

General Information	
Preliminary title of the European Partnerships	Environmental Observations for a sustainable EU agriculture (Agriculture of data)
Short description of the partnership	This partnership aims to support the delivery of a sustainable CAP, through the improvement of agricultural practices by using the possibilities the current digital and data technologies in Environmental Observations offer.
Services directly involved	Lead service: RTD.I4, AGRI.B2 Other services: DG CLIMA, DG GROW, DG JRC, DG ENV
Context and problem definition	<p>Agriculture is the single largest employer in the world, providing livelihoods for 40% of today's global population. It is the largest source of income and jobs for poor rural households. Since the 1900s, some 75% of crop diversity has been lost from farmers' fields. Better use of agricultural biodiversity can contribute to more nutritious diets, enhanced livelihoods for farming communities and more resilient and sustainable farming systems¹.</p> <p>In response to these and other pressures on land resources, in particular the increased needs for biomass, maintaining food production in a sustainable manner, enhancement of carbon storage and sinks, the EU Member States will need to develop improved systems for monitoring use of land for agriculture, biodiversity and climate policy actions, among others. EU geo-spatial data and services provide a foundation for the sharing and integration of information and data. This offers a wide-ranging opportunity for new and innovating developments. As a result, the increased availability and interoperability of data sharing systems would improve access and decrease transaction costs for all actors of the food production chain involved. Already in 2016 the FAO recognised the importance of Earth Observations for overcoming knowledge gaps in its report on 'The state of food and agriculture'².</p> <p>In addition, there is a need to validate information, and measurement of impacts of agricultural policy, but also of other land use related policies, on a wide range of indicators (social, climate, environmental etc.).</p> <p>Enhancing the interaction between policy makers, the public duty holders and the scientific and digital communities is needed to develop effective and efficient responses to these needs. The current available variety of data sets are not exchangeable straight away because of use of different formats, disciplines, actors or timelines. This has led to a number of crucial compatibility problems over the years. Digital and data technologies, such as Big data technologies and Artificial Intelligence, have been arising over the last few decades and the possibilities these offer have expanded massively. In combination with environmental observations these opportunities offered by the digital economy, can be used to a much larger extend than before to improve agricultural practices and food security, but further research and innovation activities are needed for these domains to actually grasp the benefits that digital technologies can offer.</p> <p>The GEOGLAM (GEO Global Agricultural Monitoring) initiative shows that crosscutting work in the field of both Agriculture and Environmental observations leads to promising results for generating reliable, accurate, timely and sustained crop monitoring information and yield forecasts. It confirms that further investment will widen the impacts of environmental observation technologies for agriculture. It will contribute to achieving the Sustainable Development Goals and lead to a more sustainable EU agriculture.</p> <p>Furthermore, the European Earth observation (EO) landscape is currently still fragmented and would benefit from upscaling existing and future Environmental observation initiatives. This is in particular the case when tackling the 'last mile' of the innovation process; enabling pre-operational services that can support European land-related policies, as well as other initiatives and flagships from the Group on Earth Observations (GEO). In addition, the EuroGEOSS regional</p>

