SmartAgriHubs

Connecting the dots to unleash the innovation potential for digital transformation of the European agri-food sector

	Proposal full title	Connecting the dots to unleash the innovation potential for digital transformation of the European agri-food sector
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2	BioSense Institute	RS	24	Natural Resources Institute Finland	FI
3	Schuttelaar & Partners	NL	25	Biedrība "Zemnieku saeima"	LV
4	Zuidelijke Land- En Tuinbouworganisatie Vereniging	NL	26	Instytut Chemii Bioorganicznej PAN	PL
5	Institut fur angewandte Systemtechnik Bremen GmbH - ATB	DE	27	Research Institute of Agricultural Economics	HU
6	Flanders Research Institute for Agriculture, Fisheries and Food	BE	28	Copa-Cogeca	EU
7	Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek - TNO	NL	29	International Federation of Organic Agriculture Movements European Union Regional Group - IFOAM	EU
8	Consejería de Agricultural, Pesca y Desarrollo Rural	ES	30	EC des groupements de constructeurs du Machinisme Agricole - CEMA	BE
9	Universidad de Almeria	ES	31	Fundacion Centro Tecnoloxico de Telecomunicacions de Galicia	ES
10	Fraunhofer Institute for Manufacturing Eng. and Automation	DE	32	The Bulgarian Association of Software Companies - BASSCOM	BG
11	Consultoria Agro-industrial	PT	33	FarmHack	NL
12	Waterford Institute of Technology	IE	34	European Business and Innovation Centre Network	BE
13	Innovation for Agriculture	UK	35	FIWARE Foundation e.V	DE
14	Conseil régional des Pays de la Loire	FR	36	Animal and Grassland Research and Innovation	IE
15	Association de Coordination Technique Agricole	FR	37	Codeplus	IE
16	ASTER S. Cons PA	IT	38	Ingenera	CH
17	Confederazione Nazionale Coldiretti	IT	39	Munster AI Group	IE
18	Landwirtschaftskammer Österreich	AT	40	Irish Cattle Breeding Federation	IE
19	WirelessInfo	CZ	41	Energy MoniToring Ireland	IE
20	MSG Marketing Service Gerhardy	DE	42	Cross Farm Solutions	AT
21	Agricultural University of Athens	GR	43	Ingenieurbüro für Elektrotechnik	AT
22	The National Federation of Producers in Agri-Food Industry and Related Services	RO	44	Josephinium Research	AT

#	Participant Organization Name	Country	#	Participant Organization Name	Country
45	Farmdok	AT	77	SunGIS	LV
46	Robovision	BE	78	Lesproject sluzby	CZ
47	Exobotic	BE	79	InfAgri85	FR
48	BIOSCOPE	NL	80	IQ Management	RO
49	Aurea Imaging	BE	81	Smart Research&Development Intl.	RO
50	AVR	BE	82	OriginTrail	SI
51	Synthesa	BE	83	Verein zur Förderung der bäuerlichen Veredelungswirtschaft	DE
52	Stienen	NL	84	Mitteldeutsche Agentur für Informationsservice	DE
53	Van Mierlo Ingenieursbureau B.V.	NL	85	Landwirtschaftskammer Niedersachsen	DE
54	Neuropublic	GR	86	innoSEP	DE
55	Tekever Autonomous Systems	PT	87	Danfoil	DK
56	Easytosee Agtech S.L	ES	88	Gothia Redskap	SE
57	Instituto Nacional de Investigação Agrária e Veterinária	PT	89	Agro Business Park	DK
58	Grupo Hispatec Informática Empresarial S.A.	ES	90	Smart Agritech Solutions	SE
59	Empresa de Desenvolvimento e Infra-estruturas do Alqueva, S.A.	PT	91	Thorsen Teknik	DK
60	Unparallel Innovation, Lda	PT	92	Seragro Sociedad Cooperativa Galega	ES
61	Taddei Sonia	IT	93	Alltech	ES
62	Nordi Giuseppino	IT	94	ELMEGA	ES
63	DnaPhone	IT	95	Monet Tecnología E Innovación Sl	ES
64	Casella Macchine Agricole srl	IT	96	SoundTalks	BE
65	V-SAFE	IT	97	Instituto Galego Da Calidade Alimentaria	ES
66	Uni. Cattolica Del Sacro Cuore	IT	98	Terrasolis	FR
67	GrainSense	FI	99	Università degli Studi di Ferrara	IT
68	Agrointelli	DK	100	Marathon Bio Products	GR
69	Agroväst Livsmedel	SE	101	MeteoBlue	SE
70	Cybernetic Technologies NETIC	PL	102	Consultores De Automatización Y Robótica	ES
71	Wielkopolska Agri.Advisory Centre	PL	103	Vervaeke	BE
72	Poznan University of Life Sciences	PL	104	Cajamar	ES
73	AgriWatch	NL	105	API-AGRO	FR
74	Sistemas De Informação FreedomGrow	PT	106	Forest, Environmental Research and Services Ltd	IE
75	Przemyslowy Instytut Maszyn Rolniczych	PL	107	Groupe Provence services	FR
76	Baltic Open Solutions Center Ltd.	LV	108	PNO International	NL

