

BCO Network WEBseries

Digital transition for rural areas: The JRC Toolkit The Smart Villages approach

25 March 2025

Speakers:

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Digital transition:

Long-term implications for EU farmers & rural communities

25th of March 2025
Greta Hauer

EU Policy Lab

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EU Policy Lab

A collaborative and experimental space for innovative policymaking

https://policy-lab.ec.europa.eu/index_en

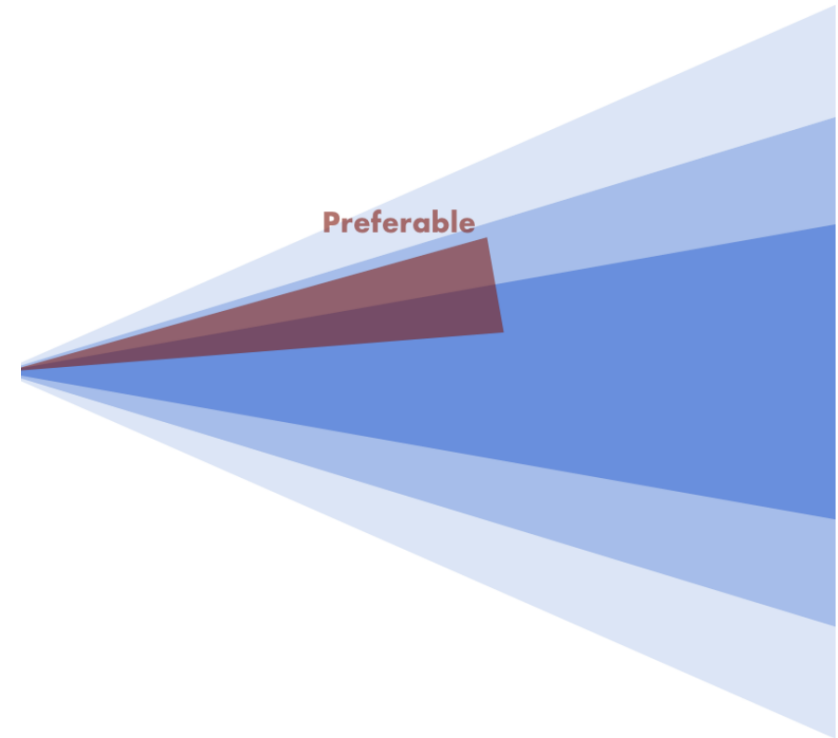
What is Foresight?

Medium/long-term perspective

Collective intelligence about future

Plausible rationales of possible developments

Future as something to **shape**

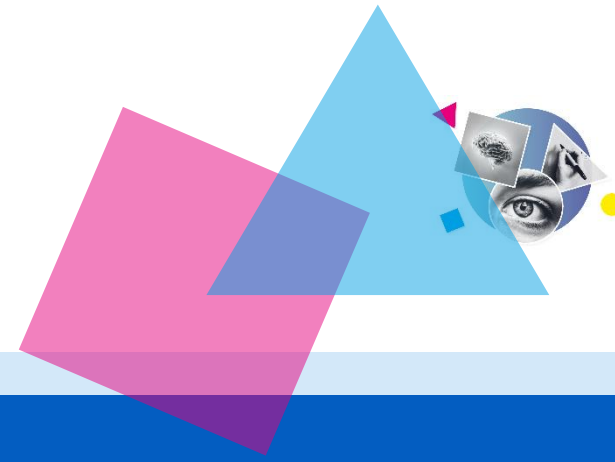


Building on previous JRC projects



Why using foresight for digital transition?

- Digital transition moves ahead at fast speed
- Technological treadmill, mostly driven by private sector
- Public sector risks lagging behind while it has roles and responsibilities
- Strategic foresight helps:
 - Systemic **understanding** of trends – multiple perspectives
 - **Anticipate** change, both incremental and disruptive
 - Build **priorities, vision, strategy**



The team



Evi Mourmoura



Pierluigi Londero



Fabio Cossu



Florence
Buchholzer



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Mondelaers



Orsolya
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Greta Hauer



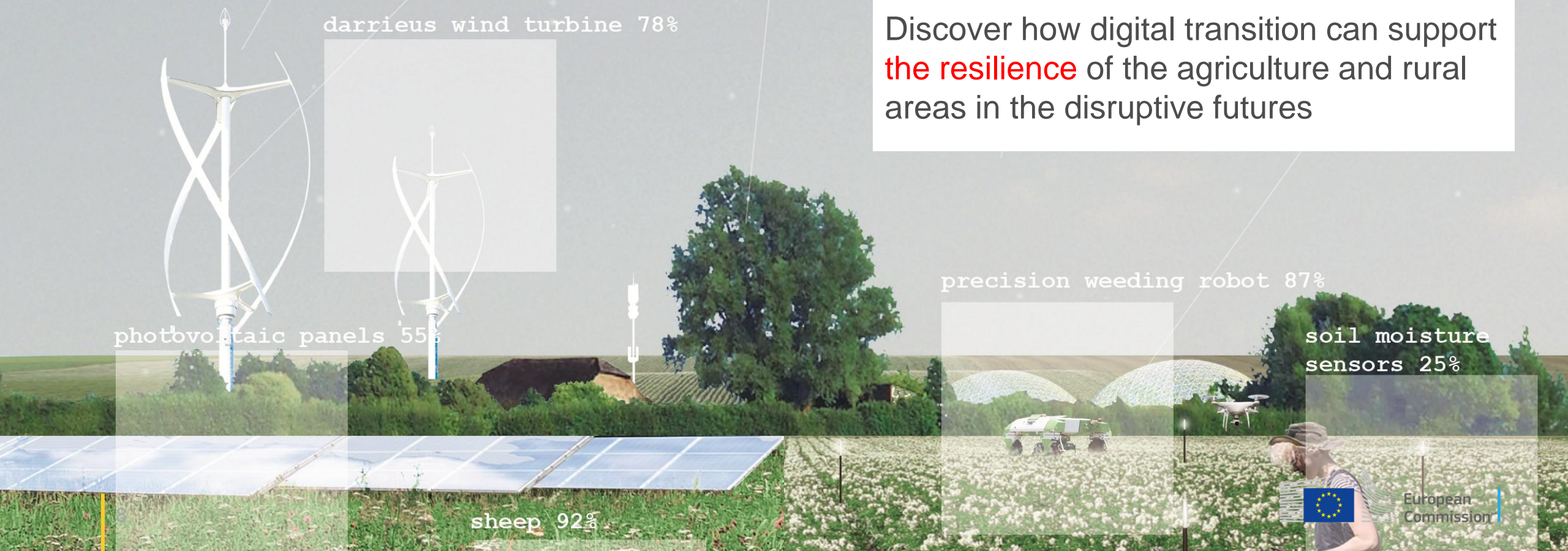
Anne-Katrin Bock

DG AGRI

EU Policy Lab

Digital transition: Long-term implications for EU farmers & rural communities

Discover how digital transition can support
the resilience of the agriculture and rural
areas in the disruptive futures



European
Commission

Links



[Link to the report](#)



