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**Resilient rural areas in the EU Common  
Agricultural Policy: Navigating the legal framework  
for Smart Villages and AKIS**

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# **Resilient rural areas in the EU Common Agricultural Policy: Navigating the legal framework for Smart Villages and AKIS**

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## **Abstract**

The paper aims to investigate the synergistic efforts of various interventions, including Smart Villages, AKIS, and cooperative frameworks, under Regulation (EU) 2021/2115, which supports within Common Agricultural Policy (CAP) strategic plans, in creating an enabling legal environment for resilient rural areas. The CAP addresses the pressing challenges faced by rural areas and agricultural communities, including demographic changes, environmental sustainability, and economic resilience. The inclusion of national AKIS strategies within the CAP Strategic Plans underscores the importance of a cohesive and dynamic innovation ecosystem. By detailing the legal framework and common indicators for assessing CAP objectives, the paper analyses the EU's commitment to sustainable agricultural practices and inclusive rural development, thus considering the synergistic efforts of the different interventions within CAP 2023-2027 to promote resilient rural areas.

## **Keywords**

Common Agricultural Policy; Smart Villages; Agricultural Knowledge and Innovation Systems (AKIS); European Innovation Partnership (EIP-AGRI); Rural Development

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SUMMARY: 1. Introduction. - 2. The Long-Term Vision for Rural Areas. - 3. Smart Villages strategies in the EU rural development policy. – 4. Agricultural Knowledge and Information Systems in the CAP. – 5. Common Agricultural Policy 2023-2027 and CAP Strategic Plan: Towards a comprehensive set of measures? – 6. Concluding remarks.

## **1. Introduction**

Farmers and rural communities face numerous challenges, including ensuring long-term food and nutrition security, enhancing environmental and climate resilience, and fostering socio-economic development in rural areas.<sup>1</sup> Despite the vital role of knowledge and innovation in addressing these challenges, agricultural research often remains fragmented and struggles to achieve practical application.<sup>2</sup> This leads to a significant underutilization of its potential. The limited adoption of new knowledge and solutions hampers the transition towards a more sustainable and competitive agricultural and food system, particularly affecting small and medium-sized farms.

Creating an environment that promotes rapid innovation and the effective utilization of existing knowledge is essential for achieving the objectives of the Common Agricultural Policy (CAP) and fulfilling international commitments across the European Union. From 2014 to 2020, the EU introduced various tools to foster innovation and advance practical knowledge. Notably, the European Innovation Partnership for Agricultural Productivity and Sustainability

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<sup>1</sup> See P. Cowie et al., *Smart rural futures: Will rural areas be left behind in the 4th industrial revolution?*, in *J Rural Stud*, 2020, 79, 169.

<sup>2</sup> See European Parliamentary Research Service, *EU agricultural research and innovation*, Briefing, January 2019. <[http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/630358/EPRS\\_BRI\(2019\)630358\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2019/630358/EPRS_BRI(2019)630358_EN.pdf)>

(EIP-AGRI) emerged as a significant policy and networking initiative aimed at accelerating on-the-ground innovation through an interactive model. This measure fosters collaboration among diverse stakeholders, including farmers, foresters, advisors, entrepreneurs, consumers, and researchers, with a focus on identifying the needs of end-users. By integrating different forms of knowledge, this collaborative approach facilitates the co-creation and dissemination of practical solutions.

In addition to providing financial support for interactive innovative projects, there is a pressing need to facilitate knowledge exchange and foster innovation processes within each Member State. Innovation evolves through the integration of diverse knowledge, stakeholders, technology, and investments. As stakeholders collaborate and share ideas, establishing adaptable innovation ecosystems within each Member State becomes crucial. Enhancing Agricultural Knowledge and Innovation Systems (AKIS) is therefore essential.<sup>3</sup> AKIS includes all individuals and entities involved in generating, disseminating, and utilizing knowledge and innovation across agricultural and interconnected domains within different regions and Member States. However, existing AKISs often fall short in addressing contemporary and future challenges, showing significant disparities among Member States and regions.<sup>4</sup> Through mutual learning, Member States can enhance their current AKISs by sharing insights and best practices, thus addressing these disparities.

