



AGRI RESEARCH FACTSHEET WATER, NUTRIENTS AND WASTE

Why do research and innovation on water, nutrients and waste matter?

Agriculture and forestry heavily depend on the availability and quality of natural resources such as land, nutrients or water. At the same time primary production impacts directly and indirectly on the integrity of these resources and contributes to their depletion. Natural resources are under further pressure from increased environmental variations linked to climate change, to which agriculture in particular is also contributing. The European Commission communication 'Closing the loop – An EU action plan for the Circular Economy' lays the

foundations of an economy where the value of resources is maintained for as long as possible, and the generation of waste is minimised. In agriculture, this translates mainly in the recycling of nutrients, the reuse of treated wastewater, or the valorisation of waste in the context of the bioeconomy. Research and innovation have a key role to play in enabling developing solutions that will help strike a proper balance between productivity and environmental goals in agriculture and forestry.

Water, nutrients and waste under Horizon 2020 Societal challenge 2 (SC2)



30

Projects or expected grants



197 M€

EU contribution 2014-2020



444

Participations in selected projects

Key themes

Water management – nutrient recycling
– fertigation – waste valorisation –
bioeconomy

Water, nutrients and waste under EIP-AGRI activities

Focus groups:

Circular horticulture
Nutrient recycling
Water and agriculture
Renewable energy on the farm
Reducing food loss on the farm

bit.ly/2HijEnZ
bit.ly/2FRWz8W
bit.ly/2wDVRCa
bit.ly/2qtS8Ln
bit.ly/2qw5yj9

Workshops examples:

Connecting innovative projects: water & agriculture
Opportunities for agriculture and forestry in the circular economy

bit.ly/2siEgnW
bit.ly/2vaP37I

Operational Groups (OGs) examples:

Many OGs deal with water (e.g. "Saving water in rice cultivation through the introduction of innovative agronomic techniques", Catalunya), nutrients (e.g. "Nutrient Management in Grasslands", Schleswig-Holstein) or agricultural waste (e.g. "Vegetable wastes: energetic and reuse opportunities", Emilia-Romagna).

bit.ly/2J5826i

Horizon 2020 SC2 collaborative projects - Water, nutrients and waste

MA = Multi-actor

FERTINNOWA^{MA}

www.fertinnowa.com

Total cost: 3 M€
EC contribution: 3 M€
Coordinator: Proefstation Voor
De Groenteteelt
Jan. 2016 – Dec. 2018

FERTINNOWA addresses fertigation of horticultural crops. It aims at creating a database and best practice guide of innovative technologies and practices, to build a knowledge exchange platform, and to ensure wide dissemination to all stakeholders involved of the most promising technologies and best practices. A multi-actor approach will be followed involving the relevant stakeholders.

FATIMA^{MA}

fatima-h2020.eu

Total cost: 8 M€
EC contribution: 8 M€
Coordinator: Universidad de
Castilla – La Mancha
Mar. 2015 – Feb. 2018

FATIMA has developed capacities that help the intensive farm sector optimize their external input (nutrients, water) management and use. FATIMA addresses and works with user communities at different geographical scales, providing them with tools and information for sustainable crop management.

AGRIFORVALOR^{MA}

www.agriforvalor.eu

Total cost: 2 M€
EC contribution: 2 M€
Coordinator: Steinbeis 2i
GmbH
Mar 2016 – Aug. 2018

AGRIFORVALOR aims at closing the research and innovation divide by connecting practitioners from agriculture and forestry with academia, associations and clusters, bio - industry, policy makers, innovation agencies, technology transfer intermediaries, etc., in multi-actor innovation partnership networks, to valorise and exploit side stream biomass resources from agriculture and forestry.

AGROCYCLE^{MA}

www.agrocycle.eu

Total cost: 7.7 M€
EC contribution: 7 M€
Coordinator: University College
Dublin
Jun. 2016 – May 2019

AGROCYCLE takes a holistic approach to understanding and addressing the operational efficiency and how to make best use of the full range of waste streams associated with the agri-food industry along the full value chain. The consortium comprises 26 partners from EU, China and Hong Kong. It will deliver a protocol for reducing food waste according to EU political targets, and to address increasing sustainability requirements in China.

