TIME4CS

SUPPORTING SUSTAINABLE INSTITUTIONAL CHANGES TO PROMOTE CITIZEN SCIENCE IN SCIENCE AND TECHNOLOGY

Open science and citizen science integration in Horizon Europe grant applications

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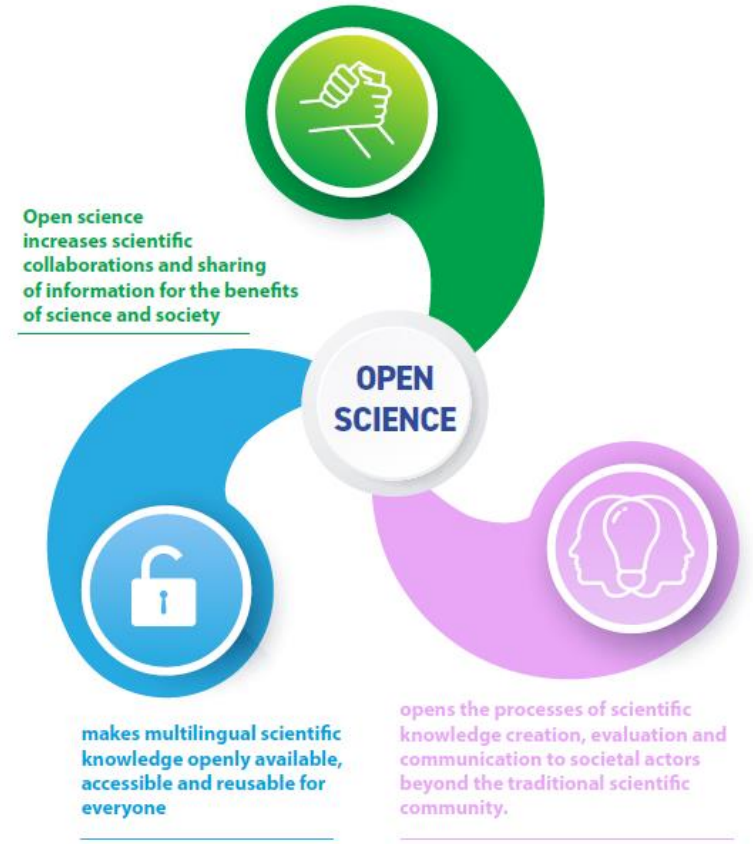
The TIME4CS project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006201

TIME4CS What is Open Science?

Open Science is defined as an inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible and reusable for everyone, to increase scientific collaborations and sharing of information for the benefits of science and society, and to open the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community. It comprises all scientific disciplines and aspects of scholarly practices, including basic and applied sciences, natural and social sciences and the humanities, and it builds on the following key pillars: open scientific knowledge, open science infrastructures, science communication, open engagement of societal actors and open dialogue with other knowledge systems.



TIME4CS

https://en.unesco.org/science-sustainable-future/open-science/recommendation

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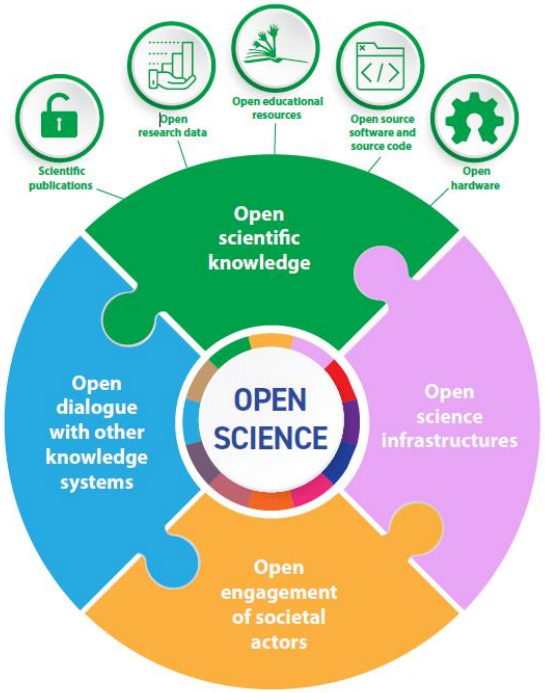
TIME4CS What is Open Science?



