GRASS CEILING

D1.2

Policy brief on megatrends and foresight on women-led innovation in rural areas

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Summary

This deliverable provides a review on megatrends and foresight on women-led innovation in rural areas in the context of the GRASS CEILING project. While there are many foresight studies on rural areas and agriculture, there is a significant gap in studies that explicitly address gender issues within these contexts. The approach taken to examine megatrends was developed in two phases in which the 9 GRASS CEILING Living Labs (LLs) and later more than 20 participants – Living Lab co-leads, GRASS CEILING Project Partners and members of the European Policy Forum for Women-Led Innovation – engaged in systematic foresight thinking to explore future scenarios and identify future opportunities and barriers for women-led innovation in agriculture and rural areas. This deliverable consists of a policy brief with an extensive overview of the rationale, methodology and findings concerning the foresight analysis.

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1. Policy Brief on megatrends and foresight on women-led innovation in rural areas

GRASS CEILING aims to empower rural women and increase the socio-ecological innovations led by women in agriculture, the rural economy, and rural communities. This policy brief reports on a foresight study conducted as part of GRASS CEILING to better understand women's contribution to the future of agriculture in rural areas in 2040. It identifies trends, enablers, and barriers to women-led innovation in farming and rural areas and provides actionable insights to inform future policy recommendations. It builds on a **review of megatrends** potentially relevant to the future of women in agriculture and rural areas, and a **participatory foresight exercise** in which the 9 GRASS CEILING Living Labs (LLs) and later more than 20 participants (GRASS CEILING partners and members of the European Policy Forum for Women-Led Innovation) were engaged.

Review of Megatrends

- **Worsening resource scarcity:** Demand for water, food, energy, land, and minerals is rising substantially, making natural resources increasingly scarce and expensive.
- **Climate change and environmental degradation:** If left unabated, anthropogenic pollution and greenhouse gas emissions will further increase the changing climate patterns.
- **Changing nature of work:** New generations entering the workforce and older generations working longer are changing employment, career models, and organisational structures.
- **Accelerating technological change and hyperconnectivity:** Technology and digital connectivity are having a growing impact on how we live, from how we socialise and work to production and governance.
- **Continuing urbanisation:** People searching for better opportunities—such as jobs, services, and education—have been moving from rural to urban areas across the world, and this accelerating trend is likely to continue in the future.
- **Diversification of education and learning:** New generations and hyperconnectivity rapidly change educational needs and delivery modes.
- **Widening inequalities:** Although the absolute number of people living in extreme poverty is declining, the gap between the wealthiest and poorest of the population is getting bigger.
- **Growing consumption:** By 2030, the consumer class will reach almost 5 billion people.
- **Increasing significance of migration:** Migration's societal and political significance has increased, with its dynamics becoming more complex in an interconnected world.
- **Shifting health challenges**: Advancements in science and better living standards have increased the opportunity for longer and healthier lives and reduced the incidence of infectious diseases, while unhealthy lifestyles, pollution, and reactive healthcare are driving a rise in non-

communicable diseases and mental health disorders.

- **Shifting global social values:** Some recent societal trends worldwide include increasing inequalities, declining fundamental rights, multidimensional poverty, slow and uneven social progress, and severe polarisation, damaging institutions essential to democracy.

Foresight exercise: Current and future challenges for women in rural areas

The women participating in the Living Labs (LL) deemed social drivers most impactful on the activities of women entrepreneurs in rural areas. This points to the importance of rural areas' social structure and values, i.e., demographic conditions, ageing, migration, tradition, culture, attitudes towards gender, etc., as key barriers for women to develop successful social innovations. More specifically, women identified the lack of services and labour shortages, which pushed women to dedicate more effort to childcare and housework and inhibited them from spending time to develop their social innovations. Policy and economic drivers were also considered highly impactful. They referred to the lack of resources and support for women farmers to develop their innovations when connected to agriculture. Environmental drivers were the second most mentioned category in the top 1 ranking. Women are concerned about the impact of the current climate crisis and its results in terms of biodiversity loss and lack of access to natural resources. Finally, digitalisation and connectivity were identified as impactful individual drivers, which could be essential enablers for women entrepreneurs if adequately developed and distributed. The women also identified new drivers, two of which were explicitly gender-related. These were the social drivers 'Double-burden [time]' and 'Shifting Values: Cultural attitudes towards gender and importance given to women-led initiatives'. The role of culture and education is reflected in the importance attached to what the women in the Living Labs identified as necessary changes to enable women-led rural entrepreneurship in Europe. Actions to educate and change people's perception about the role of women, the environment, food, agriculture, rural areas, etc., were present in many of the listed elements. This is consistent with the importance ascribed to shifting values in the description of their present struggles. These conclusions suggest that future strategies aimed at changing the material conditions of women entrepreneurs in rural areas should be backed by education and awareness-raising campaigns targeting a wider audience.

Scenarios for women-led innovation in farming and rural areas

The foresight workshops run in GRASS CEILING aimed to explore and identify factors affecting women-led innovation in agriculture and rural areas in the future. 'Rural demography' and 'Public investments' were selected as two key variables to build four context scenarios for 2040. To bring scenarios to life and allow compelling exploration of what life under a given scenario could look like, including enablers and barriers, participants were invited to put themselves in the shoes of women entrepreneurs by using *personas*. These are fictitious characters created by or inspired by Living Lab women. During two workshops, the participants developed four scenarios.

Scenario 1: Shiny prospects, hidden pressures: challenges in rural renewal

In 2040, rural areas are revitalised and experience some degree of demographic growth, accompanied by high public investment. Such context brings significant economic advantages to many women entrepreneurs: for Annike, Saulè and Mary Keller, the expansion of the population means more customers and business growth, besides possibilities for easier access to credit and subsidies due to strong public support. Services have improved, including childcare and digital and transport infrastructure, positively impacting life quality and business development. However, these benefits come with some concerns: Annike faces higher living costs due to increasing housing demand and the potential land scarcity risks affecting Mary Keller's plans for farm expansion. Julie and Nelia have more visitors, which brings economic gains but starts straining natural resources and putting pressure on the environment, their community's most valuable asset.

Scenario 2: Rural renaissance in empty fields: a thriving yet fragile rural revival

By 2040, high public investments and a thriving economy have created new opportunities for growth and innovation in rural areas. This has benefited professionals like Sofia, who enjoys rural living while relying on remote work, and farmers like Joanna, Rosa, and Silvia, who gain from public farm support and can finally access digital markets. However, they complain about how the declining rural population has weakened social bonds and diminished community life. A combination of CAP subsidies and public investments is helping modernise the farming sector and keep it competitive, even as rural populations decline. Still, labour shortages put the long-term sustainability of agriculture at risk. In addition, climate change continues to threaten rural livelihoods, calling for further adaptation efforts beyond boosting renewable energy production and crop diversification.

Scenario 3: Silver linings and silver hair: adapting to rural depopulation

By 2040, rural depopulation will persist as younger generations search for better opportunities, leaving behind an ageing population. People like Saulè experience growing isolation and erosion of community and traditions. Public services are increasingly strained, with limited investment in infrastructure. This, in turn, hampers the business prospects of farms, consultancies, and tourism, making it difficult to remain appealing to visitors. Economic struggles are compounded by the closure of essential services, such as schools and childcare facilities, placing additional pressure on rural residents, especially women like Amy and Mary Keller, who have caregiving responsibilities. Amid these challenges, Nelia and Rosa are inspired to look beyond the difficulties, exploring innovative business models that focus on urban markets and exports to adapt to the changing landscape.

Scenario 4: Growing communities, shrinking support: rural resilience tested

Low public investment and a declining economy pose major challenges for rural areas, even as lower cost of living and housing prices attract new residents and the population grows. Public funding is insufficient to meet the increasing service demand, and resources are becoming scarce. At the same time, increasing demand creates opportunities for business growth, leading many to abandon innovative ideas for more profitable, traditional activities. Joanna Flynn, for example, abandons her projects to focus on work at the family farm, and Sofia loses the motivation to pursue her ideas due to the lack of entrepreneurial support. Long-time rural residents feel the responsibility to drive change and seek alternative solutions to foster a sense of community. Joanna Flynn advocates for *greater public investments, while at the same time, Silvia establishes a foundation to raise funds for education and for promoting traditional culture and local heritage.*

Enablers and barriers to future women-led innovation in farming and rural areas

In the context of each future scenario, the enablers for, and barriers to, women entrepreneurship in agriculture and rural areas were identified as follows:

- ✓ **Social factors are the most recurring enablers and barriers**. This matches with the prioritisation of social drivers in the current struggles of Living Labs, the effects of which are particularly felt by women entrepreneurs. Similarly, economic and policy enablers and barriers are repeatedly mentioned, corresponding with their recurring presence in the driver analysis and future vision. **Economic and policy factors span multiple domains, going well beyond agriculture** and suggesting the need to integrate efforts across sectors. Regarding environmental factors, the analysis of drivers shows that women entrepreneurs are concerned about the impact of the current climate crisis and its consequences on biodiversity and natural resources. The future vision confirms this fact: **women entrepreneurs recognise the need for adaptive measures to climate change and show their readiness to implement them**. The fact that technological enablers and barriers are less recurrent should not be interpreted as women disregarding technology. Indeed, digitalisation and connectivity are two relevant drivers discussed in the present struggles and future vision. The future vision shows that **technological developments will be part of any transformative pathway**.
- ✓ **Some of the barriers identified are inherently rural.** A 'Shrinking user base for rural services due to depopulation' or 'Missing investments for infrastructure' are characteristics of rural areas that do not affect only women entrepreneurs. Similar inherently rural barriers were part of the present struggles, e.g., demographic drivers and future visions, e.g., rural-urban connections and migration. Nevertheless, the typical rural barriers can have a disproportionate impact on women when interacting with gender-specific factors (e.g. 'Persistent gender norms' and 'Limited childcare options hindering work-life balance'). Since women's entrepreneurship does not occur in a vacuum**, if these foundational issues remain unaddressed, tackling additional barriers to women-led innovation will be difficult**. As also clearly acknowledged in the 'Strategic Dialogue on the Future of Farming': "*Without boosting the development of rural areas, it will be very difficult to achieve gender equality and empowerment in the food and farming sector*" (p.80).
- ✓ Linked to the above, **some factors are related to the specific type of rural areas**. For instance, 'Tourism pressures leading to housing strains' would typically affect rural areas with a high tourism appeal, where balancing the needs of residents and the needs of tourists could become a challenge. On the other hand, 'Community-led solutions leveraging embedded ties for environmental and economic issues' would depend on a strong and active local community, making this enabler viable only in areas with some social cohesion. This suggests the need for integrating different levels of policymaking, as was discussed in the vision: targeted and informed policies at the local and regional levels **should be integrated with more general strategies of rural development** that account for the specificity of women-led rural entrepreneurship.

- ✓ **There are inherently cultural barriers connected to prevailing stereotypes and values potentially influencing any other domain of life and work in rural areas**. Moreover, 'Persistent gender norms' and 'Care burdens disproportionately affecting women's work-life balance' limit women's participation in economic, social, and political activities, often leaving their capacities and contributions undervalued. These results are aligned with the analysis of drivers, which identified 'shifting values' as the most prevalent individual driver in the present struggles of the Living Lab participants. The future vision also includes 'Progressive cultural attitudes towards women and the gendered division of roles' as one of its elements. Being deeply rooted cultural barriers, there is the risk that, **unless explicitly recognised and addressed, such factors will perpetuate inequalities and pose a further obstacle to rural development** by failing to recognise a whole component of the human capital in these areas.
- ✓ **Such cultural barriers risk being further reinforced by sectoral policies**, e.g. 'Agricultural policy failing to address women-specific needs' or, similarly, 'Lack of policy measures explicitly addressing women-led farming and innovation'. These obstacles could be transformed into opportunities, e.g. through targeted 'Policy incentives and cultural initiatives promoting women's visibility in rural businesses' and 'Policy initiatives for women-led farming and business leadership (e.g. access to credit and land)'. Additionally, the future vision highlights some of the actions that could be potentially used to shift towards more progressive values regarding education and awareness. Combined actions and policies could be a promising way to shift current stereotypes and foster more equal opportunities by changing the structures that inhibit broader development.

