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1. Introduction & context

Agricultural production has to increase drastically for the next years in order to meet societies' needs and, at the same time, should be more sustainable (Alexandratos, 2012). Innovation is seen, in Europe among others, as the key solution to cope both with these challenges and to economic growth and employment. A lot of studies and actions were done since the 80s' on innovation and several aspects, especially on its process, were highlighted. A main dimension revealed is the complexity of this process and the large number of people it implies. In short, innovation doesn't belong only to one kind of people (research or R&D services) but is composed by complex interactions between lots of different stakeholders. However, even if we know more about the innovation process, the 'European Disease' is not so far behind us: it is still a main challenge for Europe to lead to many innovations, and to increase productivity, despite of its production of excellent scientific knowledge. As highlighted by the latest European initiatives such as PPPs and EIP[i], there is still today a gap between research and practices. This gap, and the work which remains to be done, are not so much part of the innovation theory elaboration, but are rather operational challenges (Hall, 2007).

Furthermore, ICT, automation solutions and robotics could play a considerable role in the development of innovation, and among others, for the development of sustainable and efficient farming systems (ref SRA)[ii]. These technologies could indeed be used as a result of the innovation process (new tools and technologies used by farmers for example) or during the process it-self (by strengthening information exchange and networking among all relevant stakeholders).

For all these reasons, and also because of the pressure on public research to produce not only scientific knowledge but also concrete innovation (Smits, 2002), participants of the ICT AGRI era-net became more and more interested on promoting innovation, especially by involving other stakeholders in their activities. Then, within the context of the Work Package 5 of the era-net, which originally aimed at "Establishing and maintaining a framework for long term network and collaboration", a small-scale but innovative initiative was launched to boost innovation and strengthen the links with several stakeholders. This initiative was named PPP Action (Public-Private Partnerships Action).

The PPP Action (Public-Private Partnerships Action): description

Even if the ICT AGRI ERA-NET was more focused on the coordination of research activities in Europe, it showed a growing interest toward innovation. Hence, **from November 2011, the ERANET has launched an experimental one year action on innovation.** This experimental initiative named "**PPP Action" aimed at promoting PPPs in a broader sense**: all types of partnerships between actors from public research and other stakeholders such as end users, private companies and intermediaries (industrial clusters, professional associations...).

The underlying assumption of this action is that **the innovation process is a complex and collective process**, involving a lot of various players, taking place in a specific context and, for which success or failure 'isn't often due to technical or scientific problem but generally involves ethical; social, management, organizational and institutional problems." (Smits, 2002). In other words, the innovation process is not considered anymore as a linear process (roughly resumed by the sentence 'from researchers to end users') but a complex and collective one, in which involvement of various stakeholders is strongly needed. The concept however retains its definition of 'source of energy', definition done the first time when the word 'innovation' appeared around 1939 by J. Schumpeter[iii].

3.1 Objectives

The action, in which all the era-net participating countries were involved, had a twofold objective:

- To **bring together the stakeholders of the innovation process in agriculture around a same challenge: the reduction of the use of pesticides**. Results expected could be, in the best case, the set-up of concrete partnerships involving public research, industries and end users. A less ambitious conclusion of this action could be the set-up and strengthening of linkages between these stakeholders.
- To **design a methodology**, based on existing methods, to **both manage this PPP Action** and then, in a second time, **to analyze it to improve** the process for further actions on innovation.

3.2 Methods

One objective of the experimental PPP action was to design a methodology to gather together the main stakeholders of the innovation process to develop concrete innovation or even better to use an existing suitable one. With this purpose, a preliminary study was done on the several existing methods to involve stakeholders on the innovation process or, more widely on methods to manage innovation. Without providing an exhaustive list, we will present quickly an outline of the main existing methods of management we have reviewed, focusing on some of their main aspects. Then, we will describe the method applied in our PPP experimental action.