Towards the Digital Transformation of the European Agri-Food Sector

SmartAgriHubs

ECOSYSTEM

108 Partners Involved covering all EU

68 partners are SMEs

54% of budget allocated to SMEs

OPEN CALLS

6M EUROS distributed through Open Calls

75% of Open Call budget to SMEs

70 New Innovation Experiments

DIGITAL INNOVATION HUBS

140 DIHs in the existing Network covering all **28 Member States**

Regional Approach – **9 Regional Clusters**

Attract **260 New DIHs**

FLAGSHIP INNOVATION EXPERIMENTS

28 FIEs

22 Countries involved

13 Cross-border collaboration FIEs (47%)

IMPACT

30M additional funding mobilized from other sources (public, regional, national and private)

80 new digital solutions introduced into the market

2M Farms involved in digitisation

Aquaculture: **1** (3,5%)

Arable: **8** (28,6%)

Livestock: **10** (35,7%)

5 sectors

Fruit: **4** (14,2%)

Vegetable: **5** (17,8%)
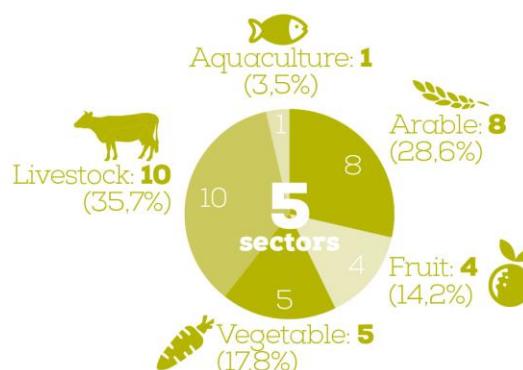
Unique Selling Points

1 **Diverse, yet Inclusive Ecosystem of Agri-Food Innovators:** A broad value-chain network covering all EU member states and relevant players, with emphasis on farmers and farmers' organizations, ensuring that all stakeholders will benefit from the Digital Transformation of the European agri-food sector.

2 **Extensible Portfolio of Pan-European Innovation Experiments:** 28 Flagship Innovation Experiments, selected through an open and inclusive procedure, ensuring not only geographic and thematic coverage, but also replicability across Europe and the ability to mature the DIH innovation services. Open Calls will further expand the network capturing new technological advancements and farmer's needs.

3 **Destined to be a Sustainable DIH-network:** SmartAgriHubs will ensure that all DIHs will have an adequate portfolio of mature innovation services through which farmers, advisors AgTech SMEs in a local one-stop-shop get access to the latest knowledge, expertise, technology and finance. The network of DIHs that will ensure replication of innovations throughout Europe will be sustained after the project.

4 **Strong synergies with RIS3:** Embedded in Smart Specialization Strategy of European Regions, SmartAgriHubs will leverage all available resources, matching public and private funding with emphasis on Structural Funds. The SmartAgriHubs network will actively support all actors of the innovation ecosystem, from farmers wanting to invest in digital solutions to regional governments wanting to design effective digital transformation strategies and interventions.

5 **High-Calibre Consortium:** Orchestrated by Wageningen Research, the global leader for agri-food R&I with a proven track record in coordinating complex innovation actions, SmartAgriHubs is uniting the entire European ecosystem of digital innovation players. This consortium will guarantee a maximum ROI for European taxpayers and a vital agri-food sector that produces adequate and safe food for future generations.