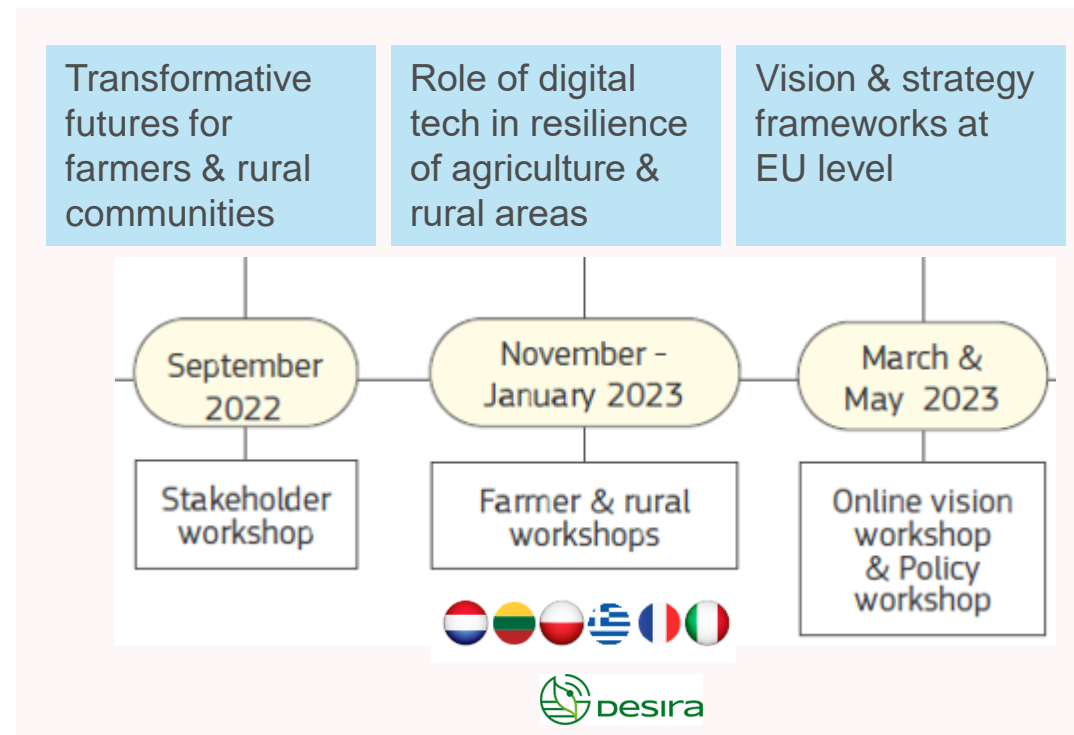
[Link to the digital version of the toolkit](#)



Digital Transition: Long-term implications for Farmers and Rural Communities

[Link to the video about the study](#)

Overview of the foresight process



Transformative futures 2040

Navigating Storms



High energy prices hinder advanced technologies. Food scarcity and land competition fuel social unrest. Regions focus on becoming self-sufficient, through decentralised solutions and frugal digital technologies.

Community revival amid technological collapse



Disruption of energy & internet connectivity infrastructure due to extreme weather events leads to frequent power outages, unstable internet connection & soaring energy prices.

Reclaiming digital sovereignty



When satellites fail, corporate farms struggle. Small independent farmers form communities focused on digital sovereignty and develop their own technologies.

Resilient roots to withstand the shocks



Despite disruptions to technologically advanced farms due to satellite failure, progress towards sustainability continues thanks to the resilience of regenerative farms and support from the green tech industry.

Implications for resilience



Broadband deployment as a foundation for resilience & critical enabler



Robustness to withstand extreme climate events and energy shortages



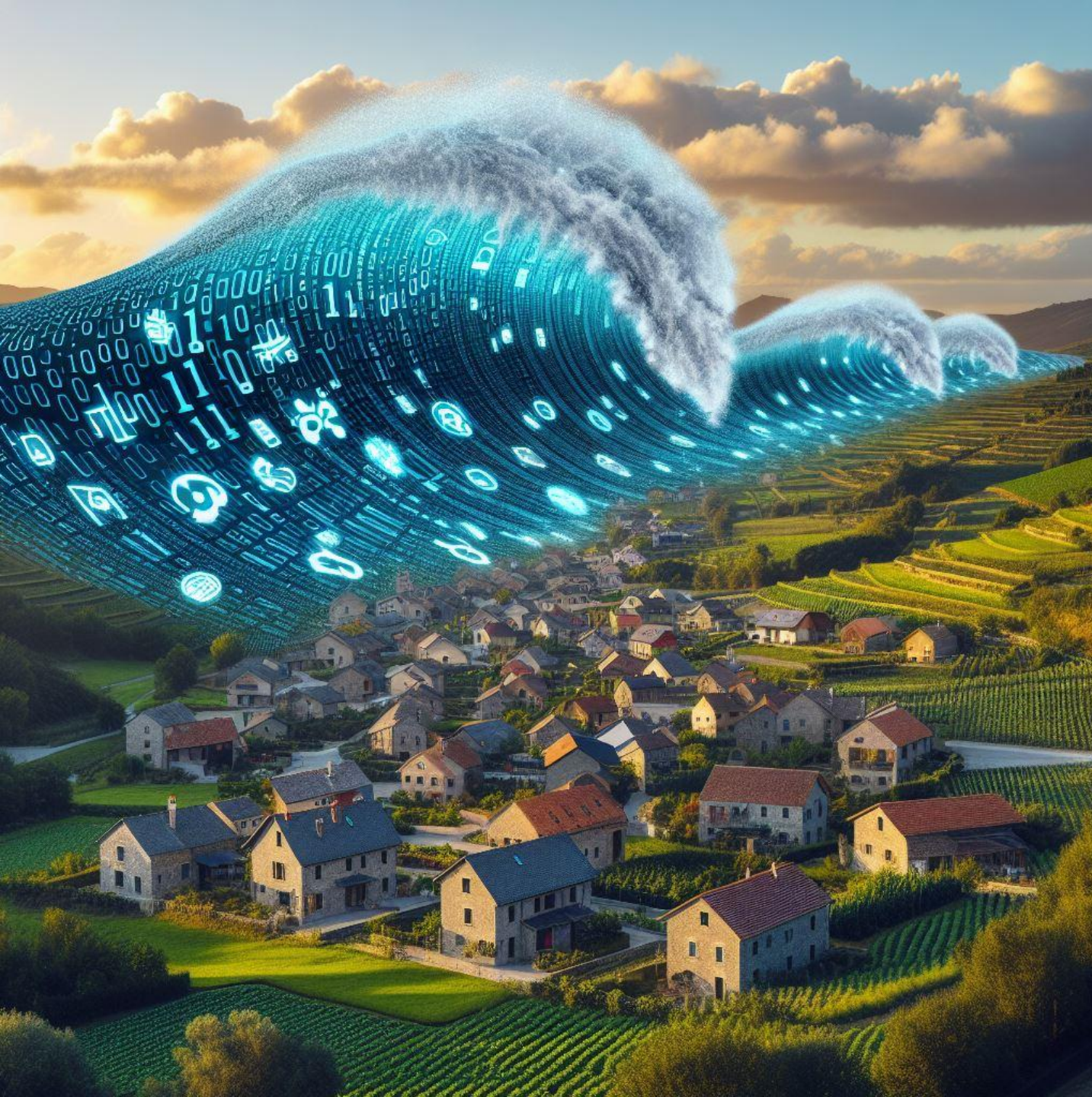
Contingency for service interruptions & support to traditional communication



Energy-efficient broadband solutions for self-sufficiency, alternative energy sources



Support for decentralisation in technology (local networks and data centers) to promote regional self-reliance and autonomy

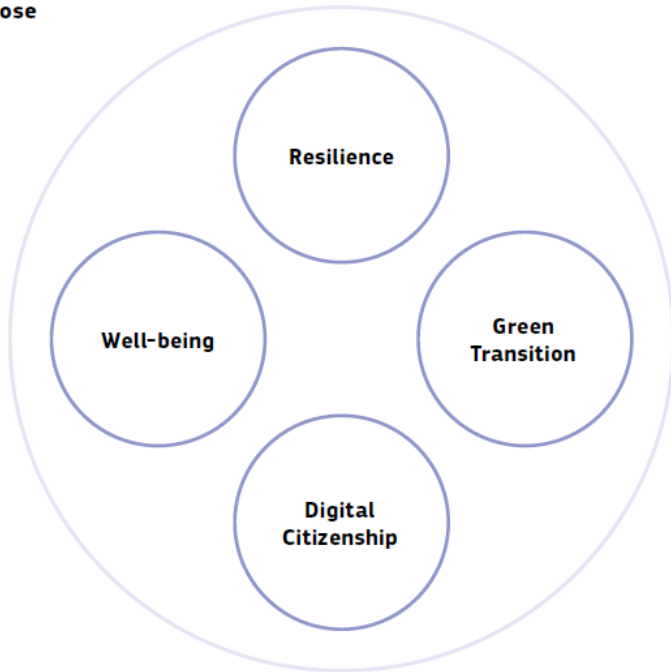


What is the purpose of digital transition?