Review of the methods which involved stakeholders

The interest on involving several stakeholders in the innovation process is far from new, and how to involve them and how to manage these interactions and processes could take different forms. Briefly, we could highlight three main aspects which differentiate these

methods. First, these methods could choose to focus on some kind of stakeholders. For example, it could focus on end users' involvement: 'Farmers' knowledge really does count' was proclaimed and studied since the 90's, if not before (Hall, 2007). It could otherwise focus on industries participation (it is the case for Public Private Partnerships used by industrial development and among others by UNIDO[iv]). Or finally, it could imply the participation of the greatest possible number of stakeholders (Bos & Groot Koerkamp, 2009). These same methods could also vary regarding the degree of involvement of the stakeholders. It could simply begin with interviews or consultations of stakeholders, or it could involve them more actively. Examples with end users (farmers) could be found in participatory methodologies (Chambers, 2007) and surveys of end users (Jørgensen et al., 2006). Other methodologies, such as open innovation and Living Lab, not only include stakeholders' views or ideas in the innovation process, but make them work together with information and knowledge exchanges as well as with the sharing of results (advantageous or not). Then, another main difference between all these methods is the degree of openness and information exchanges. Open innovation, 'one of the hottest topics in (current) innovation management', which helps practitioners and scholars to 'rethink the design of innovation strategies in a networked world' (Huizingh, 2011), focuses obviously on the openness and the sharing of information. Rather, PPPs allow the exchange and work on a more confidential level.

Method used in the PPP Action

For our operational challenge and regarding the specific area of technologies for crop protection, three aspects of the methods mentioned above seemed crucial.

- First, we have decided to develop PPPs, with a focus on private companies, without excluding other stakeholders. Indeed, private partners could be interested more directly by the ICT AGRI activities (for example with the opportunity to participate to scientific project funded by the era net)
- Secondly, as particularly highlighted in open innovation approaches, some flexibility was left in order for creativity and collective work to develop. In our case, the degree of openness was up to the players involved and could have been different regarding the content as well as for the type of partnerships created. Indeed, as the proposals integrated ICT technologies embedded with "hardware" technologies, the different components of innovation should have the opportunity to be developed in more or less closed or open systems.
- Lastly, as our challenge was mainly operational with time constraints, we have decided to use existing methods (the value chain approach) with some improvements due to the specificities of the area, context, etc. of our action.

In order to nurture the first spark of discussion between the players of our PPP experimental action, **a value-chain approach** was adopted. This approach identified all the players who are involved in the innovation process 'from conception, through the different phases of production (…), delivery to final consumers, and final disposal after use' (Kaplinsky and Morris, 2008). Then, each brick of the innovation process provide a useful basis for the discussion and collective work. If the right persons are involved in this collective work, this basis give them a good overview of the possibilities of innovation, possible added value, difficulties they could meet, and so forth, at various levels. Our general objective was to create the right condition to stimulate interactions and collective work of the participants.

3.3 PPP Action: management and steps

In order to attract industrial partners and end users, it was necessary to work on concrete topics and technologies, especially given that no other incentives measures or helps were provided (no funding,…). To be practical and attractive to private stakeholders, it was decided to work around a specific challenge (a societal problem) with suggestions of concrete technologies or solutions. The challenge was the reduction of the use of pesticides and it was chosen because a lot of participants could be concerned in the era net.

The three suggestions used to start and boost exchanges and discussions between the players were the following:

- An **E-services package**, a sharing services platform using ICT, in which each user will only have access to what he needs, according to the characteristics of his farm or firm.
- **Smart adjustments tools on sprayers** which aim at improving techniques and conditions of pesticides application on short and mid-term. The goal was to develop smart, easy, efficient and open-ended adjustment tools on sprayer machines.
- **Combined and modular robotic solutions** which, over a longer term, could combine multi-actions (for instance mechanic + chemical actions, electric + mechanic actions…) from a single robotic platform.

For these 3 suggestions, their different components and corresponding actors were identified. These aspects refer to technological elements and actors, but not only: societal, legal, and contextual aspects and actors were also identified collectively and were involved. The main idea was to start the discussion and not to realize these three suggestions. Any proposition of participants on other possibility was encouraged.