Conclusion

Although there are many foresight studies on agriculture and rural areas that have been developed for policy purposes in recent years, there is a significant gap in studies that prioritise gender issues in these contexts. Many of the reviewed sources did not explicitly address gender aspects, while the SCAR (2021) report and projects like H2020 RURALIZATION and H2020 Polirural identified gender inequality as a concern or recognised the gendered impacts of other drivers.

Work began with engaging women entrepreneurs in the 9 Living Labs directly, to appraise their lived experience and bring into light their current and future concerns. The main outcome was a comprehensive overview of drivers of change currently affecting women and a list of ten key elements sketching a future vision for women-led rural entrepreneurship. In Phase 2 of the work performed, more than 20 participants were engaged in scenario orientated discussions, keeping the experiences of the 'women entrepreneurs' as the main focus. In summary a set of enablers and barriers to future women-led innovation in farming and rural areas was derived capturing the following:

- ✓ **Social factors are the most recurring enablers and barriers**.
- ✓ **Economic and policy factors span across multiple domains, going well beyond agriculture.**
- ✓ **Women entrepreneurs recognise the need for adaptive measures to climate change and show their readiness to implement them**.
- ✓ **Technological developments will be part of any transformative pathway**.

- ✓ **Some of the barriers identified are inherently rural e.g.** a 'Shrinking user base for rural services due to depopulation' or 'Missing investments for infrastructure'.
- ✓ Typical rural barriers can have a disproportionate impact on women when interacting with gender-specific factors (e.g. 'Persistent gender norms' and 'Limited childcare options hindering work-life balance'). **If these foundational issues remain unaddressed, it will be difficult to tackle additional barriers to women-led innovation** effectively.
- ✓ **Some factors are related to the specific type of rural areas**.
- ✓ **Targeted and informed policies at the local and regional level should be integrated with more general strategies of rural development** that account for the specificity of women-led rural entrepreneurship.
- ✓ **There are inherently cultural barriers connected to prevailing stereotypes and values potentially influencing any other domain of life and work in rural areas**. **Unless these are explicitly recognised and addressed, such factors will not only perpetuate inequalities, but also pose a further obstacle to rural development.**
- ✓ **Such cultural barriers risk being further reinforced by sectoral policies**, e.g. 'Agricultural policy failing to address women specific needs. '

As a concluding point, some enablers seem to suggest that **rural entrepreneurship has a potential role in revitalising rural areas**, for instance 'Community and peer (woman-to-woman) support systems aiding personal and business growth', 'Women resettlers enriching rural culture and innovation through progressive ideas'. Likewise, the elements set out in the future vision 'Creating networks, collaborations, and community' capture a pathway for supporting women entrepreneurs to adapt and support efforts to overcome future challenges. Indeed, **women rural entrepreneurship is as much of a subject in rural areas dynamics as it is an agent of rural change.** Another example is **'the recognition for smaller and diverse entrepreneurial initiatives in rural areas'.** These are, on the one hand, particularly relevant for rural areas, where small businesses are a vital component of the rural fabric, and on the other for women-entrepreneurs, who often lead smaller businesses, e.g. in agriculture. In the future vision, moreover, small and family farms are assigned a special role in taking better care of the environment and rural community. This may lead to reconsider the statement from the Strategic Dialogue on the Future of Farming mentioned above and refine it as '**without boosting women-led rural entrepreneurship, it will be very difficult to achieve the development of rural areas'**.

Annex 1 – Rationale and methodology

GRASS CEILING aims to empower rural women and increase the number of socio-ecological innovations led by women in agriculture, the rural economy and rural communities. The project will contribute to advancing the UN's goals on gender parity, realise the EU Gender Equality Strategy, and achieve the goals of the Green Deal, the Farm to Fork strategy, the Long-Term Vision for Rural Areas, and the European Pillar of Social Rights. GRASS CEILING focuses on achieving greater understanding, awareness, and recognition of women's role in rural areas and agriculture, challenging and transforming gender roles and stereotypes, and creating better policies and tools.

Foresight studies are meant to envision, explore and anticipate the future. The term 'foresight' refers to a 'systematic, participatory, future-intelligence gathering and medium-to-long-term vision-building process aimed at enabling present-day decisions and mobilising joint actions' (Competence Centre on Foresight, European Commission, 2020). **Action-oriented or strategic foresight can assist decision-making in thinking ahead strategically and future-proofing policies,** especially when they deal with complex problems (Major et al., 2001; Vervoort et al., 2015). In addition, foresight studies provide **systematic knowledge about potentially significant trends** and developments in the social, environmental, political, economic, and technological spheres relevant to the issue at stake (Habegger, 2010). One of the first things that is usually done in a foresight study is to look at the factors which may affect how the future of a certain initiative, organisation, region, policy, etc., could unfold. These factors, or **drivers of change, are the forces influencing and determining the direction of change** in complex dynamic systems (Bisoffi, 2019; European Commission, 2020). **Trends** are patterns of change within specific regions or sectors, while **mega-trends** are global, long-term forces with significant future impacts (Bisoffi et al., 2019; European Commission, 2020). The study began with a mega-trend review (Chapter 2), which identified the key trends and drivers potentially relevant to the future of women in agriculture and rural areas. The review served the additional purpose of understanding whether previous foresight studies dealing with rural areas and agriculture had addressed gender issues.

The second part of the foresight study entailed a two-phase participatory foresight exercise. In the first phase, women entrepreneurs from the 9 Living Labs were engaged in a future-oriented discussion, focusing on the current challenges and desired vision for their specific rural context (Chapter 3). This activity in the Living Labs included the definition of *personas*, that is, fictitious characters inspired by the women entrepreneurs living and working in agriculture and rural areas, which were used later to connect women entrepreneurs lived experience to the second, more exploratory, phase of the exercise. The latter comprised two foresight workshops dedicated to identifying enablers and barriers to women-led innovation in agriculture and rural areas, using exploratory scenarios (Chapter 4).

Scenarios are a common tool in foresight studies. They are used to test strategies, policies, and plans by exploring drivers and uncertainties and thus supporting decision-making (Pérez-Soba and Maas, 2015). They can come in the form of qualitative narratives or quantified descriptions (or a mix of both) of alternative futures. In fact, scenarios are neither a prediction about the future nor plans, and they do not provide a direction for action: they are **descriptions of plausible futures and serve**

as contexts for decision-making. While normative scenarios answer questions about *what should happen* in the future, for instance to achieve a certain vision or goal, exploratory scenarios answer questions on *what could happen* and are used to explore uncertainties and communicate how the future may unfold (Vervoort et al., 2015; Zurek, et al; Arcuri and Brunori, 2023). In this study, a light touch of normative scenarios was combined to envision the desired future of Living Labs (Chapter 3) with exploratory scenarios in the workshops (Chapter 4). The workshops took place online between September and October 2024 and involved more than 20 participants among Living Lab co-leads, project partners and members of the European Policy Forum for Women-Led Innovation (T6.4).

Methodology of the foresight study

This foresight study should be understood as a process encompassing two different tasks (1.2, 1.3). Each has been carried out using multiple methods across different phases, as exemplified in Figure 1 and illustrated in detail in Table 1. Between one phase and the next, the results of the previous phase were analysed and fed into the next phase.

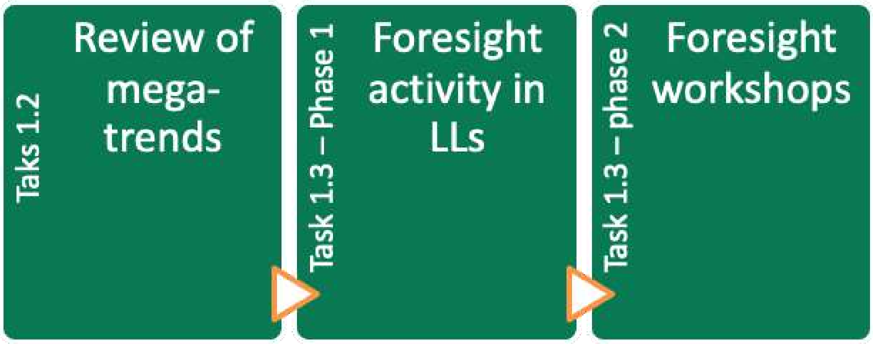


Figure 1 – Foresight study process: different phases. Source: authors' own elaboration

Table 1. Overview of phases and methods in the foresight study

Task	Aims	Methods
Review of mega-trends Task 1.2	✓ To provide an understanding of women's role in the future of agriculture and rural areas through the analysis of mega-trends ✓ To understand whether previous foresight studies considered gender issues ✓ To design *ad hoc* methodology for Task 1.3	Desk-based meta-analysis for the review of 15 recent foresight studies and reports from major European and global organisations and projects. The aim was to identify and appraise key trends and drivers, starting from a list of mega-trends that served as the baseline framework for the meta-analysis. The documents were selected for being the most recent foresight studies in the domain of rural areas and agriculture. They include reports from EU-funded research projects (H2020), publications from the Joint Research Centre of the European Commission (JRC), the Standing Committee on Agricultural Research (SCAR), and the World Economic Forum (WEF). All the documents are included in the references of this report, no. 6-20. The 14 Megatrends Hub inventory of the Competence Centre on Foresight of the European Commission (2020) was taken as baseline for the analysis. This list of mega-trends has been

		integrated by drawing from the documents reviewed, identifying a set of connected drivers for each mega-trend and considering their relevance and implications for women in agriculture and rural areas. It is not intended to be exhaustive of all potential areas affected by the mega-trends, but rather to signal key factors worth monitoring and prioritising (Chapter 2). The additional outcome of this task is the comprehensive methodology designed *ad hoc* for the second part of the foresight study. It combines well-established foresight methods as a series of different phases, adjusted to the specific needs of GRASS-Ceiling.
Foresight exercise T1.3 phase 1	✓ To engage Living Labs with women innovators in an internal foresight activity ✓ To prioritise drivers ✓ To sketch a vision for women entrepreneurs in future European agriculture and rural areas ✓ To deepen the understanding of women's role in deploying innovation in agriculture and rural areas	Task 1.3 entailed the very participatory foresight exercise. In phase 1, Living Lab co-leads organised and facilitated an internal foresight activity in their own Living Lab. Women innovators were involved directly in a future-oriented discussion on current and future challenges and vision of their specific rural context. The activity entailed: (i) the definition of *personas* (fictitious characters inspired by the women entrepreneurs living and working in agriculture/rural areas) (Annex 5), (ii) a prioritisation of drivers of change for their context, and (iii) a preliminary discussion on what their vision for the future looks like (Chapter 3). To support the accomplishment of this activity, UNIPI provided: ▪ a one-hour training session for Living Lab co-leads (between February-March 2024); ▪ a standardised template for the reporting of consistent results across Living Lab regions (Annex 7); ▪ supplementary materials, for supporting Living Lab co-leads in the discussion on drivers of change. The results collected from Living Labs' template reports fed into preparatory activities for the foresight workshops (e.g. *personas*, priority drivers). The content of the templates was coded and submitted to qualitative content analysis by using the software Atlas.ti.