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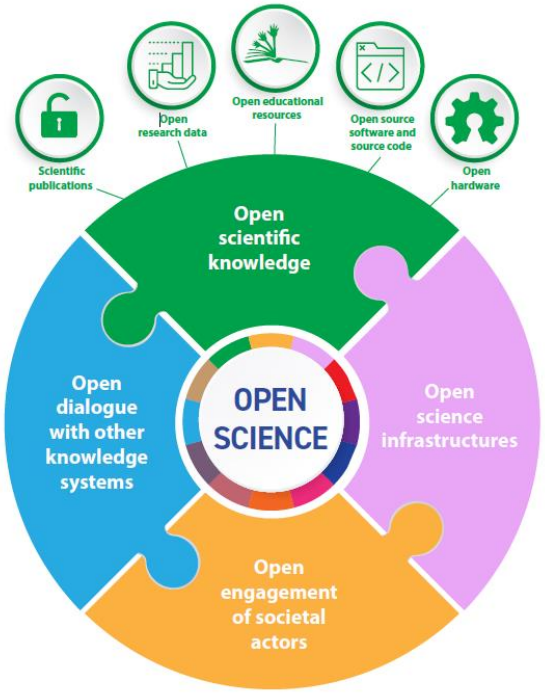
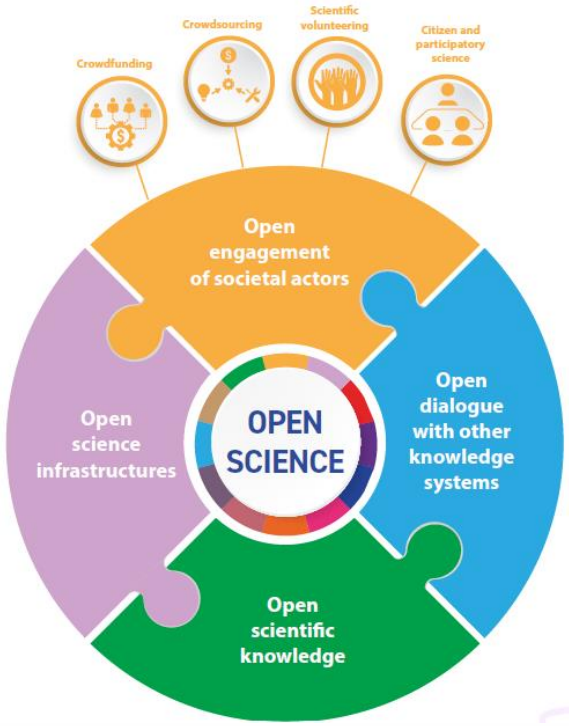