In order to manage the action, 5 steps were designed and another was added lately. The steps were, in short, the following[v]:

- Validation of the challenge and of 3 concrete suggestions of solutions by the era net participants
- Creation of the three value chains (corresponding to the 3 suggestions of solutions). ICT AGRI era net members but also some private partners were invited to participate in this step.
- Mapping of the stakeholders and main issues (technological locks, weaknesses, …) for these three suggestions
- Analysis and dissemination of the value chain to the stakeholders who should be involved
- Meeting with the stakeholders and workshop around the value chain analysis. It took place the 13th and 14th of June 2012 in Paris, during the Smart AgriMatics conference.
- The 6th step, added after the workshop, aimed to find funding for the stakeholders interested in the PPP action, in order for them to begin their partnerships. This step was not planned at the beginning and not enough time was left to complete this task successfully. Nevertheless, this attempt has put forward the difficulty to combine policies and funding mechanisms with spontaneous bottom up approaches.

2. Results and recommendations

4.1 Results

The experimental PPP action of ICT AGRI ERA-NET ran during one year at the European level and both the evolution of the action and the results (positive and negative) are important to analyze. The positive results were:

- The links made between several partners from different countries, from both public and private sector, interested by crop protection,
- A better knowledge of these stakeholders, and the premises for the mapping of private stakeholders, intermediaries and end users association
- A 200 participants conference organized with two other European projects (AgriXchange and Smart AgriFood projects) with a workshop to develop PPPs
- A first experience of the ICT AGRI era-net as intermediaries for innovation which hopefully will be useful for further actions
- Some recommendations for next innovation management actions.

One of the difficulties in this action was to assess its impact and results. Indeed, numbers and figures are not easy to calculate, whether that is to assess the impact of this action on partnerships or in networking. However, the role of intermediaries should not be underestimated and on the contrary, should be encouraged.

4.2 Recommendations & conclusions

A more mixed view on the PPP action could highlight some aspects leading to the following recommendations:

Finding the right stakeholders and involving the intermediaries first

Most of the difficulties we met during our experimental action were due to the time and challenge of identifying **the right stakeholders.** Hence, **intermediaries** such as industrial clusters, national or local associations, and also era-net, have a very important role to play there, and they should be encouraged to do so. Nevertheless, as they usually have a national mission, it was difficult to motivate them. In our action, the involvement of intermediaries and the lack of mapping of these players were underestimated. Besides, even if intermediaries were found and involved, it was not done at the right scale: local intermediaries were showing more interest and were more active than most of the intermediaries contacted at the wider level.

Creating a motivation for all the stakeholders involved

Strongly linked to the previous aspect, another essential point highlighted in the action analyzed is the **motivation of the players** and **the way to manage it**. As mentioned by Hartwich *and al.* (2003), PPPs are interesting for both public and private players. For public players, it ties research more closely to users‟ needs (and can augment investments in research). And for the private sector, it improves competitiveness (as other forms of outsources activities). But, in the operational action, stakeholders don’t really measure the interest of these partnerships and are not able to see, in a lot of different existing actions and initiatives, which one is interesting for them. A constant reminder of the interests and gains for each player is necessary, as well as other form of motivation (such as financial help

to set up the project for example). The follow up of the ERA-NET will be build to offset this issue.

Mapping and – or coordination of innovation funding programs
Several funding mechanisms for innovation, promoting projects with industrial partners, exist in some European countries. It could be important to map these mechanisms in order to inform the stakeholders, or even better, to support them to benefit from these mechanisms in trans-national projects including companies. These funding programs could indeed work as an extra motivation to form PPPs.

Managing the confidentiality and the diversity
As we experienced in the PPP action, some private partners (large companies or SMEs) expressed their interest without participating directly to the collective work. The main reasons of this distance could be the early stage of the project and a need for confidentiality: Ways of managing these interests and some confidentiality required should be found while at the same time going on with the collective work. Also, involving the different intermediaries of the players at different moment of the innovation process could offer more efficiency. For example, an earlier involvement of private companies and consumers (or their representatives) was strongly suggested by all the stakeholders involved in our action and could offset the issue of "economic viability" which appears to be essential, as well as other issue already highlighted such as "ease of use, reliability and legislation or liability issues" (Blackmore, 2007). A specific work on motivate them should be done and took several forms: examples of successful PPPs, assessments on the impact of such partnerships, financial (or other types of) advantages to linked with public research and end users associations.