¹ <https://www.un.org/sustainabledevelopment/hunger/>

² <http://www.fao.org/3/a-i6030e.pdf>

	<p>initiative³, launched in 2017 under GEO, acknowledges that defragmenting the European EO landscape will benefit the users. This initiative also relevant for the Action Plan⁴ on EC_Communication on “EU actions to improve environmental compliance and governance”⁵.</p> <p>In the domain of Agriculture the recent signing of the Declaration on ‘A smart and sustainable digital future for European agriculture and rural areas’⁶ by currently 24 Member States confirms the need for a partnership which consolidates the commitment of Member States to work together and with the European Commission to tackle these issues.</p>
Objectives and expected impacts	<p>The objective of the partnership is to support the delivery of a sustainable European agriculture, through the improvement of agricultural practices and farm profitability by using the possibilities the current digital/data technologies in the field of EO offer. The partnership will leverage and embed – through applied research and innovation – the use of evolving geo-spatial (Environmental observation, and geographically-explicit) datasets, which can play a supportive role in the delivery of the CAP and environmental policy-objectives. The partnership will support data provisioning according to the INSPIRE directive requirements. This will accelerate the sharing of observational datasets throughout the combined field of Earth observation and agriculture and will be of benefit to society.</p> <p>In line with the trend towards the digitalisation of the EU’s farming sector, the goal is to develop new digital services and applications enabling more efficient, environmentally friendly, and profitable food production systems. These services will greatly improve the benefits to the users by combining and sharing geospatial datasets in the fields of EO, agriculture, climate, and environment. The technologies used in combining datasets and enhancing interoperability will produce important spill-over effects in other fields too.</p> <p>By leveraging existing and new information, the partnership will aim at defragmenting the current landscape of Environmental observation within Europe and contribute to the transitioning to a more sustainable farming sector. Although Environmental observations (from different sources, space, UAV, in-situ) will be the main focus of the partnership, additional work on e-governance in a broader sense is also within its scope. This includes for example improving the performance and simplifying the related management and monitoring systems (e.g. the Integrated Agricultural Control Systems of the CAP). Common developments and innovation among MS in this domain will serve as catalyst for a better use of the monitoring approaches developed in other projects by the partnership.</p> <p>As an impact, the partnership will deepen the understanding of the necessary needs of future datasets in the run-up to 2030, on the base of research outcomes. It will support the evolution and synergies of different thematic geo-spatial monitoring and information systems over the forthcoming decade, with identifiable new opportunities. Furthermore, it will pave the way for better and more efficient use of datasets and services.</p> <p>Improved multidisciplinary cooperation and information on monitoring, reporting, validation and compliance assurance should lead to the improvement of, among others, forecasting and modelling capabilities for decision-making by governments and to more efficient implementation of agricultural and environmental objectives of Member States and the EU.</p>

³ https://ec.europa.eu/info/research-and-innovation/knowledge-publications-tools-and-data/knowledge-centres-and-data-portals/eurogeoss_en

⁴ COMMISSION STAFF WORKING DOCUMENT – [SWD \(2018\) 10 final](#) - Environmental Compliance Assurance — scope, concept and need for EU actions. Accompanying the document EU actions to improve environmental compliance and governance{COM(2018) 10 final}

⁵ [COM\(2018\) 10 final EU actions to improve environmental compliance and governance](#)

⁶ The signing MS recognise the importance of addressing without delay the economic, social, climate and environmental challenges facing the EU's agri-food sector and rural areas, and highlight the necessity to encourage an evolution of farming systems towards more resilience and resource efficiency in the long term, and note the potential of digital technologies to help tackle such challenges. (<https://ec.europa.eu/digital-single-market/en/news/eu-member-states-join-forces-digitalisation-european-agriculture-and-rural-areas>)

	<p>This partnership will contribute to and lead the way to achieve broader accurate evidence based policies and initiatives on land use and habitat status. Through its dedicated actions it will serve EU policies related to climate adaptation, environment and other land-use policies that already require extensive performance monitoring, reporting and compliance assurance actions.</p> <p>Forecasting capabilities and usage of combined datasets can already be expected as outcomes in the second half of the timespan of Horizon Europe, as it will be building on results of FP7, Horizon 2020 and GEO-initiatives.</p>
Necessity test: rationale for a European Partnership	<p>MS managing authorities need to be involved to ensure a sustainable and long-term partnership with outcomes that fit the users' needs. Managing authorities are able to assess these needs on a national scale in a way that goes beyond the scope of any single project under the Framework Programme. Moreover, actions taken only under research actions in the FP would not guarantee the involvement of MS managing authorities.</p> <p>An EU intervention in the form of a partnership with also the research and development communities involved, would help promote the development of targeted solutions and therefore ensure MS ownership of the process, foster cooperation between MS and ensure a large geographical coverage.</p> <p>The scope of the partnership is too ambitious to be covered through Commission resources alone: the engagement of the MS is necessary in order to reach a critical mass of resources enabling to cope with the challenge.</p> <p>Finally, with a large part of R&I in this area done by public entities (universities, research institutes), direct steering by the MS is critical for test beds and to access the data and information.</p>
Relevant for the following parts of Horizon Europe	<p>Pillar II 'Global Challenges and European Industrial Competitiveness'</p> <p><input type="checkbox"/> Cluster Health</p> <p><input type="checkbox"/> Cluster Culture, creativity and inclusive society</p> <p><input type="checkbox"/> Cluster Civil Security for Society</p> <p><input checked="" type="checkbox"/> Cluster Digital, Industry and Space</p> <p><input type="checkbox"/> Cluster Climate, Energy and Mobility</p> <p><input checked="" type="checkbox"/> Cluster Food, Bioeconomy Natural Resources, Agriculture and Environment</p> <p><input type="checkbox"/> Cross-cluster</p> <p><input type="checkbox"/> Pillar III 'Innovative Europe'</p>
Currently identified links with other partnership candidates / Union programmes	<p>Copernicus (the European Earth Observation programme) and the Global Earth Observation System of Systems (GEOSS) are major sources of the required information, as are ESA programmes. A further source of collecting EO information is through citizens' observatories (so-called crowdsourcing) that can further engage citizens in a manner not feasible through research calls.</p> <p>Other sources include ongoing initiatives on new data flows stemming from tools used in precision agriculture, internet of things, etc. For data management, processing and capacity building (e.g. AI) the EU Digital Europe Programme⁷ will be very important.</p> <p>This partnership could furthermore be of interest to the 'soil health and food' and 'climate change' missions proposed. The proposed partnerships 'Towards more sustainable farming: living labs and research infrastructures in agro-ecology' and 'Biodiversity' also have strong linkages.</p>
Does the proposed partnership build on currently active ones?	<p>The partnership can build on the existing EuroGEOSS (European Component of GEOSS) Action Groups and other activities of the first year cycle of EuroGEOSS implementation. There is a great interest from the community of actors involved in the Action Groups. Out of the nine Action Groups, the Action Group on Agriculture is the largest - including major R&I groups in agricultural research, followed by the Action Group on Land Use. These action groups are on a voluntary base but show great potential in upscaling current initiatives in the</p>

