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IMPACT OF DIGITALIZATION IN MANAGEMENT OF INTERNATIONAL BUSINESS IN ORGANIC AGRICULTURE. WAYS TO RESPOND TO CHALLENGES. USH PRO BUSINESS, INTER-BIO, WALLACHIA HUB STUDY CASE

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Abstract

Digital technologies are used increasingly in everyday life, in any aspects of human activities. Pandemics like coronavirus imposed stricter rules for health, and people, most probably, will prefer to be safer with organic products.

Even before the crises, organic agriculture especially was on the path to digitalization. Now we realize better that Digitally Conducted Organic Agri-food (DCOA) solutions will emerge even faster. This paper is investigating the

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trends of evolution of digital transformation in organic agri-food industry and their impact on trade flows with food products. We look at the new emerging business models triggered by the DCOA solutions and the managerial challenges this will require especially for innovative start-ups, farmers and SMEs in agri-food sector.

Finally, we argue that university led innovation ecosystem, like the study case presented, may offer knowledge hubs for farmers, processors and sector branch organizations in the organic sector.

Keywords: *digital technologies; organic agri-food industry; emerging business models; innovation ecosystem.*

JEL Classification: F23, Q55, Q57

Romanian Organic Farming in the International Context

Romania is part of EU market and organic agriculture policy. "Organic farming" is a term protected and assigned by the EU to Romania for defining this farming system and is similar to the terms "ecological farming" used in other Member States. "*Organic farming is a mode of production characterized by the use of plant cultivation and animal husbandry techniques that respect the natural balance by excluding the use of synthetic chemicals, promoting and enhancing biodiversity, promoting and stimulating biological cycles and limiting the use of inputs*". In recent years, in Romania as in most European states, there is a growing interest for products harvested from organic farming, but smaller than other states. Unlike conventional agriculture, organic farming is a system of agricultural management but also of food production, which brings together the most effective practices on the environment, climate, biodiversity, animal welfare and conservation of natural resources. The use of such a production and processing system can bring multiple social benefits. These include: environmental protection and feeding the population with food treated with substances and through natural processes.

Romania has the necessary resources and could become one of the most developed countries in terms of conversion to organic farming, mainly due to the large areas of agricultural land it owns and have not gone through this process. The growing interest of people in the consumption of organic products, but also the involvement of the European Commission on this subject, in order to protect the

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environment on the one hand and to make the population aware of the benefits on human health on the other hand, draws future lines in the whole agricultural field. Thus, national and especially international trade will focus in the coming years on organic agricultural products. Farmers, who choose in advance the conversion of crops to the organic system, will be able to enjoy after obtaining certifications and substantially improved earnings. Specifically, the objectives of organic production policy are an integral part of the objectives of the CAP, by ensuring that farmers receive a fair return in exchange for compliance with organic production rules. In addition, the growing consumer demand for organic products creates the conditions for the further development and expansion of the market for those products and, therefore, for the increase in farmers' earnings involved in organic production. Romanian farmers must quickly adapt to changes adopted at the international level, in order to capitalize on Romania's potential and become competitive in both national and international markets.

However, there is still a fairly large segment of the population that does not consume organically made and processed products due to a lack of confidence in the quality and superior properties of these products, taking into account their higher costs.

In this sense, Romanian farmers who have already completed the conversion period or are in the process could benefit from increased visibility and confidence from domestic and international consumers, if they have a certification of the superior quality of harvested and processed products, based on rules adapted to the climate, soil and biodiversity conditions specific to Romania.

With an agricultural area of 14.630 mil. ha out of which the arable surface is of 9.24 mil. ha (64.2% of the total) and with pastures and meadows of 4.82 mil. ha (33% of the total) and vineyards and orchards of 0.405 mil. ha (2.8% of the total), Romania has a large agricultural potential. Only a small part of the potential is dedicated so far to the organic farming.

Romania is the new largest producer of organic products and is among the top ten producers with increases in bio-production according to the latest FiBL 2019 report. Thus, the report indicates an ecological area increase of 14.2%, the 6th place in Europe regarding pace of increase of organic land. This demonstrates that there is an increased interest of the Romanian producers to produce bio compared to other countries in Europe.

This growth dynamics in recent years however has not lead to a higher place in the share of organic land in total agricultural land (only 2% in Romania, much lower

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compared to other countries: Hungary – 4.3%, Poland – 3.4%, Bulgaria – 2.9%, Germany – 8.2%, Lithuania – 8.1%, Slovakia – 10%, Czech Republic – 12.2%, Estonia – 20.5%).

