



# Research, innovation and technology transfer in the agri-food sector in the Western Balkan countries/territories: Phase II

## Progress report for Serbia

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# Methodology

- Questionnaire structured interviews
- The Serbian Focus group meeting

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# Interview results

## Key function 1: Advice, research and education

### ***Role of advisory service in enhancing RITT***

- It is functional, but it should be strengthened both financially and technically
- It is necessary to spread activities within the service to new areas
- The system missing a bottom-up approach for the information flow

### ***Role of research in enhancing RITT***

- Many scientific projects have been realised, but the impact of their results is very small.

### ***Role of education and training in enhancing RITT***

- In Serbia there are a lot of secondary schools as well as faculties in agri-food sector.
- In order to improve RITT it is necessary to: adopt study programs more appropriate for needs, introduce more practice in companies, improve institutional capacity for students practice as well as research, introduce entrepreneurship courses in university study programs, involve people from business companies in teaching process, adequate and regular trainings and education for all participants in RITT process , targeted trainings specialised for each group of AKIS actors, etc.

## Key function 2: Knowledge diffusion through networks

### *What is the level of cooperation and interaction?*

- Coordination between some AKIS actors is on higher, while between others it is on the lower level.
- Better support for the Advisory service as a key actor in these interactions can contribute to better coordination and interaction among stakeholders at all levels.
- All interactions should be on two-way basis and significantly improved with respect to knowledge exchange for RITT.

### *Extent and role of technology and innovation adoption from abroad*

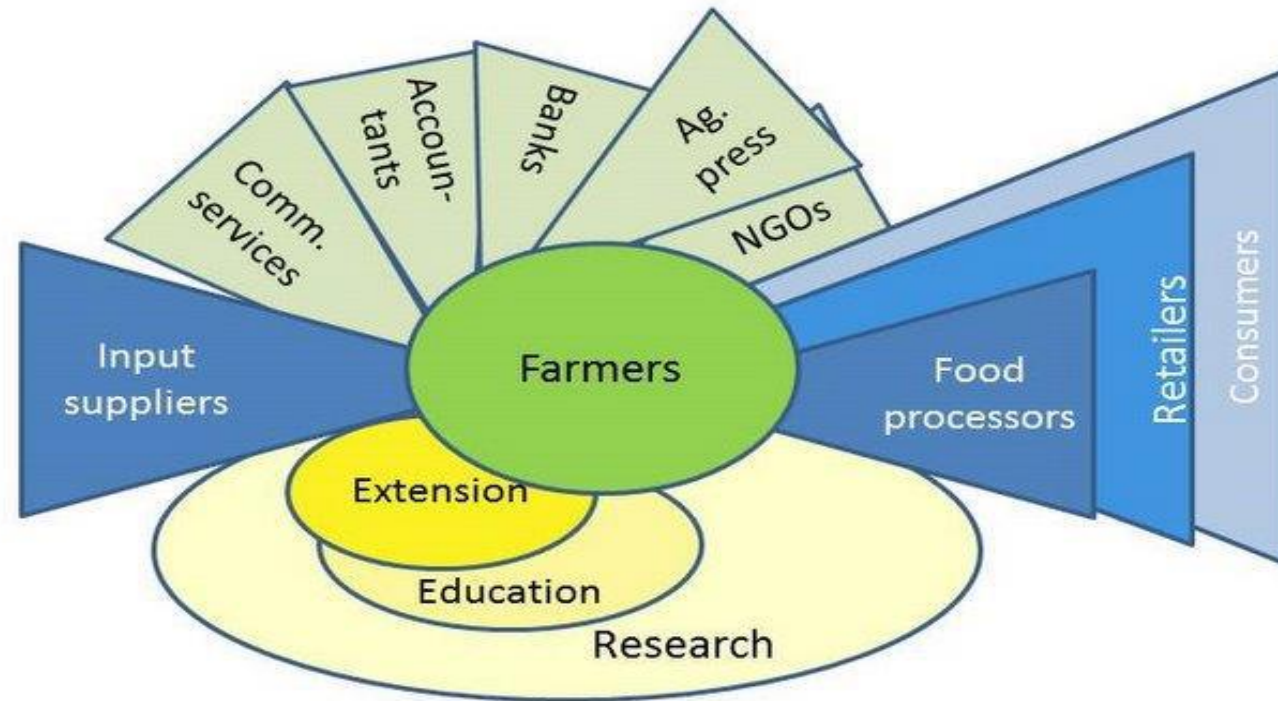
- Opposite opinions:
  - Technology and innovation from abroad usually have higher prices than domestic and it is limiting factor for adoption of these technologies. The other limiting factor is that these technologies can only be partially applied in practice in Serbia, since agro-ecological, technical - technological and social conditions are significantly different.
  - The extent of adoption of technology and innovation from abroad is in all parts of agricultural products value chain quite high, with expressed confidence in imported technologies among producers.
- Providers of missing knowledge and innovative products from abroad are much better trained for technology and knowledge transfer, well organized, supported with significant resources, advertising and marketing, more motivated than the researchers from national research institutions.

### *Specific connections/collaborations*

- Regional cooperation in RITT is realized through IPA cross border programs and bilateral cooperation programs, while with the rest of Europe and the world it is realized through Horizon and other similar programs.



## Key function 3: Development of an AKIS vision



- The AKIS is not formalized system in Serbia, although the initiatives for its formation are present for more than a decade.
- The structure of AKIS and the role of stakeholders in it should be further developed and formalized, and communicated to all participants.