<p>NoAW ^{MA} www.noaw2020.eu Total cost: 7.8 M€ EC contribution: 6.9 M€ Coordinator: INRA Oct. 2016 – Sep. 2020</p>	<p>NoAW deals with innovative approaches to turn agricultural waste into an asset, in a circular economy approach, on a territorial and seasonal scale. For this purpose, NoAW intends to explore the potential of agro-waste and urban waste to be converted into a portfolio of eco-efficient products. The consortium comprises 26 partners from EU, China, Taiwan and Hong Kong.</p>
<p>SolACE ^{MA} www.solace-eu.net Total cost: 7.2 M€ EC contribution: 6 M€ Coordinator: INRA May 2017 to Apr. 2022</p>	<p>SolACE aims to help European agriculture face the challenge of more frequent combined limitations of water and nutrients in the coming decades, through the design of novel crop genotypes and agroecosystem management innovations to improve water and nutrient use efficiency.</p>
<p>FAIRWAY ^{MA} www.fairway-project.eu Total cost: 5 M€ EC contribution: 5 M€ Coordinator: Wageningen Research Jun. 2017 – May 2021</p>	<p>FAIRWAY aims to review policy, governance and farm management approaches to protect drinking water resources in the EU against nitrate and pesticides pollution, and to identify and further develop approaches for a more effective drinking water protection. FAIRWAY uses a multi-actor approach to facilitate effective cooperation between actors of different sectors and levels.</p>
<p>TomRes ^{MA} bit.ly/2IbtR9 Total cost: 6 M€ EC contribution: 6 M€ Coordinator: U di Torino Jun. 2017 to Nov. 2020</p>	<p>TOMRES will select tomato rootstocks and scions tolerating combined stress, while retaining fruit quality and yield, taking advantage of innovative screening approaches. It will test and optimize sustainable crop management strategies and the use of rootstocks more suited to water and nutrient uptake from the soil.</p>
<p>WATERPROTECT ^{MA} water-protect.eu Total cost: 5 M€ EC contribution: 5 M€ Coordinator: Vlaamse Instelling voor Technologisch Onderzoek Jun. 2017 – May 2020</p>	<p>WATERPROTECT aims at the uptake and realisation of management practices and mitigation measures to protect drinking water resources. It will create an integrative multi-actor participatory framework including innovative instruments enabling actors to monitor, finance and implement management practices and measures for the protection of water sources.</p>
<p>COASTAL ^{MA} h2020-coastal.eu Total cost: 5 M€ EC contribution: 5 M€ Coordinator: VITO May 2018 – Apr. 2022</p>	<p>COASTAL aims to improve rural-coastal synergy in strategic business and policy decisions and the collaboration between coastal and rural actors. It will develop, demonstrate and apply a set of tools and indicators by combining multi-actor approaches with system dynamics modelling. This will improve the understanding of interactions between land and sea activities and help develop evidence-based solutions jointly improving economic development and environmental protection, including inland water quality.</p>
<p>SHui bit.ly/2WlMe06 Total cost: 5.5 M€ EC contribution: 4.8 M€ Coordinator: Agencia estatal consejo superior de investigaciones científicas Sept.2018 – Aug. 2022</p>	<p>SHui is conceived as a network integrating long-term experiments of its 19 academic and SME partners across different environmental conditions and cropping systems in the EU and China. It provides a platform for research on soil-water resources management under water scarce conditions, to better understand the linkages between agricultural soil hydrology and sustainability and for a systematic assessment of adaptation and mitigation methods.</p>
<p>Circular Agronomics ^{MA} circularagronomics.eu Total cost: 7 M€ EC contribution: 7 M€ Coordinator: Institut de recerca i tecnologia agroalimentaries Sept. 2018 – Aug. 2022</p>	<p>Circular Agronomics propose solutions towards making agriculture an integral part of a circular economy by increasing resource efficiency while simultaneously addressing associated environmental challenges such as greenhouse gas and ammonia emissions as well as eutrophication of water bodies. In particular addressing Carbon (C), Nitrogen (N) and Phosphorus (P) cycling in European agro-ecosystems and related up- and down-stream processes within the value-chain of food production.</p>