A disadvantage of the Romanian bio-sector is the low number of consumers of organic products linked to the underdeveloped character of the domestic market. Moreover, there is a lack in the permanent collection of statistical data on the sale and purchase of bio-products on the domestic market.

Another area where Romania is better, in international comparison, is the collection of ecological honey in wild areas, the 4th place in the world as collection areas (1.8 million ha in 2014). FiBL reports are the most appreciated and accurate in the world in the field of organic farming, and the 2019 report is based on international comparable national statistics up to the level of 2017.

Statistics shows us clearly where Romania is in the international comparison in the field of organic products: modest developments compared to others, high potential as production and surface but low domestic demand, modest weight of ecological areas in total, small number of processors and processed products export less capitalized. A still undeveloped market but with a great potential.

Competent authority for the organic sector in Romania, the Ministry of Agriculture and Rural Development (MARD), in conformity with the provisions of art. 27 R(CE) no. 834/200, is responsible for implementing policies in the organic farming sector. At the MARD level, the implementation unit is General Directorate for Agricultural Policies – Directorate for Policies in the Vegetable Sector – Organic Farming Compartment. At territorial level there are Directions for County Agriculture.

Technical inspections are carried at the MADR level through the Directorate-General for Control, Anti-Fraud and Inspection, Inspection Monitoring Directorate, Check and Control Inspection Unit, verification and technical inspection service. At territorial level, inspection is carried through/by – Directions for County Agriculture, Monitoring Inspection, Technical Inspection, Verification and Control in Agriculture/ Organic Farming.

In terms of policy instruments, one may notice the compensatory payment granted through different schemes which could be cumulated under various forms for organic farming and environment protection: investments in physical assets; support for investments in the processing/marketing and promotion of agricultural products; support for the setting-up and operation of Operational Groups (GOs) for the development of pilot projects, development of new products, support for horizontal and vertical cooperation between actors in the supply chain.

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Perspectives of the development of the organic sector in Romania are: increasing the organic land surface; better market organization of producers, processors, traders on sector branches; more market transparency and promotion of good practices; inclusion of organic farming in broader concept of sustainability, awareness and assessment at the level of market operators and branch organizations; raising consumer awareness about organic products and their traceability; promotion of exports and R&D in organic agriculture.

The Romanian export of organic products will be greatly stimulated by this brand-focused and manufacturing-focused participation to Biofach China, but also by the contribution of export research and innovation. *Spiru Haret* University shows its involvement in both innovative export and innovative product research. Moreover, one can say that for the first time there were 3 exclusive clusters of organic products from Romania, Bio Danubius, Bio Concept Valea Prahovei and Bio Nest. The creation of the Inter-Bio association and the clusters that struggle to organize product lines are qualitative elements whose results we will see in the future.

Organic farming benefits farms by creating a natural balance in the water and nutrient circuit, controlling pests and weeds, increasing soil fertility by stimulating microorganisms and using green manure, which leads to reduced erosion and wider coverage of the soil for cultivation. This culture system supports the environment, being a good solution in reducing in the medium and long term some problems such as: acid rain, global warming, biodiversity reduction and desertification. "*By not using synthetic chemical fertilizers, pesticides and other synthetic chemicals, by rational and balanced use of resources, especially renewable ones, by caring for nature and by specific methods and techniques, organic farming ensures good protection of soil, water and air resources*."

Studies conducted by specialists in soil science, climatology and environment have shown that there is no palm of cultivated land that does not suffer, more or less, due to one or more phenomena such as: water and wind erosion, landslides, compaction, crust formation, acidification, alkalization, salting, humus content decrease, poor and very poor supply of phosphorus and assailable potassium, chemical pollution etc. Unfortunately, lately, this situation has become worse due to the cultivation "by ear" of the land, as well as the expansion of agricultural systems in which land is taken by force and through which is exploited until exhaustion and then abandoned. The generalization of the drought and the increase of the frequency of acid rains contribute even more to the collapse of agriculture and, implicitly, to the disappearance of villages and communes.

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Literature Review

One of the hypotheses we started from was the cooperation between economic actors which is a form of adaptation to changing market conditions for all categories of market players. At present, as the dynamics have intensified, business networks that operate or will operate in the new economic contexts will have to restructure, in order to have access to new resources and capacities, to new markets, new logistics and communication corridors, the use of promotion and communication platforms. At the same time, strategic alliances have the role of boosting partners by facilitating the risk-sharing process, increasing technological intensity and exchanging good practices.