Abstract

SmartAgriHubs is dedicated to accelerate the digital transformation of the European agri-food sector. It will consolidate, activate and extend the current ecosystem by building a network of Digital Innovation Hubs (DIHs) that will boost the uptake of digital solutions by the farming sector. This will be achieved by integrating technology and business support in a local one-stop shop approach involving all regions and all relevant players in Europe.

The heart of the project is formed by **28 flagship innovation experiments** demonstrating digital innovations in agriculture, facilitated by DIHs from **9 Regional Clusters** including all European member states. Concurrently, SmartAgriHubs will improve the maturity of innovation services of DIHs so that digital innovations will be replicated across Europe and widely adopted by European farmers.
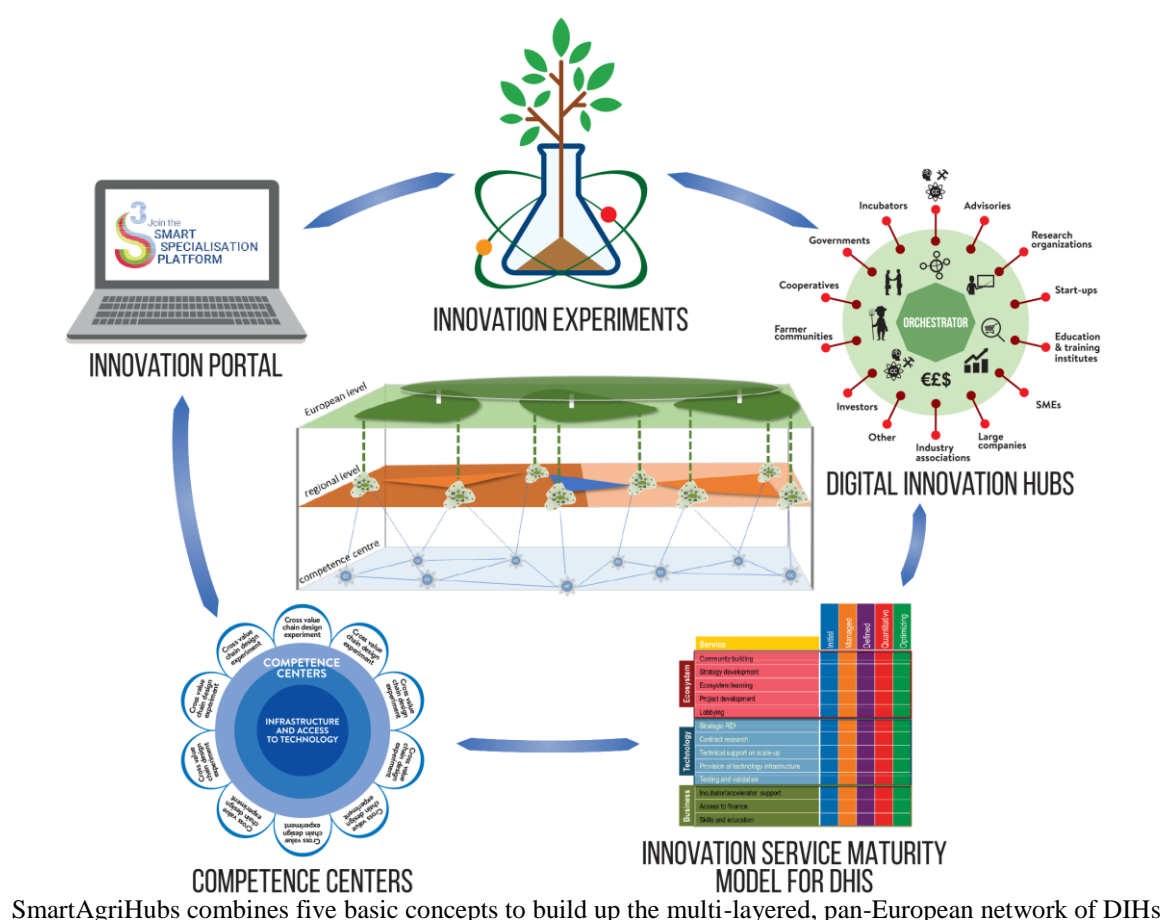
A **lean multi-actor approach** focusing on user acceptability, stakeholder engagement and sustainable business models will boost technology and market readiness levels and bring user adoption to the next level. This will be enhanced by synergetic effects between SmartAgriHubs and RIS3, since SmartAgriHubs will work in lock step with European regions to maximize the return of European investments, including regional structural funds and private capital.