⁷ [EU Digital Europe Programme](#)

	<p>field of EO. The partnership will make ensure that these ongoing initiatives can continue on the long term in a sustainable manner.</p> <p>A number of existing projects and initiatives may also complement the work related to agricultural (policy) and/or Earth Observation: RUR-20-2018: Digital solutions and e-tools to modernise the CAP; RUR-03-2018: Contracts for effective and lasting delivery of agri-environmental goods (depending on the selected project, selection procedure going on); DT-ICT-08-2019: Agricultural digital integration platforms (under GAP); RECAP-project; BEACON-project; CAPSELLA; SENSAGRI; AfriCultuReS: http://africultures.eu/; TWIGA (http://twiga-h2020.eu); GEOGLAM: Group on Earth Observations Global Agricultural Monitoring - http://www.geoglam.org/index.php/en/ and GMES Africa: A Joint Support Programme of the African Union Commission and the European Commission Initiative (financed by DG DEVCO)</p>
Expected type and composition of partners	<p>The co-funding partners should be (Member) States (policy-related managing authorities, paying agencies for agricultural/environmental policy and - networks, etc.) combined with universities and research organisations. These partners are needed to ensure a structural and long-term impact as well as sufficient geographical coverage.</p> <p>Depending on the phase of the partnership and in cooperation with the partners involved, possible reinforcement with services from the private sector (geo-spatial business) representation could be of added value.</p> <p>Other potential stakeholders are organisations like ESA (European Space Agency), EUMETSAT, ECMWF, and FAO. In addition participation of industry would be important, either as a full partner or associated, as it is a service oriented initiative which requires know how on market uptake and digital technology. Further discussion will be needed on how to ensure collaboration with industry.</p>
Contributions and commitments expected from partners	<p>Financial and/or in-kind contributions are expected to top up the EU contribution. These (in-kind) contributions could be e.g. consisting of infrastructural elements, demonstrations, activities related to policy or market uptake and other innovation-related aspects.</p>
Currently envisaged implementation mode(s).	<p><input type="checkbox"/> Co-programmed European Partnership</p> <p><input checked="" type="checkbox"/> Co-funded European Partnership</p> <p><input type="checkbox"/> Institutionalised European Partnership</p> <p><input type="checkbox"/> Article 185</p> <p><input type="checkbox"/> Article 187</p> <p><input type="checkbox"/> EIT-KIC</p>
Justification of the implementation mode	<p>The partnership is not of the magnitude to have the potential of becoming an institutionalised European Partnership.</p> <p>However, involvement of the Member States' managing authorities is needed for the success of this partnership as they play a key role both from a regulatory point of view and in view of scaling up and deployment. Co-funding, more than co-programming will better ensure Member States' involvement and engagement. They are necessary for the outreach beyond the span of the Commission and are needed for a sustainable implementation.</p>
Proposed starting year	<p>Year: 2021 or 2022</p>