Citizen Science



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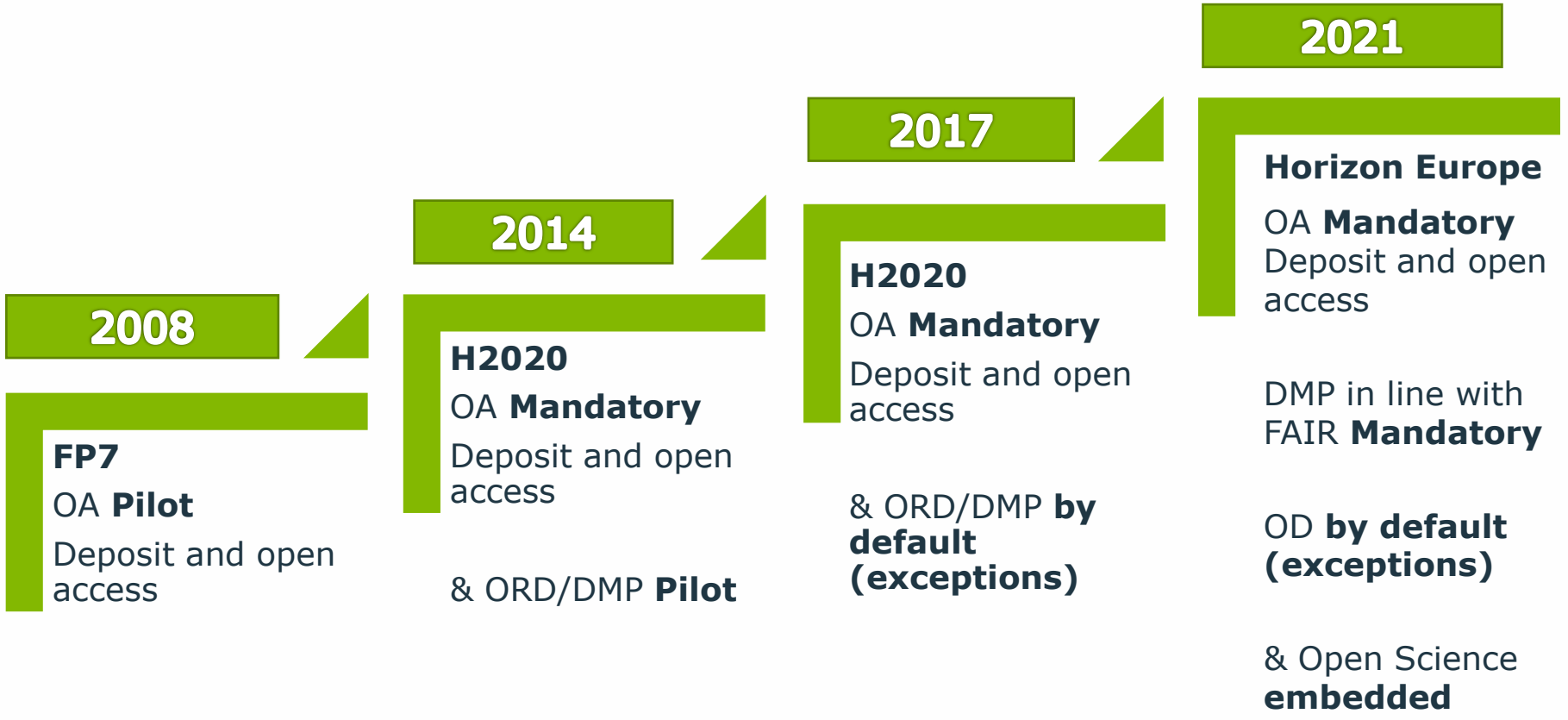
TIME4CS European policies evolution



Under **Horizon Europe (2021)**

- Open Science embedded across Horizon Europe
- Strengthening of the open access obligations and focus on responsible research data management in line with the FAIR principles

From «**Fit for Purpose! Shaping Open Access and Open Science Policies for Horizon Europe**» Victoria Tsoukala, PhD - DG RTD Open Science (Unit G4) - PUBMET 2019, Zadar, September 19th, 2019

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TIME4CS What is Open Science?

Open Science

Horizon Europe moves beyond open access to open science, for which it features a comprehensive policy implemented from the proposal stage to project reporting.

Definition

Open science is an approach based on open cooperative work and systematic sharing of knowledge and tools as early and widely as possible in the process.

Includes the active engagement of all relevant actors, including society.

- ✓ It has the potential to increase the quality and efficiency of research and accelerate the advancement of knowledge and innovation by sharing results, making them more reusable and improving their reproducibility.
- ✓ It makes science more efficient through better sharing of resources, more reliable through better verification and more responsive to society's needs.
- ✓ Is mainstreamed throughout Horizon Europe, from evaluation to implementation. (be aware of differences compared to Horizon 2020!)

European Commission

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TIME4CS Horizon Europe proposals evaluation

Evaluation criteria (RIAs and IAs)

EXCELLENCE

- ✓ Clarity and pertinence of the **project's objectives**, and the extent to which the proposed work is ambitious, and goes beyond the state-of-the-art.
- ✓ Soundness of the proposed **methodology**, including the underlying concepts, models, assumptions, inter-disciplinary approaches, appropriate consideration of the **gender dimension** in research and innovation content, and the quality of **open science practices** including sharing and management of research outputs and engagement of citizens, civil society and end users where appropriate.

IMPACT

- ✓ Credibility of the **pathways** to achieve the expected **outcomes and impacts** specified in the work programme, and the likely scale and significance of the contributions due to the project.
- ✓ Suitability and quality of the **measures to maximize expected outcomes and impacts**, as set out in the dissemination and exploitation plan, including communication activities.

QUALITY AND EFFICIENCY OF THE IMPLEMENTATION

- ✓ Quality and effectiveness of the **work plan**, assessment of risks, and appropriateness of the effort assigned to work packages, and the resources overall.
- ✓ Capacity and role of each **participant**, and extent to which the **consortium** as a whole brings together the necessary expertise.