Another analytical and methodological hypothesis is along the lines drawn by Jeffrey D. Sachs who highlighted the impact of artificial intelligence and its disruptions and other advanced digital technologies (automation, cyber surveillance, use of technology platforms in international business transactions) that lead to a reduction in labour demand, especially unskilled labour, such as the textile industry, and thus to a decrease in export earnings.

Other authors argue in their paper that developing ecological value chains for processed products and targeting foreign markets is a chance for Romanian small producers in this field but challenges they are facing need consistent support given in a coherent manner. By comparing good international practices in the field with the way the product lines are organized in Romania, their study identifies the main shortcomings in the organization of local processing value chains and several critical export factors such as certification, branding and how the association of producers can become a catalyst for the sector's competitiveness in the context of bio-economy.

Also, Lianu, Rădulescu and Gudei agreed that a rapid shift of paradigm from healthcare community to planetary health and more awareness of the severe public health impacts of global environmental change and bringing together clinical communities with other communities are necessary. This will help us all to understand how global environmental change impacts our health and to promote together bottom-up environmental action through patient education, awareness, new business models and responsible action.

The literature review indicates that digitalization of organic agriculture is in the central debate of IFOAM, FIBL etc. Food and Agriculture Organization (FAO) and the International Telecommunication Union (ITU) have developed the e-Agriculture Strategy Guide to assist countries in designing and implementing digital agriculture

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strategies. The guide aims to: ensuring an enabling environment for e-agriculture to flourish; addressing the required national digital environment overall; and leveraging on the potential of digital technology adoption by other sectors. FAO has developed applications, databases and platforms to support the work being carried out in countries around the world. These digital services increase access to useful data, information, maps and statistics. This FAO Digital Services Portfolio includes four apps that bring agricultural services closer to farmers, providing real-time information on weather and crop calendars, livestock care, markets, and nutrition-related aspects of food production.

The legislative framework of organic agriculture clearly indicates adapting of the sectors to the requirements regulated by the Regulation of the European Council. There are already rules at the national level for the conversion from conventional to organic farming. In Romania, organic agriculture was officially recognized by the Emergency Ordinance on organic agri-food products no. 34/17 April 2000, followed by other specific normative acts such as: H.G. no. 913 of September 13, 2001 on "*Methodological norms for applying the provisions of O.U.G. no. 34/2000*"; the M.A.P.D.R. no. 417 of September 13, 2002 on "*Specific rules on the labelling of organic agri-food products*"; the M.A.P.D.R. no. 527 of August 13, 2003 for the approval of the *Rules regarding the Inspection and Certification system and the accreditation conditions of the inspection and certification bodies in ecological agriculture*; the M.A.P.D.R. no. 721 of September 26, 2003 for the approval of the *Rules on Import and Export of organic agri-food products*; Order no. 190 of June 28, 2006 on amending and supplementing the annex to the Order of the Minister of Agriculture, Food and Forests and of the President of the National Authority for Consumer Protection no. 417/110/2002 for the approval of the specific Rules on the labelling of organic agri-food products.

Methodology

In this article we analysed statistical data related to production and trade of organic product from reliable sources such as IFOAM and FiBL. In parallel, we analysed and described business models of organic farmers, producers and traders. Finally, we investigated best practices and made study cases.

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New Digital Technologies in the Organic Farming and Their Impact on Trade. Implementation of the New Organic Trade System

There will be many ways through which new digital technologies will impact the international trade. We may see at least two developments:

- New patterns of trade with organic products;
- New flows of trade in technology related services for sustainable agriculture such as Solutions in IoT, GIS, blockchain and precision agriculture.

The trade system for organic farming and for agricultural products is under international scrutiny. Changes in the organic trade system proposed in the new organic Regulation of EU will be applicable to the international trade of organic products and to organic farmers from third world countries. In the same time, other countries and group of countries such as USA, China and others will come with their own proposals. The result will be a new system for imports of organic products and the implementing proposal establishing two import regimes based on equivalence or compliance, depending on the third world country where the organic good has been produced. This will bring more need for digitalization since a big amount of date will have to be managed. For example, the equivalence system will maintain current equivalence agreements (currently with 13 non-EU countries) that will have to be renegotiated in the frameworks of EU bilateral trade agreements. For the countries without this equivalence recognition, only control bodies recognized by the EU can certify organic products for export to the EU. In these countries, after a 5-year transition period when the new regulation enters into force, farmers will have to fully comply with the EU regulation. This change affects organic farmers in third countries without a trade agreement with the EU.

