How to design and develop inclusive knowledge and innovation agricultural networks: Lessons from the case of the Portuguese Cluster of small fruits

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1 | The research context

- EIP AGRI (European Innovation Partnership on agricultural productivity and sustainability) and related initiatives, such as Operational Groups
  1. Relies on multi-actors networking - farmers, researchers, advisers, others
  2. Grounds on the innovation system approach, which envisages innovation as an outcome of interactive collective learning processes, involving heterogeneous actors and multiple sources of knowledge
- The link between networking behaviour and innovative performance is well-established (business literature)
- The idea underpinning EIP-AGRI of linking producers and users of knowledge and promoting their interaction around problem-solving is well grounded on the evidence provided by the ‘innovation systems’ and related literature.
2 | Research gaps and paper goals

- Evidence gaps that matter to the implementation of the EIP-AGRI activities comprise the lack of knowledge regarding the best-fitted network configuration for different farming systems and farming styles, and the nature and effectiveness of a facilitator function and role to bridge communication between researchers and farmers.

1. to present the configuration of the Portuguese Cluster of Small Fruits, by describing its structure, content and dynamics as learning and innovation network.

2. to discuss how the originality of this network regarding its inclusiveness might be kept in its future development in spite of the tensions evidenced towards the segregation of different groups of farmers.
3 | Data collection and analysis

- **Case study** approach, with 3 phases:

1. **Exploratory research to understanding and mapping the actors of the Portuguese small fruit sector** by conducting a collection and systematization of the latest news and events, direct observations and participation of the research team in some of those events (meetings, workshops, among others);

2. **Exploratory-descriptive approach to gather information about the structure, content and dynamics** of the network was done using interviews guides applied through personal interviews.
   - the sample selection was random: ‘facilitators’ (3), ‘suppliers of knowledge’ (9), and small farmers (‘knowledge demanders’) (24).

3. To carry on the **analysis of social network**, supporting the **flow of information in the process of creating, sharing and storing knowledge**, Social Network Analysis (SNA) methodology was adopted.
4 | The berries sector in Portugal

- Novel and exponentially growing sector: from a few hectares in 2009 to thousands in 2016

- The berries cultivation has been initiated in Portugal in the nineties, there was a group that continued the crop, located in the Southern that has created, converted and stored local-specific knowledge (‘pioneers producers’) 

- Since 2009, driven by the economic crisis and young unemployment it generated, agricultural sector experienced an exponential demand from ‘young farmers’ (40 or less years old) benefiting from the RDP measures

- In the Central-Northern local authorities envisaged this ‘young farmers’ demand as an opportunity to counter depopulation and land abandonment

- They enhanced and supported the sector organization at this region aiming at to attract young farmers
4.1 | The berries sector in Portugal

Geographical dichotomy: Experienced vs. Inexperienced

Central-northern is dominated by small young new-established inexperienced producers; mono-production of blueberries; sector novelty

Southern area is characterised by larger and specialized producers; experienced and innovative; well networked with research and trade
A broad network, horizontal nationwide, encompassing multiple purposes and actors, with a national scale and sectoral scope.

Was created in 2013, resorting to public funds (to agglomeration economies).

It is led by a sectoral association, which is the main network facilitator along with other three partners (public and private R&D organisations).

Its major concern is to ensure the sector’s competitiveness and sustainability.
## 5 | The *Small Fruits Cluster (SFC)* – Actors and roles

<table>
<thead>
<tr>
<th>Actors</th>
<th>Description of their role in small fruit sector</th>
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<tbody>
<tr>
<td>Independent producers</td>
<td>Production</td>
</tr>
<tr>
<td>Private companies</td>
<td>Berry production, harvest and/or trade</td>
</tr>
<tr>
<td>Micro</td>
<td>Storage, processing and transformation</td>
</tr>
<tr>
<td>SME</td>
<td>Advisory services (technical support, accounting, marketing, certification) supply</td>
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<tr>
<td>Producer groups</td>
<td>Berry  production, harvest and trade</td>
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<tr>
<td>Cooperatives</td>
<td>Knowledge transfer (creation, storage, conversion and sharing)</td>
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<td></td>
<td>Supply of advisory services (technical support, accounting, marketing, certification)</td>
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<td></td>
<td>Berry  harvest and trade</td>
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<tr>
<td>Farmer associations</td>
<td>Support and sectoral promotion</td>
</tr>
<tr>
<td>Sectoral associations</td>
<td>Promotion and support of knowledge creation and exchange</td>
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<td></td>
<td>Support and sectoral promotion</td>
</tr>
<tr>
<td></td>
<td>Internationalization and innovation promotion</td>
</tr>
<tr>
<td>R&amp;D public institutions</td>
<td>Knowledge creation, storage, conversion and sharing</td>
</tr>
<tr>
<td>R&amp;D private institutions</td>
<td>Knowledge creation, conversion and sharing</td>
</tr>
<tr>
<td>Local governments</td>
<td>Supporting and encouraging enterprising farmers (land banks, business incubators, licensing new projects), territorial marketing</td>
</tr>
<tr>
<td>Public regional advisory agencies</td>
<td>Providing support to project installation management and technical advice</td>
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<tr>
<td></td>
<td>Knowledge transfer (creation, storage, conversion and sharing)</td>
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</tbody>
</table>
5 | The *Small Fruits Cluster (SFC)* – Groups of actors

