

## Strategic research themes and research priority for 2019

The Strategic Research Council (SRC) has prepared four research themes and one research priority for 2019:

- Towards a sustainable, healthy and climate-neutral food system
- Innovative materials and services to promote resource wisdom and sustainable development
- The evolving role of public authority and the potential for steering society
- Culture in an increasingly technologically driven society
  
- Cross-cutting priority: Strengthening the ethical dimension in research

### Theme 1: Towards a sustainable, healthy and climate-neutral food system

This theme will seek a solution for moving towards a sustainable, healthy and climate-neutral food system. Food system refers here to the whole made up of the multi-level connections between people, organisations, technologies and the environment (land, air and water) as well as other production inputs (infrastructures, energy, fertilisers and pesticides, etc.) and biodiversity. Instead of being part of the problem, the food system of the future must be part of the solution to climate change.

The food system plays a vital role in achieving the sustainable development goals. Agriculture is a major source of greenhouse gas emissions the world over. It also has significant impacts on the water supply and the condition of water bodies. Besides climate impacts, important subthemes also include other environmental impacts as well as the impacts of various change trends and change needs on producers, regional economies and agricultural policy and on consumers, culinary culture and consumption habits.

The agro-food sector and the prices of food have a major impact on wealth distribution, health and wellbeing. Agriculture and agricultural policy are also of great regional economic significance. Eating habits and customs are a cultural component that serves to build and strengthen communities – from the level of families all the way to the level of nations. Consumption habits mould our wellbeing and health and also influence land use, greenhouse gas emissions and other environmental impacts. The food system is thus not only of environmental but also of economic and social significance.

The development of a sustainable, healthy, safe and climate-neutral food system calls for research on topics including the supply of inputs in agriculture, agriculture and retail as components of the food system, interaction between the various operators and market dynamics, and regulation and the steering potential for public authority. Research is furthermore required into, for instance, new ways of food production, changes in soil and land use, nutrient flows and cycles, and social issues relating to food systems such as changes in consumption habits, food shortages and the effects of income and scarcity on healthy nutrition.

Even though the entire food system cannot be examined within the confines of a single project, it is important that the research be undertaken from a systemic perspective. The food system is a dynamic whole comprising, for example, investment, production, packaging, trade, consumers and waste treatment. The research focus need not be confined to Finland and instead also broader issues may be addressed, such as the reform of the EU common agricultural policy or needs for adaptation and development in the global food system.

The research projects need to cater to ethical considerations relating to the theme. The context of the food system gives rise to numerous such considerations, including but not limited to fairness, the realisation of fundamental human rights, and the rights of animals.

## **Theme 2: Innovative materials and services to promote resource wisdom and sustainable development**

Modern materials have revolutionised our way of life. Plastics, for example, have contributed greatly to the improvement of people's health and wellbeing. Many materials, both in and of themselves and through their use, put an unsustainable burden on the natural environment, however. The time is ripe for new kinds of material and service innovations to allow development that is sustainable for both humankind and nature. The research under this theme will concern resource-wise innovations to reduce consumption that is harmful to nature and to develop new materials and services. The research should deliver tools to facilitate the rapid and widespread dissemination of such innovations by making use of the opportunities provided by digitalisation, such as data management and artificial intelligence. This theme will seek solutions to replacing the unsustainable material foundation of our way of life with new materials and innovative services.

The theme centres on systemic change management and the promotion of resource wisdom. Funding under this theme will be made available to research into the identification and exploitation of paradigm shifts in materials and their processing. In particular, research is required into the impacts of such advances in materials on manufacturing, services, the labour market and employment, environmental protection, consumption habits, skills requirements, and education and training. A strong ethical dimension must be built into the research, for instance, such that ways to achieve social and ecological justice in material production and service provision are sought as part of the projects.

Development gives rise to the need for new material solutions in fields including energy generation, transport (vehicles and routes), packaging and distribution systems, and construction, healthcare and electronics. Product design must cater for circular economy requirements as well as the use of raw material supplies that is sustainable in terms of biodiversity, mining and water, for example. Ways of using new and renewable materials and approaches to address environmental pressures arising from, for instance, plastic particulates and nanoparticles as well as medical and chemical residues might provide a point of departure for the research. This requires development throughout the chain, from new materials to their economic, social and environmental impacts.