T1.3 phase 2	✓ To conduct a foresight exercise through two online workshops ✓ To analyse results, refine the set of enablers and barriers to women entrepreneurship and build scenarios ✓ To draft report.	The second phase of the Foresight exercise has been implemented through 2 online workshops of about 2 hours each, held in September-October 2024. UNIPI organised and facilitated the workshops, respectively aimed at first exploring and then identifying enablers and barriers to women-led innovation in farming and rural areas up to 2040. The outputs for the exercise included: ▪ an overall foresight choreography, including workshop arrangement, working groups facilitation ▪ a template for remote real-time collaboration (Annex 5) ▪ a set of *personas* cards, used to connect the activity carried out in the Living Labs with the workshops (Annex 5) ▪ a two-axes scenario matrix (Annex 5), resulting in four scenarios sketched along two key drivers identified as crucial in the review phase (rural demography and public investments) During workshop 1, participants have been invited to explore mega-trends and drivers relevant to their rural areas. Then they split in two facilitated working groups, and each participant chose a persona, from a set of personas cards representing women entrepreneurs. The exploration of future scenarios took place by thinking and acting "in the shoes" of the personas, answering the question "what happens if…?" in the scenario matrix. The aim at this stage was to *explore* which elements could affect women-led innovation in farming and rural areas in 2040. Workshop 1: 27 participants (Living Lab co-leads and project partners). In workshop 2, the participants reconvened, and a summary of the previous session was made. Split again in two working groups, each chose a personas card. The aim was to reflect upon their personas' goals in relation to their professional activity and *identify* what factors could enable and hinder women entrepreneurs in achieving their goals in the scenarios. Data collected during the two workshops were analysed and elaborated on to define results presented in Chapters 4 and 5 Workshop 2: 19 participants, including 4 invited guests from the European Policy Forum for women-led innovation .

Annex 2 - Review of megatrends

One of the main tasks encompassed in a foresight exercise is the identification of the factors which may affect how the future of a certain initiative, organisation, region, policy, etc., could unfold. These factors, or **drivers of change**, are the forces influencing and determining the direction of change in complex dynamic systems (Bisoffi, 2019; European Commission, 2020).

Drivers are the underlying causes behind trends and mega-trends. A **trend** is 'the direction in which something is developing or changing', and its degree of predictability depends on the inertia of the system, that is, on the degree of dependence of the future on the past (Bisoffi et al., 2019). If trends are patterns occurring in a specific region, sector, or domain, **mega-trends** are bigger, global trends. They are defined as 'long-term driving forces that are observable now and will most likely have significant influence on the future' (European Commission, 2020). While it is worth making this distinction, it must be pointed out that a factor, e.g. urbanisation, can be seen as both a driver and a trend. As a driver, in some places, it can be the underlying cause of rural areas' marginalisation, pollution, waste production, and spread of diseases; as a trend, it can be linked to land abandonment, the loss of importance of agriculture, the search for better job opportunities, and so on. In addition, drivers of change often interact, making it even more difficult to assess their effects separately.

2.1 Mega-trends and drivers potentially relevant for women in farming and rural areas

The analysis conducted in Task 1.2 of GRASS CEILING entailed a comprehensive review of 15 documents from existing foresight studies and identification of trends and mega-trends relevant to women in farming and rural areas. The first outcome of the review was a confirmation of the very premise for undertaking this exercise. Indeed, while there are many foresight studies on agriculture and rural areas that have been developed for policy purposes in recent years, **there is a significant gap in studies that explicitly address gender issues in these contexts.** Many of the reviewed sources did not explicitly address gender aspects, while the SCAR (2021) report and projects like H2020 RURALIZATION and H2020 Polirural identified **gender inequality as a concern** or recognised the gendered impacts of other drivers. Below, a non-exhaustive list of mega-trends is provided starting from the 14 Megatrends Hub inventory[1] of the Competence Centre on Foresight of the European Commission (2020) (Figure 2).

[1] The list draws from the 15 reviewed sources, available at the end of this document, from No. 6-20 of the reference list. We started from, and integrated, the inventory by the Competence Centre on Foresight of the European Commission, which provides a repository of documents on 14 global megatrends considered relevant for the future of European and global societies.

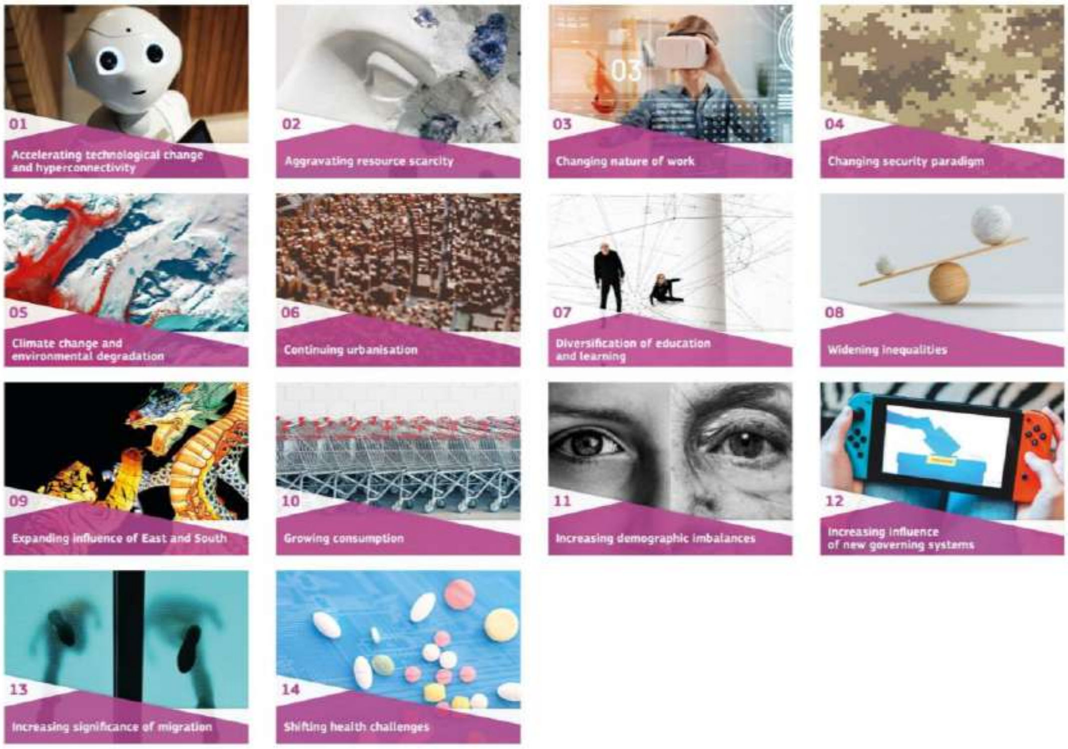


Figure 2 - Megatrends Hub. Source: Competence Centre on Foresight, EC (2020).

The list has been integrated by drawing from the documents reviews whereby a set of connected drivers were identified for each mega-trend, considering their relevance and implications for women in agriculture and rural areas. This list is not intended to be exhaustive of all potential areas affected by the mega-trends, but rather to highlight key factors which should be monitored and prioritised above others.

- **Worsening resource scarcity:** demand for water, food, energy, land and minerals is rising substantially, making natural resources increasingly scarce and more expensive. As the world's population is projected to grow by almost one third by 2050, resource use could double globally by 2060, with water demand increasing 55% by 2050 and energy demand growing 30 % by 2040 (Bock and Krzysztofowicz, 2021). Water scarcity, for instance, not only puts a strain on crops and livestock, but it is also becoming a source of conflicts in many regions of the world (Gleick and Shimabuku, 2023), while women often bear the responsibility for water collection in rural households lacking access to running water, with broad effects on their well-being, safety (Carr et al., 2024) and access to education. In many European regions, increasing competition between different resource uses can raise issues, especially in rural areas with intensive agriculture, high population densities and/or intensive industry (H2020 Polirural). At the same time, the quality of natural resources is deteriorating (e.g. soil degradation, biodiversity loss).
- **Climate change and environmental degradation:** continued unabated, anthropogenic pollution and greenhouse gas emissions will further increase changing climate patterns. Climate change is expected to increase global average temperatures by at least 1.5 °C above pre-industrial levels by 2040, with multiple severe impacts across different regions of the world (IPCC XXX). Impacts categories for the EU encompass human mortality from heat and cold waves, windstorms, water

resources, droughts, river and coastal flooding, wildfires, habitat loss, forest ecosystems, agriculture, and energy supply (Bock and Krzysztofowicz, 2021). Agriculture both affects and is affected by climate change, with positive and negative impacts. The main impacts include increased pressures on crop and livestock production resulting from water availability, overall temperature variations, extreme meteorological events, presence and persistence of pests and diseases, as well as fire risks (Hart *et al*., 2017; IPCC, 2018). In the EU, climate related impacts on agriculture have largely been negative, with moderate positive impacts limited to temperature increases in northern latitudes (Bisoffi et al., 2020). There is large evidence of gender disparities in climate vulnerability, especially in poorer countries: women farmers get higher income reduction from extreme weather events compared to men and higher additional work burden, despite female-headed households showing different coping strategies for agriculture (FAO, 2024). It is expected that global warming affects food security by 2050 (JRC, 2022).

- **Changing nature of work:** new generations entering the workforce and older generations working longer are changing employment, career models, and organisational structures. Across the globe, women have fewer income opportunities compared with men: they are less likely to work for income or actively seek work (the global labour force participation rate for women is just over 50% compared to 80% for men), they are less likely to work in formal employment and have fewer opportunities for business expansion or career progression (World Bank, 2024). Women in work earn less than their male colleagues: in the EU27, the gender pay gap in 2022 was 13% (Eurostat, 2024). Women's participation in the job market depends on welfare systems, social policies, parental leave schemes, cultural norms (REFREF). Employment in rural communities is declining due largely to their heavy reliance on declining sectors, especially in remote areas, where the absence of jobs encourages selective out-migration of women and young people towards towns and cities (AA.VV., 2021). The gap between male and female employment in rural areas equals 13% in the EU (compared to 10% in cities), rising to over 20% in certain Member States (Chartier et al., 2020). Women may have more precarious contracts (e.g. seasonal workers) or play an 'invisible role' in rural societies (e.g. assisting spouses), which increases their vulnerability, e.g. in terms of access to social protection or maternity benefits (Chartier et al., 2020). Remote work has the potential to increase the possibility to work in rural areas, to help rural dwellers remain connected, participate in the labour market and access a wider range of possibilities for social integration and participation in distant cultural offers (H2020 DESIRA). For rural businesses, digital technologies may provide tools to diversify their activities and access different markets, e.g. through internet sales, telework, access to websites and digital platforms, although this may come with risks, especially for individuals with lower levels of digital literacy (H2020 DESIRA). In agriculture, about 56% of farmers are older than 55, while only 6% are younger than 35. Women manage 28% of farms, and 40% are older than 65 years (SCAR, 2021). Part-time farming, or a farmer's spouse working off the farm provides additional income support, leading to commuting flows (AA.VV., 2021). Employment opportunities in sectors other than agriculture (e.g. rural tourism, artisanal and craft production), requiring different skills and human capital, are decisive for diversifying the rural economy and gaining attractiveness for young people and women (H2020 RURALIZATION; AA.VV., 2020). Rural business succession and generational renewal will also affect the potential for women and younger farmers to take over the businesses of retiring farmers, with potentially better prospects for succession or new entrants in farming (H2020 RURALIZATION).

