IT for interconnection of social, economic and environmental aspects in agribusiness

INTERNATIONAL RESEARCH SUMMARY REPOR SURVEYS ON FARMS, CURRENT SITUATION AND DEMAND

Result 1 – Work Package 1

Prepared by Meath Partnership

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Introduction, Aims & Objectives

There is a common agreement among the agricultural society that feeding an extra two billion people by 2050 will require solutions relying heavily on innovative use of information and communication technologies (ICT). A commonly used term for the use of technological advances in agriculture is "Agriculture 4.0" – sometimes considered the fourth agricultural revolution.
The "Future IT for Farms" (ITFARM) project promotes the idea that the Fourth Industrial Revolution has the power to change things across a broad spectrum of the society, it is here and now, and schools and other executives need to be ready. The old way of doing things is not enough anymore, and education (for both young and adults) will be the first to embrace all facets of "Industry 4.0" and all the opportunities it will bring. Providing education for family farm entrepreneurship based on integrated digitisation of business production processes following challenges of the "Agriculture 4.0" revolution is an opportunity of great benefit.
The International Research Summary Report is summarising findings of the "*Surveys on farms and current situation and demand*" conducted in partner countries of the ITFARM project (IT for interconnection of social, economic and environmental aspects in agribusiness) with the aim to identify the current situation and demand in relation to the application of IT in the Agricultural Sector.

The surveys were conducted in each partner country and were followed by detailed analysis of the current practices among the target group. To support the implementation of the process, the following activities were undertaken by project team members in each partner country:

- ***Desk-based research:*** *collection of data obtained from electronic sources which focused on precision agriculture.*
- ***Field-based research:*** *empirical data obtained through participatory approaches involving the target groups.*

Desk based research

The desk research was conducted by all partners and examined 5 main areas of interest, including; (a) basic information about agriculture (main features and specialities); (b) robotization and digitisation in agriculture; (c) precision agriculture; (d) leaders in the market of Precision Agriculture Technologies; (e) qualifications and education for future technologies.

<u>Basic information about agriculture</u>

Agricultural activities vary across European countries due to climate concerns, topography and national customs. Ireland is primarily focused with dairy farming and tillage farming; Italy is heavily involved in grain farming; seed, horticulture, pigs and poultry farming are common in Hungary; and viticulture is common in Greece. In the Czech Republic, there are approximately 26,000 entities farming approximately 3.5million hectares of farmland, with an average farm size equal to 130 hectares.

<u>Robotization and digitisation in agriculture</u>

Across Europe, the desk research highlighted that many farmers and agricultural professionals are not currently using robotization and digitisation at present. Belgian farmers in particular currently avail of only 20% of the technologies that are available to them.
A myriad of barriers are currently visible in relation to the unwillingness of farmers to adapt robotization and digitisation onto their farms, including the aging population of farmers across

Europe who are not familiar with technology; legal concerns in relation to the processing of personal data; and in Ireland, a lack of access to broadband in rural areas.

Precision agriculture

Precision agriculture seems to be in early stage development across all countries, except for Italy. 12% of farmers in Hungary; 25% in the Czech Republic and 46% in Ireland are currently using some form of technology and precision agricultural techniques within their practices.

Leaders in the market of Precision Agriculture Technologies

A plethora of leaders in this market exist across Europe; all of whom are familiar to most farmers in their respective countries. Some of the most famous leaders include;

- *Agricolus - https://www.agricolus.com/en/*
- *Agri-Precision - https://www.agri-precision.cz/*
- *Agrostis - https://www.agrostis.gr/index.php/en/*
- *Arc-Net - www.arc-net.io*
- *Ionos - https://ionos-uav.com/company/*
- *MagGrow - www.maggrow.com*
- *Moocall - www.moocall.com*
- *NIK - https://nik.bg/*
- *ONDO - https://ondo.io/bg/*

Qualifications and education for future technologies

Several training programmes across European countries, including courses offered by Teagasc in Ireland; the University of Molise in Italy; the Catholic University of Louvain, in Belgium, and through the Hellenic Open University, in Greece.

The field research

A total of 83 farmers across Europe participated in the field research, with the majority of these farmers being aged over 50 years.

Due to the varied types of farming that is conducted across Europe, different types of technologies are used in each country. In Ireland, for example, farmers cannot justify the use of expensive technologies on their farms, due to the small size of Irish farms. However, they do implement "animal health and welfare" supports as well as soil management techniques. Meteorological systems were identified as a technology used by Bulgarian farmers. ZigBee technologies were only mentioned by Hungarian producers, who also use automatic irrigation and seed drill depth technologies on their farms.

Across the seven countries that participated in this survey, all farmers identified three main factors that impact their decision-making process in relation to introducing ICT technologies onto the farm. These included (1) lack of capital resources; (2) high capital investment; and (3) the unsure nature of whether the farmers would actually gain a return on their investment. Additional factors were highlighted, including legal challenges associated with investing in ICT; no public funding being available to support the farmer to introduce ICT technologies on their farm; and the short life span on new technologies.

Farmers who participated in the field-research were clear with regards to the training opportunities and support that they would require in order to implement ICT technologies onto their farm; they all wanted face-to-face training events, with a possibility for consultation. A small number of farmers

were interested in online training, and this can be explained by the fact that the majority of farmers identified that they are lacking in ICT technologies, and lacking the confidence required to use ICT technologies.
Additionally, further skills that farmers are lacking include; (1) lack of soft skills; (2) lack of qualified persons; (3) lack of applicable ICT software. One farmer also highlighted a barrier that they face, which includes the time that it takes to train a young family member into the daily operations of the farm.

Conclusions of the consortium

The general conclusion of the consortium partners is that the majority of the surveyed subjects have not undertaken the digital transformation process yet. They make little or no use of digital technologies not only because the machines are expensive and not affordable but also mostly because farmers lack the knowledge needed to use them.
Most of them are in the position to understand the benefits of applying smart technology but their main concerns still remain the lack of financial resources and the high capital investment. However, they remain positive about training opportunities with the majority of participants preferring face-to-face training and identifying the lack of theoretical knowledge of processes related to ICT technologies as the major need for their evolution.

Recommendations of the consortium

Considering the findings of the research as well as conclusions of the consortium consulted after sharing the national findings amongst the partners, the following next steps were identified and suggested in terms of developing the future modules and training materials as part of the ITFARM project:

- *Create resources raising awareness about the positive impacts of ICT technologies on various processes in agriculture (increasing time and financial effectiveness etc.);*
- *Create resources about different technologies and equipment available on the market;*
- *Create resources about potential funding opportunities farmers can avail of in order to increase their ability to purchase, introduce and successfully adapt these technologies in their businesses;*
- *Create and offer further training opportunities to support the process of introducing these technologies including development of skills related to planning, purchasing, adapting these technologies as well as the ability to determine the different positive impacts of the technologies on the processes.*

Partners

Czech University of Life Sciences Prague - Czech Republic
www.czu.cz/en

University de Liege - Belgium
www.uliege.be

Agraren Universitet Plovdiv - Bulgaria
www.au-plovdiv.bg

Aintek Symvouloi Epicheiriseon Efarmoges Ypsilis Technologias Ekpaidefsi Anonymi Etaireia - Greece
www.idec.gr

CESIE - Italy
www.cesie.org

Meath Community Rural and Social Development Partnership Limited - Ireland
www.meathpartnership.ie

TREBAG Szellemi tulajdon- és Projektmenedzser Korlátolt Felelősségű Társaság - Hungary
www.trebag.hu

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