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Svar fra Universitetet i Bergen: tematisk innspill til EUs kommende rammeprogram for forskning og innovasjon

Universitetet i Bergen setter pris på anledningen til å gi innspill om tematiske prioriteringer i EUs kommende rammeprogram for forskning og innovasjon, jfr. brev fra Kunnskapsdepartementet av 8. oktober 2024. Vårt innspill er vedlagt.

Med vennlig hilsen

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Vedlegg
1 Input from the University of Bergen: Thematic priorities in the next EU research and innovation programme

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Thematic priorities in the next EU research and innovation (R&I) programme

The University of Bergen highlights the following areas as crucial for maintaining the necessary knowledge preparedness and addressing the societal challenges facing Europe, where European R&I collaboration adds significant value. These interconnected areas require both basic and interdisciplinary research, with SSHA disciplines integrated into all themes. Sufficient investment in infrastructure, including data-sharing systems and data stewardship roles, is essential for maximizing European R&I potential. To be able to mobilize excellent R&I environments in all sectors to participate in the programme, it will be of great importance to secure long-term stability with regard to the budget as well as rules and conditions.

Health: Health R&I are essential for addressing urgent challenges in all aspects of health care. Digitalization is transforming patient care, but further research is needed to fully harness its potential in improving health outcomes. In the coming years, **sharing of health data across Europe**, combined with **advancements in AI** will be pivotal in addressing future health challenges.

Research is needed to address the alarming rise in **mental health** problems among children and young people, as well as health issues posed by **an aging population**. The socioeconomic cost of neurodegeneration is now higher than that of cardiovascular disease and cancer combined, and finding solutions to these challenges is crucial for sustaining healthcare systems in Europe. Dedicated research on **women's health** is needed to bridge the knowledge gaps related to gender-specific differences in physiology, diagnosis, and disease progression. Additionally, the **health impacts of climate change and migration** present complex issues that require coordinated, interdisciplinary research.

Through advanced surgery and new-generation drugs, a higher number of patients survive severe **brain damage**. However, **more R&I is required to improve these patients' quality of life**, and solutions in this area have the potential to reduce long-term costs of medication and treatment and thereby reduce the burden on the health sector.

Precision medicine holds significant promise in the treatment of serious diseases, including **cancer**, but major advancements are still needed. This requires focus on **basic and translational medical research** for better diagnostics and development of new treatment methods.

Priority setting in health and **inequalities in health** are related areas of increasing urgency as the gap between what is technologically possible and what is financially viable is rapidly widening, increasing pressures on public health systems. Health is a significant driver of economic inequality, and mechanisms for setting fair priorities in health are key both for the health of the population and for social cohesion and democratic legitimacy.

The **contributions of arts and art-based therapies in healthcare** should also be explored. A comprehensive and collaborative approach will enable Europe to lead in health innovation while ensuring the well-being of its citizens.

Climate: Climate change represents one of the greatest challenges faced by human societies. More research is urgently needed to understand the processes determining climate change and the multidimensional consequences, as well as the political, social, economic, and technological complexities of mitigating and adapting to climate change. Basic and interdisciplinary research is critical, with particular focus on three areas:

A future ice-free Artic: The Arctic Ocean may become ice-free during summer season within the coming decades due to climate change. While scenarios remain uncertain, even transitional phases of diminishing ice cover present both opportunities—such as new shipping routes and access to marine resources—and significant threats, including climate feedback and ecosystem loss, with global implications. To enable sustainable management and informed political decisions, more precise predictions of Arctic ice conditions are essential, necessitating enhanced observations and deeper process understanding.

Developing Ecosystem Prediction: Integrated prediction systems that combine Earth System, Ecosystem, and Social System models need to be developed and made ready for application. These tools, enhanced by emerging technologies like artificial intelligence, can drive sustainable ecosystem management. Advancing this research requires concerted international efforts.

Just transformation: Climate change will widen social inequalities, both within and between societies, heightening the risk of social tensions. Transdisciplinary research is urgently needed to explore pathways for societal transformation that address the climate and biodiversity crises while promoting social justice and cohesion.

Oceans, Climate and the Blue economy: Our oceans are deeply affected by climate change and face multiple other stressors. We need basic research to attain a better understanding of how oceans and ecosystems, particularly coastal, Arctic, and deep-sea, are affected. The production of seafood must increase to provide a healthy diet for all, and the marine sector has the potential to supply renewable energy production and minerals, all of which require solid environmental impact assessment. This again requires increased knowledge of marine biodiversity, particularly of mid-water and deep-sea communities and their contributions to ecosystem services.

Coastal and shelf sea regions should receive particular attention as they emerge as a focal point of the multiple impacts of climate change, land use, freshwater discharge, and land-based and sea-based human activities. A key question is how to reconcile the necessity of restoration and biodiversity conservation with the need for provision of more energy, food and bioresources from the sea. There is a critical need for coordinated interdisciplinary and intersectoral research to increase our understanding of coastal processes under multiple stressors. Further, we need research on the trade-offs between use and conservation of the marine environment, as well as on cross-border governance and management principles. Research is also needed on the regulatory and legislative framework. EU R&I funding in this area can create tools necessary for knowledge-based policy decisions, including global climate models, digital twins of the ocean, and data and monitoring systems.