Proposals aspects are assessed to the extent that the proposed work is within the scope of the work programme topic

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TIME4CS Horizon Europe proposals evaluation

"Excellence" criterion

(methodology)

- Evaluation of the quality of open science practices
- E.g.1 page to describe Open Science practices + 1 page to describe research data/output management [RIA,IA]

"Quality and efficiency of implementation" criterion

(capacity of participants and consortium as a whole + list of achievements)

- Explain expertise/track record on Open Science
- List publications, software, data, etc, relevant to the project with qualitative assessment and, where available, persistent identifiers

Publications are expected to be open access; datasets are expected to be FAIR and 'as open as possible, as closed as necessary'. **Significance of publications to be evaluated on the basis of proposers' qualitative assessment** and not per Journal Impact Factor

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TIME4CS European policies evolution | Citizen Science

2015

3 O's strategy

Open innovation

Open science

Open to the world

The 'Integrating Society in Science and Innovation' call of the initial **SwafS 2014- 2015 work programme** included topics on public outreach and multi-actor engagement for scenario building.

2016

The Council[1] recognised citizen science as an open science priority

The **2016-2017 work programme** saw three topics focus specifically on the involvement of citizens (alongside other actors) in coproducing research content.

2018

The Open Science Policy Platform (OSPP) included citizen science as one of eight Open Science ambitions

Partly in response to the interim evaluation of Horizon 2020, the **SwafS work programme 2018-2020** included a strategic orientation on 'exploring and supporting citizen science' and developed a portfolio approach to work towards this orientation.

Elaborated from **Citizen Science and Citizen Engagement,** Achievements in Horizon 2020 and recommendations on the way forward doi:10.2777/05286

[1] **Council conclusions on the transition towards an Open Science system** https://data.consilium.europa.eu/doc/document/ST-9526-2016-INIT/en/pdf

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TIME4CS Recommendations for Horizon Europe

- **Reinforcing Citizen Science**: mention explicitly CS in the **proposal template** (Excellence evaluation criterion)
- Develop Massive Open Online Courses (MOOC) on Citizen Science and advice projects to sign up for such **trainings** to guide them in the **integration of CS** in their activities
- Continue to **fund** CS actions
- Strengthening the **network**, coordinate communication among CS projects
- Support **CS newcomers** by raising public awareness on CS and delivering trainings to citizen scientists
- **HE Missions**: citizens' engagement for the definition and implementations of Missions is crucial. 3 stages: communication/awareness raising, co-design/co-creation and co-implementation
- Going local: use of cascading grants to **identify CS actors at local level**

Citizen Science and Citizen Engagement, Achievements in Horizon 2020 and recommendations on the way forward
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TIME4CS Horizon Europe proposals template

1.2 Methodology

[...]

Describe how appropriate **open science practices are implemented as an integral part of the proposed methodology**. Show how the choice of practices and their implementation are adapted to the nature of your work, in a way that will increase the chances of the project delivering on its objectives [e.g. 1 page]. If you believe that none of these practices are appropriate for your project, please provide a justification here.

- *Open science is an approach based on open cooperative work and systematic sharing of knowledge and tools as early and widely as possible in the process. Open science practices include early and open sharing of research (for example through preregistration, registered reports, pre-prints, or crowd-sourcing); research output management; measures to ensure reproducibility of research outputs; providing open access to research outputs (such as publications, data, software, models, algorithms, and workflows); participation in open peer-review; and involving all relevant knowledge actors including citizens, civil society and end users in the co-creation of R&I agendas and contents (such as citizen science).*
- *Please note that this question does not refer to outreach actions that may be planned as part of communication, dissemination and exploitation activities. These aspects should instead be described below under 'Impact'.*

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TIME4CS Open Science practices

What?	How?	Mandatory per Grant Agreement / Recommended
Early and open sharing of research	Preregistration, registered reports, preprints, etc.	Recommended
Research output management	Data management plan (DMP)	**Mandatory**
Measures to ensure reproduciblity of research outputs	Access and/or information to research outputs and tools/instruments for validating conclusions of scientific publications and validating/re-using data	**Mandatory**
Open access to research outputs through deposition in trusted repositories	• Open access to publications • Open access to data • Open access to software, models, algorithms, workflows etc.	• **Mandatory** for peer-reviewed publications • **Mandatory** for research data **but** with exceptions ('as open as possible, as closed as necessary') • Recommended for other research outputs
Participation in open peer-review	Publishing in open peer-reviewed journals or platforms	Recommended
Involving all relevant knowledge actors	Involvement of citizens, civil society and end-users in co-creation of content (e.g. crowd-sourcing, etc.)	Recommended