## Key function 4: Entrepreneurial activities and experiments

### *Role of the private sector/businesses in transferring technology and innovation in the agri-food sector*

- Private sector role in RITT is mostly proportional to the company relative size and strength in the market, and include all activities that they can afford (field days, lectures, presentations, commercials, involvement in specialized TV shows, etc.).
- Bigger companies have their own RI centres; while smaller just implement what they can afford from the market.
- There is a small number of private consulting agencies that provide advisory services on a commercial basis.
- Their activities are mainly focused on providing information and technical support in the preparation of tender documentation, business plans, bookkeeping, etc.

### *Up-take and use of green and clean technologies*

- Not widespread in Serbia, primarily due to high prices, long term and not profitable effects
- Present in Serbia but on a smaller scale, mostly through organic production.
- Examples that are most common in practice: temperature regulation in farms and especially indoor production through renewable energy sources, introduction of biogas production plants, a sustainable production system on individual farms, improvement of soil fertility using manure, zero waste processing and other green technologies.
- It is notable that green energy use is growing.



## Key function 5: Market formation

### *Role of external factors on enhancing RITT*

- EU accession have the most positive effect on enhancing RITT in the agri-food sector by insisting on policy harmonization and introduction of the EU standards.
- Global economic crisis, migrant and refugee crisis, Covid 19 pandemic, etc. have strong negative effects on all segments of economy and society, including RITT in the agri-food sector.
- Crisis situations can also boost innovations and initiate new ideas.

### *Role of demand-side factors for the transfer of technology and innovation*

- The research activities are mainly not planned starting from the needs of private sector, but still the most of the research studies are demand driven.
- The transfer of the results is usually not sufficiently efficient and depends mostly on profitability and expected risk of adopted new technology.
- Bigger companies listen to consumers and market and try to adopt and provide what is needed.

### *Role of supply-side factors for the transfer of technology and innovation*

- Suppliers often appear in the role of promoters of modern innovative solutions.
- Supply side has to be informed about the need of users and market to be able to properly shape RITT.



## Key function 6: Creation of legitimacy

### *Incentives or disincentives to generate and transfer innovation and technology*

- There are many incentives in Serbia supporting the generation and transfer of innovation and technology
- Besides that, small businesses have the state support through various institutions and programs, such as the Innovation Fund and its programs.

### *Role of IPARD and other programs*

- The IPARD programme speed up innovation and the use of new technologies in the agri-food sector.
- For the period 2014-20, IPARD program supported Serbian agricultural sector with around 175 M EURs.
- There are also other programs which contribute to new technology transfer, such as: FAO, IPA, USAID, etc.

### *Constraints and opportunities for the transfer of green and clean technologies*

- The main constraints : not profit motivated and oriented technologies, the effects could not be seen in a short period of time, a low level of awareness among farmers and food producers in respect to importance of green technologies, the lack of regulatory mechanisms which will foster or stimulate implementation of green technologies.
- In Serbia, the European Bank for Reconstruction and Development (EBRD) has launched the Green Innovation Vouchers (GIVs)



## Key function 7: Resource mobilisation

### ***Governance arrangements and modes for transferring research and development into practical applications***

- Agricultural advisory services in cooperation with scientific and educational institutions is a key actor in the dissemination of knowledge and information on innovations and new technologies to agricultural producers.

### ***Innovation Spiral***

- The Chamber of Commerce and Industry of Serbia (CCIS) has positioned itself as one of the most important actors of the national innovation system.
- CCIS organizes initiates and supports all forms of innovation and creativity that contributes to improving the level of technological development of the country.
- CCIS provides quality and timely information, advisory and consultancy services to all creators, training and preparation of the company to adapt to European standards, training in the field of innovation activity and intellectual property rights, strengthens the links between education, research institutes, innovation and technology centers, technology parks and commercial sectors etc.



# Conclusions and lessons learned

According to the results of this study the following conclusions could be made:

- **Legislative and strategic framework for research and innovations exists**, as well as developed network of research and education institutions that support agri-food sector in Serbia.
- **Main challenges for enhancing RITT in the agri-food sector in Serbia are:** implementation of existing strategies, legislatives and incentives, as well as transfer of research results into agricultural practice, allocation of financial resources and further improvement of capacities for research and innovation in all segments of AKIS.
- **Links between science, advisory and the business sector exist but the interaction and cooperation is not sufficiently coordinated** and thus the initiatives for coordinated rather than isolated actions would be supportive for enhancement of RITT. All these interactions should be on two-way basis and significantly improved and formalised by implementation on AKIS.
- **The AKIS is not formalized system in Serbia**, although the initiatives for its formation are present for more than a decade. The structure of AKIS and the role of stakeholders in it should be further developed and formalized, and communicated to all participants.
- **The Agricultural Advisory Service is very important for RITT and it should be further modernised**, by strengthening its human and infrastructural capacities. Their filed of work should be widen from primary agricultural production to processing technologies as well. Also, the advisors should be continuously trained and educated about possible solutions for new and actual topics and challenges of modern agricultural production.
- **Producers and SMEs trying to adopt the technologies from abroad, as well as green and clean technologies adequate to their size and financial capacity**, especially those with short-term visible effects. Also, government have different support programs to help farmers in this process.
- **RITT process in Serbia is highly influenced by many external factors, some with positive** (EU accession, new quality standards, logistics and digitalization) **and others with negative effects** (global economic crisis, migrant and refugee crisis, Covid 19 pandemic, climate change etc.).
- **Demand-side factors** are very important for creation of new technologies and its transfer into practice, they **influence the choice of research topics in some extent, but not completely. The supply-side factors rather appear in the role of promoters of modern innovative solutions than creators or initiators of new ideas.**