

Workshop report

Food 4.0 and globalisation: chances and challenges for the Western Balkans – the role of the consumer in changing global food supply chains

Place:	Belgrade (Serbia)
Host/Organizer:	Ivan Đurić, Leibniz Institute of Agricultural Development in Transition Economies (IAMO); Vlade Zarić, Faculty of Agriculture, University of Belgrade
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By

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“Digitalisation processes in agriculture and food processing should be considered from a broad perspective, one that takes into account all kinds of sensors used on the field, through GPS-navigated agricultural machinery, field mapping by drones, and automatization in food processing, and all the way to social networks. Digitalisation enables innovative processes, provides higher transparency along the supply chain, and helps to create a higher level of trust between consumers and supply-chain actors” (Ivan Đurić, organiser).

The digital revolution is having a significant impact on today’s society, placing the digital transformation of economies at the top of political agendas around the world. “Going digital” enables new business models that allow for interactions, value creation, and transactions at the global level, regardless of where businesses are located physically (OECD (2017): Digital Economy Outlook). Empowered by digital tools, businesses can scale their production quickly and more efficiently compared to the previous “traditional” business models, and reduce the costs and risk by combining the newest technology (mainly from developed economies) with labour from developing nations.[1] Thus, the term globalisation achieves its full meaning through the digital revolution.

Spurred on by the digital revolution, agriculture and the food industry are also undergoing significant changes. They started from simple cultivation (known as Food 1.0), slowly absorbed the innovations brought about by mechanisation and processing in Food 2.0, then underwent tremendous changes in the face of different technologies and genetics in Food 3.0, before the advent of Food 4.0, which is characterised by underlying digitalisation processes. Food 4.0 builds on big data, genomics, nanotechnology, and different communication technologies, all of which help to provide healthier food, reduce food waste, and ensure the sustainable consumption of scarce resources.[2] With the help of digital technologies, today’s consumers have a lot more information, which necessarily influences their food choices, and ultimately empowers them to initiate structural changes within existing agro-food supply-chain systems. One tool for such empowerment, especially in the field of agriculture and food production, is transparency along agro-food supply chains. According to numerous marketing studies, mainly conducted in developed countries, widespread distrust has encouraged food and drink manufacturers to become transparent about the origins of their ingredients, their production processes, and the product flows within their supply chains.[3] Today’s consumers want to be closely connected to the food that they consume, making “Transparency the Currency of Trust in the Digital Age”. [4] Similarly,

Deloitte [5] identifies transparency as a means to win the trust of consumers, and also emphasises that transparency is a principal driver of new purchase motives such as health and Wellness, safety, and social experience.

Agro-food supply chains should be forced to adopt digital processes to improve competitiveness and to become more transparent. There is a growing need for cooperation outside the framework of the traditional actors of agro-food products, so that innovative processes and new business models can be created that would be accepted by end consumers. This new type of cooperation is increasingly seeking to include the sector of information technology in production processes, distribution, and sale of agro-food products. Also, consumer initiatives are one of the most critical drivers of innovation, since the digital revolution allows easy access to information on agro-food products at any stage along the supply chain.

These tremendous changes in the agro-food sector are particularly important for Western Balkan (WB) countries as they enter the very competitive market of the European Union (EU). Agriculture has a high stake in the total GDP of WB countries (11.03% on average, compared to 1.59% in the EU). Moreover, employment in agriculture is also high (16.51% on average, compared to 4.52% in the EU) due to the large number of small farms. Nonetheless, there is little farm specialisation or product diversification, and little attempt made to find niche markets for producers.

The process of joining the EU places an additional burden on WB countries – namely, the lack of a time frame in which actors in supply chains can prepare for the competitive common market of the EU. Within the limits of ongoing processes, it is necessary to change the current situation in which small producers in the WB region face competition from the EU at the level mostly of non-distinctive agricultural products. In the market race for homogenous products and against the economy of scale, the chances of winning are slim. In contrast, by creating new business models that will create the conditions in WB countries for new demand-driven food channels, supply chain actors have a chance to defeat competitors.

Overall, governments, and not only in the WB, should set clear priorities to create the conditions that foster innovation. As for digitalisation, the priorities should be to develop telecommunications, internet access and speed, skills and competencies related to information and communications technology (ICT), access to data, security, ICT adoption, and the e-commerce economy. The fact that digitalisation in agriculture and food processing is one of the top priorities of the Serbian government was confirmed by the Assistant Minister for International Cooperation and European Integration and by the Minister of Education, Science and Technological Development, Prof. Dr Viktor Nedović, who said that digitalization processes are taking place in all sectors of the Serbian economy.

The workshop “Food 4.0 and globalisation: Chances and challenges for the Western Balkans – the role of the consumer in changing the global food supply chain” was organised to demonstrate the significance and current state of digitalisation in agricultural production and the marketing of agricultural and food products in WB countries (see the workshop programme in the appendix). The main aim of the workshop was to bring together researchers and stakeholders from different WB countries to discuss digitalisation processes in agriculture and the food industry, and to share the latest insights into promotion strategies for different agro-food products. The general aim comprised the following sub-aims:

- To provide an understanding of how “new” technologies and consumer demand could be used to enhance cooperation activities, enable innovative processes, and improve the competitiveness of agro-food supply-chain actors.
- To provide information on applicable (easy-to-use) and state-of-the-art tools that businesses could use in any marketing activity (or strategy to promote exports).
- To enhance regional cooperation between research institutions and agro-food stakeholders in the WB.