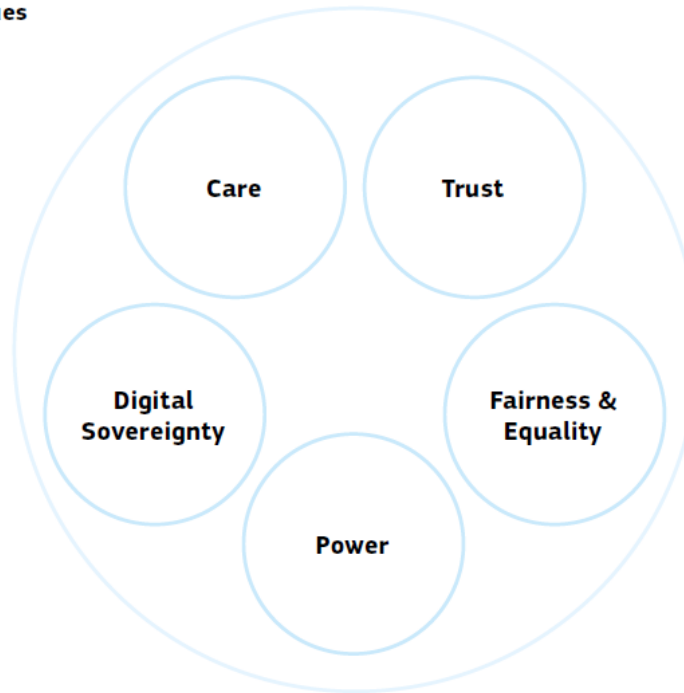
Which values & principles to guide it?

Vision Framework

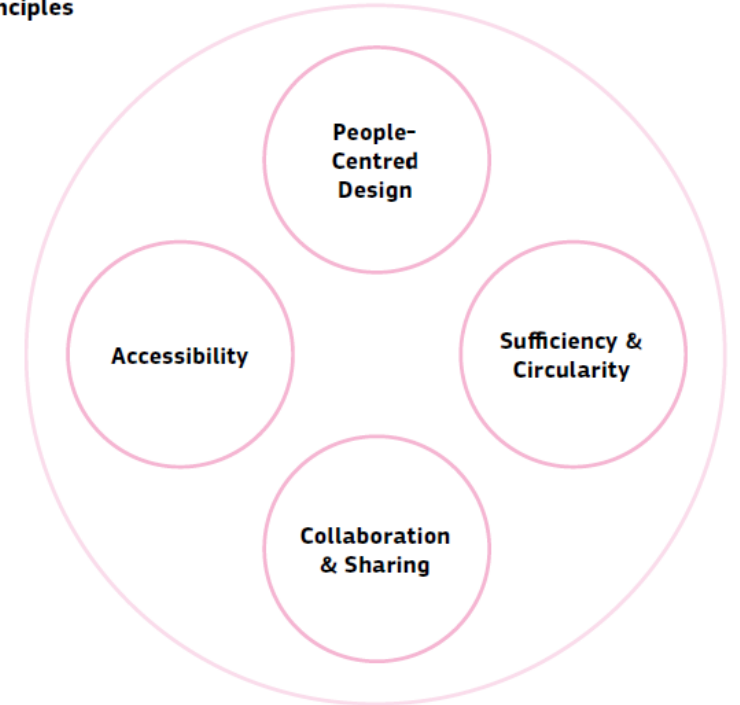
Purpose



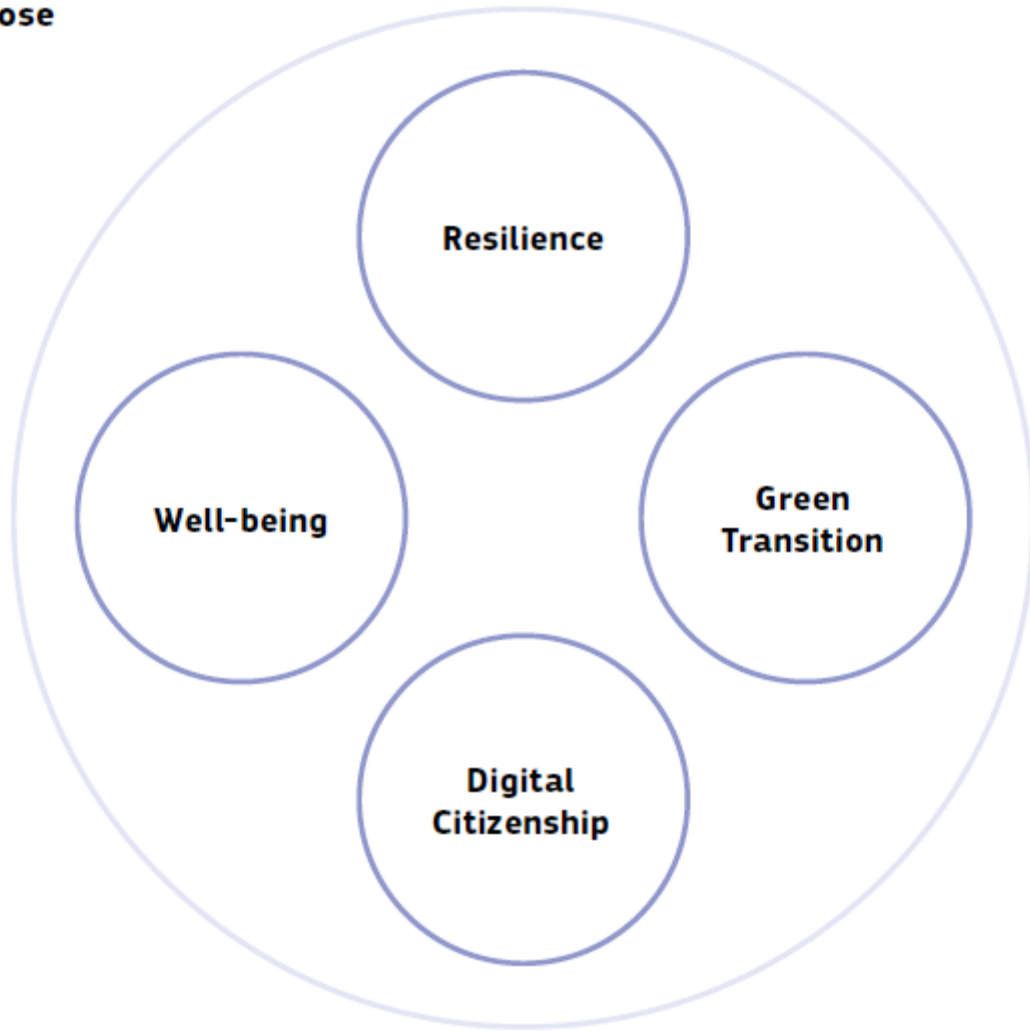
Values



Principles



Purpose



Resilience of infrastructure

From providing connectivity to ensuring a resilient digital ecosystem that supports green transition