- Open science practices are described in the HE Programme Guide (see Resources)
- This is a non-exhaustive list: other open science practices (on top of the four already mandatory ones) may be mandatory per specific work programmes or call conditions (i.e. imposed in case of public emergency)

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TIME4CS Citizen Science in HE topics

HORIZON-CL6-2024-BIODIV-01-1: Invasive alien species

Expected Outcome: In line with the European Green Deal and in particular with the objectives of the EU biodiversity strategy for 2030, projects will contribute to the following impact of destination "Biodiversity and ecosystem services": "Understand and address direct **drivers of biodiversity decline…** invasive alien species…".

Project results are expected to contribute to all of the following expected outcomes:

- The establishment of alien species accidently introduced in the EU environment is minimised and where possible they are eradicated,
- Early warning systems to inform relevant stakeholders of the introduction of invasive alien species, building upon EASIN,
- The introduction of invasive alien species is effectively prevented and established ones are systemically managed,
- Public awareness, literacy and engagement, on inv management are supported and improved,
- Pressure on species on the Red List threatened by contributing to the following key commitment of the a 50% reduction in the number of Red List species th

Scope: Invasive alien species are one of the five main Besides inflicting major damage to nature and the econon facilitate the outbreak and spread of infectious diseases, p wildlife. The rate of new introductions of invasive alien sp Without effective control measures, risks to our nature Climate change and land-use changes facilitate the sprea species and create new opportunities for them to becon contributing to the adaptation to climate change.

Regulation (EU) 1143/2014 on invasive alien species (IAS) entered into force on 1 January 2015. It establishes a list of Invasive Alien Species of Union concern (the Union list). The IAS Regulation provides for a set of measures to be taken across the EU in relation to invasive alien species included on the Union list. EASIN (European Alien Species Information Network) facilitates information on Alien Species and officially supports the EU Regulation 1143/2014.

Successful proposals should:

- Develop models based on dynamic data, accessible to end users, to prioritise species, manage pathways and sites most vulnerable by the introduction of invasive alien species;
- Develop methods for the identification, early detection and surveillance of invasive alien species, such as sensors for biophysical signals (sounds, ultrasounds, volatile organic compounds, thermal etc.), DNA-based including barcoding and application of environmental DNA, artificial intelligence, sentinel plants in ports, airports, railway stations, and logistics platforms. The use of robotics (both aerial and non-aerial), especially in marine environments, could be considered.

Proposals should address Area A: terrestrial ecosystems or Area B: aquatic (including marine) ecosystems. The Area should be clearly indicated on the application.

Proposals should build synergies with on-going projects supported under Horizon 2020 and other projects supported under Horizon Europe. The project "Natural Intelligence for Robotic Monitoring of Habitat" could provide hints about the usage of mobile robotic sensors.

Cross-articulation with the other data spaces, and notably with the European Open Science Cloud shall be foreseen, exploiting synergies and complementarities of the different approaches.

Participatory approaches, such as citizen science, could be appropriate modes of research for this action.

In area B in particular, projects results funded under the following topics should be considered: HORIZON-CL6-2021-BIODIV-01-03: Understanding and valuing coastal and marine biodiversity and ecosystems services, Topic HORIZON-CL6-2021-BIODIV-01-04: Assess and predict integrated impacts of cumulative direct and indirect stressors on coastal and marine biodiversity, ecosystems and their services and HORIZON-CL6-2022-BIODIV-01-01: Observing and mapping biodiversity and ecosystems, with particular focus on coastal and marine ecosystems. In addition, in area B, projects should coordinate their activities with objective 1 of the Mission "Restore our ocean and waters".

Proposals should include specific tasks and allocate sufficient resources to coordinate with

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-9-food-bioeconomy-natural-resources-agriculture-and-environment_horizon-2023-2024_en.pdf

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HORIZON-CL6-2024-FARM2FORK-01-6: Citizens' science as an opportunity to foster the transition to sustainable food systems

Data-driven solutions in food systems also benefit the European Open Data Directive to share public data[191] and envisioned data spaces[192] as well as provide a base of AI deployment as enablers of the European Green Deal objectives.