The digital agenda of these new trade regulations will have to focus on assessing the impact of the compliance system on existing organic trade flows, especially on the behaviour of non-EU-equivalent third world countries farmers and on the behaviour of other actors of the organic supply chain (including control bodies, importers and retailers).

Another scope for digitalization will be examining the impact on certification costs for farmers in countries as well as the dynamics of the organic certification market, including competition with other relevant global organic standards and on domestic organic production.

In EU, digitalization may look into regions where agri-environmental conditions might create new opportunities for EU farmers; analysing existing statistical data on

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trade flows and the connection with domestic organic sector dynamics; providing recommendations for policy-makers to develop a power-balanced structure in the design of organic trade policies, regulations and agreements which support the democratization of access to markets.

By emphasizing the importance of natural resources and limiting the use of invasive techniques and substances, organic farming will move the agenda of the international trade towards conservation biodiversity and natural landscapes, restore and conserve traditional material and spiritual values. Trade will be, in this way, focused towards higher standards of living in rural areas, by creating jobs and contributing to human health by obtaining products that are superior in quality to those resulting from conventional agriculture. Here, we see also the growing role of digitalization, since higher standards and quality control at world level cannot be manage without technologies such as IoT, GIS or blockchain.

The consumer's behaviour will be more focused on new approach for human health as a holistic science related to animal health, health of the earth and environment protection. A new concept of "*One Health*" has emerged. From the angle of organic farming, new correlations between the health of humans and the health of soils, air and water will be identified and put at the disposal of the consumers all over the world through IT&C applications and services. The crisis of confidence in conventional agriculture, fuelled by new serious cases of poisoning, mad cow disease, foot-and-mouth disease, swine fever, bird flu, genetically modified organisms (GMOs), e-coli will trigger new innovative solutions which will be trade worldwide. A recent initiative of the European Commission to organize between 24 and 26 of April the most impressive Hackaton dedicated to applied research and boost to the international market of new solutions to combat COVID 19 epidemics is a clear indication of the new tradable services and products related to health care.

Strict cultivation rules should be laid down, including details of plant, animal and aquaculture production specific to certain areas, including rules for wild and crop harvesting. Moreover, these rules are also urgently needed with regard to the production of processed food, feed, wine production and yeast which are used as food or feed, all in order to ensure harmonization and compliance objectives and principles of organic production and once the certification is received, to provide more confidence to citizens. When new rules are applied, they both restrict trade with older non complied products and boost trade with new products and services. Digitalization again will make the difference in application of these new rules.

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Organic plant production focuses on feeding plants mainly through the soil ecosystem may impact international trade. The principle of cultivating soil-related crops and feeding plants mainly through the soil ecosystem was established by Regulation (EC) no. 834/2007. However, certain operators have developed an economic activity by cultivating plants in "raised layers" and have been certified as environmentally friendly under Regulation (EC) No. 1234/2007, 834/2007 by their national authorities. On June 28, 2017, an ordinary legislative procedure reached an agreement that organic production should be based on plant nutrition mainly through the soil ecosystem and be soil-related, and the cultivation of plants in "high layers" should no longer be allowed from that date. In order to enable operators who have developed such an economic activity to date to adapt, they should be allowed to maintain their production areas if they have been certified as environmentally friendly by that date by their national authorities, pursuant to Regulation (EC) No. 834/2007, for an additional period of 10 years starting with the date of application of this regulation. Based on the information provided to the Commission by the Member States, this activity was authorized in the Union, before June 28, 2017 only in Finland, Sweden and Denmark. The use of uplifts in organic farming should be the subject of a report from the Commission to be published five years after the date of application of this Regulation.

According to our assessments, these new standards requirements regarding the observance of pedoclimatic conditions will impact the international trade. New ways to manage international business in organic agriculture will be needed and new challenges are ahead.

Management of International Businesses in Organic Agriculture. Ways to Respond to Challenges. Challenges for Managers Related to International Business in Organic Sector

Since digitalization will impact international trade, as we have demonstrated before, the management skills must be adapted. According to our assessment based IFOAM and FiBL evaluations, management of sustainable precision agri-food industry will be the key challenge for managers.

According to FAO guidelines, the managers in organic farming will have to take into consideration the indicators below regarding their international business (see fig. 1). Looking into the complex dimension of the international standards, one may notice as major challenges the following ones:

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- Identification of non-compliance areas;
- Supply chain and traceability;
- Risk management and quality control;
- Trust, reputation and branding management;
- Identification of still internationally under negotiations areas which are under dispute.

