European Environment Agency

Mr Patrick Child
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European Commission
Sent by email only to: Patrick.child1@ec.europa.eu

30 April 2025
CLD/mae/mah

Subject: Research needs for the work programmes of Horizon (2026-2027) and the next EU Framework Programme for Research (FP10)

Dear Mr Child,

Further to the invitation to the Scientific Committee of the European Environment Agency (EEA) to provide perspectives on research and knowledge needs to DG RTD – and to the work programmes of Horizon (2026-2027) and the next EU Framework Programme for Research (FP10) especially – we would like to emphasise a few areas related to environment, climate and sustainability where more research is important for Europe to succeed with targets and objectives on wellbeing, competitiveness and prosperity, from our perspective.

EU policies for the public good

As emphasised by the Scientific Committee in its scientific opinions and advice to the EEA this past year, there is a **strong scientific basis for global action** on environment, climate and sustainability. However, we are still lacking sufficient integrated perspectives and governance responses to address these challenges sufficiently and simultaneously. Transforming European societies in line with the EU's long-term targets and ambitions will require democratic legitimacy, societal acceptance and, therefore, coherence between democratic and sustainability goals.

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The EEA Scientific Committee sees the concept of One Health[1] as one valuable perspective to combine both the need for action on areas that are systemic and deeply interconnected and as a tool to link scientific evidence and governance to directly improve the wellbeing of European citizens.

Managing complexity

Human and non-human life is dependent on a healthy and biologically diverse environment. Addressing the causes behind the dramatic deterioration of climate and environment – as entrenched parts of the polycrisis – requires us to act in a context of complex interdependencies between environmental, social and economic systems.

In all its recent assessments of Europe's environment, the EEA has identified unprecedented and growing pressures from core and globally connected systems of production and consumption. These are the main drivers of environmental degradation and climate change in Europe (i.e. energy, food, mobility and urban infrastructures). At the same time, taking fully into account our dependency on the natural environment, as well recognising interdependencies between climate, nature, resource-use, economic development and human wellbeing, remains a challenge. Left unresolved, this is likely to prevent effective responses to environment and climate challenges. Tasked to provide scientific advice in support of data and knowledge to achieve Europe's environment and climate ambitions, the Committee is especially cognisant of the need to accept uncertainty and ambiguity as inherent elements in policy and decision-making. Interdisciplinary approaches that make uncertainty and ambiguity understandable would support evidence-based policy-making, avoiding unfortunate outcomes where scientific evidence is neglected or ignored.

In addition to the evolving understanding of challenges as complex and systemic, insufficient progress is proof that the conventional way of governing such issues is no longer fit for purpose - with biodiversity as the most apparent example.

We propose to include in the next work programmes of Horizon (2026-2027) and the next EU Framework Programme for Research (FP10) more emphasis on innovation of governance models to better capture complexity, interdependencies and uncertainty as fundamental dimensions of decision making.

Because transformational change affects deeply rooted interests and practices, and leads to distributional effects, governance approaches must include understanding of conflict, resistance and trade-offs.

[1] Multiple definitions of One Health exist but the concept is now largely used to describe and manage complex health issues that involve several interconnected areas and sectors – often with a view to guide stakeholders towards more participatory decision-making processes. We use the EEA's definition of One Health as "an **integrated**, **unifying approach** that aims to sustainably balance and optimize the **health of humans, animals, plants and ecosystems**", agreed by the One Health High Level Expert Panel (OHHLEP) supported by the The Food and Agriculture Organization of the United Nations (FAO), The World Health Organization (WHO), the United Nations Environmental Programme (UNEP) and the World Organization for Animal Health (WOAH). This is the definition applied by the EU cross-agency task force on One Health, consisting of the EEA, the European Food Safety Authority (EFSA), the European Centre for Disease Prevention and Control (ECDC), the European Medicines Agency (EMA) and the European Chemicals Agency (ECHA).

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Approaching knowledge and research through a lens of One Health is one way to promote more integrated assessments and can support the move away from assessing and addressing direct and indirect effects of policies as if they were unrelated.

Inter-agency approaches

While EU policy initiatives have already shown that the EU is attempting to capture links and dependencies between health and environment, including the Zero Pollution Action Plan and initiatives related to the European Health Union, this is built on incomplete research and knowledge. As members of the EU cross-agency task force on One Health, the EEA has done important work to support the transdisciplinary cooperation among EU agencies to prevent and respond to health threats together with the European Food Safety Authority (EFSA), the European Centre for Disease Prevention and Control (ECDC), the European Medicines Agency (EMA) and the European Chemicals Agency (ECHA). EEA work includes assessments of how pollution, the largest environmental cause of disease and premature death in Europe and globally, as well as other environmental factors, affect the health and wellbeing of Europeans. Integrated approaches like One Health could further develop and expand this type of integrated knowledge, including the health of humans, animals, plants and the environment, and the necessary considerations of socio-economic aspects and trade-offs.

As health crises like antimicrobial resistance (AMR), zoonotic diseases, and environmental pollutants continue, the need for cross-disciplinary research, innovative regulatory frameworks, and effective implementation has never been more pressing.

In the following, we highlight three areas of knowledge and research needs related to environmental, climate and sustainability where we believe the concept of One Health could contribute.