1. Core group with four organizations (1 FBO, 2 R&D, 1 FBO-internationalisation promoter; that coordinates the network and includes their key facilitators.

2. Independent producers, producer groups, small and medium firms of producers and others, cooperatives, farmer associations, private advisors, project developers and up and downstream firms, among others (knowledge and information supply)

3. Inexperienced producers (this is the largest group, with hundreds of producers, although not all of them participate in CSF activities, they are the demanders for information and skill)

4. The local governments and local development associations of central-northern region (enablers and supporters).
5 | The SFC – Network interactions

Fig. Interactions among the SFC network interviewed actors
5 | The SFC – Knowledge network actors interaction

CFS network interactions according to the categories of actors

Colors
Yellow - Receive interactions
Green – Seek interactions

Lines
-- Network border
■ Strong connections
— Weak connections

Symbols
☆ Sectoral association
□ R&D public and private organisation
▲ Public sector departments and public regional agency
◆ Farmer association, Cooperatives, Profit and non-profit producer groups
□ Local Governments and local development associations
○ Inexperienced producers
○ Experienced producers (independent producers and private companies)
○ Private advisors, project developers, up and downstream firms
☑ Other actors
The SFC – Spatial configuration

Legend:
- ★ Sectoral association
- ● R&D public or private services
- □ Farmer association
- ♣ Cooperatives
- ■ Producer group
- ○ Experienced producer (independent producers and private companies)
- △ Inexperienced producer (independent producers and private companies)
- ▲ Public regional agencies
- ⬇ Local governments and local development associations
- — NUT II
The CSF illustrates how social interaction becomes a powerful tool capable of enhancing systemic innovation, that is mostly incremental in its nature and resorting to processes of imitation and informal collective learning experiences to solve practical problems, within which farmers act as knowledge co-creators and exchangers.

- In the case of mature producers, collaborative innovation processes take place in their own networks, involving other experienced producers (national and abroad), buyers and researchers who are largely outside the CSF.

- They rely on incremental innovation processes, products and marketing. In their innovation processes, they combine scientific, synthetic and tacit knowledge, aiming at continuously improving their production practices (e.g. irrigation and fertilizer dosing and timing) and adjusting their products to market demand.
6 | Key findings

❖ Cluster built on various asymmetries:
  ▪ Geographical (Central-Northern vs. Southern)
  ▪ Experience (Inexperienced vs. Experienced)
  ▪ Cognitive (Starters vs. Optimisers)
  ▪ Cohesion (Tensions vs. Stability)

▪ Still it has shown able to deliver knowledge an information to small-scale young inexperienced producers

▪ By proving a learning platform with interaction opportunities for actors, namely producers with relevant distances: geographical, experience and cognitive

▪ Challenge is how to enhance SFC cohesion and long run stability
7 | Lessons learned

❖ The CSF illustrates that the facilitator function is important and that it might assume different configurations:

a) bridging and brokering analytical and synthetically knowledge delivered by researchers;

b) enabling the bridge between different actors.

❖ Pioneers, best farmers or innovation-led farmers appear to be good bridging communication facilitators (overcoming cognitive distances)

❖ The inclusiveness can be a critical feature of knowledge and innovation networks focused on productivity and sustainability gains, such as the case of the OG designed under the EIP-AGRI framework, because when there is a segregation between farmers with more access to scientific and technical knowledge and the ones that have less ability to do that, the goals of EIP-AGRI will be attained only in a limited level.
Inclusiveness can be achieved by knowledge and innovation networks in spite of geographical and cognitive distances, when farmers share **common goals** (such as the competitiveness of the sector).

Imbalances and tensions within knowledge and innovation networks caused by geographical and cognitive distances between key actors might be surmounted with **wise governance structure**, namely through the inclusion of best/pioneer farmers and ensuring the representativeness of the different types of actors: sectoral associations, advisory services and researchers.

**Agglomeration economies based networks**, which are very important in some agricultural sectors (e.g. fruit, wine) and in countries or regions where **small-scale farm is significant**, can in fact be the grounds for knowledge and innovation networks in the sense wanted by the EIP-AGRI, since inclusiveness and facilitation functions are accounted for properly.
Acknowledgments

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