# Feedback on Qualitative Mapping

**How integrated are the strategies and R&I policies on the scope of Food and Nutrition Security in your country?**

In order to achieve sustainable and resilient food systems that provide nutritious food from both land and sea, it is necessary to know both the composition of a nutritious diet and also how climate change will affect food production and the nutritional quality of food, through effects on the quality of agricultural and marine primary products.

*Current status*

*Potential for the development of sectors.* The food sector is the largest share of Lithuanian bioeconomy, just like in the majority of other EU states. Food industry and agriculture are the largest subsectors of Lithuanian bioeconomy, which can be characterized by average growth rate over the past mid-term period. Fishing and aquaculture is a very small part of the food sector, also developing at an average rate. The strategic principle of bioeconomy of the priority of food security ensures the priority of the food sector in bioeconomy. The priority of agriculture and fisheries is also determined by the principle of combination of food security with sustainable use of renewable energy sources for industrial (including energy) purposes and assurance of environmental protection.

The development of the Lithuanian food sector has been encouraged by rapidly increasing food demand in the world as a result of a rapid growth of population and their purchasing power. A relatively slow growth of agriculture and food production in the future has been forecasted. The potential of biomass production in agriculture has been increased by the possibility of including suitable abandoned agricultural land in production and sustainably intensifying agricultural production in order to increase the productivity of agriculture. Also, solving the increasing problem of soil degradation especially in territories of productive land, is very important. The forecasted rapid increase of demand for fish and other aquatic products in the world has increased the potential of the development of aquaculture in Lithuania; aquaculture will help meet this demand, because according to forecasts of FAO and OECD, fish catch will decrease, while the production of aquaculture products will increase. Moreover, controlling the quality of fish resources in open water has become in-creasingly difficult. The development of aquaculture in Lithuania is associated with the increase of quantities of valuable species of fish in ponds and the aquaculture cultivation in closed systems, which has been rapidly developing in the world and is much simpler compared to pond aquaculture.

*Potential of research and experimental development.* The Lithuanian research system is fragmented, thus the culture of cooperation not only between researchers and entrepreneurs, but also between scientists from different institutions is low. Interinstitutional and international coordination of innovation activities remains inefficient in Lithuania; the created infrastructure necessary to ensure research and business partnership also functions ineffectively.

*Ambitions*

Cross cutting activities should be carried out, including education, outreach, data sharing, standardization and harmonization, to support a knowledge flow from scientific research towards practice. This will support a multidisciplinary approach and ensure the involvement of key stakeholders.

Dialogue and co-design with stakeholders is crucial for acceptance and uptake of the research outcomes along the following societal actors:

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- Consumers - awareness and acceptance of the consumer towards foods is key. Aspects to be considered are: nutritional quality, food safety, production methods, sensory aspects, ethical and environmental issues.
- Industry - working with industry to increase diversity in feed and food sources to provide greater nutritional qualities and contribute to resilient production systems, to explore food products which are both ethically and economically viable.
- Regulatory authorities - close cooperation to encourage the authorisation of new products.

*This gives rise to further goals from Lithuania perspective:*

- **Food Production**

  The first activity focuses on the improvement of food, specifically, taking into account climate impacts and nutritional needs, to breed resilient, nutrient-rich, and resource-efficient plants and animals (land and sea) for food and feed - **create a suitable environment as well as sustainably increase production and productivity in the agriculture.**

- **Food Processing and Transformation**

  Food processing affects food safety, functionality and shelf life, and can result in improved digestibility and bioavailability of nutrients. Within this topic, food processing (post-harvest practices) will be examined to improve the conservation of nutritional qualities, and at the same time, optimally using the product to reduce energy and resources consumption, avoid waste and contribute to a circular economy. In this context it is important to bring **food and food processing closer to the consumer and to involve the consumer in the dialogue on healthy and sustainably produced food.**

- **Food Consumption**

  The third level of improving the food systems for food and nutrition security is to understand the basis of food choice and food waste. It is necessary to identify the tensions, barriers, synergies and opportunities, at the level of retail, food service and consumers, to allow sustainable and healthy food consumption - develop long-term strategies for the sustainable use of resources and provide targeted support for research.