Efficient energy systems and energy system management: To efficiently harvest intermittent, renewable energy resources, and avoid over-investment in energy production, we need improved energy system management tools, as well as high quality input data. At present, we lack an energy system management tool that combines and allows interaction between new and existing tools for intelligent and automated power system operation.

The introduction of large shares of unregulated power production from solar PV and wind power are common to European countries and efficient solutions for energy storage at various time scales, energy management and demand flexibility are needed. The legal and economic framework must be designed to balance the need for energy security and sufficient production capacity and to avoid overinvestment and unnecessary area use.

An integral part of optimal handling of unregulated power production is efficient use of surplus energy, i.e. power-to-X. This includes novel, energy efficient methods for production of e.g. hydrogen and ammonia, as well as safe storage and handling of such energy carriers.

Sustainable area management: Area is a scarce resource in Europe, and a source of potential conflicts between different stakeholder interests, including court cases brought by traditional and indigenous communities. In particular, a massive deployment of renewable energy will intensify current conflicts about area use. More knowledge of how such processes can be structured to minimise conflicts and risks of human rights abuse is needed.

A key question is how we can allow for ***maximum production of renewable energy while minimizing ecological harm*** by e.g. multiuse of areas and the use of ecologically degraded areas for renewable energy development. Balancing energy production with climate mitigation and nature management will be crucial for ensuring a just and sustainable development. This requires new knowledge of the costs associated with loss of biodiversity, ecosystems, and ecosystem services in renewable energy projects, and developing digital tools to integrate these into energy system models for informed decisions.

Democracy and sustainable, just, and inclusive societies: A range of developments over the past years has resulted in new challenges for European democracies: shifting geopolitical landscapes; changing dynamics of

globalization and protectionism; widening inequalities; increased migration; climate change; new developments in AI and other technologies; foreign interference and fake news influencing elections; and a sharp increase in populist parties and movements challenging the liberal democratic order. To secure the knowledge needed to protect and enhance sustainable, just, and inclusive democratic societies, R&I on these issues should be prioritized. Areas of focus should include:

- **Law and socio-legal research,** e.g. related to the green transition and AI, contemporary forms of judicialization of politics and its consequences, the pressure on human rights and international law, including legal frameworks related to migration and asylum, as well as research related to the study of resilient and adaptable legal rules.
- **Democracy in societal transformations**: The politics and governance of societal transformations are exceedingly complex. They require far-sighted, often trans-generational decisions, and this raises fundamental questions of how democratic participation and governance can be re-structured to enable far-sighted decisions as well as broad participation.
- **Inequality and inclusion**: Research on the nature and drivers of multidimensional and intersectional inequalities should be prioritized along with research on barriers to, and mechanisms for social inclusion.
- **The role of cultural heritage for inclusive societies**, including Cultural Heritage Science.

Children and youth: In many European societies conditions for children and youth are worsening. Child poverty is on the rise, as is child abuse, mental illness and suicide among children and youth, and serious crime committed by children. Child migrants are particularly vulnerable. It is urgent to have a transdisciplinary focus on how children can be better protected, included and enabled. There is great potential for advancing actionable knowledge that can guide policies and improve children's lives, by mobilizing across a wide range of academic and professional silos and including children's voices in research.

Digitilization and Artificial Intelligence: As our societies become increasingly reliant on digital solutions and AI, Europe must advance research within ICT, particularly in cybersecurity and AI, and its theoretical underpinnings. Key research questions include how to make the ICT-systems and data secure, ensuring privacy while maximizing data utility for individuals and society. This requires foundational research in computer science and cybersecurity at all TRL-levels to maintain a strong knowledge base. Research is needed to improve energy efficiency of algorithms, trustworthiness, and cybersecurity of e-infrastructures and AI-systems. Interdisciplinary collaboration is essential, combining informatics with natural sciences, medicine, psychology, social sciences, humanities, law, and artistic research, to develop beneficial digital and AI-solutions.

These topics should be addressed in the successor of pillar 2 in FP10, which is an important instrument for universities in Horizon Europe. Cross-sectoral and cross-disciplinary research and innovation creates added value within the EU Programme. Open and competition-based calls for proposals through the renowned cluster set-up and work programmes known from the present programme should continue in the next FP. Where partnerships create an added value to such clusters, they can be set up and it is important to secure Norwegian access to the partnerships relevant for the topics mentioned above. UiB regards partnerships contributing to the green transition, such as Clean Hydrogen, Sustainable Blue Economy and Clean Energy Transition as important for Norwegian actors. Within the health field, UiB recommends Norway's participation in the upcoming co-funded partnerships Rare Diseases, One Health Antimicrobial Resistance, Pandemic preparedness, and Brain Health. We also recommend participation in the new partnership on Resilient Cultural Heritage. For general reflections on **Missions and Partnerships**, UiB refers to the recommendations in our position paper on FP10: A New Framework Programme for Research and Innovation (FP10).