Open Calls with a total budget of ±6 M€ will expand the network and ensure that technological developments and emerging challenges of the agri-food sector are incorporated in the DIH service portfolio. SmartAgriHubs' inclusive structure and ambitious targets will bring the entire European ecosystem together, connecting the dots to ensure global leadership for Europe in the AgTech market.

The consortium, led by Wageningen Research and other partners of previous key projects such as IoF2020, FIWARE, S3P Agri-Food and I4MS, will leverage the existing ecosystem and guarantee a maximum ROI for European taxpayers and a vital agri-food sector producing adequate and safe food for future generations.

SmartAgriHubs project at a glance

SmartAgriHubs aims to build a strong, multi-layered network of agricultural Digital Innovation Hubs (DIHs) and Competence Centres (CCs) to exchange knowledge and create a pan-European market for digital solutions for farming and food production. The basis is formed by a network CCs that are connected to a regional layer of adjacent DIHs. These will be coordinated by regional clusters and managed at the European project level. As indicated in figure below, the SmartAgriHubs network combines five basic concepts that are based on validated methodologies and models: **(i) the Competence Centres (CCs)** form the cornerstone for DIHs where expertise, test infrastructures, etc. are available **(ii) Digital Innovation Hubs (DIHs)** through which the competences are matched with demands, ideas, funding, etc. and orchestrated and supported by concrete services to translate this interaction into **(iii) Innovation Experiments (IEs)** in which ideas, concepts, prototypes, etc. are further developed, tested and finally introduced into the market. Because most of the current Agricultural DIHs are not yet fully ready to realize the desired digital transformation, the **(iv) the Innovation Services Maturity Model (ISSM)** will monitor, assess and help to let the DIHs' innovation services to reach their desired level. In the end we'll have to deal with large numbers of DIHs, CCs, IEs and interactions between them, so an **(v) Innovation Portal** becomes unbearable as a searchable register, knowledge exchange, brokerage, etc. The next paragraphs will explain in more detail how we have prepared these building blocks to build up the network.

SmartAgriHubs combines five basic concepts to build up the multi-layered, pan-European network of DIHs

Innovation Experiments (IEs)

Innovation experiments are conducted through DIHs **enabling access to the latest knowledge, expertise and technology (through CCs) for any business by testing and experimenting digital innovations relevant to its products, processes or business models**. IEs will play a crucial role in network expansion for SmartAgriHubs and thus strengthen the network of DIHs and CCs in numbers and quality of services. SmartAgriHubs has **identified a critical mass of dedicated, pan-European so-called Flagship Innovation Experiments (FIEs)** through its network of regional cluster leaders. First, a long list was created based on the following criteria:
- Innovativeness of the experiment,
- FIE should be endorsed by an existing DIH and should develop/improve specific DIH services,
- at least 75% of the budget needs to be allocated to SMEs,
- private sector organization will get 70% of their costs subsidized,

- per partner the budget is between 40.000 and 100.000 €,
- brings together end-users (e.g. through farmer's associations or similar organisations) and technology providers (either a CC or AgTech SME),
- combining with other funds is applauded.

Through a careful selection process, a **well-balanced set of 28 FIEs was defined** putting the **emphasis on DIH services reusability**. The selection imposed the necessity of having IEs with ideas diversity, tackled intra-border challenges, properly addressed contribution to the major digitization challenges in the agri-food sector and ideas that demonstrate the variety in approaches to use innovative digital solutions and competences.