Projects results are expected to contribute to all the following expected outcomes:

- Better understanding of citizens' food consumption behaviour, the factors influencing choices and drivers that would facilitate changes in behaviour in an inclusive manner towards healthy and sustainable food consumption practices;
- Contribution to positive changes in individual behaviour towards healthy and sustainable food consumption and sustainable food system transformation.

Scope: Currently, consumers are sceptical to share data, least to the government[193]. As there is a need for more data-driven decision making, engaging citizens in research through the provision of data on their practices, choices and attitudes towards the food system provides potential for a more direct citizen engagement in transforming food systems. The approach allows to exchange ideas, solutions, and opinions to encourage Responsible Research and Innovation (RRI) in driving sustainable food system transformation.

Citizen's science[194] is a fast-growing mode of research and innovation[195] that can allow for enhanced food system transformation driven by engagement, trust and transparency. It can leverage relevant private relevant data to take stock of current citizens' behaviour towards the food system, including aspects such as food consumption, marketing and food environment influence, health, mobility, regionality/locality, food-related waste generation and management, etc. by using collective intelligence.

Proposals are expected to address all the following:

- Explore the potential of 'citizen's science' in the food systems domain by engaging and empowering citizens in using and providing data and technology to ensure inclusive solutions to drive sustainable food system transformation by promoting sustainable food consumption, reducing food waste, and creating a resilient food system;

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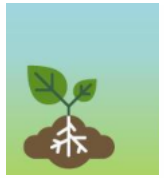
TIME4CS Citizen Science in HE Missions

Missions will continue to help deliver key EU policy priorities such as the European Green Deal, Europe's Beating Cancer Plan, NextGenerationEU, the EU Industrial Strategy and A Europe fit for the Digital Age, amongst others.

To achieve their goals and promote societal change, missions will implement the reuse and reproducibility of research results such as FAIR research data and open access to scientific publications. Also, the missions will closely involve citizens in their implementation and monitoring throughout their duration, also showcasing the added value of the EU.

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-12-missions_horizon-2023-2024_en.pdf

Mission: A Soil Deal for Europe



Under the envisioned 2024 call of the Mission 'A Soil Deal for Europe', the Commission at this stage, plans to fund amongst others (on a provisional basis and subject to all relevant input and discretion) actions in the areas of: soil decontamination, biodiversity, citizen engagement, citizen science and the promotion of skills for sustainable land and soil management.

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TIME4CS Citizen Science in HE Missions

Citizen engagement is a pillar concept for the Mission. Proposals may involve coastal communities with important biodiversity hotspots, including islands and the EU Outermost Regions in the co-creation of measures that meet the Mission's aims while granting due consideration to local communities' needs and values. Proposals are expected to involve where appropriate European Solidarity Corps and citizens science activities in the restoration efforts.

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-12-missions_horizon-2023-2024_en.pdf

documentaries, communication campaigns, podcasts, music, artistic performances, exhibitions, literary arts, etc.), and for inspiring and engaging people to take part in a broader debate and in taking actions, including through innovative methodologies and tools, arts and participatory processes. Arts and other creative forms of engagement have shown to be able to mobilise people that would otherwise not easily connect to more scientific or technical information on soils. Existing examples include initiatives to raise awareness on soils in schools by painting with earth colours or citizen projects on collective composting and urban gardening or the production of documentaries and exhibitions for the general public.

Various and innovative methodologies and tools to increase citizens' awareness and engagement should be tested in different contexts to reach and involve a large number of people with the overall scope of increasing soil literacy across society. An increased societal awareness of the importance of soil and of the challenges it faces should lead to a better protection and restoration of this precious resource across Europe and possibly beyond.

National and local authorities and coastal communities should be involved in the design and implementation of innovative solutions to ensure that these solutions are successfully implemented in the long term. Citizen engagement is a pillar concept for the Mission and a key element in relation to conservation and restoration actions. Activities should, therefore, use innovative participatory management practices, citizen-science initiatives and awareness-raising actions to promote a proactive involvement of local communities including scientists, land and sea use planners, marine protected area managers, and other stakeholders, to enable co-creation of solutions. Awareness raising actions to inspire and generate co-ownership for protection of local habitat and biodiversity should be included as well as collaboration with existing initiatives. Citizen engagement related activities should also be gender-responsive and socially inclusive.

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