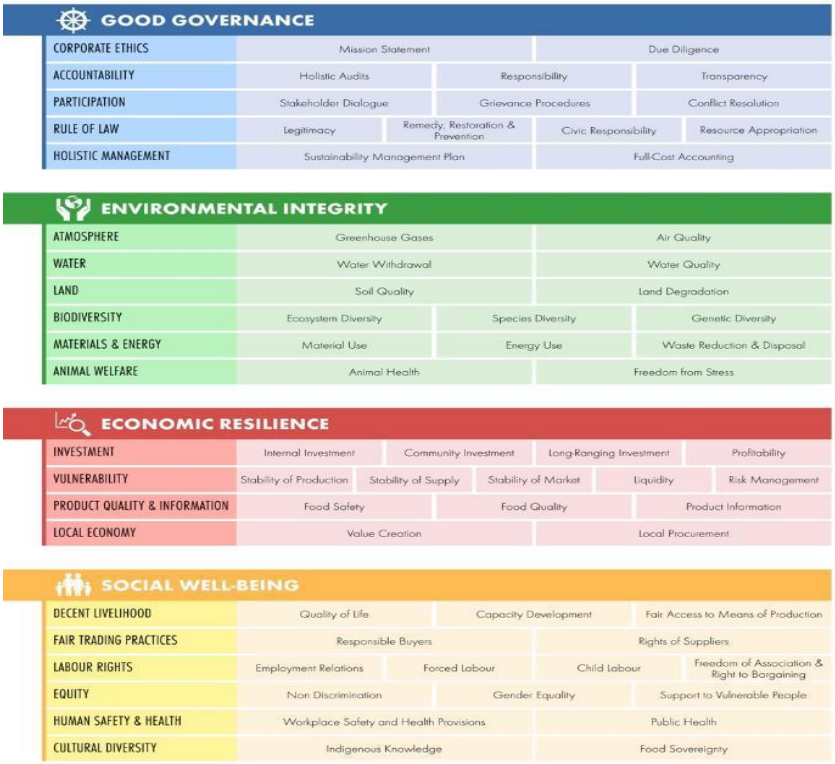

Fig. 1. FAO Indicators Applied in International Business
Source: FAO/SAFA guidelines, FIBL interpretation

Regarding this last aspect, some of the challenges are also focused on horizontal regulation on labelling of origin and the organic labelling of origin applicable which

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is still matter of international dispute. The labelling of flavourings for example, on the label of an organic product will create international disputes. Any modifications will trigger international negotiations about how they should mention the flavours. If a producer uses five different flavours in a product, they should all be mentioned separately.

When a supermarket sells organic next to conventional products it packs the organic products to prevent the mixing of the organic and the conventional products. In order to prevent unnecessary packaging, the exporters will want to use as little as possible packaging. What would be accepted as packaging? A sticker, a banderol, the crate in which the apples are stored? There does not seem to be a general interpretation yet.

An importer of products from third world countries is confronted with the demand from a client to place the production date of the products on the 25 kg packages. Is this a legal obligation? The participants of the workshop agree that it is not an obligation that comes from the organic regulation and questioning whether it is a legal obligation at all. But it may be part of the quality control system of the supplier.

New technologies should be used by managers such as GIS, big data, satellite images, blockchain technologies or others to have a good traceability of goods and mass-balance checks. But the use of these new technologies in the organic environment must be properly assessed. Regarding the integrity of international supply chains, the importance of a fast, harmonized and efficient exchange of information between all the actors, control bodies, competent authorities and operators will be a major challenge. From a managerial perspective, using online systems to facilitate the exchange of information will be fundamental. Data management will be of a growing importance since there is a lot of data that can be used to improve the integrity of the supply chain. It is crucial to share data, but attention should be given to rights to access and ownership.

Regarding certification and control, this will be not the only issues for control bodies. Operators and importers in particular need to take their part of responsibility in guaranteeing the integrity of the supply chain. Since 2012, the EU Competent Authorities are less involved in the import and more responsibility is given to control bodies and operators. In many cases, the importer is the one that can carry out the best risk analysis. Also, in the new organic regulation, the responsibility clearly shifts to the operator, for example in the management of detected and confirmed non-conformities. This applies also within the EU.

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The new regulation (EC/848/2018) introduces many specific rules that the organic sector will have to comply with. This includes, among others, the possibility of trade with heterogeneous plant material for organic farmers, a non-equivalence organic trade regime and the possibility of group certification for European operators.