- **Accelerating technological change and hyperconnectivity:** there is a growing impact of technology and digital connectivity on how we live, from how we socialise and work, to production and governance. The rise of digital platforms, precision agriculture, mobile agriculture apps, drones, etc., can improve agricultural productivity and rural livelihoods (Bock and Krzysztofowicz, 2021). Precision agriculture could reduce the gender gap by making farming operations easier for women, especially for performing physically demanding tasks (H2020 Polirural). However, new technologies like robotics or automated livestock systems may lead to the loss of jobs in agriculture (H2020 DESIRA; Farmers of the future, 2020). The rural digital divide affects especially the most vulnerable groups in remote and sparsely populated areas (DESIRA H2020), where limited access to technology can be due to lower digital skills and literacy. Limited access to financial services by women may limit their capacity to access available tools, while at the same time, new forms of care services, like telemedicine or mobile services may ease the burden of care work (H2020 RURALIZATION).
- **Continuing urbanisation:** people in search of better opportunities – such as jobs, services, and education – have been moving from rural to urban areas across the world, and this accelerating trend is likely to continue in the future. Young women are more likely to leave rural regions than young men (European Commission, 2020). This trend is strictly interwoven with the trend of **increasing demographic imbalances.** The world's population will reach 9.7 billion by 2050, with rapid growth mainly in Sub-Saharan Africa and stagnating numbers of residents in the majority of developed countries. It is estimated that Europe's share of the global population will shrink in the future and within this, it's working age share of population (Vesnic Alujevic et al., 2023). Likewise, rural areas will experience a population decrease across all world regions. Demographic changes in rural areas of Europe indicate depopulation and an ageing society, although at a closer look, a nuanced situation emerges, depending on different levels of socio-economic development and regional contexts, e.g. predominantly rural vs intermediate rural (Bock and Krzysztofowicz, 2021). Ageing societies and shrinking labour forces will have consequences for economic growth, labour markets, the sustainability of social security systems (e.g. pension systems), and demands for and provision of goods and services, such as health and elderly care and housing (Vesnic Alujevic et al., 2023). In the EU, farmers' ageing is expected to affect the structure of the primary sector, and about 11 % of agricultural land in the European Union is at high risk of abandonment by 2030 (Muench et al., 2022). Current trends combine rural exodus, selective out-migration of women and young people and the arrival of newcomers, including migrants, highly skilled former urban dwellers, and retired people. The challenge will be particularly acute in the farming sector (AA.VV, 2020). Heavy social implications of demographic changes in rural areas can be challenging for the provision of public services such as health and social care for the elderly and childcare for families, but could also trigger social innovations, like community-based service provision, which could be empowering for women farmers, like on-farm childcare (Chartier et al., 2021). Availability and quality of services (e.g.,

education, healthcare, banking) are crucial factors contributing to the quality of life in rural areas (Bock and Krzysztofowicz, 2021).

- **Diversification of education and learning:** new generations and hyperconnectivity are rapidly changing both educational needs and modes of delivery. While advancements in cognitive science, information access, new pedagogy, and lifelong learning are diversifying education and ways of learning, the link between education and school-based learning could weaken in the future, with informal and unstructured learning gaining more recognition. New forms of education, learning and independent advice can make access to actionable knowledge very easy (Barabanova and Krzysztofowicz, 2023), also in rural areas, where online training in particular is expected to play an increasing role in providing access to knowledge for rural people (Tisenkopfs et al., 2021). In rural contexts, such new approaches to education and training education and training are essential for keeping pace with technological advancements and, as digitalisation reshapes jobs and most aspects of daily life, updating digital literacy requirements is crucial (Tisenkopfs et al., 2021). Both a rural-urban and gender gap exist in the share of young people (aged 18 to 24) who are Neither in Employment nor in further Education or Training (NEET). The figure was 3.7% higher in rural areas of the EU than in cities, and for young women (16.3 %) compared to young men (15.4 %) in 2015. The latter further increases when comparing young women living in rural areas (18.8 %) with young men (17.0 %) (AA.VV., 2021). H2020 POLIRURAL emphasised how education and knowledge are crucial for all rural regions, empowering young people, women, and newcomers to embrace innovative regional policies and supports that address challenges such as equitable access to new skills and knowledge, reducing brain drain of highly educated youth, meeting rising individual expectations, leveraging social media and connectivity, and adapting to the opportunities of digitalization (AA.VV., 2021). Societal resilience to multiple shocks and risks may be strengthened through investments in health and education, as pillars of managing both present societal needs and longer-term human capital and economic development (WEF, 2023). The risk of collapse or inadequacy of public infrastructure and social services, i.e. the failure of social security systems and the erosion of essential benefits, including, among others, education, would pose significant challenges particularly for the vulnerable segments of the population (WEF, 2023). This is strictly connected to the trend of **widening inequalities.**
- **Widening inequalities:** although the absolute number of people living in extreme poverty is declining, the gap between the wealthiest and poorest of the population is getting bigger. Such a trend is exacerbated by the cost-of-living crisis, i.e. the major inability among broad sections of populations to maintain their current lifestyle due to increases in the cost of essential goods, which are not matched with a rise in real household income (WEF, 2023). The cost-of-living crisis has been ranked as the most severe global risk in the short-term (2 years) by Global Risks Perception Survey respondents, although its persistence could result in a growing proportion of the most vulnerable parts of society being priced out of access to basic needs, fuelling unrest and political instability (WEF, 2023). Several foresight studies have identified inequality as a challenge, a driver in the evolution of economic systems and a risk to social cohesion (Bisoffi et al., 2018). Sources of inequalities are not limited to inequalities of income: in the EU, social and

economic gaps between rural and urban communities already contribute to inequalities, and individuals with a university-level education tend to live, on average, five years longer than those who only have a lower secondary education or less (Matti et al., 2023).

- **Growing consumption:** by 2030, the consumer class is expected to reach almost 5 billion people. This means 1.3 billion more people with increased purchasing power than today, notably in Asia, where the middle-class consumption will be expanding. While this expansion is expected to drive economic development, the demand for food, water and energy will grow respectively by 35%, 40% and 50% by 2030. If, on one hand, the food transition could lead to increased global demand for animal proteins and highly processed convenient food, on the other, there is a shift in food demand which could reshape the agricultural sector led by increased health and ecological consciousness by more mindful and aware consumers (Bock and Krzysztofowicz, 2021). More and diverse farming models will emerge to respond to the increased diversification of lifestyles, trends (e.g. lab-grown meat and bio-based products) and dietary patterns (e.g. smart personalised food, special diets such as vegetarian, vegan, low carb, paleo, ready-to–eat food, new food services, food safety, local production, environmental or animal welfare considerations) (Muench et al., 2022).
- **Increasing significance of migration:** the societal and political significance of migration has increased, with migration dynamics becoming more complex in an interconnected world. Global food systems and immigration patterns to Europe will be deeply affected by changing migration patterns at the global level. The share of international migrants in the world population has not grown significantly in recent decades, and the importance of migration as a social and political concern has intensified considerably. Large-scale involuntary migration and displacement across or within borders is recognised as one of the major global risks both in the short- (2ys) and the medium-term (10ys), due to persistent discrimination and persecution, lack of economic advancement opportunities, natural or human-made disasters, and internal or interstate conflict (WEF, 2023). Even though migration tends to have a positive economic impact, there seems to be growing concern that current levels and patterns of migration are unsustainable in many parts of the world, with consequences for the rights of migrant and refugee people and for social cohesion at large (Bisoffi et al., 2019). Migration, the public attitude towards it and related policies may affect the European economy and, within this, the agri-food system in terms of labour supply in an ageing society and size of rural and urban populations.
- **Shifting health challenges**: Advancements in science and better living standards have increased the opportunity for longer and healthier lives and reduced the incidence of infectious diseases. However, unhealthy lifestyles, pollution, and reactive healthcare are driving a rise in non-communicable diseases like cardiovascular issues, diabetes, cancer, and mental health disorders such as depression and anxiety. Related aspects important for farming and for farmers as consumers are unhealthy diets (rich in sugar, fats, salt, highly processed foods, fast and convenient food etc.), and the use of antibiotics in farming. Food-related diseases like diabetes, heart disease, some cancers and a host of other problems that add to the costs of already overburdened healthcare systems in many wealthier countries (SCAR, 2021). Food policies have an important role to play and could change in reaction to this trend with implications on food

demand. The widespread increase in mental health disorders and rising inequalities across various demographics negatively affect well-being, social cohesion, and productivity. This includes but is not limited to, conditions like anxiety, dementia, depression, loneliness, and stress (WEF, 2023). As mental health challenges grow, they impact individuals' quality of life and healthcare systems.

- **Shifting global social values:** Some recent societal trends across the world are increasing inequalities, declining fundamental rights, multidimensional poverty, slow and uneven social progress, and severe polarisation, damaging institutions essential to democracy. Inequality and conflicts in societal values could precipitate regulatory changes regarding education, employment, housing, gender, immigration and the environment (WEF, 2023). Crises related to chronic financial stress and rationing of essentials – such as having to choose between heating and eating – will have long-term physical and psychological impacts even on healthy people (WEF, 2023). Lower confidence in public institutions could also influence public health and erode social cohesion (WEF, 2023). Social cohesion is the key ingredient for effective democratic societies, ensuring that people share a sense of belonging and trust in one another, as well as a broad commitment to common values and goals. Although a higher share of people in rural areas than in urban areas agree or strongly agree with the statement that they feel close to people in the area where they live, there has been a significant drop in the share of people in more remote rural areas who strongly feel a sense of belonging (Bock and Krzysztofowicz, 2021).

Annex 3 - Current and future challenges for women in farming and rural areas: insights from 9 Living Labs across Europe

This chapter presents and discusses the main results of the Phase 1 of Task 1.3, i.e., the first part of the foresight exercise on women-led innovation in agriculture and rural areas. As explained in the methodology, each of the 9 Living Labs of GRASS CEILING were asked to conduct an internal foresight activity and report on its results in a template. A summary of the results from each Living Lab can be found in Annex 6. The structure of the chapter follows the structure of that reporting, with the exception of the part dedicated to the identification of personas in the templates. The identified characters were processed by the authors of this document, transformed into 'personas cards', and used to connect the activity in the Living Labs with the following part of the foresight exercise in Phase 2. Although it was not specifically required in the templates, some of the Living Labs used the personas to facilitate the reflection in the following stages of their Phase 1 workshops. A list of the personas identified is included in Annex 5.

The first section of this chapter provides a picture of the present struggles of rural women entrepreneurs by summarising Living Lab participants' discussion about the main drivers that impact their entrepreneurial activity. The Living Labs were initially asked to identify drivers as general factors to take into consideration when thinking about their present situations. Apart from the list of drivers provided, which was based on one of foresight studies reviewed in Task 1.2 where drivers were classified following the STEEP criterion, some of the Living Labs identified new drivers. These new drivers were also classified by the authors of this document following the same STEEP criterion. However, this general picture could overrepresent the typologies of drivers whose list included more options in the template. E.g., five economic drivers were given as an option, while just two environmental drivers were included in the list. To correct this, a question was added where participants were asked to rank the three main drivers in order of importance, which provides a more nuanced understanding of the most impactful drivers amongst the previously identified ones. In the analysis, organised by type of driver, general trends were identified as reflected in the Living Labs' answers, highlighting the negative or positive perception of specific drivers in the present and pointing at some of the differences in the answers.