#	Regional Cluster	#	Title	Countries involved	Sector	TRL Current	TRL Target
1	British Isles (UK & Ireland)	1	Farm Sustainability Audit	IE, CH	Livestock	5/6	7/8
		2	Sustainability tool for remote assessment and management of farmland – STREAM	IE	Livestock	5	9
2	Scandinavia	3	Digitising farm machinery produced by SMEs	DK, SE, FI	Arable	7/8	9
		4	Adopting digital technologies by farmers	DK, SE, FI	Livestock	7	9
		5	Digital tools and knowhow for valued grain chain	DK, SE, FI	Arable	8	9
3	France	6	Co-creation of value and innovations in horticulture - AgriFarmLab	FR	Vegetables	6/7	8/9
		7	Information system and DSS tool for cereals cultivation - Digi-PILOTE	FR	Arable	6	9
		8	Decision support tool for digifarmers - STRATE-GEEK	FR	Arable	6	9
4	North West Europe	9	Deep learning and hyperspectral imaging - AI4AGRICULTURE	BE	Vegetables	5/6	7/8
		10	Smart data use on arable farms – Farmcube	NL, BE, DE	Arable	5	8
		11	Pig health assessment based on sensors - SmartPigHealth	DE	Livestock	6/7	8/9
		12	Improving responsibility in livestock production - DIG-ITfarm	BE, ES, DK	Livestock	6	8
		13	Ammonia Emission Monitoring Network – AEMON	BE, NL	Livestock	6	8
5	Central Europe	14	Mower-robot for Vineyards	AT	Fruits	4	7
		15	Precision Farming on small-scale farms	AT	Arable	6	8
6	North East Europe	16	E-services using drones for quantity buyers	PL	Fruits	5	8
		17	On-line DSS for optimizing fertilisers - PULS for fertilizers	PL, NL	Vegetables	5/6	7
		18	Autonomous Greenhouses – smart micro farming and smart large-scale production	PL, GB, ES, SI	Vegetables	5	9
		19	Bee Monitoring and behaviour prediction	LV	Livestock	5/7	7/9
		20	Ground Water and Meteo sensors experimentation	LV, CZ, CH	Arable	7/9	9
7	Iberia	21	Sensoring and AI algorithms for early crop disease detection – SAIA	PT, ES	Fruits	4	7
		22	Iberian Irrigation Portal	PT, ES	Arable	5	7
		23	Data-Intensive Dairy Production	ES	Livestock	5	7
8	Italy	24	Implementation of ICT in aquaculture - AquacultuER4.0	IT	Aquaculture	4/6	7/9
		25	Data driven and precision-based management in vineyards – VINPREC	IT	Fruits	4	7/8
9	South East Europe	26	Digitizing Leafy Vegetables	GR	Vegetables	5	8
		27	Animal Identification with IoT	RO	Livestock	4	7
		28	Decentralised trust in agri-food supply chain	SI, SRB	Livestock	6	8/9

Overview of Flagship Innovation Experiments in 9 regional clusters

For the proper classification of the FIEs, SmartAgriHubs distinguishes the following categories in terms of:

- **Regional coverage** – SmartAgriHubs is using a regional cluster approach, where each cluster represents a group of DIHs and CCs within a region, has a pan-European coverage and will intensify outreach of technological transformation. The FIEs are distilled from **9 regional clusters**: UK & Ireland, Scandinavia (Sweden, Norway, Finland, Denmark), France, North West Europe (Germany, Belgium, The Netherlands), Central Europe (Austria, Czech Republic, Swiss, Slovakia, Hungary), North East Europe (Poland, Baltic countries), Iberia (Spain, Portugal), Italy and South-East Europe (Greece, Balkan countries).
- **Cross-border activities** – SmartAgriHubs project **aims to be highly inclusive, not discriminating regions with low technological advancement**, but rather strives to **close the digitization gap among regions**. Therefore, half of the total number of SmartAgriHubs FIEs are built on cross-border collaboration to ease and promote technology uptake and use of DIHs services, especially for SMEs as it enables access to technological, business and ecosystem services.
- **Thematic coverage** – European regions are identifying their key sources of agri-food competitive advantages and are building their Smart Specialization Strategies (RIS3) on these. DIHs strategies are **aligning with RIS3** and our FIEs have took it into account. As a consequence, SmartAgriHubs is covering variety of **agricultural sectors and application areas, organized into 5 groups**: aquaculture, arable farming, livestock, fruits and vegetables, while all 5 groups incorporate a **value chain approach**, also addressing logistics and retails.
- **DIHs services** – All FIEs are closely linked to the DIHs and their services. Regarding technology services, FIEs require technical support, experimentation testing, demonstration, and validation. The business services are associated to finance and funding access, market intelligence, business support and development, commercial infrastructure. Mentoring, community building, training, dissemination, and accelerating adoption are required ecosystem services.