The paper aims to investigate the synergistic efforts of various interventions, including Smart Villages, AKIS, and cooperative frameworks, under Regulation (EU) 2021/2115, which supports CAP strategic plans, in creating an enabling legal environment for resilient rural areas. In the context of CAP 2023-2027, the collaborative efforts of farm advisory services, CAP Networks, and the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI) are pivotal to advancing this goal. The integration of national AKIS strategies within the CAP Strategic Plans is expected to serve as a catalyst for the development and organization of national innovation ecosystems. The European Union is dedicated to ensuring well-functioning AKIS across its territory to prevent redundancy, reduce costs, maximize the impact of EU and national/regional funding, and accelerate innovation. The

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<sup>3</sup> See A. Knierim, K. Prager, *Agricultural Knowledge and Information Systems in Europe: Weak or strong, fragmented or integrated?*, PROAKIS Report, 2015. <[http://proakis.webarchive.hutton.ac.uk/sites/www.proakis.eu/files/AKIS\\_characterisation\\_briefing\\_final.pdf](http://proakis.webarchive.hutton.ac.uk/sites/www.proakis.eu/files/AKIS_characterisation_briefing_final.pdf)>

<sup>4</sup> See A. Knierim, *The AKIS concept and its relevance in selected EU member states*, in *Outlook on Agriculture*, 2015, 44(1), 29.

concept of Smart Villages, as promoted by the EU, plays a crucial role in this context.<sup>5</sup> Smart Villages leverage digital and other technologies to enhance the resilience, sustainability, and quality of life in rural communities. Their aim is to empower rural areas by increasing their capacity for innovation, fostering economic diversification, and improving service delivery through digital solutions. The Smart Villages initiative aligns with the goals of AKIS by integrating digital tools and collaborative approaches to address local needs and challenges. By fostering innovation and connectivity, Smart Villages contribute significantly to sustainable farming and robust food systems,<sup>6</sup> ensuring that rural areas remain active participants in the broader objectives of the CAP and EU policies.<sup>7</sup> This integrated approach is essential for building resilient rural areas capable of adapting to changing circumstances and contributing to the sustainable development goals of the EU.

## **2. The Long-Term Vision for Rural Areas**

The European Commission's 2020 Communication, "A Strong Social Europe for Just Transitions," highlighted several critical drivers for future rural policies.<sup>8</sup> Firstly, demographic trends indicated a decreasing population in many rural areas, exacerbated by an ageing population, particularly in these regions where the natural demographic balance was more negative compared to cities. The Communication acknowledged that the green, digital, and demographic transitions affect people differently and that these changes would necessitate a long-term vision for rural areas. This vision was intended to support rural areas in addressing their unique issues, such as ageing and depopulation, connectivity, risk of poverty, and limited access to services, social protection, and healthcare. Additionally, the insights gained from the Covid-19 pandemic underscored the need to improve rural quality of life, achieve balanced

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<sup>5</sup> For a general analysis of the Smart Villages policy, see S. Stojanova, *Smart Villages Policies: Past, Present and Future*, in *Sustainability*, 2021, 13(4). See also

<sup>6</sup> See L. Klerkx et al., *A review of social science on digital agriculture, smart farming and agriculture 4.0: New contributions and a future research agenda*, in *NJAS-Wageningen journal of life sciences*, 2019, 90, 100315.

<sup>7</sup> See V. Zavrtnik et al, *Smart Villages: Comprehensive Review of Initiatives and Practices*, in *Sustainability*, 2018, 10(7).

<sup>8</sup> See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A Strong Social Europe for Just Transitions, COM (2020) 14 final.

territorial development, and stimulate economic growth in rural areas.<sup>9</sup> Thus, the Long-Term Vision for Rural Areas (hereinafter, LTVRA) communication, issued in June 2021, aimed to tackle the challenges of ageing, depopulation, access to and enhancement of basic services, poverty risk, and the implementation of digital solutions to improve connectivity in rural areas.<sup>10</sup>

Considering the EU Green Deal commitments,<sup>11</sup> demographic changes, and the multifaceted challenges impacting rural areas and communities, the Long-Term Vision for Rural Areas serves as a strategic roadmap to ensure a just transition in rural areas by 2040.<sup>12</sup> The European Commission, adhering to its dedication to democracy and equality and recognizing the effects of demographic shifts, pledges to leave no one and no place behind, bringing the EU closer to its citizens. The LTVRA provides a new framework for rural development.<sup>13</sup> This updated rural policy narrative continues the EU's evolving policy trajectory, which began with the Communication on the Future of Rural Society,<sup>14</sup> and includes the Cork Declarations of 1996 and 2016.<sup>15</sup> It also draws inspiration from the OECD's New Rural Paradigm,<sup>16</sup> and the Rural Policy 3.0 framework, emphasizing the well-being of rural communities.<sup>17</sup>

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<sup>9</sup> M. Monteduro, A. De Nuccio Alice, *Multifunzionalità dell'agricoltura per la rigenerazione delle aree rurali a rischio di desertificazione demografica, economica e socio-culturale*, in *Le Istituzioni del Federalismo*, 2020, 2, 365.

<sup>10</sup> See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A long-term Vision for the EU's Rural Areas - Towards stronger, connected, resilient and prosperous rural areas by 2040, COM/2021/345 final.