Green transition: Aligning with sustainability goals

Energy-efficient technologies & practices in broadband infrastructure

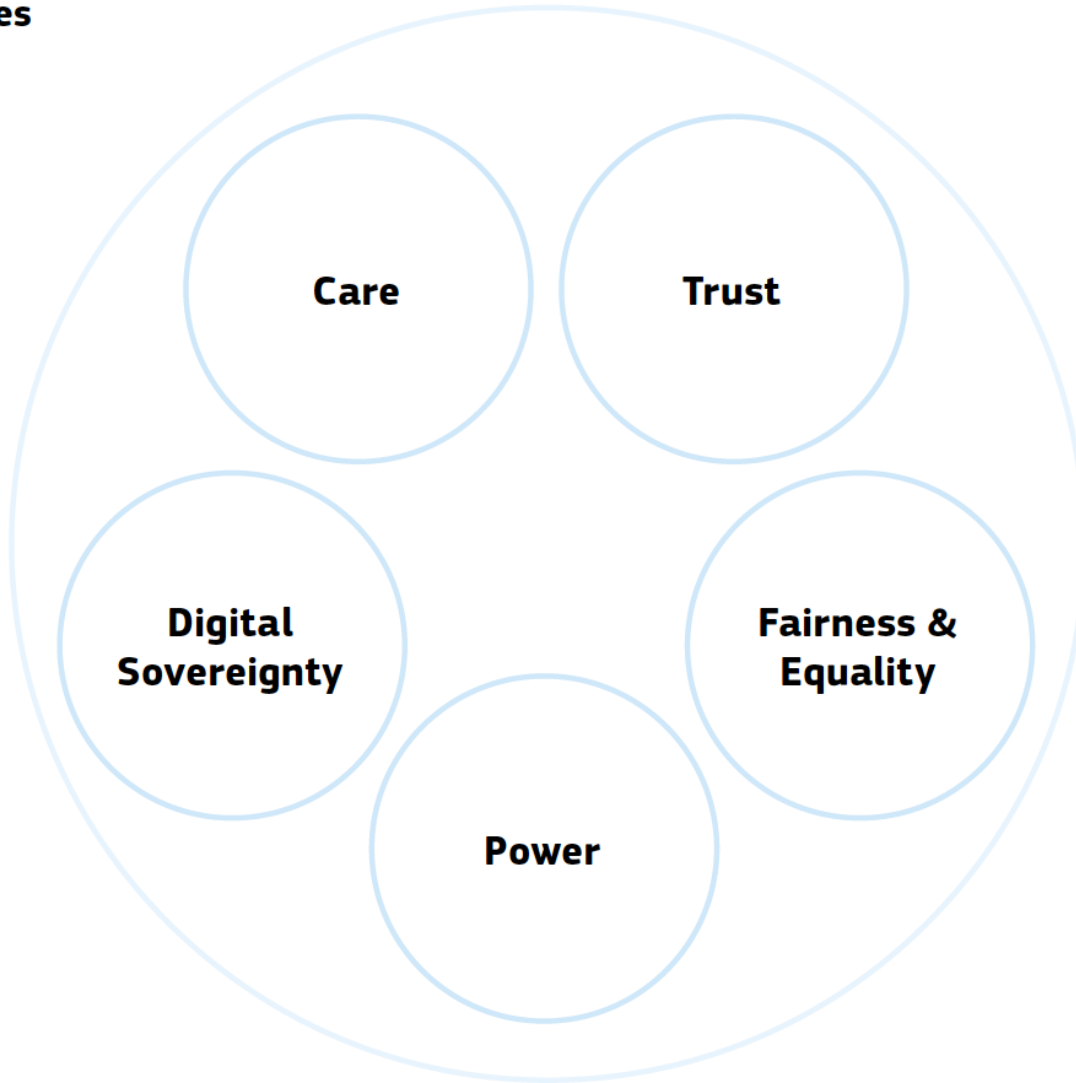
Enable digital citizenship

Provide tools & platforms for active participation in the society

Enhance well-being through connectivity

Improve access to services & opportunities (health care, education, social services)

Values



Trust

Transparent communication about deployment
Safeguarding user privacy
Ensuring reliable services

Fairness & equality

Access to all, especially to marginalised groups & remote areas

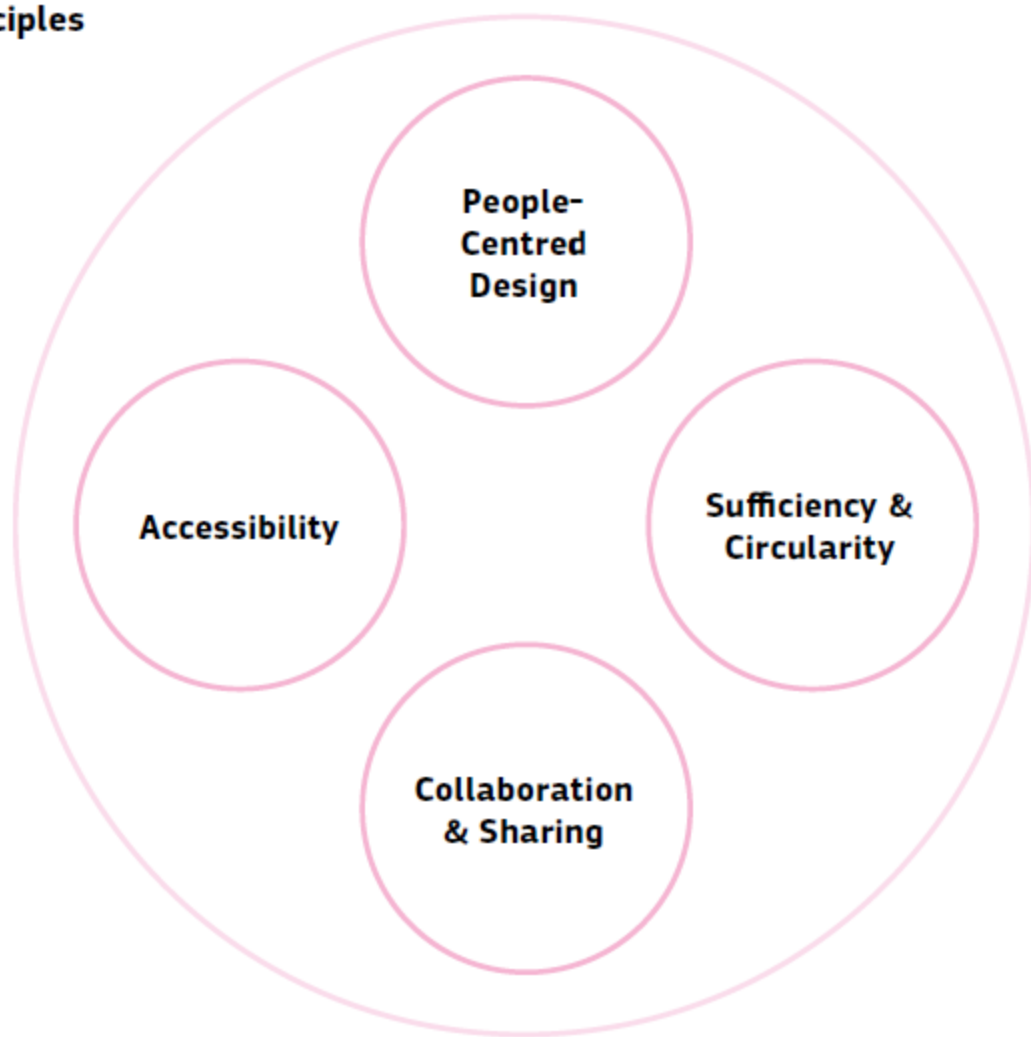
Power & sovereignty

Supporting local decision-making & ownership structures;
Reducing reliance on external tech providers

Care

Designing & deploying tech in a way that nurtures the well-being of inhabitants & natural environment

Principles



Collaboration & Sharing

Involves farmers, rural communities, the private sector, governments, and tech companies working together. This can be achieved through forming networks, sharing knowledge, data, practices, tools, and infrastructure, as well as promoting cross-border networking and collaboration.

Accessibility

Ensuring accessibility and affordability of digital technologies and services to all farmers and rural communities, regardless of their location, income, or the size of their operation.

People-Centred Design

Factoring the needs and preferences of farmers and rural communities in the development of digital tools and services through an iterative process of user feedback and design.

Sufficiency & Circularity

Ensuring that digital technologies are environmentally, socially and economically sustainable, durable, open for modification, recyclable, and are used frugally.