*Gaps*

The world's population will rapidly increase, and will reach 9.7 billion in 2050. The continuously increasing demand for food products in the world will promote the development of agriculture, aquaculture and food manufacturing sectors in Lithuania. The impact of climate change on the bioeconomy business will continue increasing for changes occurred in the past and the current greenhouse gas (GHG) emissions. The assessment of individual types of economic activities revealed that the highest GHG emissions were in agri-culture, accounting for 50.4 percent (in 2014), followed by the chemicals industry with 30.1 percent (with producers of chemical fertilizers being the main pollutants) and waste sector with 14.5 percent. Thus, the trends of the development of bioeconomy will be highly dependent on all these factors.

Ensuring food and nutrition security is a complex issue, requiring an integrated food systems perspective. To achieve food and nutrition security, there is a need to understand what the "ideal diet" is for different specific populations and in different regions to generate profiles of nutritional needs and the corresponding diets. There is also a need to understand climate change effects on food composition and the food system as a whole, again looking at macro- and micronutrients in order to develop resilient and sustainable food systems as well as feed for farmed animals on land and sea.

**Specific situation on FNS/ Priorities:**

1. **Create a suitable environment for food security and nutrition**

   - action to investigate how climate change and other environmental stressors affect agro-forest and aquatic ecosystems, their productivity and biodiversity as well as examine how intensive use of resources affects agro, forest and aquatic ecosystems, identifies the long-term effects and potential damage of such effects, and propose the rehabilitation of measures.

2. **Make agriculture and food systems sensitive to nutrition and food safety**

   - protecting human health and the environment by understanding the environmental impact of the food and feed chains and the environmental impact of these chains,

   - development of high value-added products and services. Particular attention should be paid to new promising areas that could, in the future, lead to the country's prosperity: environmentally-friendly technologies, future energy, creative industries, and wellness.

3. **Develop long-term strategies for sustainable use of resources and promote targeted research**

   - knowledge and innovation transfer in agriculture, forestry and rural areas promoting resource efficiency and supporting the transition to a low carbon economy in the agricultural, food and forestry sectors,

   - balancing consumers needs as a key factor in the competitiveness of the food industry and the impact of food on the health and well-being of Europeans.

**Annexes:**

*Priorities declared in **Agriculture, food, fisheries and rural development research and experimental development program 2015-2020** (Lithuania):*

1. Knowledge and innovation transfer in agriculture, forestry and rural areas;
2. Increase the viability of farms and the competitiveness of all types of agricultural activity in all regions, and to promote innovative farm technologies and sustainable forest management;
3. Promote the organization of the food supply chain, including the processing and marketing of agricultural products, animal welfare and risk management in agriculture;
4. Promoting resource efficiency and supporting the transition to a low carbon economy in the agricultural, food and forestry sectors;
5. Development of high value-added products and services. Particular attention should be paid to new promising areas that could, in the future, lead to the country's prosperity: environmentally-friendly technologies, future energy, creative industries, and wellness.

*Priorities declared in **National Research Programme 'Healthy and Safe Food'**:*

1. Food quality and safety: ensuring chemical and microbiological food safety and improving the quality in the context of the European food chain;
2. Food processing: optimizing innovation at the European food industry by integrating advanced technology in traditional food products and in order to increase functionality, quality, nutritional value, including the development of new products;
3. Environmental impacts and the global food chain: protecting human health and the environment by understanding the environmental impact of the food and feed chains and the environmental impact of these chains;

4. Consumers: understanding of consumers and their needs as a key factor in the competitiveness of the food industry and the impact of food on the health and well-being of Europeans;
5. Nutrition: Understanding the useful and harmful nutritional factors, including the needs of specific population groups, in order to reduce the incidence of food-related illnesses.

*Priorities declared in* **National Research Programme 'Sustainability of agro-, forest and water ecosystems'***:*

1. Action to investigate how climate change and other environmental stressors affect agro-forest and aquatic ecosystems, their productivity and biodiversity;
2. Examine how intensive use of resources affects agro, forest and aquatic ecosystems, identifies the long-term effects and potential damage of such effects, and propose the rehabilitation of measures.

Date: *January 2018*