<sup>11</sup> For a comprehensive analysis of the Green Deal, see P. Lattanzi, Il "New Green Deal", la Pac 2021-2027 e la sostenibilità nelle produzioni alimentari, in P. Borghi, I. Canfora, A. di Lauro, L. Russo, *Trattato di diritto alimentare italiano e dell'Unione europea*, Giuffrè, Milano, 2021.

<sup>12</sup> For an overview of the relationship between Green Deal and regionalization, see the recent analysis in K. Gromek-Broc, K. *The European Green Deal and Regionalisation*, in K. Gromek-Broc (eds), *Regional Approaches to the Energy Transition*, Springer, 2023.

<sup>13</sup> See M. Pertoldi et al., *Handbook of Territorial and Local Development Strategies*, Publications Office of the European Union, Luxembourg, 2022.

<sup>14</sup> See Communication from the Commission, The Future of Rural Society, COM (88) 501.

<sup>15</sup> A conference on the future shape of Rural Development Policy was held in Cork, Ireland, from November 7-9, 1996. Over 500 participants engaged in three days of discussions, culminating in the presentation of the "Cork Declaration." This declaration encapsulates the participants' views on the requirements for Rural Development Policy post-1999. On September 6, 2016, DG AGRI presented the Cork Declaration titled "A Better Life in Rural Areas". This declaration was the result of a bottom-up approach, incorporating discussions held with stakeholders during a two-day conference. See the Cork Declaration titled "A Better Life in Rural Areas" at <[ec.europa.eu/enrd/sites/default/files/cork-declaration\\_en.pdf](http://ec.europa.eu/enrd/sites/default/files/cork-declaration_en.pdf)>.

<sup>16</sup> See OECD, *The New Rural Paradigm: Policies and Governance*, OECD Publishing, 2006.

<sup>17</sup> See OECD, *RURAL 3.0. A framework for rural development*, Policy Note, 2018.

The Long-Term Vision for Rural Areas (LTVRA) outlines a number of key areas for action to achieve stronger, connected, resilient, and prosperous rural areas by 2040. These areas are supported by flagship initiatives.<sup>18</sup> To create stronger rural areas, the LTVRA emphasizes empowering and energizing local communities. This involves engaging a broad range of stakeholders, networks, and all levels of governance to develop tailor-made, place-based, and integrated policy solutions and investments. In terms of resilience, the LTVRA focuses on preserving natural resources, restoring landscapes (including cultural aspects), greening farming activities, and shortening supply chains. These measures aim to increase rural areas' resilience to climate change, natural hazards, and economic crises. Lastly, to foster prosperity, the vision encourages diversifying economic activities into new sectors with positive employment effects and enhancing the value-added of farming and agri-food activities. This approach aims to create a more prosperous future for rural areas.

The LTVRA acknowledges that the CAP, through the European Agricultural Fund for Rural Development, is a key source of EU funding for rural areas.<sup>19</sup> It fosters a smart, resilient, and diversified agricultural sector, bolsters environmental care and climate action, and strengthens the socio-economic fabric of rural areas. However, there is a need for mechanisms to ensure that rural matters are addressed in a coordinated and coherent manner across all policy areas.<sup>20</sup>

Indeed, the successful implementation of the LTVRA requires a coordinated and coherent approach across different policy areas. Rural development cannot be addressed in isolation;<sup>21</sup> it must be integrated with broader economic, social, and environmental policies. Ensuring that rural matters are considered in all relevant policy areas will be crucial for the LTVRA's success. The LTVRA represents a comprehensive and forward-thinking approach to rural development. By addressing the unique challenges faced by rural areas through targeted interventions and coordinated policies, the European Commission aims to create resilient, sustainable, and

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<sup>18</sup> See Miller D. et al, *First set of recommendations for the development of future rural policies*, 2022. <[rural-interfaces.eu/wp-content/uploads/2022/04/SHERPA\\_D7.3\\_Recommendations-future-rural-policies\\_set1.pdf](https://rural-interfaces.eu/wp-content/uploads/2022/04/SHERPA_D7.3_Recommendations-future-rural-policies_set1.pdf)>

<sup>19</sup> See European Commission, Directorate-General for Agriculture and Rural Development, *Taking stock of how CAP strategic plans contribute to the objectives of the long-term vision for the EU's rural areas – Final report*, Publications Office of the European Union, 2023.

<sup>20</sup> See L. Naldi et al, *What is smart rural development?*, in *Journal of Rural Studies*, 2015, 40, 90. The author examines the policy-oriented concept of smart rural development, integrating the principles of smart growth and smart development within the EU strategy.

<sup>21</sup> See A. K. Górecka, *Smart villages and rural development*, in *Acta Scientiarum Polonorum*, 2021, 20, 39.



prosperous rural communities. The success of this vision will depend on effective implementation, stakeholder engagement, and continuous adaptation to evolving challenges and opportunities.