- To foster the transfer of knowledge from experts and practitioners to post-doctoral researchers so that the latter can gain a better understanding of the holistic approaches and multi-stakeholder environment, an understanding that is necessary if they wish to apply successfully to the EU for funding to carry out research projects (e.g. HORIZON 2020).
- To establish new networks between regional and European (German) researchers, as well as between academia and the business sector, and thereby develop innovative research ideas.

The first part of the workshop was devoted to the future of agriculture and current state-of-the-art digitalisation processes in the Serbian agro-food sector. One of the keynote speakers was Prof. Dr Vladimir Crnojević, director of the BioSense Institute in Novi Sad (www.biosens.rs), who presented his vision of digital agriculture in Serbia where all production processes are completely digitalised, thereby facilitating the collection of large amounts of data. These diverse data (big data) will be used to create different digital tools that allow agricultural producers to plan their production based on the real potential of the land, spend inputs efficiently, and achieve higher yields. BioSense has already created a National Platform for Digital Agriculture – AgroSense – that has about 10,000 users covering more than 10,000 ha in Vojvodina (Northern Serbia). By providing only their email address and what they plan to produce (e.g. wheat or corn), users are able to benefit from a completely free range of services, such as a digital image of their land, precise weather forecasts, accumulated precipitation data, notification of when they should perform some agro-technical activities, the digital recording of actions already taken, and so on. That such an approach to agricultural production is not just a vision was confirmed by Mr Stanko Oparnica of Al Rawafed Serbia (www.alrawafed-serbia.com), who pointed out that, in farming over 10,000 ha, his company fully applied digitalisation tools (such as digital field mapping, GPS, and variable sowing). Digital solutions have already contributed to significant cost reductions after the first year of application, while leading to increased productivity and profits. Mr Oparnica also pointed out that, while obtaining the latest digital equipment is not a problem, finding highly skilled agro-engineers to implement and maintain this equipment in the fields is difficult. The same issue is relevant not only for WB countries, but for almost the whole of Eastern Europe.

This triggered a discussion on the importance of making systematic changes to the current educational system so that it can undergo rapid technological development. If farmers cannot obtain the necessary skills, they will not be able to benefit from new technologies. The owner of the Superior Seeds company (<http://www.superior-seeds.co.rs/home/>), Mr Nebojša Džinović, confirmed the importance not only of skilled workers but also of researchers. He argued that scientific approaches should be merged with digital solutions to improve agro-food production processes and products. As an example, he pointed out that it is already possible today to produce seeds that are adjusted to the specific agro-ecological conditions of the seeding area, and to produce particular fertilisers that are suitable for almost every possible soil type. Furthermore, using digital tools helps companies to reach consumers around the world.

The second part of the workshop was devoted to the issue of how modern agro-food supply chains can enhance their business models by generating and analysing large amounts of data from their clients. Marijana Agić-Molnar, an Adriatic Regional Director of the GfK (<https://www.gfk.com/sr-rs/>), gave a presentation on integrated market intelligence (IMI), a concept that provides businesses with a competitive advantage. She stressed the importance of data science, and argued that every company should prioritise gaining the skills necessary to understand big data and marketing processes. By drawing on different data science techniques (such as data integration, predictive modelling, and machine learning), companies can create targeted marketing through retail analytics (assortment planning, product placement, and space allocation), marketing analytics (promotions, pricing, and brand analysis), supply-chain analytics (logistics, inventory, supplier performance, and demand forecasting), and store

operations analytics (workforce effectiveness and store performance). The important message is that owning data, i.e. knowing your customer, will be the most important competitive advantage in the future.

The third part of the workshop had a strong focus on agro-food marketing through social media channels. Jelena Popović-Bujić of the Iceberg Salat Centar (www.iceberg.rs) showed how digitalisation not only contributes to the production process, but also in its broader sense (digital communication with consumers through social media) has great importance in creating marketing tools. She pointed out that the reorientation of marketing activities from traditional marketing (such as outbound marketing - radio, TV commercials, and print ads) to innovative marketing (inbound marketing - social networks and blogs) had contributed to the significant success of the company. Furthermore, innovative marketing tools allowed customers to interact with the company directly, and to express their opinion – which is very important in upgrading existing products or creating new ones. The importance for economic performance of online communication with customers was also stressed by Mr Dragan Sajić (owner of the Garden Center, www.garden.rs), who said that customers are looking for much more than just simple information on the webpage. They want to see a broader context in which a specific product might be of importance. By providing a “big picture” to customers, research results confirmed that it helps in creating a high level of trust and a long-term relationship resulting in repeated purchases. Having a website is no longer enough; companies have to be present on all available social networks (such as Facebook, Youtube, Twitter, and Instagram) so that they can reach a wide range of customers.