These changes will have implications for organic farmers, processors, retailers, traders, and certification bodies. There are still many open questions about how the new regulation will be implemented. During this period of change, it is important to maintain trust of European consumers, as their behaviour will remain an important driver for the future growth of the organic market.

Organic Inputs and Circular Economy: Increasing the Circularity of Agricultural Production

Specific challenge – The Circular Economy Action Plan adopted in 2015 sets ambitious targets to make the EU's economy more resource efficient and to develop appropriate incentives for "closing the loop". Organic agriculture adopts a "circular" approach applying ecological and recycling/reusing principles to production. The practices of crop rotation, nutrient recycling and biological fixation of nitrogen through legumes, composting integrating animal and crop production, concern for the health of the soil have been the circular solutions for closing the loop in agriculture.

This less input-intensive strategy of the organic sector, combining new technologies and methods with scientifically sound, positive environmental outputs, has great potential for increasing the resource efficiency of European agriculture as a whole. This potential becomes apparent when addressing nutrient availability, with increasing prices on synthetic fertilizers, and reduced availability of non-renewable resources (e.g. phosphates).

Scope-research should focus on: scaling up different inputs available for organic agriculture; more effective natural plant protection products and the development of new fertilizers, their production and use in the light of both the EU organic regulation and organic principles; assessing the use of contentious waste products for critical and scarce resources in agriculture; investigating other feed inputs (e.g. concentrates, protein feed) and feed additives; better use of available by-products and alternative inputs (e.g. feather meal, oil cakes, okra as protein feed for fish and pigs) that could reduce the dependency on imported protein feed and increase the local feed sufficiency; further development of integrated animal-plant production systems to

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increase their adoption among EU farmers; socio-economic factors that impact on the adoption of these circular methods by farmers and consumers' attitude to these new production methods.

European Market Observatory for Organic Food & Farming

Specific challenge – Market transparency in the organic food market remains a challenge, especially the collection, analysis and pooling of data at the European level. This includes electronic data on product volumes and values, product flows in the internal market, estimates of the retail sales markets, import/export data, price data, data on certificates, practices for fraud prevention, and data on contamination in organic farming. There is also very limited information on farm-gate and retail prices, the differences in structure of the supply chains and on added value and the farmer share in value chains.

Research also needs to address the integrity and reliability of the organic certification and control systems including organic imports, in view of rapidly increasing number of operators and how they adapt to the new rules. Further, there is a specific need for pooling consumer survey data related to organic markets to overcome the current lack of harmonization of procedures and indicators.

Data need to be pooled, exchanged and analysed for an EU-wide market perspective which also identifies changes in trends over time. There is also a need to gather statistical information about agro-ecological initiatives in order to understand the scale of agro-ecology and to overcome the lack of any statistical data on it.

Scope-research should: build on the outcomes of the Organic Data Network (ODN) and other projects (e.g., LIVESEED) to ensure design and use of national databases for the availability of organic seeds and transplants; include all data categories identified by the ODN, such as primary production (area and livestock, production volume and value), prices (farm level, retail), national retail sales volume and value (including the importance of specific outlets, direct sales and procurement, product categories) and data on international and intra-European trade; develop recommendations for standardization and broadening of existing surveys on consumer attitudes, demand for organic products and cultural preferences across the EU and EFTA; collect better data about certification, control and the integrity of the organic sector for a more reliable and efficient control system and fraud prevention; gather data to understand the scale of agro-ecological initiatives at European level.

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Boosting Organic Breeding and the Production of Organic Cultivars

Specific challenge – To preserve agrobiodiversity, the organic regulation provides new tools, such as the definition of organic heterogeneous material (OHM), and permission to market such materials. A temporary experiment for improving the release of organic varieties suited for organic production is foreseen in the regulation. To reach 100% organic seed of adapted cultivars by 2036 for all crops and in all Member States is an important political goal.

The new regulation will also open the door for the revival of different traditional and local crops and breeds. It will pose new problems for adequate and timely up scaling of organic breeding and seed production meeting the demand of fast-growing markets and climate change challenges. To capitalize on the new organic regulation and the temporary experiment on organic varieties to start in 2021, implementation should be accompanied by coordinated European research which includes a broad range of crops taking into account the diversity of the European seed systems.