The second section summarises the Living Lab discussions about the future of women-led entrepreneurship in rural areas. While the identification of present drivers served as the baseline to think about the future challenges, the last part of the discussion in the Living Labs entailed thinking in terms of their desired futures visions. Our analysis synthetises a set of common elements in the Living Labs' discussion. Each of the elements presented includes the content of the desired future transformation, i.e., the vision, and potential interventions and policies hypothesized by the LIVING

LAB participants to overcome the challenges that could emerge, i.e., the actions required. In that way, the results of the analysis sketch a potential 'Future Vision of Women-led Rural Entrepreneurship in the EU'. In the conclusion of the document, this vision is used to discuss the results from the Phase 2 workshops.

3.1 Present struggles of women entrepreneurs in rural areas

3.1.1 Overview

Firstly, the main **category of drivers**, i.e., amongst social, technological, economic, environmental, and policy drivers, identified across the Living Labs was social drivers, followed by economic drivers and policy drivers. In fact, one or more social drivers were mentioned as relevant by each of the Living Labs for their respective rural areas. Technology drivers and environmental drivers were the least mentioned in the templates.

Secondly, regarding **individual drivers**, the most mentioned one was the social driver 'Shifting values', followed by the technology driver 'Digitalisation', the policy driver 'EU/National Policies and Regulatory Frameworks', the social driver 'Demographic', and the environmental driver 'Climate Change' (Figure 3).

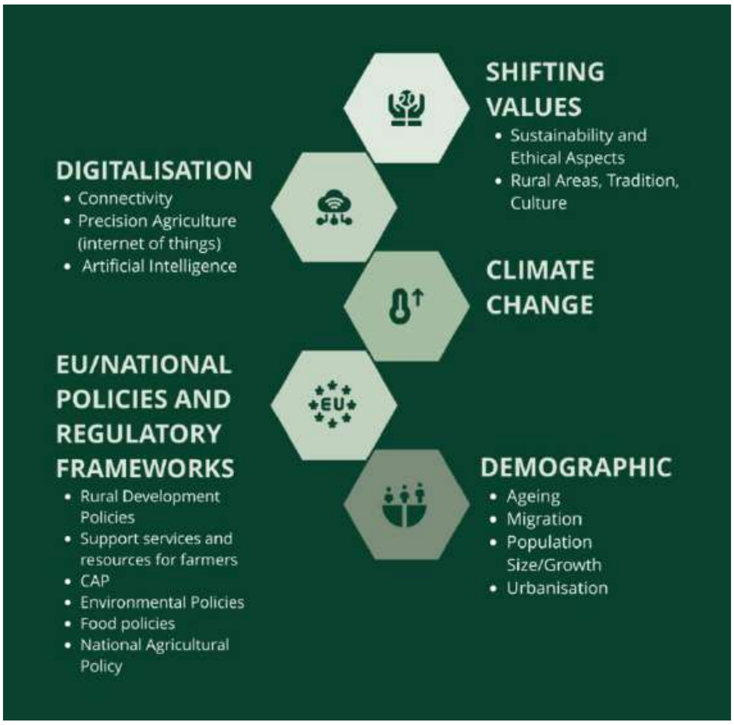


Figure 3. Most mentioned drivers in the Living Labs templates.

Thirdly, the Living Labs identified **14 new individual drivers** (6 economic, 4 social, 3 policy, 1 technology) apart from the list of possible drivers provided in the templates. From those new ones, the abovementioned 'Artificial Intelligence' and 'Support services and resources for farmers' were the most mentioned, i.e., twice each.

Interestingly, **two of the new drivers identified by the Living Labs were explicitly gender-related**. These were the social drivers 'Double-burden [time]' and 'Shifting Values: Cultural attitudes towards gender and importance given to women-led initiatives'.

Fourthly, regarding the **top three ranking of drivers** identified by the Living Labs, the main **categories of drivers** present were social drivers, policy drivers, and environmental drivers (Figure 4). Four policy drivers, three environmental drivers, two social drivers, and one economic driver were mentioned as the first driver in the ranking. No technology driver was mentioned as the first one.

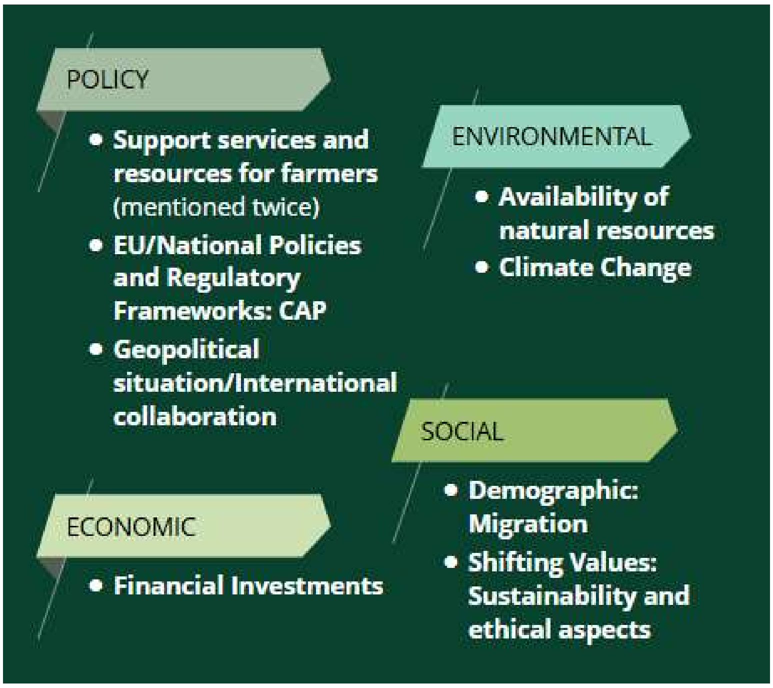


Figure 4. Drivers ranked as top 1 by the Living Labs in their template reports.

3.1.2 Social Drivers

Demographic drivers such as migration and ageing are mostly considered in a negative way as a cause of severe problems for rural areas. Young people out-migrate, and this compromises generational renewal, promotes depopulation and the dismantlement of services, and reduces the availability of labour. Moreover, old people are regarded as less open to change. Interestingly, despite recognising out-migration as a problem, some Living Labs argued that international migration to rural areas can also help solving labour shortages:

The positive impact of global migration is recognized as helping to solve the labour shortage, the perception is that "it is easier for foreigners to find employment in Croatia". (Living Lab Croatia)

Shifting values are also considered as relevant social drivers, with positive or negative implications depending on the type of values they refer to. Values connected to the importance given to sustainability or ethical aspects, e.g., care for the environment or animal welfare, were mentioned in positive terms but as being currently largely absent. Values placed on rural areas, tradition and culture are generally seen positively. E.g., family farms are seen as providing fundamental social aspects respect to large agribusinesses, and the values embodied by rural areas are seen as attractive for people from cities, which might promote tourism and help rural areas economically. This type of values was sometimes mentioned in combination with sustainability values such as caring for the environment and the landscape, e.g., rural populations can be "custodians of the values of the territory" (Living Lab Sweden). However, the perception of these 'rural values' by urban populations can also include negative stereotypes:

There are risks of faulty expectations when travelling to rural areas, including, bugs, experienced dirtiness, and lack of Wi-Fi – a potential negative 'disneyfication' of rural areas, which were mentioned. (Living Lab Sweden)

Finally, the cultural attitudes towards gender and importance given to women-led initiatives are currently seen as having negative consequences for women entrepreneurs in rural areas. These generally translate into an increased responsibility for women to take care of the household and children and undervaluation of the social innovations they develop:

Women discussed the multiple demands on their time. These include childcare, domestic labour, paid employment, their enterprises, and multiple volunteering roles. One woman spoke of her frustration when she was asked if she worked, and despite numerous volunteering roles in social enterprises and developing her own enterprise, she heard herself reply 'no' to the question. (Living Lab Scotland)

3.1.3 Policy Drivers

Starting with the geopolitical situation, current conflicts and the fluctuation of international markets due to changes in policies were seen negatively and creating a context of uncertainty:

Crises and instability force farmers to adapt. The economic situation of farms is difficult to predict due to the geopolitical influence on prices, affecting both farm operations and investment planning. (Living Lab Lithuania)

The driver 'support services and resources for farmers' was broadly understood as policies that could enhance the access for women farmers to advisors and networks, collaborate with researchers and innovative companies, or general measures that could help them to save time by hiring temporary workers. It was seen as a potentially positive driver if well designed and implemented:

People with the right skills to advise you, a good advisor who can see you as a person as well as your needs and the company. Support from innovation companies and access to networks. It is crucial to have a network around you. (Living Lab Norway)

As a result of the current EU and national policies, JF (Persona 1) commented on the lack of support available to help with farm work. This has critical implications for farmers as they are unable to take Maternity, Paternity, Paternal or Parent's Leave as a result. JF spoke of working on the farm with her newborn babies in a sling on her back as she carried out tasks on the farm. She also noted that extra help would also be needed during calving season. She highlighted that policy changes are required at an EU level so that farm families can hire staff to help when needed. (Living Lab Ireland)

Rural development policies are seen as positive but currently underfunded:

Existence of a rural development policy (diversification and support for rural employment) but with a limited and scarce budget to improve the quality of life in rural areas. (Living Lab Spain)

It took a decade for the inhabitants of rural areas to recognize the advantages of the EU rural policy and to change their expectations from the policy of exclusively supporting agriculture. Passive production support is replaced by support based on project ideas, their realization and results. That is why rural development policy contribute to rural entrepreneurship and sustainable rural development. (Living Lab Croatia)

The Spanish Living Lab discussed the positive and negative effects of the Common Agricultural Policy (CAP) and the negative effects of other environmental policies.

All participants agreed that CAP support is currently indispensable for maintaining fair incomes in both agricultural and livestock farms. […] Existence of environmental and biodiversity protection regulations that conflict with agricultural interests, limiting the competitiveness of agricultural and livestock farms. (Spain Living Lab)

In contrast, national agricultural policies were discussed and negatively depicted as unpredictable and inadapted to small farms:

National agricultural policy is not particularly adapted to local food producers. Difficult to compete. It is perceived as a threat to adapt to the political fluctuations and it is unpredictable. (Living Lab Spain)

Support is given to large farms, not small ones. It is perceived as a threat to adapt to the political fluctuations and it is unpredictable. (Living Lab Norway)

3.1.4 Environmental Drivers

Environmental drivers, i.e., climate change and the availability of natural resources, are almost unanimously regarded as threating the survival of agriculture and rural areas. Women entrepreneurs from some Living Labs considered that environmental problems are connected to values. Moreover, environmental problems are not taken seriously enough:

Environmental problems are being ignored and not prioritised. (Living Lab The Netherlands)

Participants in the foresight exercise] felt that the availability of natural resources raises both a concern and a values issue at the same time. The fact that there is a fear today that there will be no availability of natural resources in the future creates uncertainty and concretizes a problem to be addressed in the future. (Living Lab Italy)

Interestingly, the Swedish Living Lab was the only one to see climate change not just as a problem but as a potential opportunity for rural women:

In the discussion one group identified positive feature of a changing climate in terms of being able to produce new crops in the region, and 'nicer weather' (warmer summers) which could prompt more tourism. On negatives, the group mentioned lack of fodder, water, grazing, too wet pastures, invasive species and parasites – all potentially affecting their farming in the future. The other group discussed a bit of a paradox, as while producing beef by having free-ranging cows eating grass may be good for the environment – by e.g. producing biodiversity and keeping the landscape open – it may not be good for the climate, due to emissions of greenhouse gases, produced both by the cows and diesel-driven tractors used in their farming. (Living Lab Sweden)