### **3. Smart Villages strategies in the EU rural development policy**

In the mid-2010s, the concept of Smart Villages began to take shape, drawing from initiatives in Africa, Central and South America, and Asia.<sup>22</sup> Within the European Union, this notion gained prominence through the 2016 Cork 2.0 Declaration for a Better Life in Rural Areas, which set forth a ten-point manifesto aimed at enhancing rural living standards. A key aspect of this manifesto was addressing the digital divide between urban and rural areas and leveraging the opportunities provided by connectivity and digitalization in these regions. The European Commission further advanced this concept in 2017 with the publication of "EU Action for Smart Villages." This document outlined various areas for intervention and the allocation of EU funds to actively support Smart Villages through a comprehensive and integrated approach. According to the publication, Smart Villages are communities that incorporate digital technologies and innovations into their daily activities, thereby improving their quality of life, enhancing public service standards, and optimizing resource use.

A Smart Village strategy is designed to identify challenges, needs, resources, and opportunities.<sup>23</sup> Rather than replicating existing strategies, such as those included in the LEADER approach, it aims to complement them, allowing both strategies to coexist within the same area.<sup>24</sup> Cooperation is fundamental to this approach, involving the establishment of partnerships and support from local authorities.<sup>25</sup> This cooperation encompasses partnerships among small villages and between small villages and nearby urban areas. Nonetheless, it is possible for a Smart Village to function as an independent entity without any cooperation. Smart

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<sup>22</sup> See Y. Liu, *Revitalize the world's countryside*, in *Nature*, 2017, 548, 275.

<sup>23</sup> See Navío-Marco J et al., *The rising importance of the "Smart territory" concept: definition and implications*, in *Land Use Policy*, 2020, 99.

<sup>24</sup> On the LEADER approach, see *inter alia* O. Müller et al, *Learning to LEADER. Ritualised Performances of 'Participation' in Local Arenas of Participatory Rural Governance*, in *Sociologia Ruralis*, 2019, 60, 222.

<sup>25</sup> In 2019, following contributions from online consultations in August 2018 and further discussions within the steering group of the pilot project "Ecosocial Smart Villages," an operational definition of "Smart Villages" was established. This definition highlighted the importance of local community involvement and the use of digital tools, focusing on several key characteristics.

Villages seek solutions that are locally rooted and capable of creating value and benefits for the community.<sup>26</sup> They are characterized by social and digital innovation, including broadband access, education, and the empowerment of rural communities. Additionally, other definitions have been proposed by stakeholders involved in rural development policies and practices.<sup>27</sup>

The European Commission's document on EU Action for Smart Villages referenced a pilot project initiated by the European Parliament, which aimed to examine the characteristics of Smart Villages and identify best practices for future development strategies.<sup>28</sup> The European Network for Rural Development, particularly its thematic group on Smart and Competitive Rural Areas, has played a key role in promoting this concept since September 2017. This group has increased interest and disseminated information on Smart Villages through briefings, case studies, practical advice, and a strategic toolkit for developing and implementing the Smart Villages concept. The Venhorst Declaration of October 21, 2017, marked another significant development.<sup>29</sup> It called on citizens and policymakers to contribute to the creation of sustainable rural communities, following the approach outlined by the Commission in its EU Action for Smart Villages<sup>30</sup>. The declaration also emphasized "*smart growth*", particularly the role of small

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<sup>26</sup> On the relationship between Smart Villages policy and community centred approach, see V. Zavrtnik, *Sustainable and Community-Centred Development of Smart Cities and Villages*, in *Sustainability*, 2020, 12(10).

<sup>27</sup> For comprehensive analysis of current state-of-the-art of the smart village concept based on a bibliometric analysis, see K. Bokun, J. Nazarko, *Smart villages concept — A bibliometric analysis and state-of-the-art literature review*, in *Progress in Planning*, 2023, 175.

<sup>28</sup> In December 2019, following a public procurement procedure, the European Parliament launched a new phase for Smart Villages by initiating a preparatory action on Smart Rural Areas in the 21st Century. The European Commission served as the awarding authority for this initiative. As part of this action, 21 Smart Villages were selected and established to act as models for implementing the Smart Villages concept. The project, which is set to be completed by June 2022, aims to identify the essential characteristics and related actions required for a village to become a Smart Village. After selecting the 21 Smart Villages, a roadmap toolkit was developed to outline the key steps for these villages to develop and implement their Smart Village strategies, complemented by additional practical tools. Throughout the project, various regional events and workshops will be organized to support and facilitate the development of Smart Villages.