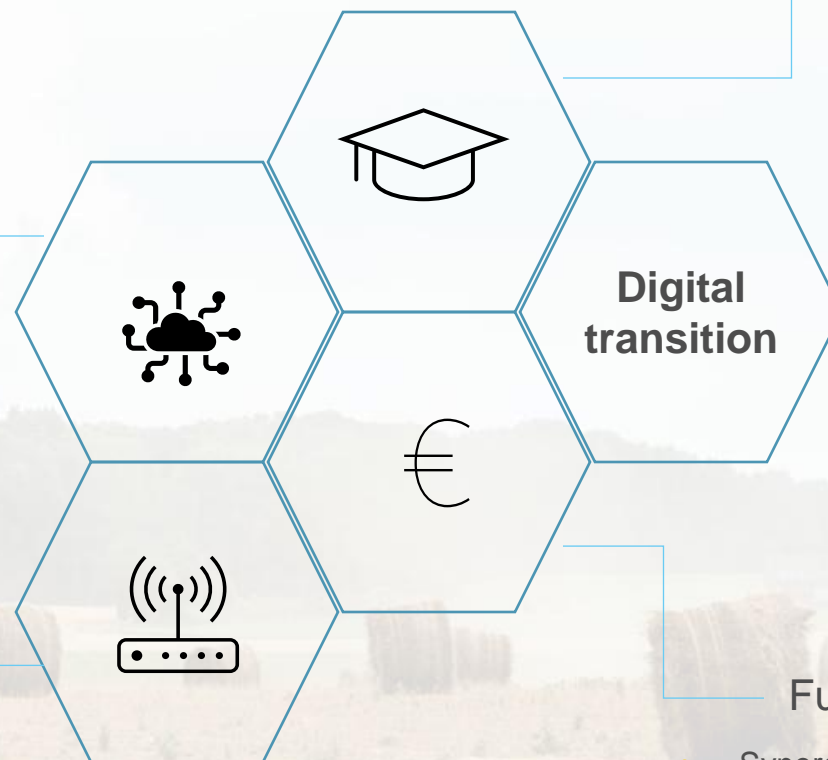
Enablers for digital transition

Digital ecosystem & governance

Dynamic & adaptive regulatory environment (data protection, privacy & cyber security)

Infrastructure & connectivity

- Physically robust & secure infrastructure & hardware/software



Capacity building

- Coordinated approach to education, training & life-long learning

Funding & investment

- Synergies between funding schemes & measures
- Public-private partnerships

Recommendations



Adoption of technology:
vision & broader
implications of
connectivity



Policies to support
flexibility & diversity of
digital solutions



Governance
framework at the
EU level



EU digital transition
strategy
+ MS/regional/local
strategies



A collaboration between Foresight & Design for Policy

THEORY CONTAINS 2 TYPES OF CARDS:
DEFINITIONS & QUESTIONS – EACH ONE
RELATES TO ONE OF FOUR CATEGORIES.

I. PURPOSE

Purpose relates to the question: *What do we need the digital transition for?*

II. VALUES

Digital transition should reflect values such as *trust, fairness, equity, power, sovereignty, and care.*

III. PRINCIPLES

A number of principles should guide this process. These are *collaboration and sharing, accessibility, people-centred design, sufficiency, and circularity.*

IV. ENABLERS

The key enablers to support the process include *capacity building, an effective digital ecosystem & data governance, infrastructure & connectivity, and an adequate funding.*

INSTRUCTIONS FOR QUESTIONS

This activity helps you discuss the purpose behind digital transition in your area, put into context the values and principles to guide a transition, and reflect on the enablers that will support your digital transition process.

SETUP

DURATION approx. 2 hours

PARTICIPANTS 2 to 6 people

CONTENT 46 questions

MATERIALS summary sheet

GAMEPLAY

1. Divide *Purpose*-cards among participants.
2. Each participant answers a single question while others add their own views.
3. Summarise the discussion by addressing the *black question cards*. Record key points on the *Summary Sheet*.
4. Proceed to *Values, Principles, and Enablers*. Each player selects two questions from these sections.
5. Repeat *Steps II* and *III*.

D

DEFINITION 6 OF 22

Green Transition

A fundamental shift in production and consumption patterns is needed to live within planetary boundaries. Digitalisation can enable a fair and inclusive green transition. It can ensure systems management that increases agricultural efficiency and productivity through more accurate application of feed, water, energy, and pesticides.

Relates to *Purpose*
THEORY

D

D

DEFINITION 12 OF 22

Digital Sovereignty

Digital sovereignty implies reducing dependency on companies or platforms that gather large amounts of data, leading to the accumulation of power and knowledge, often outside rural and farming communities or even national jurisdiction.

Relates to *Values*
THEORY

D

Q

QUESTION 10 OF 46

How can we integrate values and principles in our digital transition strategy/process?

THEORY → VALUES & PRINCIPLES

Q

Q

QUESTION 39 OF 46

What are the key data standards, rules and regulations that are critical for our digital ecosystem?

THEORY → ENABLERS

Q

Q

QUESTION 11 OF 46

How do we build and sustain trust in digital systems, technologies, actors, and processes in our areas?

Relates to *Trust*
THEORY → VALUES

Q

The toolkit can help you to:



Uncover key issues for
Vision & Strategy



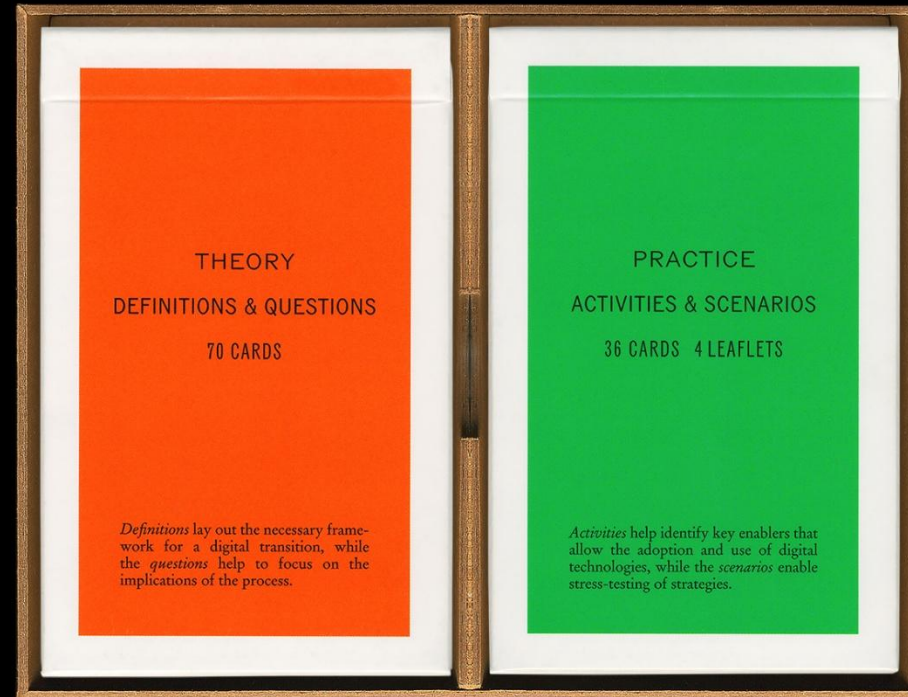
Engage Stakeholders



Future-Proof your
Strategy



Set or revise
Objectives, Milestones
& Action plans



Q

QUESTION 40 OF 46

**What are the
main barriers in
infrastructure
and connectivity
in our area?**

THEORY → ENABLERS

0

Q

QUESTION 25 OF 46

**Which marginalised
or vulnerable groups
may be negatively
impacted by
digitalisation?**

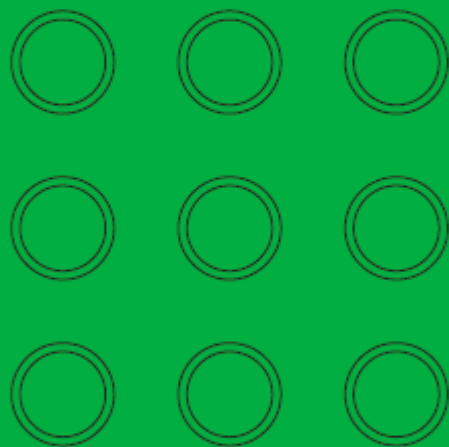
Relates to *Care*
THEORY → VALUES

0

A

ACTIVITY 1 OF 5

Map out key actors and stakeholders in your digital ecosystem



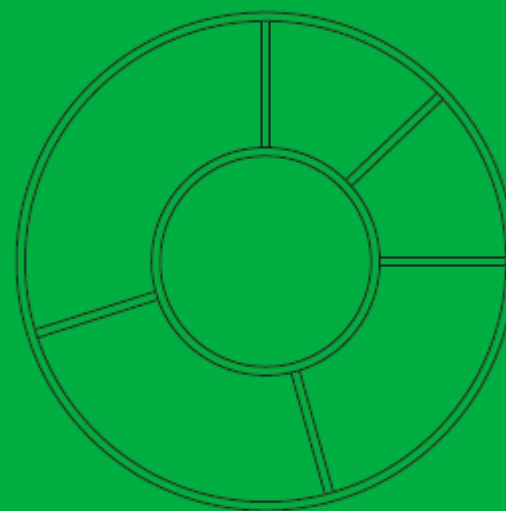
Position the relevant *actor-cards* on the flipchart.