3.1.5 Economic Drivers

Economic drivers were generally regarded as negatively influencing the capacity of rural women to develop social innovations because of the lack of resources, i.e., financial investments and housing, and the disconnection between food production and consumption. There is perceived lack of financial investments both at the micro and macro level, which is an important obstacle for women:

According to the participants, financial investments, access to credit and the availability of forms of financing are very influent in today's agricultural and rural business landscape […] Professionals such as Sofia's would not be able to work and would not be able to make their expertise available to companies in need of support in investment decisions. (Living Lab Spain)

There was a lot of discussion about the difficulties of accessing micro finance for smaller entrepreneurial activities. It is easier to access large amounts of funding. There are limited smaller funds available to which they can apply. The women believe that lack of access to this type of funding holds them back. (Living Lab Scotland)

The Dutch Living Lab pointed at the disconnection between food production and consumption, partially due to globalization, as an important driver limiting the possibilities of women farmers:

If people don't understand where their food comes from, they are not connected to how it is made and the work that goes into it. Cheap processed food is too cheap whereas fresh, healthier food is too expensive making it difficult to choose a healthier diet. Farmers are not paid just amounts because consumers just want to pay as little as possible. The competition for low prices is also driven by supermarkets. (The Netherlands Living Lab)

The Scottish Living Lab pointed that the lack of affordable housing as a big obstacle for young people and women to stay in rural areas:

The lack of affordable housing and the impact on their communities came up repeatedly. It is very difficult for young people to afford housing in rural areas. Amy spoke about the difficulties of trying to access teachers for the local schools because they cannot afford to live in the area […] Julie spoke about how she would like to reduce the hours she works but this is impossible because of the level of their debt linked to purchasing their house. (Living Lab Scotland)

3.1.6 Technology drivers

Regarding technology drivers, an increased connectivity, and the digitalization of agriculture through AI, precision agriculture, robots, etc., is seen as potentially positive for women involved in the agricultural sector, although some potential limitations are foreseen. Some of these are the lack of access and unaffordability of technological developments, the high competences required to use them, or the difficulties to adapt them to small farms:

Connectivity today is useful to avoid depopulation of some territories and help the demographic issue. By making sure that there is a return of all those brains that leave the South to study or to find new opportunities. […] Connectivity is also useful to find solutions, to build a "plane B", for example to fight threats such as "Xylella" in the South of our region. Connectivity is also an opportunity for improving the generational turnover ad attracting new generations of farmers. (Living Lab Italy)

One group discussed access to new technologies, and the idea of being more efficient by farmers sharing resources e.g. one farmer doing certain activities for others, so not all of them need to buy the same technological equipment. The other group discussed that while new technology may be fantastic it requires new extensive competencies. Other concerns mentioned were (limited) access to new technologies, e.g. for smaller farms where larger machinery and precision farming may be unfit. It was mentioned that while cattle (cow) farming has access to new technologies, in horse farming there is a stark lack of technological solutions and developments, possibly because it is dominated by women farmers. (Living Lab Sweden)

The Dutch Living Lab also pointed at some potential disadvantages of the integration of technologies in rural areas:

Mobile telephones are creating problems throughout society for example, too much time is spent on them. This is especially a concern for the youth who are vulnerable. It is difficult to identify the truth with AI. This brings mistrust and misleading information. It also brings unrealistic expectations that AI reinforces and can be detrimental to real-life experience. In addition to this, technological advancement is not always beneficial to the consumer, such as in the case of solar panels having negative compensation agreements. (Living Lab The Netherlands)

1.1.7 Key lessons from the present of Living Labs

First, it is worth mentioning that the discussion on how drivers affect the life of women entrepreneurs in the present was characterised by a **focus on negative impacts**, i.e., they focused on describing their **barriers**. In contrast, the positive impact of drivers, i.e., the potential **enablers**, was much less discussed. This underlines the importance of prioritising the overcoming of barriers in policy initiatives targeting women entrepreneurship in rural areas.

Second, the results from the Living Labs show that **social drivers are the ones deemed more impactful** on the activities of women entrepreneurs in rural areas. **Social** drivers were the most identified category of drivers in the first part of the exercise, while two social drivers were placed as the top-1 in the ranking. This aligns with the rest of results presented in this document and the analysis of megatrends which points at the increasing demographic imbalances due to continuous urbanisation and migration or shifting global values as key dynamic influencing rural areas. This seems to indicate that Living Lab participants regard the **changes in the social structure and values of rural areas**, i.e., demographic conditions, ageing, migration, tradition, culture, attitudes towards gender, etc., **as key barriers for women to have the possibility to develop successful social innovations**. The demographic problems are translated into a lack of services and labour shortages which, in combination with the traditional regressive attitudes towards gender, result in women having to dedicate more effort to childcare and housework than men. Therefore, they are deprived from the time to develop their own social innovations.

Third, **policy and economic drivers** were also considered as highly impactful. Although some economic drivers were identified by the Living Labs in the first part of the exercise, the results of the ranking show that policy drivers are considered as more relevant, i.e., four policy drivers were placed as the top 1, while one economic driver, i.e., financial investments, was placed in that position. This suggests that **women are highly aware of the impact of policies on the outcomes of their social**

innovations, mainly when they are connected to agricultural activities, i.e., support services for farmers or the CAP. However, they also think that **policies are currently very ineffective or badly implemented**, which intensifies the social barriers described above by, e.g., not providing enough resources and support for women farmers to develop their innovations. Moreover, the **economic drivers are also regarded as barriers which intensify social problems**, e.g., the lack of investments and housing intensifies the demographic problems. The interconnected nature of social, economic, and policy drivers suggests that the strategies aimed at addressing these barriers should be combined.

Fourth, although environmental drivers seemed not to be very impactful in the first part of the exercise, they were the second most mentioned category of drivers in the top-1 of the ranking. This difference might be explained by the risk of overrepresentation that was introduced in the introduction of this chapter. This indicates that **women entrepreneurs are concerned about the impact of the current climate crisis and its results in terms of biodiversity loss and lack of access to natural resources**. Interestingly, the environmental issue is regarded as a 'values issue' since **environmental problems are not taken seriously**. In contrast, rural women are believed to embody values such as care for the environment. This points at a potential synergy between traditional rural values of stewardship with new environmental concerns, which suggests that **rural women entrepreneurs could have a potential role as 'custodians of the territory'**.

Finally, concerning the lower importance given to technology drivers both in the identification and ranking of drivers, this should not be interpreted as women entrepreneurs disregarding the impact of technology on their social innovations. In fact, **digitalisation and connectivity** were identified as impactful individual drivers, which **could be important enablers** for women entrepreneurs if properly developed and distributed. However, the results from the ranking seem to indicate that **women entrepreneurs do not consider technology as a priority when compared to other types of drivers**.

3.2 Future vision for women-led rural entrepreneurship in Europe: 10 key elements

3.2.1 Progressive cultural attitudes towards women and the gendered division of roles

Vision elements:

- ✓ Women entrepreneurs and farmers are actively encouraged and enabled to flourish.
- ✓ Value-based choices of women are respected.
- ✓ The responsibilities for childcare are shared between sexes and are not primarily the responsibility of women.
- ✓ Rural women with children are not isolated and can find support in networks.
- ✓ Women's social innovations, including economically undervalued activities such as volunteering and environmental management, are positively considered and properly rewarded.

Actions required:

- ✓ Effective approaches to gender equality throughout policy documents at EU and national levels.
- ✓ Development of women-led rural cooperatives. This could be highlighted in EU and national policies and supported through appropriate funding programmes.
- ✓ Organisation of women-only online forums, where women would feel less intimidated to participate. The content could include networking and support, information about available training, and sources of funding.
- ✓ Support to the change of awareness through strong media campaigns that emphasize the importance of women in entrepreneurship.
- ✓ A farm relief service offering, for example, 30-day farm help during busy periods such as calving season and for longer periods to allow parents to take maternity and paternity Leave. This service could be expanded to provide a range of services, from physical help with farm tasks, to personal assistants for rural entrepreneurs and cleaners in the family home.

3.2.2 Creating networks, collaborations, and community

Vision elements:

- ✓ Caring for one another becomes a core value in society.
- ✓ Community power is stimulated to overcome loneliness and build stronger ties amongst people.
- ✓ Connectivity does not just mean to connect through technologies, but to network people.
- ✓ Proposals and suggestions coming from the grassroots are listened.
- ✓ Innovators which were previously isolated have created networks of good practices.
- ✓ The rural economy becomes a sharing economy where inhabitants are better fit to share cars, machinery and tools.
- ✓ Collaboration is a necessity in rural areas to better use resources in the future.

Actions required:

- ✓ Promote farmers as being once again central to communities so their role is appreciated.
- ✓ In a business sense, organising purchasing centres/warehouses/cold storage facilities at the level of local self-government units is necessary.

3.2.3 Creating conditions to ensure good health and care

Vision elements:

- ✓ The promotion of integrated health conditions, i.e., mental and physical, is a core goal.
- ✓ The improved provision and access to care services and welfare, e.g., childcare, elderly care, hospitals, schools, etc., has created and sustained thriving rural areas.
- ✓ As shown with Covid-19, the risk of pandemics will increase.

Actions required:

- ✓ Give lessons about health and welfare in schools.
- ✓ Use new technologies to improve the access to care services, e.g., the use of drones to reach remote areas, including islands, and the development of digital services.
- ✓ More efficient use of existing premises for nurses and medical doctors could also improve access to health services.

3.2.4 Rural-Urban connections and migration

Vision elements:

- ✓ The connection between healthy urban and rural areas creates opportunities for both.
- ✓ Connectivity technologies are used to avoid outmigration and depopulation, and they also serve to promote the return of people who migrated to cities in the past.
- ✓ Remote work is a trend that presents an opportunity for rural development as it makes it possible for people not having to commute.
- ✓ Urbanisation increases the need for experiencing nature in rural areas and increases demands of authentic food and experiences: food and rural tourism are flourishing.
- ✓ The increased risk of pandemics could imply more people moving to rural areas.

Actions required:

- ✓ Cities and bigger municipalities fund fairs and events that help women farmers.
- ✓ Greater aid or tax reductions for those who contribute to achieving greater social performance, either by residing in small villages or by contributing to the maintenance and survival of rural communities.

3.2.5 Research, education, and awareness-raising

Vision elements:

- ✓ It needs to be clear what is ‘real’ and what is ‘fake’ news and information.
- ✓ Advisory services and scientists are connected to entrepreneurs.
- ✓ The increasing awareness among policymakers and farmers will create conditions for dialogue.
- ✓ People are educated about farming and share what is ‘exclusive and exotic’ – coming closer to farming and farmers.

Actions required:

- ✓ Teacher packages and incentives to attract teachers to rural areas, including a rural living allowance.
- ✓ Education needs to embrace new forms of agriculture and multifunctional agriculture.
- ✓ Promote playing outside and visiting farms to connect with nature and the food process.
- ✓ Promote change of consciousness through projects like GRASS CEILING, where women gather, collaborate and network.

3.2.6 Access to finance, housing, and energy

Vision elements:

- ✓ Young people must be able to live in rural areas. If young people can afford housing in rural areas, then there will be children for local schools and nursery provision.
- ✓ Having access to micro finance with minimum paperwork will be key for women entrepreneurs.
- ✓ There will be problems in accessing energy source, which will be both a limitation, e.g., rising costs of production, and an opportunity, e.g., business opportunity of renewable energy.
- ✓ Less energy-demanding products and more efficient energy sources will be developed.

Actions required:

- ✓ Improve the access to affordable housing. Affordability needs to be calculated based on local wages rather than on the price of houses in the area.
- ✓ There needs to be future policies restricting second home ownership in remote areas.
- ✓ Simplification in accessing funding; there are many different schemes that all have different application forms.
- ✓ Increase grants for environmental management.
- ✓ Create incentives for energy production, e.g., though taxes and subsidies.