Scope-research should: identify and develop additional governance and financial models to support organic plant breeding; include the whole value chain and strengthen capacity building and collaboration with existing actors of the breeding and seed business to achieve the required breeding gains; implement the cultivar testing under organic conditions in collaboration with examination committees, consisting of public and private actors from on-farm and on-station networks for pedo-climatic regions; develop governance models and common marketing strategies for introducing improved cultivars and breeds as well as seed multiplication and treatment; investigate seed, root and gut micro biome to improve resilience of cultivars and breeds; focus on several crop categories including fodder and horticultural crops and/or animal species including aquaculture.

New Genetic Engineering Technologies and Their Implications for Organic Farming

Specific challenge – The development of new genetic engineering techniques in plant breeding represents a challenge to the organic sector. In the EU, these methods are currently not permitted in organic farming. However, a possible future exemption or change in the regulatory framework poses an existential threat to the organic sector regarding transparency and traceability. The new gene technologies are controversial within the European public, intensively promoted by some scientists and actors of the agricultural industry and currently rejected by the sector. At the

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same time, new gene technologies in plant breeding could potentially contribute to agricultural sustainability, when embedded in a comprehensive approach to farming and food production, where plant protection relies on a variety of measures from crop genetic diversity to measures to increase local biodiversity.

However, ethical values such as freedom of choice and the precautionary principle have a relevant role on the acceptance of new technologies in general and, more specifically, in genetics, biology, and agriculture and food production. Limited scientific knowledge is available about values and beliefs that are relevant in the organic sector. Therefore, it is necessary to better understand the values, boundaries and principles that shape both plant breeding based on genetic engineering and organic plant breeding. It is also necessary to ensure that detection methods and strategies are developed to identify products obtained by new genetic engineering techniques and that both the organic sector and the conventional GMO-free sector have the technical means to identify and avoid the unintended presence of GMOs in their products.

Scope – In order to i) safeguard the integrity of organic food, ii) ensure access to crop genetic resources for organic breeders, iii) allow farmers autonomy with regard to seeds, iv) produce organically and meet the highest consumer expectations, and v) ascertain that value based approaches to plant breeding are in line with agricultural sustainability, research needs to focus on the following: gaining a better understanding of the role of values, principles and aims of organic farmers and breeders on the compatibility of technologies for organic production and breeding; assessing and quantifying the contribution of seeds of different provenance to the sustainability and resilience of organic farms; comparing the efficiency of different breeding approaches for organic farming; developing detection methods and strategies to identify products obtained by new genetic engineering techniques; identifying the current market authorization of plants and animals associated with new genetic engineering methods.

Dealing with Contamination in Organic Products

Specific challenge – A great variety of synthetic substances of agricultural and other origin are present in the environment polluting natural resources as well as agricultural crops. This is particularly evident in organic farming, where synthetic pesticides may not be used, but traces can be found due to contamination. This poses multiple challenges for the organic sector: (1) minimizing the levels of contamination

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in organic products is essential to maintain consumer trust in organic food; (2) the presence of unauthorized substances in organic production requires investigating by control bodies and operators. Not only does this incur labour and analytical costs to the individual operator, it can also delay delivery of the commodity, which may affect the entire downstream supply chain. The non-harmonized approach of different EU Member States poses additional difficulties when organic food is traded internationally.

Scope-research should focus on the following: identifying critical contamination points of organic agricultural products in the organic value chain to increase the understanding of the main sources and extent of contamination by non-authorized substances; identifying and developing effective and efficient methods and practices for the reduction of the contamination of products; increasing the detection of fraud in cases of intentional use of synthetic substances; developing better guidance for the organic sector on dealing with contamination, leading to better international harmonization in the field; data sharing among relevant stakeholders to allow a more coordinated approach to contamination sources.

USH Pro Business, Inter-Bio, and Wallachia Hub Study Case

USH Pro Business is specialized in activities dedicated to the entrepreneurial environment such as: research, development, innovation and technology transfer; entrepreneurial development; business education; establishment and development of innovative clusters; internationalization; establishment and development of start-ups. It is a dedicated centre for entrepreneurial activities, designed to support companies and provide solutions to sustain competitiveness throughout the business life cycle.

The centre offers support and consultancy services in the formation, development and collaboration of intra and inter-clusters at regional, national and international level in order to promote, revive and develop the cluster members and for interprofessional organizations.

USH Pro Business is a member in several bioeconomy clusters (Bio Danubius, Prahova Valley Bio Concept), Green Energy (Cermand), IT&C and Engineering (Danube Engineering Hub and Smart Alliance), the Romanian Textile Concept and Construction Industry (CCIO). Due to its activity, USH Pro Business became the specialized part of the managerial unit of the clusters in issues such as internationalization and R&D. The centre takes an active role in promoting the clusters in EUSDR and is loading the team related to project collaboration in the EUSDR.