PRACTICE

V**A**

ACTIVITY 5 OF 5

Allocate budget for your digital transition strategy



Allocate amounts for e.g. capacity building; *infrastructure and connectivity*; *digital ecosystem* and/or *data schemes*; *collaboration and networking*; *research and development*.

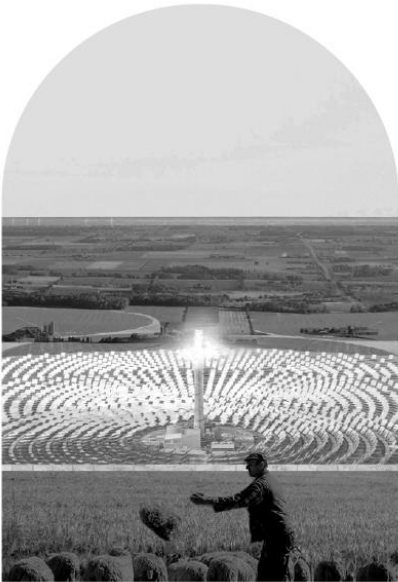
PRACTICE

V

What are the risks for our digitalisation strategy across the four scenarios? How can we mitigate them?

SCENARIO 1 OF 4

Navigating Storms



SCENARIO 2 OF 4

Community Revival Amid Technological Collapse



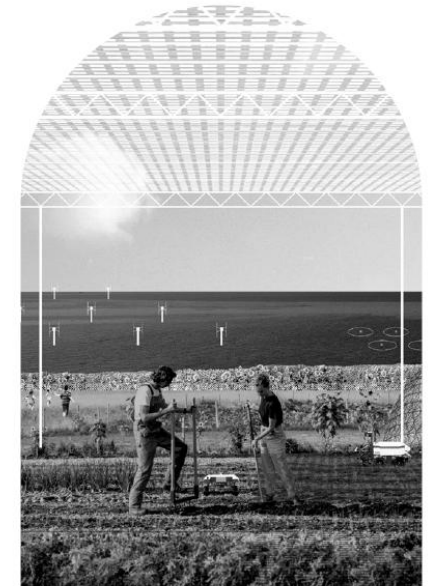
SCENARIO 3 OF 4

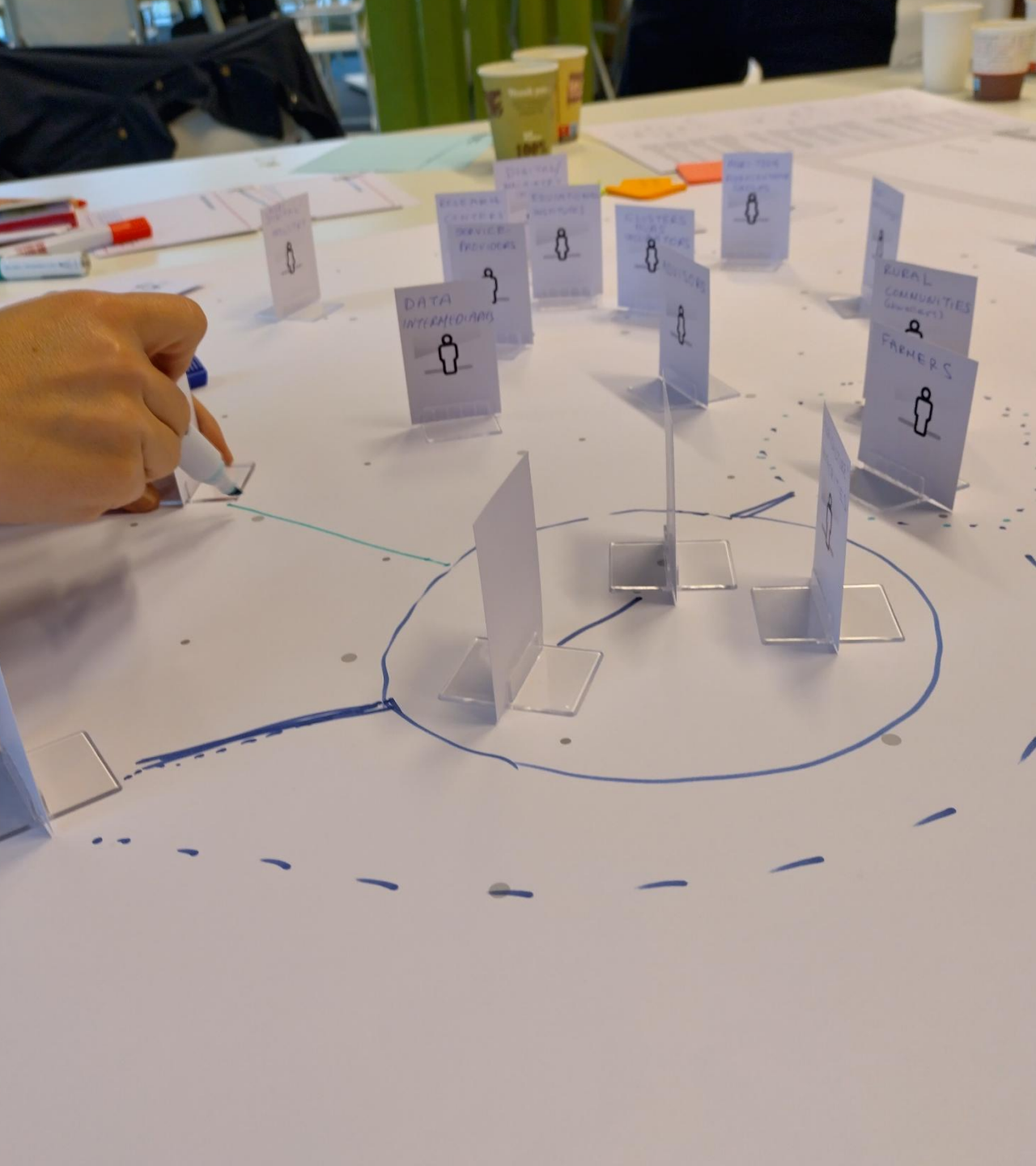
Reclaiming Digital Sovereignty



SCENARIO 4 OF 4

Resilient Roots to Withstand the Shocks





*Interested to use the toolkit?
Get in touch:*

jrc-foresight@ec.europa.eu

Keep in touch



<https://policy-lab.ec.europa.eu>

Keep in touch



EU Policy Lab: policy-lab.ec.europa.eu

EU Science Hub: ec.europa.eu/jrc



@EU_ScienceHub

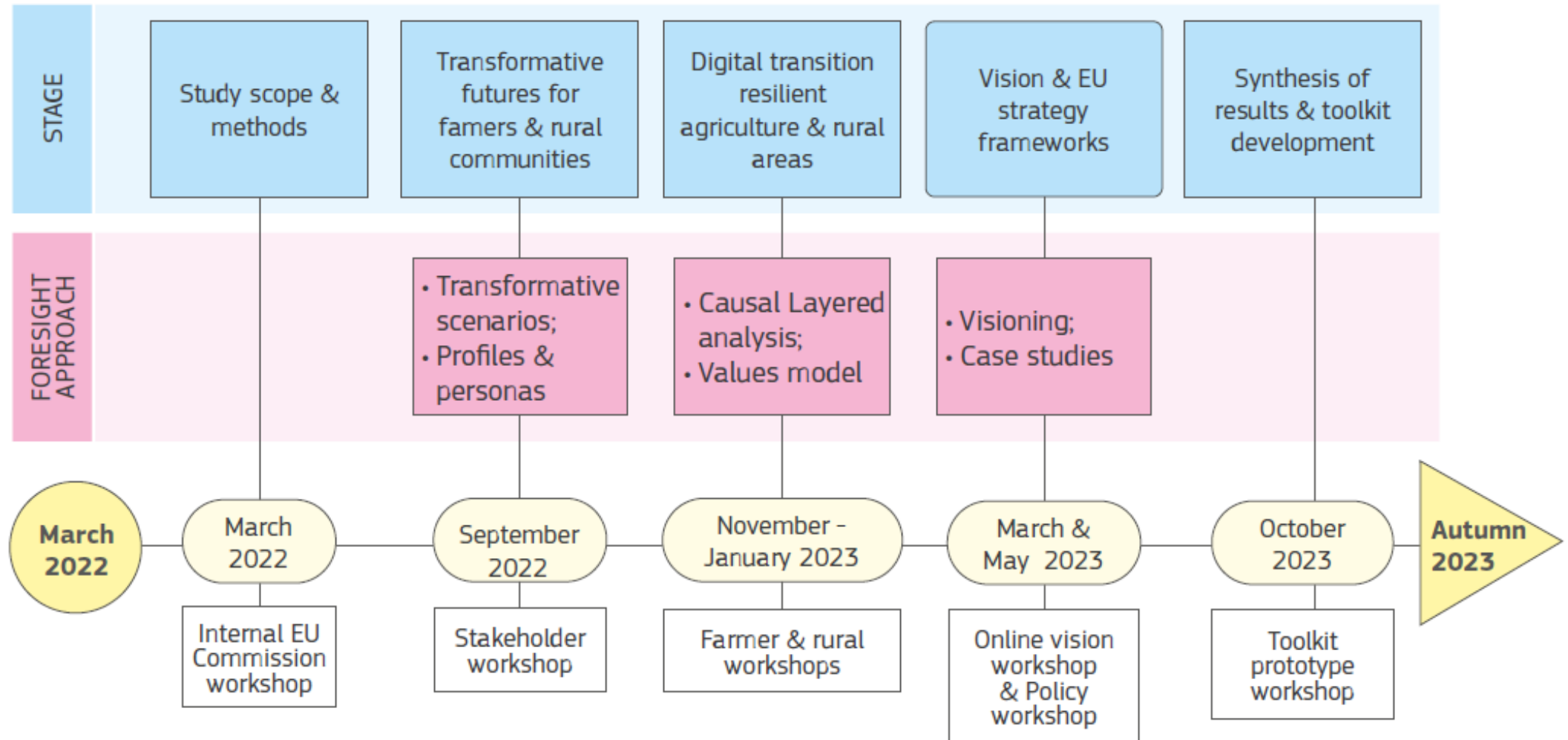


EU Science, Research and Innovation

Conclusions - Next steps for an EU strategy

- Toolkit-based workshops with AGRI colleagues and Member States
- Development of vision and strategy at EU level
 - Roadmap
 - Coordination/Governance
 - Roles and responsibilities
 - Resources
 - Linkage with CAP & Long-Term Vision on Rural Areas

Overview of the foresight process



Transformative futures 2040

Starting point



- Staple food & energy
- Self-sufficiency
- Land competition



- Food monopolies
- Rural depopulation
- GMOs & synthetic foods



- Large corporate monoculture farms
- Technocratic governance
- Sustainability initiatives compete



- Sustainable & circular agri-food
- Alternative proteins gain traction
- Thriving rural areas

Wild cards



Transformation



- Food supply chain disruptions
- Self-governing food & energy networks
- Open-source low tech solutions



- No-tech & low input production
- Shorter supply chains
- Autonomous self-sufficiency approaches at local/regional level



- Struggling corporate farms
- Peer-to-peer farmer communities using digital tech
- Better pay for manual workers



- Low-tech regenerative farms mitigate tech failures
- Re-orientation of green tech to EU
- Strong ties & diversified agri help to avoid conflicts



#EU
AgriFood
Days

AGRI DIGITAL

*A digital transformation for farmers and rural communities
for sustainable future*



Brussels,
8 December 2023

On-site event
with web streaming

New roles for people & technology

Tidal Energy Producer

Sara, female, 28



Tidal power plant technician working in a growing local sector in her hometown; maintains and repairs equipment in a challenging environment, often during extreme weather conditions.

Augmented reality nature teacher/guide

Keith, male, 52



School teacher with a degree in sustainable development and future-oriented education; conducts virtual field trips to wilderness areas for students and digital tourists; based in a remote wildlife-rich area.

Circular Economy Enabler

Tom, male, 31



He links businesses, farms, public canteens etc to develop circular economy projects in an area.

Key takeaways

Coping
with
shocks

Managing risks → predict – forecast – warn

Wisdom

Good judgment → complexity of information and systems - risk of digital inequalities

Community

Social ties → engagement in decision making, social integration & well-being

Preventing
transfor-
mation