3.2.7 Policy coordination and conflicts

Vision elements:

- ✓ It is necessary to create situations and cooperation in which political confrontation and dynamics of eligibility are avoided.
- ✓ Future policy support for farms will be more tailored to regional and local needs.
- ✓ Policies will be put in place to fill the generation gap that is being created.
- ✓ EU policy is seen positively in comparison to national policies.
- ✓ However, the state is expected to support local agricultural production and family conciliation, which typically affects women.
- ✓ Public support policies such as CAP or rural development aid will continue to be very important, but with significant changes and nuances.

3.2.8 Dynamics of environmental change

Vision elements:

- ✓ A long-term vision needs to have the environment at its core.
- ✓ Climate change and the lack of availability of natural resources are taken as a reality that women entrepreneurs and farmers will have to deal with in the future. These does not just affect European countries but also other like China and India.
- ✓ Agricultural entrepreneurs need to work together every day to take steps to realise a healthy environment on their own land.

- ✓ Climate change could also bring opportunities in certain regions, such as the possibility to grow new crops in the region, and 'nicer weather' (warmer summers) which could prompt more tourism.

Actions required:

- ✓ Increase the public's knowledge of soil quality, environment and sustainability.
- ✓ Households need to take on the responsibility of ensuring they live in a healthy environment.
- ✓ Reinforce networks so that women entrepreneurs can use them to find new solutions, create ideas and ways to adjust.

3.2.9 Agriculture and farming entrepreneurship and businesses

Vision elements:

- ✓ For agricultural producers and farmers, being able to get paid on the same level as other jobs is essential. In case it is achieved for women entrepreneurs, it will give them room and surplus to take care of theirs family and other interests.
- ✓ Consumers realise that fair prices for good food could ultimately mean a higher percentage of their income is spent on food.
- ✓ Sustainability of business models will require implementing best practices, fostering networking, borrowing things that work in other dimensions, and this may push policy to divert funding to agriculture and rurality.
- ✓ The future leans towards better-sized farms that take advantage of economies of scale to save costs and thus achieve higher performance.
- ✓ If the future leans towards the expansion of the agribusiness model, both environmental and social sustainability will be highly compromised.
- ✓ Local food production and family farms must be prioritised economically and politically.

Actions required:

- ✓ Promotion of local food in different ways. E.g., by using branding schemes, creating pride around the products in the region, telling the story behind (i.e., where the products come from, how they are made, the quality), public meals must be locally produced.
- ✓ To achieve for taking advantage of economies of scale, the cooperative and the integrative model are good examples for small farmers.
- ✓ Reduce regulatory burden on farmers.
- ✓ Financial support for farms that contribute to achieving greater environmental performance, such as extensive livestock farming or regenerative agriculture.
- ✓ More local food in supermarkets needs to be available so consumers can make the choice.

3.2.10 Technological developments

Vision elements:

- ✓ Access to knowledge and information and new technologies will have the biggest impact on women's entrepreneurship, positively if they spread on time and in the right way, negatively if they are disconnected or missing.

- ✓ We should be able to connect even the most remote village, and we have very fast broadband connection.
- ✓ Compared to the past, we have a different awareness and tools that should not be demonized in any way. The mockery of the 'new', e.g., drones in agriculture, must be overcome.
- ✓ Regarding agriculture, digitization is key to increasing the sector's profitability, aiding decision-making, and improving the quality of life for farmers and livestock breeders.
- ✓ The issue of connectivity in agriculture is related to a data issue. People can build decisions having a very large amount of data.
- ✓ There are already existing technologies that could be used to phase out the use of fossil fuels, but strong interests hamper their implementation.
- ✓ Women are committed to using new organic products that improve soil, reduce costs, and help produce larger quantities, while also contributing to the sector's environmental sustainability.
- ✓ Certain technologies, e.g., the Internet of Things (IoT) or digital assistants, could be used by women to organise their multi-tasking (e.g., childcare, farm work, their socio-ecological innovations) and reduce their time burden.

Actions required:

- ✓ Development of sustainable, health-positive, devices and broadband that do not emit damaging signals.
- ✓ Drones for the delivery of produce to reduce time spent on performing in-person deliveries.
- ✓ Wider use like Siri to set task lists and prioritise tasks for women multi-tasking childcare, farm work and their own socio-ecological innovations.
- ✓ Development of more sophisticated versions of devices that already, e.g. cleaning robots.
- ✓ Regulations are still needed for the use of certain field support innovations, such as drones.

3.2.11 Key lessons from the future vision of Living Labs

The ten elements synthesised in the previous paragraphs are an attempt to summarise the discussions about the future of women-led entrepreneurship in the Living Labs. **They should not be seen as isolated envisioned future trajectories, but as complex interrelated dynamics,** separated only for analytical purposes, i.e., to identify needed actions to inform policymaking. Not all the elements are gender-specific, as some envisioned elements concern rural areas in general, e.g., 'rural-urban connections and migration', or society as a whole, e.g. 'dynamics of environmental change'. Some of them relate with the main barriers that had been previously identified in the analysis of drivers, e.g. 'progressive cultural attitudes towards women and the gendered division of roles' or 'access to finance, housing, and energy'. Others point at crucial principles that should guide actions to meet future challenges, e.g., 'creating networks, collaborations, and community'. Taken together, they sketch a potential **'Future Vision of Women-led Rural Entrepreneurship in Europe'**, which can provide a starting point for integrating the perspectives of women rural entrepreneurs in discussions about the future of European rural areas. To conclude, two important dynamics reflected in the vision are worth discussing:

Firstly, **more attention was given to the perceived necessary changes and policies than to the events that were thought to happen in the future**. Although there is just one policy-specific element, i.e., ‘policy coordination and conflicts’, potential policy changes are identified in all elements. This aligns with the importance ascribed to policy drivers in the description of their present struggles. On the one hand, this conclusion highlights that the choices made by women entrepreneurs in the future will depend on whether policies will enable them to overcome the barriers that they currently face, i.e., availability of funds, support systems, advisors, etc. On the other hand, it shows that **women entrepreneurs, despite acknowledging the negative features of current policies, trust policy-making bodies and are open to dialogue and collaboration**.

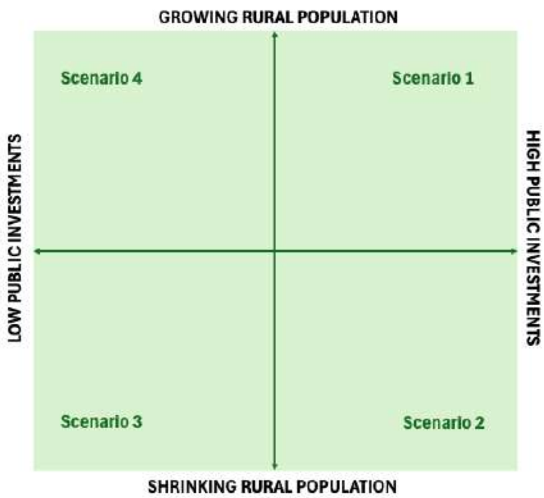
Secondly, **important attention was put on awareness and education**. Apart from the point ‘research, education, and awareness-raising’, actions to educate and change people’s perception about the role of women, the environment, food, agriculture, rural areas, etc., were present in many of the listed elements. This is consistent with the importance ascribed to shifting values in the description of their present struggles. Moreover, women in the Living Labs seem to share a general positive attitude towards growing awareness. These conclusions suggest that future strategies aimed at changing the material conditions of women entrepreneurs in rural areas should be backed by education and awareness-raising campaigns targeting a wider audience.

Annex 4 - Scenarios for women-led innovation in farming and rural areas

4.1 Scenario building

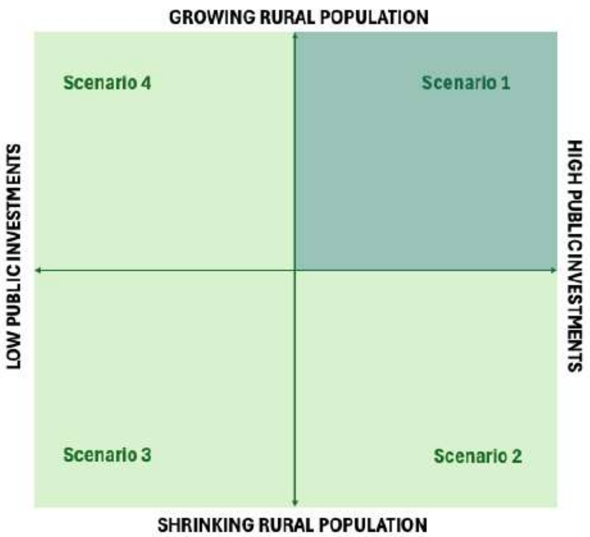
Scenarios are a common tool in foresight studies. They are used to test strategies, policies and plans by exploring drivers and uncertainties and thus supporting decision-making (Pérez-Soba and Maas, 2015). They can come in the form of qualitative narratives or quantified descriptions (or a mix of both) of alternative futures. In fact, scenarios are neither a prediction about the future nor plans, and they do not provide a direction for action: they are descriptions of plausible futures and serve as contexts for decision-making. While *normative scenarios* answer questions about *what should happen* in the future, for instance to achieve a certain vision or goal, *exploratory scenarios* answer questions on *what could happen* and are used to explore uncertainties and communicate how the future may unfold (Vervoort et al., 2015; Zurek, et al; Arcuri and Brunori, 2023). Scenario building often occurs through a two-axes matrix, built along two main independent variables, or drivers. The four resulting quadrants provide a frame for comparing scenarios. By answering the question *'what happens if…?'*, foresight participants are allowed to explore uncertainty, imagine how plausible future scenarios may unfold, and anticipate potential opportunities and obstacles.

In the foresight workshops run in GRASS CEILING (see Table 1, in Methodology section), the aim was to explore and identify which factors may affect women-led innovation in agriculture and rural areas in the future. Based on the previous review (Task 1.2), 'Rural demography' and 'Public investments' were selected as two key variables foreseen to be both very impactful and uncertain in the future. A scenario matrix was therefore built along the two axes and used to provide foresight participants with four context scenarios for 2040. To bring scenarios to life and allow effective exploration of what life under a given scenario could look like, participants were invited to put themselves in the shoes of women entrepreneurs by using *personas*. These are fictitious characters created by or inspired to Living Lab women. A complete list of personas cards is available in Annex 5.



From the input gathered during the two workshops, scenario narratives were developed and are presented below. For each, a narrative of the context is accompanied by details of the discussion of enablers and barriers from the perspective of the women entrepreneurs.