<p>Nutri2Cycle ^{MA} nutri2cycle.eu Total cost: 7 M€ EC contribution: 6,8 M€ Coordinator: Ghent University Oct. 2018 – Sept. 2022</p>	<p>NUTRI2CYCLE explores an integrated approach of farm techniques and systems that allow better reconnection between animal husbandry and plant production. Important emphasis is placed on the possibilities of agro-processing (e.g. anaerobic digestion, composting, etc.) to improve this interconnection. At the same time, this reconnection will serve a better return of carbon to soil and a reduction of emissions, which can optionally be combined with energy production for self-consumption on-farm.</p>
<p>NUTRIMAN ^{MA} nutriman.net Total cost: 2 M€ EC contribution: 2 M€ Coordinator: Terra Humana Ltd. Oct. 2018 – March 2021</p>	<p>NUTRIMAN is a Nitrogen and Phosphorus thematic network compiling knowledge “ready for practice” and “close to market” technology/product development results with disruptive innovation character above TRL7/IRL7 that are not sufficiently known or used by practitioners. Track records of recognized key performance indicators in market competitive commercial scale are demonstrated to the user. The network focuses on the large scale take up of recovered N/P innovative fertilisers produced from un-exploited resources of organic or secondary raw materials in line with the circular economy model. The result is an extensive range of appealing end-user materials.</p>
<p>SCALIBUR scalibur.eu Total cost: 12 M€ EC contribution: 10 M€ Coordinator: : Instituto Tecnológico del Embalaje, Transporte y Logística Nov. 2018 – Oct. 2022</p>	<p>In the SCALIBUR project, leading waste management companies, technology developers and research organisations have teamed up with four European cities to demonstrate new value chains for biowaste recycling. In its pilot cities, SCALIBUR will support the integration of innovative systems for collection, transport, sorting and pre-treatment of biowaste. SCALIBUR will also create new circular economy business opportunities by demonstrating innovative technologies to transform biowaste into high-value industrial products such as bioplastics and biopesticides.</p>
<p>VALUEWASTE valuewaste.eu Total cost: 10 M€ EC contribution: 8 M€ Coordinator: CETENMA Asociación Empresarial Centro Tecnológico de la Energía y del Medio Ambiente de la Región de Murcia Nov. 2018 – Oct. 2022</p>	<p>VALUEWASTE proposes an integrated approach in urban biowaste upcycling for the production of high-value biobased products, developing the first complete solution to fully valorise biowaste that can be replicated across Europe. The project focuses on three new value chains implementing urban biowaste valorisation into high-value products, generating economic, social and environmental benefits: food & feed proteins and other ingredients, and biobased fertilisers.</p>
<p>SuWaNu Europe ^{MA} bit.ly/2WEWaBP Total cost: 2 M€ EC contribution: 2 M€ Coordinator: BIOAZUL, SL Jan. 2019 – June 2021</p>	<p>The thematic network builds upon the previous SuWaNu project and intends to bridge the current innovation gaps and achieve an effective implementation of reuse solutions in agriculture. It will summarize, share and present existing and upcoming knowledge and skills in the field of water reuse in agriculture to the relevant stakeholders such as farmers and farming advisory groups.</p>
<p>LEX4BIO ^{MA} bit.ly/2WGWmR2 Total cost: 6 M€ EC contribution: 6 M€ Coordinator: LUKE June 2019 – May 2023</p>	<p>LEX4BIO explores the optimised usage of bio-based fertilisers from side-streams, ensuring their safety and building evidence-based trust in their usage. By developing a legislative framework for their use, it will be possible to reduce dependence upon mineral or fossil-based fertilisers, benefiting the environment and the EU's economy.</p>
<p>WaysTUP! bit.ly/2YWoLQx Total cost: 11 M€ EC contribution: 9 M€ Coordinator: Sociedad anonima agricultores de lavaga de Valencia Sept. 2019 – Feb.2023</p>	<p>WaysTUP! will showcase a portfolio of new ‘urban biowaste to bio-based products’ processes starting from different feedstocks i.e. fish and meat waste, spent coffee grounds, household source separated biowaste, used cooking oils, cellulosic waste derived from municipal wastewater and waste treatment plants and sewage sludge. The project will also provide guidance for city managers on adopting new organizational models supporting the valorisation of urban biowaste.</p>