New dependencies & vulnerabilities, data power game → contingency for service interruptions

Lessons on digitalisation in Smart Villages

Edina Ocsko

BCO Session, 25 march 2025



Context & background

- E4o was coordinator of the EU-funded **Smart Rural projects** (SR21 and SR27) between 2020-2024
- E4o has been **Coordinator of the Smart Village Network** since 2018
- E4o/ Smart Village Network Services is member of the **EU's Rural Pact Coordination Group**

What will I talk about

- What we have done in the Smart Rural projects in relation to 'digitalisation'
- Examples of Smart Villages and digitalisation
- What lessons we have learnt

Smart Rural 21

To support rural communities in developing Smart Village Strategies and implementing smart actions (including renewable energy, digital services, local entrepreneurship, etc.)



Smart Rural 27

To prepare Member States and rural communities for the **implementation of the CAP post-2020** and other policies and initiatives which could potentially support the emergence of Smart Villages across the EU.



Examples

- **Torup (Denmark)** – Digital platform for exchanging 'tools and talents'
- **Stanz (Austria)** – Blockchain technology in Renewable Energy Community

Torup: Tools & Talents (2022)



Lessons from Torup, Denmark



You always need to think carefully what the real needs of community members and who the potential users are...

"In the Tools & Talents project, we had a clear idea who the users were. At least we thought we had." (White Paper)

Tool developed in close working with community leaders, however ...

"It was actually first when the platform was almost completed that the involvement with the inhabitants of the village started." (White paper)

- White paper with many practical tools and lessons on how to develop new IT tools
- The digital tool (website & App) was successfully developed and used for a number of years...



3 years later...



- Continued in a much simpler form / new website
- The idea 'survived' but not the initial IT development.
- Additional funding secured.
- Inspired a Danish Foundation to stimulate similar sharing projects.

Renewable energy community – Stanz (Austria)

- Use of blockchain technology for local renewable energy community.
- Considering a token system linked to this (SR21 feasibility study).

HOW TO **OVERCOME THE ENERGY CRISIS** IN A SMART WAY LOCALLY? -
RENEWABLE ENERGY & LOCAL ENERGY COMMUNITIES



Transforming sunshine directly into beer.



FINAL CONFERENCE OF THE
SMART RURAL 21 PROJECT

Lessons from Stanz, Austria

- The focus has been on setting up the REC.
- Technology is just a 'tool' – but an important one - for this.
- Technologically much more complex, careful consideration before launching (feasibility).



Photo © Karoline Karmer

3 years later...

- In the test-phase of technology: Actual energy trading between three households

"That's good, because we can learn a lot from the problems that others have had in the early stages." (F. Pichler, former Mayor)

- 9 households are currently connected to the blockchain pilot project, which is ready to start.
- 'Energy Agent' hardware and APP installed to monitor, control, optimise energy flows, including token system.
- Proof of blockchain technology innovation (concept).
- Currently 82 REC members. In April, some 100 metering points expected among members.
- Realtime test of token system with selected members.