Institutional structures, such as norms, legislation and industrial value chains, must evolve in step with the resource-wise economy and support the transition to it. Research within the theme may examine the desirable changes in the institutions that support change as well as the potentially required new institutions and forms of cooperation. The research could identify the production-related, skills-based and legislative obstacles that result in adherence to current technologies and approaches and hinder the introduction of new solutions and approaches.

Important subthemes also include identifying the barriers to the creation of innovative domestic markets and skills-based exports and locating solutions to overcome these barriers. The goal is to determine the capabilities required in Finland to generate and exploit paradigm shifts in materials and to make use of these to support Finland's competitiveness in international markets.

### **Theme 3: The evolving role of public authority and the potential for steering society**

Research under this theme will seek ways and tools to steer social development in today's conditions. Technological advances and the change in the role of public authority are moving rapidly. Changed conditions necessitate a re-evaluation of public authority and responsibility as well as the potential and tools for steering development to promote long-term social goals, such as the health and wellbeing of the citizenry, equal access to education and enlightenment of high standard, and socially, economically and ecologically sustainable development.

Multi-level governance, where authority is exercised by public, private and third-sector actors in the global context, is nonetheless blurring the boundaries of public authority and clouding the division of responsibility. The theme will centre on the significant changes already visible at the interface of the public and private sectors and in the interaction between the two.

Changing ways of working impose new requirements on the tools for steering and on reaching agreements. Research data is thus required on topics including forms of competitive tendering and cooperation, the significance of preventative action, and the potential for steering by information and utilisation of technology. Research-based foresight data is also required on various scenarios involving public authority and its role and the impacts of these on people, the environment, and economic conditions and reliability.

Processes and agreements should be examined from the viewpoint of both public bodies and enterprises and other actors. The research may additionally address changes in international treaties, the effects of which to an increasing degree are encroaching on the framework conditions of national decision-making. Attention in the research should be paid to topics such as the incentive effects of steering, the challenges and opportunities of impact evaluation, and competition as well as the issues arising from asymmetric information. As things now stand, it is reasonable to conclude that new technologies will be of particularly material significance and that their utilisation will often require changes in steering tools and the organisation of activities. Steering undertaken by society and the evolving relationships between private and public authority could be examined from, for example, social, economic, medical, legal, political and historical perspectives.

Important research questions under this theme have to do with topics such as public procurement, land use, corporate subsidies, competition and innovation policy, energy and climate policy, and policies and regulation concerning individual sectors such as the telecom, electricity, pharmacy and pharmaceuticals markets. Social steering and responsibility questions should also be examined in the context of the arrangement of service provision, such as growth and vitality services and social and healthcare services, care services for older people and people with disabilities, and early education and education and training. The potential for exploiting public information systems while safeguarding equality and right to privacy should also be analysed.

### **Theme 4: Culture in an increasingly technologically driven society**

Technological development is shaping human activity more rapidly than changes in culture. Many traditional ways of doing things are disappearing while new ones are arising at an unprecedented rate. While adapting to such rapid change poses a challenge to both people and organisations, change also always entails opportunities. Our understanding of knowledge, learning and civilisation are moreover evolving. Technological development will influence the means and tools used to create and transfer culture from one

generation to the next, for instance. Going forward, civilisation may be passed on through pedagogical, educational and interactive relationships dissimilar from any seen to date.

The relationship between technological development and culture is hardly a one-way street, however. Culture, cultural values and cultural goals are reflected in the kinds of technology that are developed, while the benefits of technology largely depend on the culture in which the technologies are used and the social, economic and ecological impacts of those technologies. Since the nature of culture and technology is manifold, under this theme researchers are expected to bring to the table the perspectives of their respective disciplines for multidisciplinary engagement.

Technology both enables important positive transitions and creates multiple challenges. Research under this theme will seek to locate solutions for supporting the interactions between technological advances, institutional and organisational structures and different cultures to ensure the inclusiveness of an increasingly multicultural and technologically driven society. Solutions are also needed for alleviating the social divisions associated with technological development.

### **Cross-cutting priority: Strengthening the ethical dimension in research**

Rapid advancements in technology must be underpinned by active ethical thinking that caters for different world views and alternative futures. Technological advances require measures to allow sound, responsible and sustainable research to be conducted and utilised in a way that serves the development of Finnish society and humankind as a whole. The aim is to integrate ethics into all stages of the research and innovation process from its very outset.