by exploring the dynamics at the regional and district level. The research politicises the environmental issue of water scarcity in vulnerable aquifers and water-scarce areas by establishing a precise geo-location of where it occurs, and analysing the relationships between political, economic and social factors linked to virtual water and crop exports.

METHODS

The research merges the methods of statistics and econometric analysis of virtual water[18] to test specific concepts in critical hydro politics[19] in the broader field of human geography and political ecology, including an analysis of the female/ male ratio of farmers, agricultural workers and water community of Italy, documenting their overall imbalance.
JustWater thus integrates Gender Studies with Virtual Water Studies.

Research problem

THE PROBLEM

To quantify the water used to produce agricultural crops, a new concept has been created:

virtual water

Virtual water is the water embodied in commodities – agricultural and beyond – and represents all the water needed during the production process of commodities.

At the national level, in a water-scarce country, agricultural imports embed virtual water imports and allow a nation to save national water resources while using up the water of the exporter country.

HOWEVER….

Research problem

HOWEVER….

Not all water is the same

and not all virtual water is the same:

some water is more vulnerable than others.

Some water sources are renewable, while others are non-renewable.

Some irrigation areas suffer localised water scarcity,pollution, over-pumping and other issues.

Consequently, some virtual water flows are sustainable, while others are not.

Their socio-economic impacts on the local communities of the exporting countries can vary greatly, especially where the production is mainly export-led, labour-intensive and subject to contract farming.

Materials and Methods

THEORETICAL CODING

Dataset	*CWASI datase it is a comprehensive database of country-specific water footprint and virtual water trade (VWT) data for 370 agricultural goods. The water footprint, indicating the water needed for the production of a good including rainwater and water from surface water and groundwater bodies, is expressed as a volume per unit weight of the good (or unit water footprint, uWF) and is here estimated at the country scale.Earth Syst. Sci. Data, 13, 2025–2051, 2021 https://doi.org/10.5194/essd-13-202*
Dataset	*Water Footprint Dataset , Hoekstra, A.Y. & Mekonnen, M.M. (2012) 'The water footprint of humanity', Proceedings of the National Academy of Sciences, 109(9): 3232–3237. It quantifies and maps the water footprint (WF) of humanity at a high spatial resolution. It reports on consumptive use of rainwater (green WF) and ground and surface water (blue WF) and volumes of water polluted (gray WF). Water footprints are estimated per nation from both a production and consumption perspective.*
Publication	*Book. Antonelli M and Greco F. (eds) "The WAter We Eat" 2015 (Springer) . The book combines virtual water and water footprints in a multidisciplinary approach. It Includes tips on how to make food production more sustainable in terms of water resources and presents case studies on specific food products, regions (the EU) and countries (Italy).*
Publication	*Dalin, C., Wada, Y., Kastner, T., & Puma, M. J. (2017). Groundwater depletion embedded in international food trade. Nature, 543(7647), 700–704. https://doi.org/10.1038/nature21403 Recent hydrological modelling and Earth observations have located and quantified alarming rates of groundwater depletion worldwide. This depletion is primarily due to water withdrawals for irrigation, but its connection with the main driver of irrigation, global food consumption, has not yet been explored.*
Publication	*Suvi Sojamo, Martin Keulertz, Jeroen Warner & John Anthony Allan (2012) Virtual water hegemony: the role of agribusiness in global water governance, Water International, 37:2, The recent global food crises have highlighted how the agro-food system tends to be subject to powerful agribusiness players, with thus far unidentified consequences for global water security. The paper connects hydro-hegemony and virtual water concepts.*

Materials and Methods: information from past literature

JustWater focuses on Italy's

- water-scarce areas and vulnerable hydrological units (rivers and lakes)

- and areas where groundwater is being depleted / considered vulnerable

Export-led irrigated agriculture relies on vulnerable groundwater in Italy (according to Carol et al. 2017).

CONTRADICTION?
At the global level**, Italy is the fifth net virtual water importer** while also being the **ninth largest virtual water exporter** of depleted groundwater.

In the European Union, Italy is the largest exporter of virtual water sourced from depleted groundwater.

This information, published in 2017 by Carol Dalin et. al. in *Nature*, has been largely ignored by the Italian literature on virtual water. JustWater takes Italy as a case-study to address this gap, given that the case is highly relevant at the European level and **pertinent** with the EU New Growth Strategy, reinforcing the EU Green Deal's communication,

Theoretical innovation

As a main innovative point, this project will

- cross-compare local socio-political analysis of water policies
- with virtual water studies that, according to the state of the art, currently only address global trends across nations.