Stakeholders involved in the current Flagship Innovation Experiments
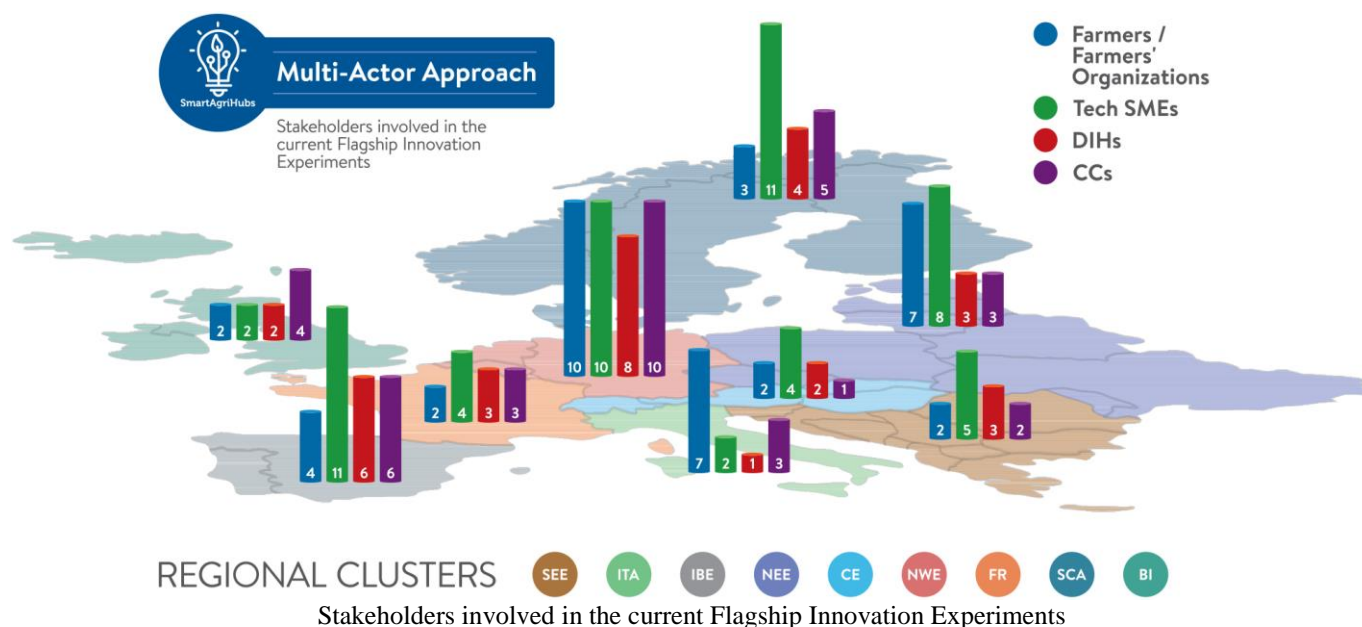
FIEs have been selected through **an open and inclusive procedure, ensuring replicability across Europe and the ability to mature the DIH innovation services**. The **FIEs will act as a role model for the next wave of IEs** that will be established by open calls. **The designated WP will monitor and evaluate the activities of IEs** based on predefined KPIs and significantly advance the TRLs of IEs through broad demonstration/validation campaigns. Moreover, it will identify synergies, reusable components, and joint activities among IEs to **maximize the market impact of the digital solutions that are developed**.
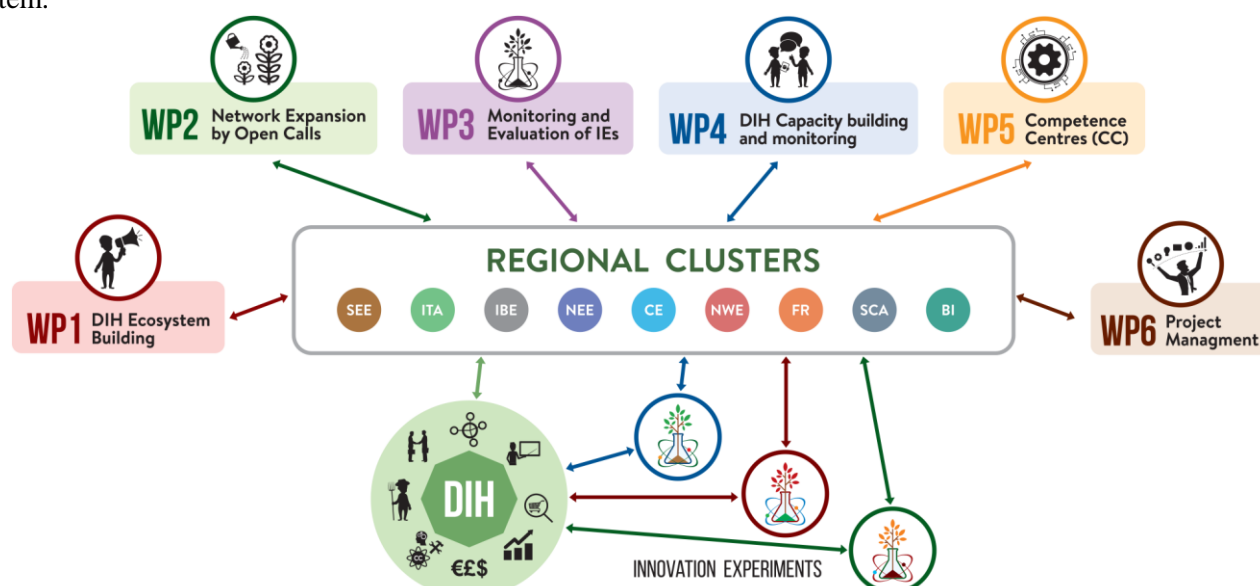
Regional clusters (RCs)