Looking for the right opportunities to meet the stakeholders
A conference was organized, in collaboration with two other European projects, to gather together the main stakeholders interested. The pulling of efforts and stakeholders done in this occasion was a solid first step, enhanced by the focus made during the event on networking. Efforts should continue down this path and some meetings or workshops could be also organized directly within the context of industrial events (professional events or exhibition). These last events offer the opportunity to meet both private partners and their customers (end users, farmers,…).

Sharing innovation and management experiences
To conclude, a main point which should be developed is the sharing of these various PPPs or others actions which try to boost innovation, at the European level. Exchange of experiences and good practices of innovations, such as in a "Community of practices", as suggested by Hall (2007), will be of considerable help to manage better these innovation process. With this aim, this specific PPP Action was disseminated in several areas, conferences among others.

3. References

Alexandratos, N. and J. Bruinsma. (2012). World Agriculture Towards 2030/2050: The 2012 revision In E. W. paper (Ed.). Rome: FAO.

Blackmore, B.S. 2007. A system view of agricultural robots, in *Precision agriculture '07*, Papers

presented at the 6th European Conference on Precision Agriculture, Greece, 3-6 June 2007

Bos, AP, & Groot Koerkamp, PWG. (2009). Synthesising needs in system innovation through structured design: a methodical outline of the role of needs in reflexive interactive design (RIO). *Transitions towards sustainable agriculture and food chains in peri-urban areas*, 219-237.

Chambers, Robert. (2007). From PRA to PLA and pluralism: Practice and theory. *The SAGE Handbook of Action Research: Participative Inquiry and Practice*, 297.

Fagerberg, J., & Verspagen, B. (2009). Innovation studies—The emerging structure of a new scientific field. *Research policy*, *38*(2), 218-233.

Hall, A. (2007). *Challenges to Strengthening Agricultural Innovation Systems: Where Do We Go From Here?* Paper presented at the Farmer First Revisited: 20 Years on, Institute of Development Studies, University of Sussex, UK.

Hartwich, F., Janssen, W., and Tola, J. 2003. Public-Private Partnerships for Agroindustrial Research: Recommendations from en expert Consultation. ISNAR Briefing Paper 61. Netherlands: ISNAR.

Huizingh, E. K. R. E. 2011. Open innovation: State of the art and future perspectives. *Technovation* 31(1): 2-9.

Kaplinsky, R., & Morris, M. (2008). Value chain analysis: a tool for enhancing export supply policies. *International Journal of Technological Learning, Innovation and Development*, *1*(3), 283-308.

Jørgensen, RN, Sørensen, CG, Pedersen, JM, Havn, I, Olsen, HJ, & Søgaard, HT. (2006). *HORTIBOT: A System Design of a Robotic Tool Carrier for High-Tech Plant Nursing Automation Technology for Off-road Equipment 2006.* Paper presented at the Proceedings of the 1-2 September 2006 International Conference, Bonn, Germany.

Smits, R. (2002). Innovation studies in the 21st century: Questions from a user's perspective. *Technological Forecasting and Social Change, 69*(9), 861-883.

[i] More information on EIP, European Innovation Partnership on their website: http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=eip or http://ec.europa.eu/agriculture/eip/pdf/com2012-79_en.pdf.

[ii] See more details on the potential of these technologies for agriculture precision in the Strategic Research Agenda of ICT AGRI, finished in 2013 : http://db-ictagri.eu/ict-agri/content/SRA.php.

[iii] The concept of innovation, its evolution and studies on the topic have been reviewed by several scholars. We therefore recommend few of them: Fagerberg, J., & Verspagen, B. (2009), Smits, R. (2002),…

[iv] See UNIDO work: http://www.unido.org/fileadmin/user_media/Services/PSD/ICT/GSA%20White%20paper%205.12.08.pdf

[v] More details on the steps in annex 2 (for step 1 to 5)