<sup>29</sup> The third European Rural Parliament, held from October 18-21, 2017, in Venhorst, The Netherlands, culminated in the Venhorst Declaration. This declaration calls on citizens and policymakers to support the vitality of rural areas and to ensure that general policies and programs are rural-proofed. Supported by over 250 representatives from rural communities across 40 European countries, the declaration advocates for the creation of sustainable rural communities and a new era of bottom-up development. Participants also proposed the establishment of a new European fund for Community-led Local Development (CLLD). The declaration is accessible at <[www.erp2017.eu/wp-content/uploads/2017/06/The-Venhorst-Declaration-FINAL.pdf](http://www.erp2017.eu/wp-content/uploads/2017/06/The-Venhorst-Declaration-FINAL.pdf)>.

<sup>30</sup> On April 11, 2017, the European Commission launched the 'EU Action for Smart Villages,' announcing a series of initiatives spanning rural development, regional development, research, transport, energy, and digital policies and funds.

and medium-sized enterprises in rural areas. The Commission's Communication on the future of food and agriculture, published in November 2017, reaffirmed its commitment to supporting rural communities and local authorities in creating Smart Villages.<sup>31</sup> This support includes capacity building, investment, innovation support, networking, and innovative financing tools to improve skills, services, and infrastructure. An evaluation conducted for the European Parliament's Committee on Agriculture and Rural Development highlighted the need for significantly greater investments to improve digital connectivity in rural areas for the effective implementation of the Smart Villages concept. It emphasized the necessity of high-speed internet access across all rural regions. The Bled Declaration of April 13, 2018, further called for actions to digitize rural areas through Smart Villages, stressing the importance of ensuring that all parts of Europe benefit equally from the digital transformation.<sup>32</sup> Broadband and connectivity were identified as crucial steps in this digitalization process. Although digitalization is often emphasized, it is not considered a prerequisite for becoming a Smart Village.<sup>33</sup>

The Smart Villages concept's integration with existing strategies, such as the LEADER approach, highlights a thoughtful and adaptive policy design.<sup>34</sup> Rather than creating isolated or redundant frameworks, the EU's approach seeks to build upon and enhance existing initiatives, ensuring a more cohesive and effective environment. This complementary strategy fosters a holistic rural development support that can address various needs and challenges more efficiently. The pilot projects and thematic groups initiated by the European Parliament and the European Network for Rural Development have played an essential role in promoting and refining the Smart Villages concept. Their efforts in disseminating best practices, providing practical advice, and developing strategic toolkits are crucial for scaling up this initiative across

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<sup>31</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, The Future of Food and Farming, COM/2017/0713 final

<sup>32</sup> The Declaration titled "Smarter Future of the Rural Areas in the EU" was signed during a special event held on April 13, 2018, in Bled, Slovenia. The event was attended by Phil Hogan, the European Commissioner for Agriculture and Rural Development. The Declaration is accessible at <[pametne-vasi.info/wp-content/uploads/2018/04/Bled-declaration-for-a-Smarter-Future-of-the-Rural-Areas-in-EU.pdf](http://pametne-vasi.info/wp-content/uploads/2018/04/Bled-declaration-for-a-Smarter-Future-of-the-Rural-Areas-in-EU.pdf)>.

<sup>33</sup> On the relationship between rural development and digital transition, see K. Saleminck et al, *Rural development in the digital age: A systematic literature review on unequal ICT availability, adoption, and use in rural areas*, in *Journal of Rural Studies*, 2017, 54.

<sup>34</sup> See B. Slee, *Delivering on the Concept of Smart Villages – in Search of an Enabling Theory*, in *European Countryside*, 2019, 11(4), 634.

the EU. These efforts ensure that local communities have access to the necessary knowledge and resources to implement Smart Village strategies effectively.

#### **4. Agricultural Knowledge and Information Systems in the CAP**

In the past decade, the European Union has seen substantial growth in the concept of AKIS, which have gained considerable prominence and recognition.<sup>35</sup> AKISs provide a valuable framework for illustrating an innovation system, focusing on the organizations involved, their interconnected relationships, the institutional structure, and the incentives and budget mechanisms that drive them.<sup>36</sup> Over time, the scope of AKISs has expanded beyond its initial focus to include a broader approach to agricultural knowledge, policy, and various sectors. The importance of strengthening AKISs has been increasingly recognized, with the goal of forging stronger connections between scientific knowledge and practical applications.<sup>37</sup> This aims to facilitate knowledge exchange and foster innovation, ultimately benefiting European farmers and foresters. This evolution is exemplified by the launch of the European Innovation Partnership on Agricultural Productivity and Sustainability (EIP-AGRI) in 2012. This initiative not only established the foundational framework for EIP-AGRI Operational Groups but also contributed to the advancement and development of EU AKISs. Indeed, the development of AKISs marks a significant milestone in modernizing the agricultural sector within the EU. By focusing on interconnected relationships among various stakeholders, AKISs foster a more holistic approach to agricultural innovation policy.<sup>38</sup>

From 2014 to 2020, the European Commission actively promoted innovation and the development of practical knowledge.<sup>39</sup> A key initiative during this period was the EIP-AGRI, a

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<sup>35</sup> See EU SCAR, *Agricultural knowledge and innovation systems in transition – a reflection paper*, Brussels, 2012.

