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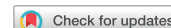
EDITORIAL

Operations management and collaboration in agri-food supply chains

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ABSTRACT

Agri-food supply chains refers to the connections that exist across the agri-food stakeholders from farm to fork related processes. In this environment, operations like planning and control are critical to enhance agri-food supply chains performance and decisions, which are considered complex mainly because the presence of a high variety of information and variables that are required to be managed simultaneously. Hence, the use of a combination of methods, methodologies and multidisciplinary approaches are one of the key trends in research to handle these complexities. The purpose of this is to benefit the agri-food sector by identifying sustainable solutions that will enhance social opportunities, as well as livelihoods, local and national economies. From this, impacts are expected in terms of providing stakeholders with validated scenarios to improve agri-food supply chain resilience, establish agri-food decision-making guidelines to enhance agriculture quality delivery and strengthen agri-food stakeholders position in local and global supply chains. However, since the interdependencies between agri-food stakeholders are related to several agri-food activities, resources and systems, the establishment of collaborative business models across the agri-food supply chain has turned more important than ever, specially to support global agri-food supply chains, food safety and traceability in response to the sustainable global challenges. Therefore, aligned with the H2020 RUC-APS research project, this research focuses in addressing key decision-making challenges in agri-food supply chain environments by connecting key operations management methodologies to collaborative research approaches in the regions of Europe, Asia and South America. The objective is to identify the operations management situations where decisions are made difficult by uncertainty in the agri-food domain, within the study and implementation of Operations Management based approaches in agri-food supply chains.

This Special Issue is dedicated to the memory of our dear colleague, mentor and friend Professor Martin Mortimer, who passed away after a short illness.

The food industry is one of the largest industries in the world, partly local, partly global, sometimes manual, sometimes highly automated, including individual food producers or processors, and companies from small to multinational. In recent years, the food industry has begun to receive more attention from the academic community in the areas of operations and supply chain management. This special issue came about following key research meetings—the EURO-2018 Special Session on 'Advances in Agribusiness' in Valencia, Spain, July 2018, the PRO-VE-2018 Special Session on 'Cognitive Systems in Food and Agribusiness Value Chains' in Cardiff, UK, September 2018. Participants and other researchers responded to the call for papers.

An agri-food supply chain can be also considered as a complex network where a variety of actors interact to make the right decisions in order to achieve end customer requirements. These challenges span several agriculture dimensions. Natural resources such as water, soil and nutrients are currently under stress, and weather conditions are becoming more volatile and uncertain, with adverse effects on agri-food supply chains. It is difficult to visualize and understand the interrelations amongst constraints and challenges from every dimension, hence it is difficult to predict future behaviours in order to mitigate unexpected conditions and their effect across the agriculture chain (Hernandez et al. 2017).

The supply chain is usually composed of actors such as large, medium and small producers who grow and trade food commodities; intermediate processors who process, manufacture and market primary and value added products; distributors such as wholesalers and retailers who market and sell the food; consumers who shop, purchase and consume food; and both government and non-government organizations who establish regulations that control the agri-food supply chain. These actors need to react efficiently to the current growing world population and dynamic market demands, complex regulations and high product variety, while maintaining high standards in food growing and production. These are the key sources of uncertainty which leads to the managerial challenges of effective and efficient operations performance in the agri-food sector. Hence, by enhancing information sharing and collaboration across agri-food supply chains a reduction in

cost and waste as well as a balance between food supply and demand is expected. In fact, collaboration among stakeholders along the agri-food supply chain is more important than ever (Hernández et al. 2014), and the right application of operations management concepts to enhance agri-food supply chain collaboration will support efficient decision-making processes for food growing and production, and help to meet end-customers' demand specifications, minimizing risks and uncertainties.

For agricultural products, successful supply chain development projects reduce not only the transaction costs but also the institutional barriers that decouple individual links in traditional distribution channels (Van Roekel et al. 2002). But it becomes difficult to deal with such a system when structures are not clearly defined. Thus, advanced agri-food supply chain research is required, especially to provide an integrated understanding of efficient agri-food supply chain decision-making under uncertainty in terms of climate, sustainability and market.

After a thorough review and revision process, we present seven papers selected for their relevance and quality which span a broad range of key topics. The first three papers look at collaboration issues. Firstly the effect of collaboration on performance is studied by Zaridis et al through a large survey around price strategy and quality strategy. Next, Fikar and Leithner look at the effects of collaboration between local producers and offers a decision support system for logistics operations between partners. Ghadge et al. look at the barriers to sustainability in a specific sector of the food industry, focusing on artisan chees producers in the UK. Sustainability is also the topic of the paper by Ramanathan et al. which looks at the impact of collaboration on green sustainability for food supply chains, particularly partner selection and team formation. Collaborations are affected by turbulence in the business sector. Despoudi et al. look at the turbulence factors and their impacts on food producers. Also looking at the issues that can affect agri-food businesses is the paper by Pereira et al which explores risk mitigation strategies in food supply chains, focussing on mango producers in Brazil and concluding that the main risk mitigation strategy is collaboration. Another important risk issue for agri-food companies is the question of food safety. This is studied by Lu et al who identify and prioritize the key factors in managing food safety, based on a case study from Chile.

We hope these papers—covering a broad range of research methods, situations, company types and locations—will help researchers to advance the management of collaborations in the agri-food industry.

Acknowledgement

Notes on contributors

Dr. Jorge E. Hernandez, is Director of studies for the Business Analytics and Big Data Msc Programme, Senior Lecturer (Associate Professor) in Operations & Supply Chain Management and Principal Investigator of the H2020 RUC-APS project, which is enhancing agri-food value chains under uncertainty in UK, France, Spain, Italy, Poland, China, Chile and Argentina. With more than 20 years of professional experience in developing and applying modelling, simulation and optimisation management methods in industries in the field of Agri-Food, Healthcare and manufacturing, Dr. Hernandez focuses in gathering current and up-to-date challenges, requirements, and constraints to produce research with IMPACT focus. As a researcher, Dr. Hernandez has been awarded, in 2016, the ULMS researcher of the year award. In 2014, Universitat Politècnica de València conferred to him the extraordinary international award to the best Ph.D. Thesis dissertation. In 2009, he received a special award recognition in 2009 for his pioneering work on Collaborative Supply Chain Management on Reverse Logistics.

Professor Martin Mortimer's work is on the development and application of agro-ecology in tropical and temperate agro-ecosystems and mathematical modelling of species interactions in plant and microbial systems. This research underpins the design of integrated weed management systems that optimizes reliance on chemical interventions and maximizes intrinsic regulatory processes within ecosystems. Professor Mortimer passed away in 2019 following a short illness.

Dr. Hervé Panetto is a Professor of Enterprise Information Systems at University of Lorraine, TELECOM Nancy. He teaches Information Systems modelling and development, and conducts research at CRAN (Research Centre for Automatic Control), Joint Research Unit with CNRS where he is managing a research project on the use of ontology and AI technologies for formalising models related to the interoperability of production systems, and mainly their enterprise information systems. He is member of the Academia Europaea. His research field is based on information systems modelling for enterprise applications and processes interoperability, with applications in enterprise modelling, manufacturing processes modelling, furniture data modelling. He received the IFAC France Award 2013, the INCOSE 2015 Outstanding Service Award and the IFAC 2017 Outstanding Service Award.

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