Why JustWATER and why now?

The project is **particularly timing**:

1) the sustainable use of water resources in European Mediterranean countries is currently challenged by climate change. Water extremes -droughts and floods - have already been occurring as a direct result of the increase in temperatures in the Mediterranean area, particularly in “climatic hot spots” as defined by the IPCC reports and discussed at the UN COP26.

2) In Italy, an IPCC hot spot, the summer of 2022 has marked one of the most severe droughts of the last 20 years.

Research goals and gaps addressed by JustWATER

Italian literature on virtual water and water footprint has:

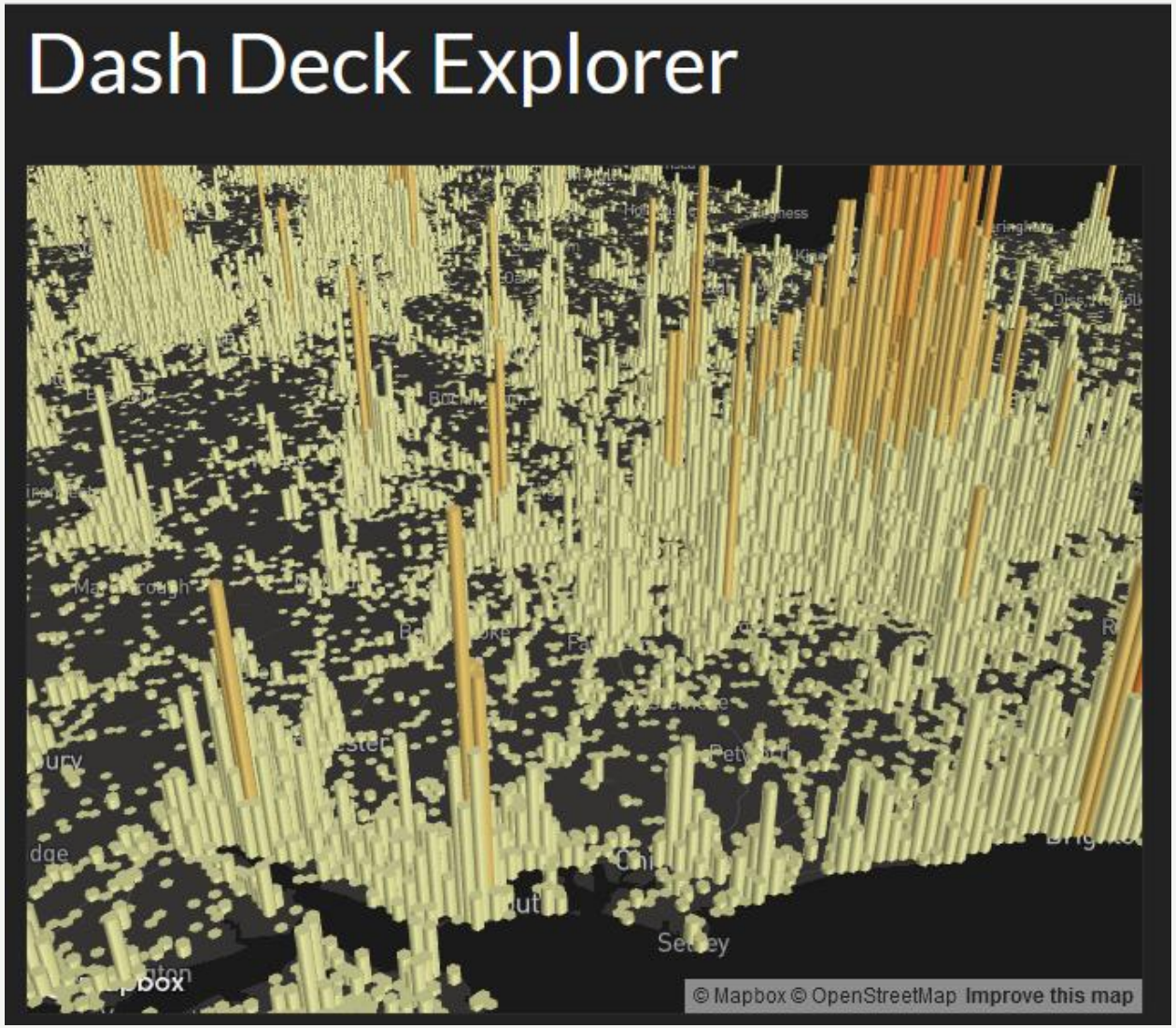
1) focused on the global and national levels, providing aggregated data by country and per major globally traded crops or data on aggregated by crop production,

2)without distinction between non-export and export crops.