<sup>36</sup> See EU SCAR, *Agricultural Knowledge and Innovation Systems Towards the Future – a Foresight Paper*, Brussels, 2016.

<sup>37</sup> See EU SCAR AKIS, *Preparing for future AKIS in Europe: 4th report of the strategic working group on agricultural knowledge and innovation systems (AKIS)*, Brussels, 2019.

<sup>38</sup> See European Commission, *A strategic approach to EU agricultural research & innovation – Final paper*, 2016. <<https://ec.europa.eu/programmes/horizon2020/en/news/final-paper-strategic-approach-eu-agricultural-research-and-innovation>>

<sup>39</sup> A thought-provoking Foresight Study, conducted by the Strategic Working Group on AKIS within the Standing Committee for Agricultural Research (SCAR), highlighted concerns about the increasing privatization of knowledge and the growing reliance of farmers on commercial solutions. To foster universally accessible innovation, it is crucial to create an open ecosystem for sharing and constructing knowledge, providing a platform

significant policy and networking effort designed to accelerate ground-level innovation through an interactive model. This model thrives on collaboration among diverse stakeholders, including farmers, foresters, advisors, entrepreneurs, consumers, and researchers. The primary principle is to identify the needs of end-users and harness complementary expertise to co-create and effectively disseminate practical solutions. The interactive innovation model aims to enhance project impact by first pinpointing end-user needs and then fostering shared ownership throughout the project's lifecycle. This model places a strong emphasis on effective communication strategies and the broad dissemination of developed solutions and opportunities across various dimensions, including geography and sectors.

EIP-AGRI leverages a unique combination of resources from two synergistic European policies: Horizon 2020 and the rural development policy within the CAP. At the core of the EIP-AGRI under the CAP are Operational Groups, which are locally based interactive innovation projects that have a crucial role in facilitating the bottom-up development of innovative ideas through collaboration among various actors.<sup>40</sup> Facilitating the advancement of innovative projects and ensuring the dissemination and implementation of their outcomes is a pivotal goal within the framework of a dynamic AKIS 2.0. This approach aligns with the overarching objective of the CAP to modernize the sector through the cultivation of knowledge,

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for diverse actors to converge and nurture ideas. The success of EIP-AGRI demonstrates that collaborative efforts among AKISs are essential for achieving meaningful progress. A variety of interventions outlined in the CAP regulation can provide the necessary support for these efforts. To strengthen the connection between research and practical application, strategies such as incentivizing and recognizing researchers for their impact on agricultural practices can enhance their career progression. Researchers could also be encouraged to produce outputs tailored for practitioners, making knowledge more accessible to farmers, foresters, and businesses. Additionally, regular engagement with practitioners at thematic agricultural events can inspire and facilitate the exchange of insights. On-farm demonstrations can serve as platforms for researchers to share findings and engage informally, enhancing their understanding of farmers' needs. Moreover, specialized training sessions can equip researchers with the tools of the interactive innovation approach.

<sup>40</sup> The number of OGs initiated under rural development programmes has already surpassed 1,000, with expectations that this figure will triple by the end of the 2014-2020 RD period. While OGs operate at regional and national levels, a parallel effort exists on a broader scale. Over 180 European and international research and innovation projects funded through Horizon 2020 address similar agricultural and rural challenges. These initiatives, like the OGs, adopt the interactive innovation model—referred to as the Multi-Actor Approach (MAA) under Horizon 2020. This approach involves stakeholders with diverse expertise collaborating from project inception through implementation to yield innovative, practical, and shareable solutions. Encouraging linkages between Multi-Actor (MA) projects and OGs is a key feature of the EIP-AGRI calls for proposals, and robust support is provided through the EU repository and EIP-AGRI networks to facilitate these connections. See EIP-AGRI Seminar, CAP Strategic Plans: the key role of AKIS in Member States, SEMINAR REPORT, 16-18 September 2020.

innovation, and the digital transformation of agriculture and rural areas,<sup>41</sup> as articulated in Article 5 of Regulation (EU) 2021/2115 establishing rules on support for strategic plans.<sup>42</sup>

Moreover, establishing robust CAP networking capabilities for innovation at the national level will be instrumental in bolstering AKIS-related undertakings. This includes fostering closer collaboration among researchers, advisors, and CAP networks in an efficient and streamlined manner. As the reservoir of practical knowledge generated through EIP-AGRI continues to expand across the European Union, CAP networks will play a crucial role in distilling and transferring the most pertinent insights to benefit rural areas.

