

The role of ICT for Future Agriculture and the role of Agriculture for Future ICT

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At the start of the 21st Century we are faced with the emerging problem of global food demand and exceeding the Earth's carrying capacity with the current way of agricultural production. Moreover, the issues of safety, health, quality and sustainability, underpinned by the concept of transparency, have become increasingly important. In many global discussions forums it has been acknowledged that ICT can and will play an important role in meeting these challenges.

Over the past thirty years ICT technologies have been introduced in the agri-food sectors. Important milestones were introduction of computers (1980s), internet, email and mobile phones (1990s), and Global Navigation Satellite Systems (GNSS), wireless communication and social media (last decade). Modern farms make use of one or more of the following ICT: computers with a farm management system to keep track inputs, outputs and economics, weather forecast, early warning and decision support systems for crop management, auto guidance systems for controlled traffic on fields, tractor mounted board computers for steering of sprayers and other machines in a preferred way, and data registration systems to meet legal and chain requirements.

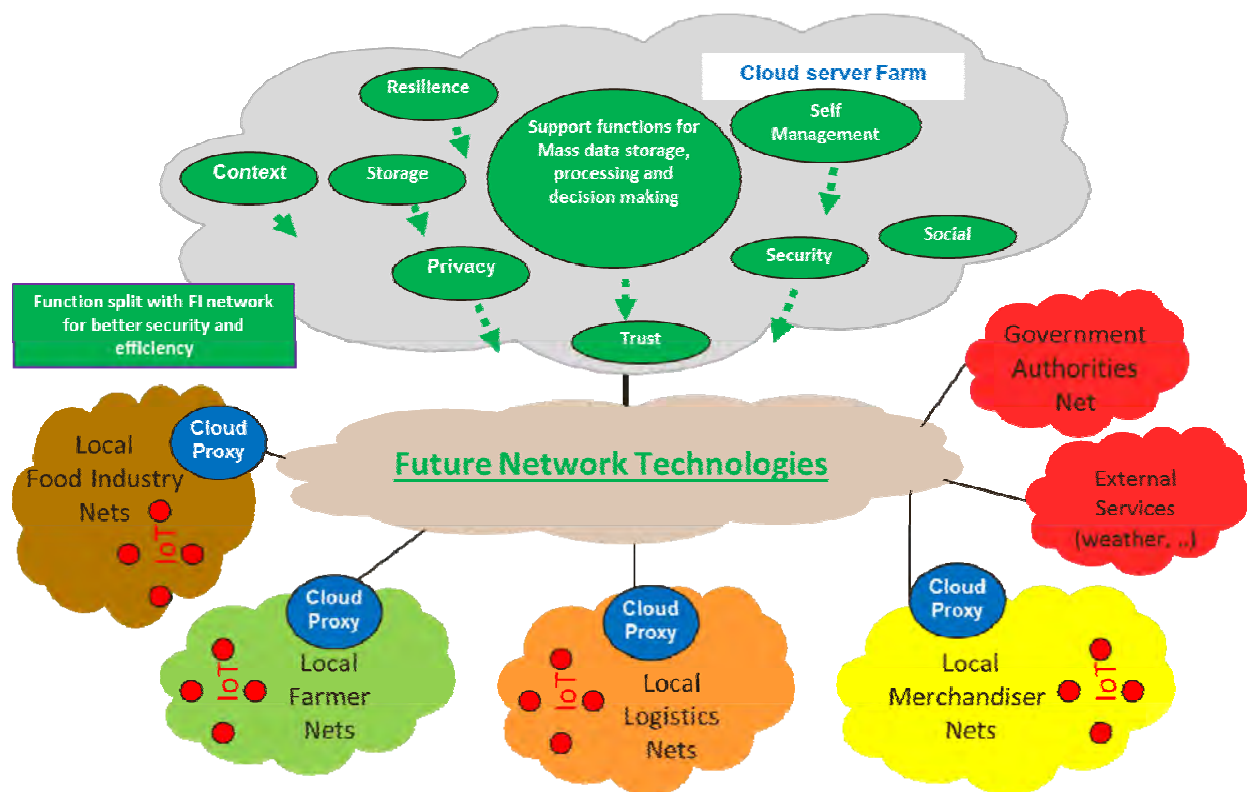
However, the uptake of these solutions has been slow due to a number of important yet unresolved issues. For instance, farmers register a large amount of data. The use of this data is still limited because handling is still far from easy in optimization of crop, farm and chain management. Problems are related with limited standardization, data protection and lack of optimization models. There's still a large potential in stimulating adoption of current ICT, but future ICT technologies even promise more potential gains. At the same time, it is believed that the agri-food sector itself can also play an important role in the development of future ICT.

Precision Agriculture and modern society could play an important roles in accelerating adoption of ICT technologies. Precision Agriculture requires fast and accurate handling and interpretation of GEO-data. Variation in soil and crop conditions are detected by various sensors and translated into sites specific actions. External data bases have to be consulted. Simple web service should facilitate this decision making. Think of digital diagnosis of crop stress and associated crop care advice. Controlled traffic farming and robotics require robust communication and GNSS networks. Society want sustainable food production. This means that farmers and food chains have to proof with data that their production systems are sustainable and risks are minimized (tracking and tracing). So, farm data will be used outside the farm by various other parties with different objectives (supply chain, food chain, governments, logistics, consumers). Social media allow new ways of promotion and sales of farm products.

The objective of this paper is to present the interactive future development of ICT for the agri-food sector. This will be based on several studies and user panel discussions that were carried out in EU-projects such as SmartAgriFood, AgriXchange, ICT-agri and FutureFarm, including a global view. The following issues will be covered in these projects:

- specific characteristics of the agri-food sector relevant for ICT development;
- future ICT needs from agri-food users' perspective;
- future capabilities of ICT to meet future long and short term needs;
- organization of future ICT development in the agri-food sector through private-public cooperation.

The results will be concluded by setting the agenda points for future ICT development for the agri-food sector and an how these can be achieved. Hereafter a depiction of architecture SmartAgriFood (result of a FP7 project of EU).



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