Other interesting activities under other Horizon 2020 sections

The **Bio-Based Industries Joint Undertaking** (BBI JU), a public-private partnership co-financed by Horizon 2020, supports many projects related to water, nutrient recycling or agricultural waste valorisation such as:

- **AGRIMAX**: agriculture and food waste valorisation co-ops (agrimax-project.eu, EC contribution: 12.5M€)
- **NEWFERT**: nutrient recovery from bio-based waste for fertilizer production (www.newfert.org, EC contribution: 1.2M€)
- **FUNGUSCHAIN**: Valorisation of mushroom agrowastes to obtain high value products (funguschain.eu, EC contribution: 5.7M€)

Marie Skłodowska-Curie Actions provide fellowships for individual researchers, innovative training networks and research and innovation staff exchange, some of which are directly related to water, nutrients and/or waste such as RURECO 'Institutions for Resilient Groundwater Dependent Rural Economies' (bit.ly/2E81W1o - EC contribution: 0.2 M€).

Many projects have also been funded selected the call for projects dedicated to water from Societal challenge Climate action and environment. An example is the ERA-NET '**WaterWorks 2015**' which supports the **Joint Programming initiative on Water** and focuses on sustainable water use in agriculture (Jan. 2016 to Dec. 2020 – Total costs: 30.4 M€ - EC contribution: 9.5 M€).

More information on JPI Water: www.waterjpi.eu

In the pipeline – 6 projects to start under 2019 H2020 SC2 calls (47 M€)

Integrated water management in small agricultural catchments ^{MA}	(2 projects, 14 M€)
Closing nutrient cycles: Bio-based fertilisers from animal manure ^{MA}	(1 project, 8 M€)
Circular bio-based business models for rural communities ^{MA}	(2 projects, 20 M€)
High-quality organic fertilisers from biogas digestate	(1 project, 5 M€)

Funding opportunities - Open H2020 SC2 calls for 2020 (40 M€)

CE-RUR-08-2018-2019-2020: Closing nutrient cycles:

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| C. (2020): Bio-based fertilisers from other by-products of the agro-food, fisheries, aquaculture or forestry sectors ^{MA} | (2 projects, 16 M€) |
| D. (2020): Bio-based fertilisers from waste water and sewage sludge | (1 project, 6 M€) |

CE-SFS-36-2020 - Diversifying farmers' income through small bio-based concepts	(2 projects, 18 M€)
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Agriculture and sustainable water management in the EU

In its staff working document ‘Agriculture and Sustainable Water Management in the EU’ (bit.ly/2J7wVyD), adopted in April 2017, the European Commission recognises ‘*the sustainable management of water and other precious natural resources as one of the defining challenges of our time*’. It further says: ‘*Water is a vital resource in the EU, not only for agriculture but for human health, energy production, nature conservation, and transport, to name but a few policy areas. The multiple benefits that agriculture provides to society depend on the **long term** sustainable management of natural resources, including water. **However** a number of current pressures are affecting the quantity and quality of our water supply, affecting its current and future sustainability.*’

The document further **highlight** the vital role that research and innovation plays in enhancing sustainable water management in the agricultural sector, highlighting the contribution of European research and innovation programmes. It recommends setting up knowledge and information support systems which allow the seamless sharing of data among public administrations and policy makers. It also recommends providing user-friendly and effective decision-support tools to farmers and water stakeholders. Significant added value could be provided by European Innovation Partnerships working in synergy.

European Innovation Partnership on Water:

www.eip-water.eu