The emphasis on CAP networking capabilities underscores the importance of an integrated and coordinated approach to innovation. By fostering closer collaboration among various stakeholders at the national level, the EU can ensure that the benefits of AKISs and EIP-AGRI are widely disseminated and effectively implemented. This approach not only enhances the impact of individual projects but also contributes to the overall modernization and resilience of the agricultural sector. Thus, the EU's focus on developing and strengthening AKISs and the EIP-AGRI initiative may represent a forward-thinking and comprehensive approach to agricultural innovation. By fostering collaboration, prioritizing end-user needs, and leveraging a combination of resources, the EU aims to create a dynamic and resilient agricultural sector. The continued support for AKISs and CAP networks is crucial for ensuring that innovations are effectively disseminated and implemented, ultimately benefiting European farmers and rural communities.

## **5. Common Agricultural Policy 2023-2027 and CAP Strategic Plan: Towards a comprehensive set of measures?**

The Regulation 2021/2115 on CAP Strategic Plans renewed the relevance of the Smart Villages concept. Starting from the preambular paragraphs, the Regulation recognizes that, as

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<sup>41</sup> See P. Lattanzi, *L'agricoltura di fronte alla sfida della digitalizzazione. Opportunità e rischi di una nuova rivoluzione*, in *Rivista di diritto agrario*, 2017, 4.

<sup>42</sup> Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013.

many rural areas in the Union suffer from structural problems such as a lack of attractive employment opportunities, skill shortages, underinvestment in broadband and connectivity, digital and other infrastructures and essential services, as well as youth drain, it is fundamental to strengthen the socio-economic fabric in those areas, in particular through the development of ‘smart villages’ across the European countryside. When providing support for investments, Member States should take particularly into account the cross-cutting objective of modernising agriculture and rural areas by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas,<sup>43</sup> and encouraging their uptake. Support for investments in installation of digital technologies in agriculture, forestry and rural areas, such as investments in precision farming, smart villages, rural businesses and information and communications technology infrastructures should be included in the description in the CAP Strategic Plans of the contribution of those plans to the cross-cutting objective.<sup>44</sup>

This arguably aligns with the overarching CAP objective of "*modernizing the sector by cultivating knowledge, fostering innovation, and digitalizing agriculture and rural domains*" as provided under Article 5 of the CAP Strategic Plan regulation.<sup>45</sup> In the context of CAP 2023-2027, the collaborative efforts of farm advisory services (outlined in Article 15), CAP Networks (as per Article 126), and EIP-AGRI (indicated in Article 127) hold significant potential to advance this objective. Progress can be achieved through support provided under intervention categories that focus on knowledge exchange and information sharing (specified in Article 78) and cooperation (outlined in Article 77). Article 77 provides support for cooperation, and as further specified in the CAP Strategic Plans, to prepare and implement smart-village strategies, as determined by Member States.

The inclusion of national AKIS strategies within the CAP Strategic Plans (as outlined in Article 114) will act as a catalyst for the development and organization of the national innovation ecosystem. The CAP Networks will facilitate closer collaboration among researchers, advisors, and CAP networks in an efficient and streamlined manner, ensuring that the practical knowledge generated through EIP-AGRI continues to expand and be effectively

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<sup>43</sup> See V. Stein, C. Pentzold, *Perspectives for Digital Participation in Rural Areas*, in A. Lorenz, L.H. Anders (eds), *EU Citizenship Beyond Urban Centres. The Future of Europe*, Springer, 2023.

<sup>44</sup> See E. Melf-Hinrich et al, *Agricultural policy in the era of digitalisation*, in *Food Policy*, 2021, 100, 102019.

<sup>45</sup> See L. Russo, *La PAC Dal 2023: Le azioni sul primo e sul secondo pilastro*, in F. Albisinni, L. Costato (eds), *Trattato breve di diritto agrario italiano e dell'unione europea*, Cedam, 2023.

utilized across the European Union.<sup>46</sup> By distilling and transferring the most pertinent insights, CAP networks will significantly benefit their respective Member States or regions, fostering a robust and dynamic AKIS 2.0 that supports the modernization and digital transformation of agriculture and rural areas.<sup>47</sup>