Knowledge need 1: Food systems and agriculture

As demonstrated by the EU's Farm to Fork strategy and Strategic Dialogue on the Future of EU Agriculture, there is now wide recognition of the need to transform European and global agriculture and food systems. In the EEA's upcoming state and outlook of the European environment assessment, to be published in 2025, the food system is recognised as by far the highest contributor to biodiversity loss in the EU. Agriculture is also the main driver of nutrient pollution, accounting for 94 percent of ammonia emissions. Furthermore, while agriculture is a substantial contributor to greenhouse gas emissions, climate change is at the same time a key risk to European food production because of climate change impacts on crops (e.g., fungal infestation) and livestock, including extreme weather events, reduced water availability and quality, as well as decreasing productivity. This also brings concerns related with food security and food safety (eg. mycotoxins, pesticides). Similarly, pollution directly impacts food production; pesticides impact soil biodiversity and pollinators, and tropospheric ozone impacts crops. Pollution and climate change can also act together to amplify negative impacts, as in the case of the release and transmission of contaminants in soil, e.g. where climate change related events such as flooding can impact the movement of contaminants.

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Although there is data and evidence available to support the improvement of food and agriculture policies, improved knowledge can help overcome obstacles – especially related to interdisciplinary analysis and alignment of policy interventions (EEA 2022). There are also evidence gaps, which need to be addressed in order to identify effective measures and to track progress.

European agriculture and food production practices are deeply interwoven with societies, economies, cultures and landscapes across Europe. Integrated approaches like the concept of One Health can help mitigate the risk that interventions in one area inadvertently introduce new risks in another. As an integral part of a global market, transformations in Europe must also consider biophysical, social and economic implications at the global level, e.g. avoiding food insecurity and unsustainable expansion of agricultural land in the rest of the world.

Finally, rapidly evolving digital technologies could significantly improve agriculture practices (e.g. land management), monitoring of the state of food systems and assessments of policy interventions. These technologies should be fully utilised when establishing new food system indicators.

Knowledge need 2: Biodiversity

There is strong scientific consensus to demonstrate that the health of humans is interconnected with nature, including the health of animals and ecosystems, as well as plants, fungi and bacteria. However, many knowledge deficits related to the food system and agriculture stem from the lack of a unified approach to capture the status and condition of biodiversity through data and indicators. Nevertheless, the evidence base to demonstrate such interconnections is growing rapidly; including research on transmission of pathogens from animals to humans (zoonosis), changes in immunological diseases from lack of microbiological diversity, and the spread of antimicrobial resistance (AMR) in the environment.

However, related to AMR, we know too little about the risk of resistance being transmitted from the environment to humans and animals. The understanding of AMR in the environment - and the capabilities and capacities to monitor it - is far less-developed than with AMR in the food and health sectors. Although the revised Urban Wastewater Treatment Directive (2024) will help improve monitoring, further advances are needed. One area of opportunity is to consider how digital innovations such as metagenomics can provide opportunities for gathering large amounts of data and therefore gaining a better understanding of risks.

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Research should be based on a more holistic understanding of human health and wellbeing that fully recognises nature as a critical life support system. Today, this is not the case. In cluster 1 “Health” in the Horizon Europe strategic plan 2021-2024, health is largely understood

as personalised health promotion and disease prevention with a focus on diagnosis and treatment. By capturing both the individual and collective health of humans, animals and the environment, the concept of One Health can capture the role of the environment in long-term prevention of both communicable diseases and non-communicable diseases in humans and animals. This includes preventing adverse environmental pressures like pollution and climate change, as well as their combined impacts together with land use on ecological dynamics (e.g. accumulation of pollutants in the food chain, plant species and pathogens) and biodiversity.

There are important knowledge needs on these interdependencies and connections between biodiversity, climate and health, both related to biophysical processes and social and psychological dimensions. As an example, restoring wetlands and floodplains to provide climate adaptation by means of flood protection also mitigates the effects of heatwaves and supports biodiversity, but potentially also affects mosquito populations and the transmission of mosquito-borne diseases. Considerations of mental health impacts of biodiversity loss, pollution and climate change should also be addressed more fully.

Expanding rationales for protecting biodiversity beyond conservation, and including for climate action, health and wellbeing, are essential for achieving the goals of the EU Biodiversity strategy for 2030 and halting the alarming rates of biodiversity loss documented worldwide.

Knowledge need 3: Data to demonstrate co-benefits

The concept of One Health is useful as one mechanism for more integrated and participatory policymaking processes, and also as a driver of data integration. To illustrate, combining data sets on climate change induced heatwaves and hospitalisation and working days lost highlights the rapidly evolving evidence base on the economic costs of diseases related to air pollution, climate change and other environmental determinants. Examples of other knowledge gaps relate to high-resolution data and combinations of data related to cancer (e.g. pollution, including microplastics, and human-biomonitoring) and mental health (e.g. impacts of lack of accessibility to green/natural areas) as well as disease vectors etc. (e.g. climate change, spread of mosquito and tick species). More evidence can strengthen the case of co-benefits between environment, climate, sustainability and health of interventions that provide the knowledge foundation for appropriate action at the policy level.

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We support recommendations in the scientific opinion on One Health from the EU's Group of Chief Scientific Advisors (GCSA) around the need to design data sharing across key One Health related data domains and the need to identify institutional and structural barriers that prevent inter- and transdisciplinary research collaboration.

We thank you in advance for considering our perspectives.

On behalf of the EEA Scientific Committee (2020-2024),

Claire Dupont
EEA Scientific Committee Chair

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