The final part of the workshop was devoted to ways of bringing the innovative idea to the marketplace. Nikica Marinković, the co-founder of Box system (<http://nomorestyrofoam.org/>), presented his innovative idea of creating wooden transportation boxes isolated with organic wool, thereby creating a more socially acceptable alternative to plastic or styrofoam boxes. To bring his idea to the market, he created a start-up and raised about 50,000 USD through different competitions and crowdfunding. Mr Marinković pointed out that digital solutions represent a great tool to develop ideas, improve production processes, focus marketing activities better, and communicate with future customers. Furthermore, Olga Jovanović of the Center for Technology Transfer (<http://www.ctt.bg.ac.rs/>) showed the importance of crowdfunding to mainstream innovations. She mentioned that digital tools, particularly online platforms, helped to boost crowdfunding, especially when it comes to innovative start-ups.

Impact of the workshop

The Food 4.0 thematic workshop had a significant impact on the cooperation activities of both IAMO (as a German partner) and the Faculty of Agriculture (as a Serbian partner). The effects can be seen through the following activities:

1. After fostering their cooperation through the Food 4.0 workshop, IAMO and the Faculty of Agriculture (FA) organised a **meeting of experts** in Belgrade on 12 June 2018 on “Modern access of transferring knowledge in agriculture”. The outcomes of the meeting can be found under the following link: <https://www.iamo.de/en/events/details/expert-meeting-modern-access-of-transferring-knowledge-in-agriculture/>
2. IAMO and FA have jointly created a **project proposal** for the DAAD foundation, entitled “Digitalisation in Agriculture – The social media impact on agro-food marketing”. The proposal is still under the review process.

3. Furthermore, IAMO is the co-organizer of the panel at the GFFA 2019, where the representative of the BioSense Institute will be among the key panellists.
4. Further steps will include close collaboration between IAMO and almost all participants of the Food 4.0 workshop (i.e. research institutions and businesses from WB countries) in preparing a joint research project proposal for the “Federal Government’s Strategy for the Internationalization of Education, Science and Research” entitled: “Integration of Central and Southeastern Europe into the European Research Area” (Bridge2ERA). This programme will include the following initiatives:
 - (a) German-Serbian Cluster Initiative
 - The following objectives will be achieved:
 - o Strategic bundling of the competences of actors from the knowledge triangle of education, research and innovation, and networking with German actors.
 - o Development and expansion of cross-sectoral cluster structures in Serbia, increased added value on the ground, access to new markets, and the acquisition of suitable workforces, including for German companies.
 - o An integrated approach is adopted that incorporates vocational training.
 - (b) WBC + Croatia Young Research Groups
 - The following objectives will be achieved:
 - o Strengthening the research and innovation systems of the WBC and Croatia, thereby contributing to their integration into the European Research Area.
 - o Contributing to the stabilization of the region by reducing the brain drain.
 - o Supporting young scientists in the WBC and Croatia by establishing bilateral groups for junior researchers that explore innovative research topics with practical applicability.
 - o Strengthening the research and management competence of junior scientists in research institutions and universities in the WBC and Croatia.
5. Finally, all WB research institutes expressed their interest in taking part in the IAMO Graduate School programme.

Notes:

[1] R. Baldwin: Global supply chains: why they emerge, why they matter, and where they are going, in: D. K. Elms / P. Low (eds.): Global value chains in a changing world, World Trade Organization, Fung Global Institute, and Temasek Foundation Centre for Trade and Negotiations, 2013, chapter 1.

[2] D. Docherty: Leading Food 4.0 Growing Business – University Collaboration for the Food Economy, UK National Centre for Universities and Business, 2018.

[3] Mintel (2017): Global Food & Drink Trends 2018.

[4] J. Springer: Shoppers want transparency. Food Marketing Institute, 2017.

[5] Deloitte: Capitalizing on the shifting consumer food value equation, 2015.

Workshop programme:

Thursday, 26 April 2018

9:00-9:30 Registration

9:30-10:00 The opening of the workshop

Viktor Nedović

Ministry of Education and Science

10:00-10:30 Agriculture 4.0

Vladimir Cnojević

BIOSENSE

10:30-11:30 Precision agriculture – practice and challenges

Stanko Oparnica

AL RAWAFED SERBIA

12:00-12:30 Integrated knowledge – a new source of growth

Marijana Agić-Molnar

GfK

12:30-13:00 Message as a marketing tool

Voja Zanetić

MOZAIK

14:00-15:00 The role of social media in agro-food marketing

Jelena Popović-Bujić

ICEBERG SALAT CENTAR

15:00-16:00 Export-driven competitiveness in WB agriculture

Goran Zivkov

SEEDEV

Friday, 27 April 2018

9:30-10:00 Connecting science and digital solutions to improve products

Nebojša Džinović

SUPERIOR-SEED

10:00-10:30 Innovations in marketing (online platforms and customer communication)

Dragan Sajić

GARDEN SRBIJE

10:30-11:00 Back to the future of packaging

Nikica Marinković

WooBox

11:00-11:30 Crowdfund your idea

Olga Jovanović

CTT-UB