3) This literature has fallen short of connecting virtual water exports to the exact geographical location beyond the national level, thus neglecting the substantial differences that exist at the regional and sub-regional levels and in particular the existence of hotspots where vulnerable groundwater and water-scarce areas are involved.

JustWater aims to clarify where depleted groundwater is involved in Italy's export-led irrigation.

By delivering GIS maps, graphic charts and a socio-economic analysis of export-led crops, JustWater can help visualize where depleted groundwater and water-scarce areas suffer from export-led water



Research Outputs of JustWATER

The outputs of the research are, more specifically:

- three open-science GIS Maps,
- one graphic chart of destinations and one socio-economic analysis framework, suitable for further exploitation in other drought-prone countries

The latter will be conceivably aimed at triggering political action for the protection of water resources in vulnerable environments under the current scenarios of water scarcity and repeated droughts.
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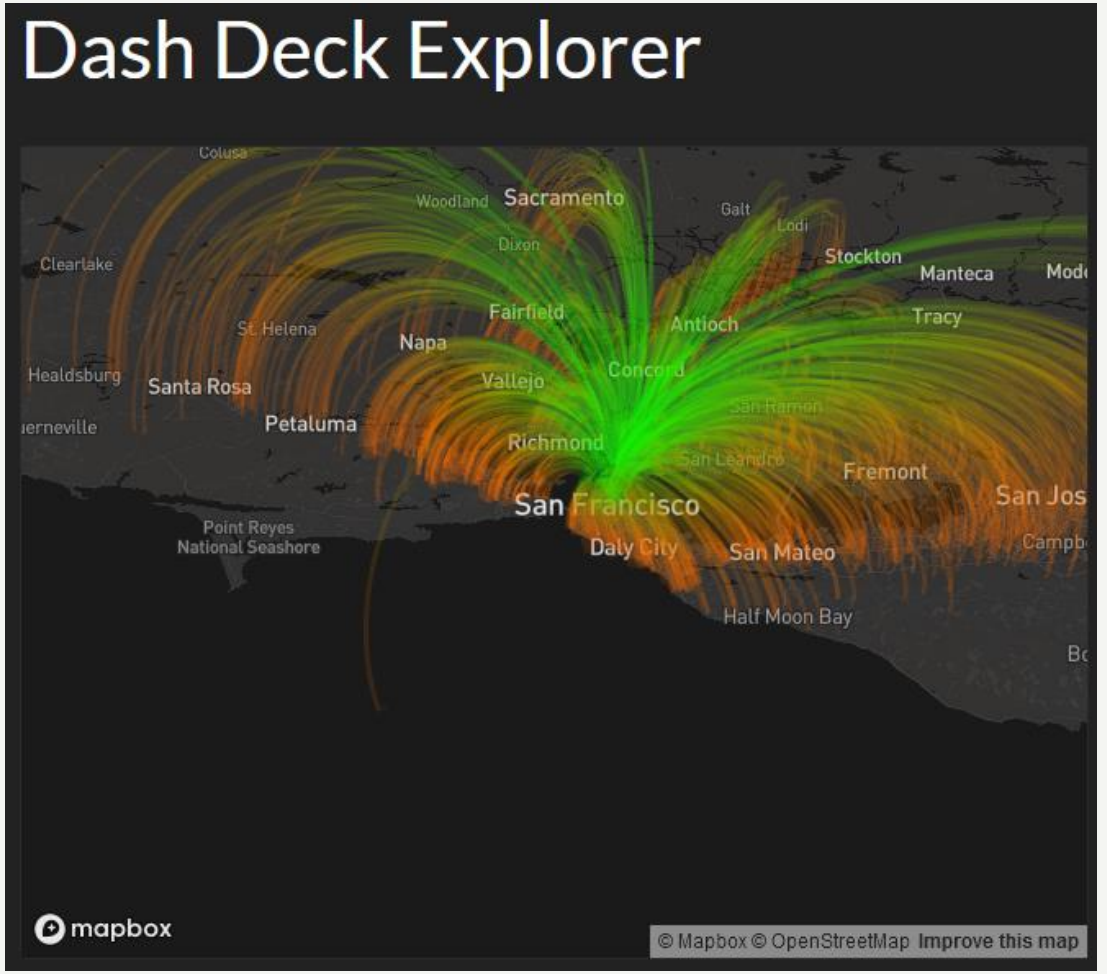

Thank you for your attention !
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