Smart and Circular Agriculture towards Sustainability 2022

BOOK OF ABSTRACTS

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Porto, 21-22 July 2022

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FCT Fundação para a Ciência e a Tecnologia

UNIÃO EUROPEIA Fundos Europeus Estruturais e de Investimento

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Foreword

Present and future challenges faced by agriculture were grouped by OECD in a dynamic triplet that relies on science, education, technology. The most promising approach to make food production systems more efficient, mitigating agriculture footprint and increasing productivity and farmer's income, is digitalization. This is understood as the integration of artificial intelligence, big data, robotics, unmanned aviation systems, sensors, information, and communication solutions, all connected and managed by the Internet of Things (IOT). Scientific research also embraces several other challenges such as: improving food nutritious quality, recovering soils and their biodiversity, protecting crop biodiversity, and increasing crop resilience to climate change as well as to new pest and diseases. In parallel with these issues, education needs to prepare a new generation of farmers able to adopt technologies, which in turn can make agriculture more attractive to younger people, reconciling them with agriculture-related jobs and with rural areas. In summary, only through positive interactions between technology, science, and education, shaped in effective and innovative policies, the UN sustainable development goals may be achieved. This conference aims to address topics related with this virtual triangle, by inviting all actors from the academy, industry, and agriculture sector, to present their main achievements and points of view, contributing for fruitful discussions.

Topic 1 – Research, Innovation & Training in Agriculture 4.0

The world population is set to reach 9.6 billion by 2050. This overwhelming fact, along with the increased frequency of extreme weather conditions resulting from climate change, and the environmental impact caused by intensive farming, highlight the urgency of agriculture optimization. Fortunately, the Industry 4.0 revolution is rapidly transforming all major industrial sectors, including the agricultural domain. Precision farming systems, based on IoT technologies, are attempting to address emerging food security and environmental protection concerns. The agricultural IoT infrastructure transformation is enabling crop producers (from big agricultural corporations down to small family farms) to receive status information from interconnect farms, crops, crop/field, equipment, storage, and livestock. The market has shown a rapid increased in Agriculture IoT systems and their infrastructures, and corporations are interested in investing and promoting their growth. However, these systems that have and will enter the market are currently maintained by people with no educational background specific to the needs of this market. Thus, multidisciplinary graduation and post-graduation courses may be necessary to overcome these difficulties.

P13 -CONSUMER PERCEPTIONS AND ATTITUDES OF THE CIRCULAR ECONOMY AND FOOD BY-PRODUCTS

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According to FAO, one-third of all edible food produced for human consumption is wasted or otherwise lost from the food chain per year, or about 1.3 billion tonnes. In Europe, the amount of industrial food waste or loss varies between 19% and 39% of the total food loss in the food supply chains. As a result, the adoption of a circular economy policy has received special attention from the agrifood industries, allowing for the creation and development of new food products made of by-products that would otherwise be wasted or used for secondary applications. The aim of this research is twofold: i) to understand the way consumers perceived the circular economy and food products from the circular economy, and ii) to evaluate attitudes towards the circular economy. For this, a mixed methodology was applied free word association methodology was applied to evaluate consumers' conceptualization of the circular economy and the use of by-products as foods. Data were analysed by grouping the responses into exclusive and exhaustive categories, and a correspondence analysis was also performed to originate perceptual maps. Additionally, a questionnaire was designed to evaluate major concepts and attitudes correlated with the circular economy. Data were reduced by principal component analysis (PCA), and participants were grouped through clustering. Results showed that consumers understand the circular economy as related mainly to Sustainability, Economy, and Circularity dimensions. Participants had great difficulty identifying the by-products used as foods or as food ingredients. Four groups were identified based on the associations to the six principal components originated by the PCA. However, the results highlighted a very low association with all clusters of the Food Valorisation dimension within the concept of the circular economy, and also a lack of a clear understanding of consumers' attitudes towards food products from the circular economy.

Keywords: by-products, consumer, exploratory study, food