In the structure of the SmartAgriHubs proposal the Work Packages (WPs) operate at EU level. The Digital Innovation Hubs (DIHs) are established at regional level throughout Europe. The innovation actions in the project are executed as Innovation Experiments (IEs) that are initiated and endorsed by DIHs and also active in a specific region. The Regional Clusters (RCs) are the intermediate connection between the regional DIHs and IEs and the central WPs. For each Regional Cluster, a Regional Cluster Leader and Co-Leader have been appointed, as presented in the Table below.

Regional Custer	Regional Cluster Leader (RCL)	Regional Cluster Co-leader (RCCL)
Iberia	CAPDER (Judit Anda Ugarte)	Consulai (Luis Mira da Silva)
UK & Ireland	TSSG (Brian Fowley)	I4Agri (David Gardner)
France	Pays de la Loire (Anne-Claire Branellec)	ACTA (Adrien Guichaoua/ Mehdi Sine)
Italy	Emilia-Romagna Region (Sofia Michelli)	Coldiretti (Ambra Raggi)
Central Europe	LKÖ (Florian Herzog)	WirelessInfo (Karel Charvat)
North--West Europe	MSG (Hubert Gerhardy)	ILVO (Jurgen Vangeyte)
South-East Europe	AUA (Spiros Fountas)	PRO-AGRO (Viorel Marin)
Scandinavia	Seges (Nicolai Fog Hansen)	LUKE (Liisa Pesonen)
North-East Europe	ZSA (Inga Berzina)	PSNC (Raul Palma)

Regional Clusters Leaders and Co-leaders

The RCs will contribute by: 1) Identify and maintaining a list of all DIHs in the region (related to WP4); 2) Periodically collecting basic information for each DIH in the region using templates provided by the core team (related to WP4); 3) Contacting DIH's in the region and Collecting ideas for monitoring the Innovation Experiments in the region, using templates provided by WP3. 4) Monitoring the region for funding schemes in their region that might offer opportunities for leverage with the SmartAgriHubs Open Calls (WP2).

As the figure below shows, the Regional Clusters (RCs) are the intermediate connection between the regional DIHs and IEs and the central WPs. Building the network of the Regional Clusters is key to form a flourishing eco-system around the Digital Innovation Hubs throughout Europe. The coordination part of the tasks to support the RCs are performed in WP6, whereas WP1 supports the Regional Clusters in the building and expanding of their regional eco-system.

Regional Clusters as the intermediate connection within SmartAgriHubs project