The renewal of the Smart Villages concept under Regulation (EU) 2021/2115 is a significant step towards addressing the structural challenges faced by rural areas in the EU. According to article 7, the achievement of the objectives referred to in Articles 5 and 6(1) and (2) will be assessed using common indicators related to output, result, impact, and context as set out in Annex I. Output indicators will relate to the realized output of the supported interventions. Result indicators will pertain to the specific objectives mentioned in Article 6(1) and (2) and will be used to establish quantified milestones and targets for those objectives in the CAP Strategic Plans, as well as to assess progress towards those targets. Result indicators related to environmental and climate-related objectives may include interventions that contribute to fulfilling commitments from the Union legislative acts listed in Annex XIII. Impact indicators will relate to the objectives set out in Articles 5 and 6(1) and (2) and will be used within the context of the CAP Strategic Plans and the CAP. Finally, context indicators, referred to in Article 115(2) and listed in Annex I, will provide additional assessment metrics. Under the Annex 1 to the Regulation, devoted to impact, result, output and context indicators pursuant to article 7, the Smart Villages are expressly placed within the specific objective of promoting “*employment, growth, gender equality, including the participation of women in farming, social inclusion and local development in rural areas, including the circular bio-economy and sustainable forestry*”, and the impact indicators of “*I.24 Contributing to jobs in rural areas: Evolution of the employment rate in rural areas, including a gender breakdown; I.25 Contributing to growth in rural areas: Evolution of gross domestic product (GDP) per capita in rural areas; I.26 A fairer CAP: Distribution of CAP support; I.27 Promoting rural inclusion: Evolution of poverty index in rural areas*”. Thus, the result indicator n.40 measures

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<sup>46</sup> See G. Pisciotto Tosini, *Gli strumenti per le imprese: I servizi di consulenza alle imprese e i sistemi assicurativi*, in *Rivista Diritto Agrario*, 2022, 2, 321.

<sup>47</sup> For an analysis of the role of law in “catalyzing” the development and diffusion of sustainable innovation in agriculture, see T. Reinhardt, *Regulation of Digital Agriculture—A Law and Economics Perspective*, in K. Mathis, A. Tor (eds), *Law and Economics of the Digital Transformation, Economic Analysis of Law in European Legal Scholarship*, vol 15. Springer, 2023. See also B. Basso, J. Antle, *Digital agriculture to design sustainable agricultural systems*, in *Nature Sustainability*, 2020, 3, 254.



the number of supported smart-village strategies, in terms of smart transition of the rural economy.

## **6. Concluding remarks**

The analysis of the legal framework governing the CAP for 2023-2027 highlights the critical role of AKIS in addressing the multifaceted challenges faced by rural areas and in building Smart Villages. The CAP's emphasis on fostering innovation, digitalization, and effective knowledge dissemination aligns with broader EU objectives such as the Green Deal and the LTVRA. These policies collectively aim to create stronger, connected, resilient, and prosperous rural communities.

The introduction of initiatives like the European Innovation Partnership for Agricultural Productivity and Sustainability and the Smart Villages concept underscores the EU's commitment to integrating digital technologies and collaborative approaches in rural development. These initiatives facilitate the co-creation and dissemination of practical solutions tailored to the needs of end-users, thereby enhancing the socio-economic fabric of rural areas. The Smart Villages initiative exemplifies the EU's strategy to leverage digital tools to improve resilience, sustainability, and quality of life in rural communities, ensuring that these areas actively contribute to the CAP's overarching goals.

The CAP Strategic Plans for 2023-2027 further institutionalize support for innovation and digital transformation through mechanisms such as the farm advisory services, CAP Networks, and EIP-AGRI. These efforts are designed to foster a dynamic and interconnected AKIS, capable of driving sustainable agricultural practices and improving the overall competitiveness of the EU's agricultural sector. The inclusion of national AKIS strategies within the CAP Strategic Plans is pivotal in organizing and enhancing national innovation ecosystems, thereby facilitating better knowledge exchange and application.

Moreover, the regulatory framework's detailed provision for assessing the achievement of CAP objectives through common indicators ensures accountability and continuous improvement. The explicit recognition of Smart Villages within these indicators highlights the EU's commitment to rural development and the promotion of inclusive growth. By measuring the progress and impact of supported smart-village strategies, the CAP aims to ensure that rural areas are not left behind in the digital transition and are well-equipped to face future challenges.

In conclusion, the CAP 2023-2027 represents a comprehensive and forward-looking approach to agricultural and rural development. By prioritizing innovation, knowledge exchange, and digital transformation, it sets a robust foundation for sustainable and inclusive growth in rural areas across the European Union. The collaborative efforts encouraged by the CAP, combined with targeted support for AKIS and Smart Villages, underscore a cohesive strategy aimed at modernizing agriculture, enhancing environmental performance, and improving the socio-economic conditions of rural communities. As the CAP evolves, its success will largely depend on the effective implementation and continuous adaptation of these innovative frameworks, ensuring that the EU's rural areas remain vibrant and resilient in the face of evolving global challenges.