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USH Pro Business actively contributed to the creation of Inter-Bio inter-professional association for organic farming producers. Inter-Bio is an inter-professional organization for organic agro-food products which aims at promoting, representing, protecting and facilitating the common interests of founding members and of all the other members of the organization in their relations with the central administration bodies, other domestic or international associations or federations.

The organization aims to develop concrete plans to adapt agri-food products to the European legislation and standards for the development of economic agents, involved in the Community's competitive environment. The members decided to associate in order to contribute to the sustainable development of the agri-food sector in Romania, by providing specialized consultancy. The interprofessional organization has three founding members, as follows. The BIOTERRA Association has over 3,000 members, with a considerable experience and a solid network of collaborators. The Association is an important voice of the Romanian farmers and supports members, collaborators and actors that are eager to embrace organic farming. Bio Romania Association Tulcea Branch is involved in educating and informing the population on the benefits of organic farming products for human health and on the importance of nature protection. Members of this branch participate in the promotion of Romanian organic certified food, on domestic and international markets. Spiru Haret University is a private educational institution in Romania, with a tradition of 28 years, which provides students with a variety of educational programs and opportunities for personal and professional development. USH Pro Business is an entrepreneurial centre, a structure linked to Spiru Haret University and three adherent members. BIO DANUBIUS is a cluster from the South East Region concerned with increasing the potential of innovation in the organic farming sector through research and increasing the competitiveness of the member companies. Bio Catina Cooperative has 11 members and many partnerships. The core business of the cooperative members is focused on ecological sea buckthorn plantations. At present, the cultivated area is 155 ha and all plantations are organic certified or in ecological conversion, treated with certified and high-tech materials. Bio Carpathia Cooperative is made up of 52 members active in the production of organic milk. This cooperative has made significant progress, and in 2018, farmers have stepped from milk production to milk processing and have created their own Bio Carpathia brand. The quantities of milk collected are enough to provide the required amounts for Covalact, half of the raw material used by Napolact and for selling under its own brand in the Carrefour stores.

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Inter-Bio interprofessional association, together with the USH Pro Business Center, is involved in organizing informational events in the agro-food sector, economic missions to promote and support its members in order to access to domestic and foreign markets.

Inter-Bio and USH Pro Business Association together with Bio Danubius Clusters, Bio Concept Valea Prahovei, BioNEst and ACEX analysed the results of the participation of the Romanian companies from the bio sector at the BIOFACH Nuremberg fair 2019 and prospects for the participation of the ecological clusters in Romania at BIOFACH 2020.

During the international conference "*The business environment and One Health. Food security and food certification. Organic and ecological products, disruptive technologies*", the debate focused on the way the business community, producers, traders, suppliers, processors and certification bodies are forging branch cooperation in order to develop new markets and new value chains closer to the holistic approach of human health. Practitioners, companies, clusters, standardization and certification bodies as well as authorities, branch associations, were invited, from a wide range of activities: organic farming and processing units, ecological products – food and non-food –, engineering and equipment producers, environment protection, e-health, R&D institutes, manufacturing industries, certification and standards bodies.

Walachia Hub is an ecosystem of innovative clusters comprising different industries such as engineering, GIS and sensors technologies, energy, smart localities, organic and bio technologies. Bringing together managers from organic agriculture with other sectors is one important objective the consortium is targeting. During several meetings, the managers are learning the way to cooperate through communities of practice. One important area of cooperation is considered to be precision and sustainable agriculture. Another topic is related to standards and the use of digital technologies to improve traceability of the products. Walachia Hub consortium intends also to launch an ecological brand of the region.

Conclusion

Digitally Conducted Organic Agri-food (DCOA) solutions are a reality for the managers in organic farming. They will have to obey stricter rules and guidelines to conduct business nationally and internationally and, as the analyses shows, these rules will converge towards enhanced sustainability. Digital transformation in organic agri-food industry is already a robust process with high impact on trade

flows with food products but also with IT&C services related to this sector. The new emerging business models triggered by the DCOA solutions should be assessed and managers trained or put to exchange knowledge. Also, they must learn to cooperate. USH Pro Business may offer knowledge to hubs for farmers, processors and sector branch organizations in the organic sector if the universities learn also to adapt and to cooperate, not only with farmers and clusters, or business associations such as Inter Bio, but also among themselves at regional level like in the case of Wallachia Hub, a consortium of clusters and universities where both organic clusters and IT&C clusters are joining forces for smart specialization.

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