The knowledge cluster on digital technology (SR27)

Smart Rural 27

European SV Observatory

SV Policies

Smart Communities

Smart Inventory

9 Nov 2023

Working with communities

Nov 2023 - Feb 2024

Technical support

7 May 2024

Conclusions

Working with communities on eServices



Cluster members are encouraged to start (or continue) the process of planning specific eServices (including the development of vision statement and ambition focusing). Online meeting led by empirica was held on the 9th of November to communities. Interested communities will be directly supported by the project, and their

Ongoing technical support to interested communities



Cluster members who started planning of eServices will be directly supported in their efforts - Note this activity is subject to interest from cluster members!. Experience from the process of planning specific eServices will be shared and discussed with others.

Concluding cluster work with members and wider audience

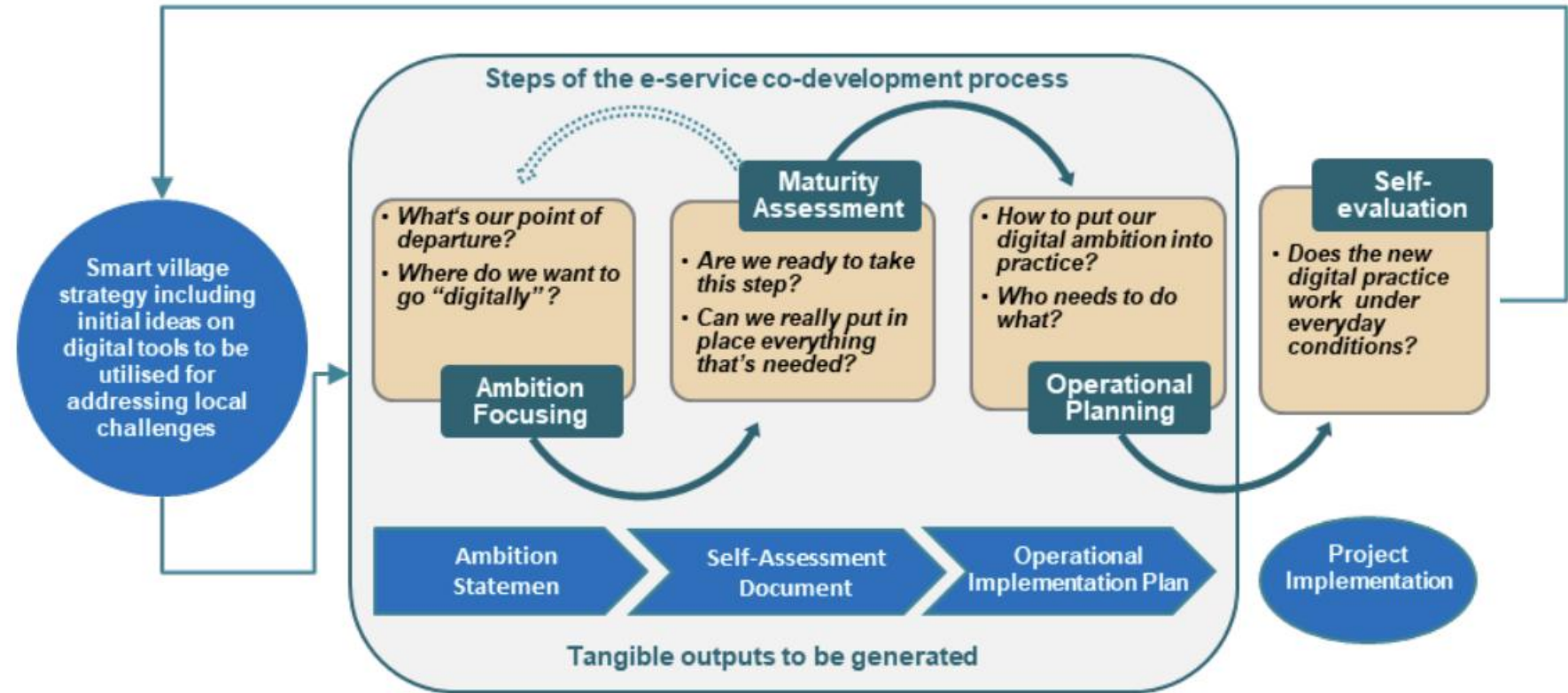


The outcomes of the cluster's work, including the [technical assistance provided to Oliete](#), were presented and discussed with the wider interested audience. You can read the [meeting report here](#).



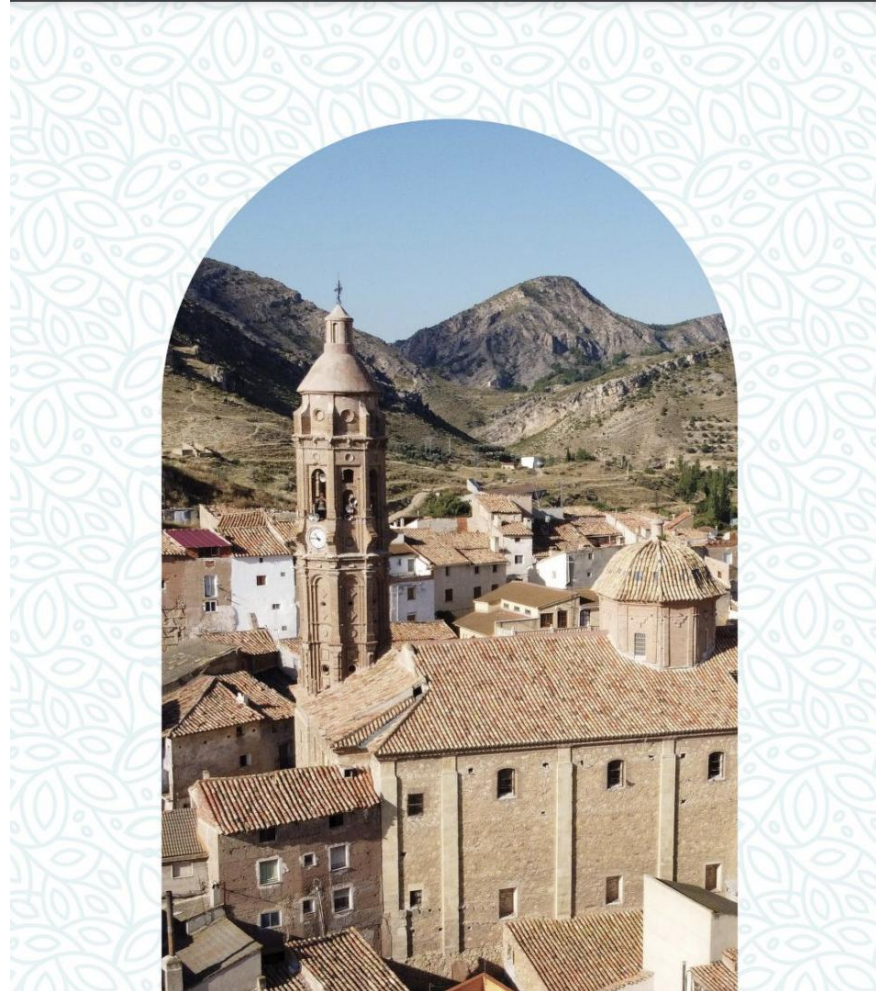
Process of digital service development:

Ambition focusing –
Maturity planning –
Operational planning



Example of Oliete, Spain:

Guided process for
developing a digital
solution for the
new e-bike system



Oliete, Teruel, Aragón, Spain

350 inhabitants

Tackling depopulation through
social, regenerative and digital
approaches.



[Apadrinaunolivo.org](https://apadrinaunolivo.org)



**Despertadores
Rurales
Inteligentes**

Lessons from Smart Rural projects:

Digitalisation with
an impact is a
longer journey than
often expected



- Large interest in the topic and high hopes.
- When it came to realising concrete ideas (community engagement, etc.) the capacity to get involved was much more limited – Need to discern 'hype' from 'reality'.
- Need to combine the use of technology with innovative non-technological practices (collaborations, business models, etc.).
- Time and effort for technological and social processess is often underestimated.

Next steps... The Smart Village Network

- The Smart Village Network **continues to support exchanges and mutual learning** among rural communities, digitalisation remains one of the key themes.

We aim to:

- create meaningful linkages between the needs of local rural communities and technological companies with relevant solutions.
- Identifying funding opportunities in response to the needs of local communities.



info@smart-village-network.eu