4.1.1 Scenario 1 – Shiny prospects, hidden pressures: challenges in rural renewal

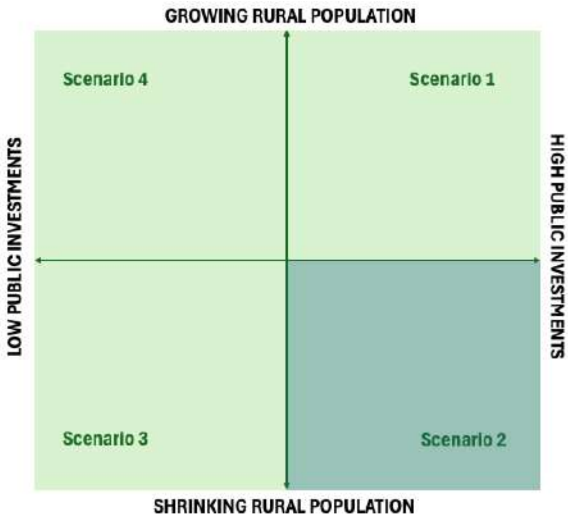


In 2040, rural areas are revitalised and experience some degree of demographic growth, accompanied by high public investment. Such context brings significant economic advantages to many women entrepreneurs: for Annike, Saulè and Mary Keller, the expansion of the population means more customers and business growth, besides possibilities for easier access to credit and subsidies due to strong public support. Services have improved, amongst these childcare and digital and transport infrastructure, with positive impacts on quality of life and business development. However, these benefits come along with some concerns: Annike faces higher living costs due to an increasing housing demand, and the potential land scarcity risks affecting Mary Keller's plans of farm expansion. Julie and Nelia have more visitors, which brings economic gains but start straining natural resources and putting pressure on the environment, their community's most valuable asset.

Table 1 – What happens if…? Scenario-based enablers and barriers. Source: authors' own elaboration.

Enablers	Barriers
Improved access to essential facilities (abattoirs, butchers, and other processors) and infrastructures (transport, connectivity) could enhance diversification at the farm. E.g. Julie Watts could develop her meat packs, croft tours, and courses for residents and tourists.	**Digital, financial and business literacy and skill gaps.** E.g. Amy would face barriers in scaling her business due to limited digital and financial literacy, and Violeta would struggle as she is not familiar with modern technologies.
Human capital, labour and public support available for business development. E.g. Population growth could benefit Violeta by providing the necessary workforce for her business, while Amy would take advantage of new technologies and public support for her business idea, especially during the start-up phase	**Environmental constraints,** e.g. Matilda's business could be threatened by ongoing droughts, necessitating strategies to manage water scarcity.
Community and peer (woman-to-woman) support systems. E.g. continued community participation and woman to woman exchange is vital for Matilda, helping her maintain crucial contacts for both personal and business growth. Daycare programs are also a crucial source of income.	**Social and cultural norms around gender norms and roles:** persistent gender norms and limited childcare options would limit the possibility of balancing the work, life and community roles of Sarah and others.
More recognition for (the value of) small and diverse entrepreneurial initiatives, especially for rural areas	**Tourism pressures**: while tourism investments would be beneficial for Julie Watts' activity, excessive tourist flows could strain local housing resources on the island, threatening the community
Policy measures targeted to sustainable agriculture, animal welfare, and climate change mitigation. E.g. CAP interventions supporting livestock models for climate resilience, better knowledge about animal welfare, support for organic certification in communal pastures and for certified quality-certified dairy products could be leveraged by farmers Sarah and Azucena	**Better targeted measures for financial accessibility:** although in a situation of high public spending, investments would not automatically translate into better access to credit and more resources for women entrepreneurs if they are not better targeted to their needs
Monitoring systems for women-targeted legislation and policies, to track the effectiveness of public support for women and regulations around shared parental leave.	**Business culture:** need to redefine what constitutes entrepreneurial success in rural settings, stressing the value of small initiatives

4.1.2 Scenario 2 – Rural renaissance in empty fields: a thriving yet fragile rural revival

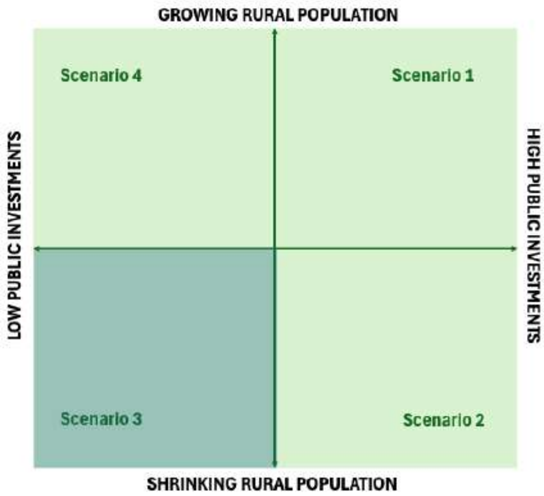


By 2040, high public investments and a thriving economy have created new opportunities for growth and innovation in rural areas. This has benefited professionals like Sofia, who enjoys rural living while relying on remote work, as well as farmers like Joanna, Rosa, and Silvia, who gain from public farm support and can finally access digital markets. However, they complain about how declining rural population has weakened social bonds and diminished community life. A combination of CAP subsidies and public investments is helping modernise the farming sector and keep it competitive, even as rural populations decline, but labour shortages put the long-term sustainability of agriculture at risk. In addition, climate change continues to threaten rural livelihoods, calling for further adaptation effort, beyond boosting renewable energy production and crop diversification.

Table 2 – What happens if…? Scenario-based enablers and barriers. Source: authors' own elaboration

Enablers	Barriers
Community and cultural preservation. Social networks and self-support groups could combat isolation and provide mutual aid among women. Matilda sees potential in leveraging funds (e.g., CAP) to preserve cultural heritage and strengthen community bonds.	**Care burden responsibilities, and lack of social support:** Joanna Flynn and others would be time poor, facing a lack of social support, which complicates family-work balance and highlighting cultural norms would still place a disproportionate burden on women, and a call for changing parenting roles to distribute childcare responsibilities more equally would be much needed.
Economic diversification and multifunctional agriculture, e.g. Joanna Flynn could benefit from her diversified work with milk soap production. Similarly, Rosa could take advantage of low prices of land to expand her farm, taking advantage of financial support for technological upgrades	**Shrinking users' base for rural services:** Rosa would be concerned about the impact of depopulation, which might further reduce available services in rural areas, make it costly to access care for ageing relatives, and affect her farm's profitability. Households with children would have to decide whether to send them to schools in the nearest centres. Sara's ability to engage her community could be weakened by population decline and isolation.
Sustainable tourism: the development of local tourism may increase the demand for eco-friendly and traditional products, which could benefit Silvia's farm, while Matilda could use technology to connect with broader audiences, leveraging the associations in which she participates.	**Labour shortages**: Silvia would struggle to find and retain workers, and Joanna Flynn would need more support from part-time help. The reduced labour pool would make expanding and sustaining businesses more difficult.
Policy incentives and cultural initiatives, for recognising and promoting women's visibility and role in farming and rural business may enhance their involvement and leadership. Targeted measures for facilitating access to land and credit would go in this direction.	**Agricultural policy limitations:** the risk of reduced funding, like CAP and rural development support, could threaten the sustainability of farms and community initiatives. Limited monitoring and evaluation, e.g. focused exclusively on the number of applications by women farmers, would fail recognising specific women's needs
Supportive innovation ecosystems, with improved knowledge sharing (e.g., on animal welfare, digital skills) can support sustainable and resilient rural communities and encourage young innovators, like Sofia, to settle in rural areas	**Lack of policy focus/interest:** the lack of measures explicitly addressing women-led farming and innovation in rural areas implies an inherent lack of interest from policymakers.

4.1.3 Scenario 3 – Silver linings and silver hair: adapting to rural depopulation

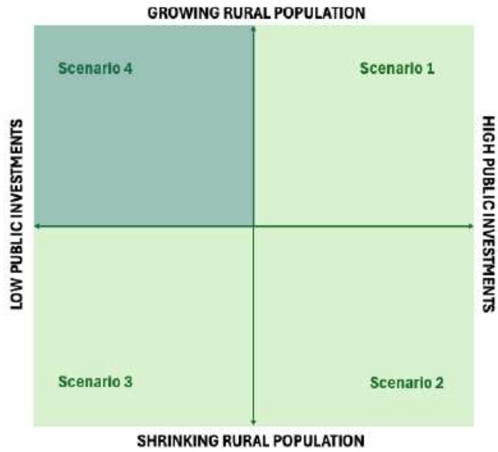


By 2040, rural depopulation persists, as younger generations continue to leave in search of better opportunities, leaving behind an ageing population. People like Saulè experience growing isolation, along with the erosion of community and traditions. Public services are increasingly strained, with limited investment in infrastructure. This in turn hampers the business prospects of farms, consultancies, and tourism, making it difficult to remain appealing to visitors. Economic struggles are compounded by the closure of essential services, such as schools and childcare facilities, placing additional pressure on rural residents, especially women like Amy and Mary Keller, who have caregiving responsibilities. Amid these challenges, Nelia and Rosa are inspired to look beyond the difficulties, exploring innovative business models that focus on urban markets and exports to adapt to the changing landscape.

Table 3 – What happens if…? Scenario-based enablers and barriers. Source: authors' own elaboration.

Enablers	Barriers
Community resilience and support. E.g. Community bonds in mountainous regions could provide significant support in the absence of external resources and help compensate for the lack of services, for Amy and Azucena	**Cuts to, or missing investments in, connectivity infrastructures, e.g. for** Julie Watts reduced investment in travel and ferry services affect connectivity, increasing the rural-urban divide and negatively impacting farming, trade, tourism
Education and training for business: e.g. in digital technologies and business skills, could help Matilda and others diversify their income sources, start or expand their business activity and adopt remote working options	**Degraded farming and processing facilities,** e.g. the abandonment of critical facilities like drinking troughs could increase the risk of livestock disease and endanger extensive livestock farming. The closure of proximity processing facilities like slaughterhouses would negatively affect production costs.
Intergenerational resilience of family farms: Violeta would benefit from one of her children deciding to return and take over the leadership at the farm. This would give continuity to the work done by their parents and make their investments pay off in the long term	**Economic constraints and reduced CAP support for extensive livestock farming and quality dairy and meat products**: economic crisis could reduce the demand for quality food, reducing the market for these products and the economic viability of the farms, which would be exacerbated by a reduction of CAP subsidies
Animal welfare knowledge and training, e.g. Sarah emphasises the importance of animal welfare education, which could improve livestock management practices despite limited investments.	**Changes in local governance, e.g.** communal grazing land management would be affected by changes in local authorities and grazing ordinances, for Azucena
Community-driven solutions for an efficient local resource use, e.g. community-based grazing land management for adaptation to local environmental constraints	**Increasing care needs of ageing population vs reduced healthcare services**
	Lack of generational renewal in farming and other rural sectors, hampering innovation and adaptation
	Lack of affordable social housing
	Lack of childcare services and facilities

4.1.4 Scenario 4 – Growing communities, shrinking support: rural resilience tested



Low public investment and a declining economy pose major challenges for rural areas, even as lower cost of living and housing prices attract new residents and the population grows. Public funding is insufficient to meet the increasing demand for services, and resources are becoming scarce. At the same time, increasing demand creates some opportunities for business growth, leading many to abandon innovative ideas for more profitable, traditional activities. Joanna Flynn, for example, abandons her own projects to focus on work at the family farm, and Sofia finds herself losing the motivation to pursue her own ideas in the lack of entrepreneurial support. To foster a sense of community, long-time rural residents feel the responsibility to drive change and seek for alternative solutions. Joanna Flynn advocates for greater public investments, while at the same time Silvia establishes a foundation to raise funds for education, and for promoting traditional culture and local heritage.

Table 4 – What happens if…? Scenario-based enablers and barriers. Source: authors' own elaboration.

Enablers	Barriers
Community networks: the rural population surge would highlight the central role of social networks, knowledge exchange, and collaborative projects, and their value for creating meaningful which can drive social innovations and economic diversification. It would be particularly important for rural mothers, for the creation of social support initiatives.	**Funding and resource constraints would restrict investment options available to farmers:** ambitious but costly farm investments, e.g. for more extensive and sustainable farming, land recovery, renewable energy and connected activities, are hard to bear for small farms without adequate support. Matilda would face financial challenges and would have to limit the expansion of her tourism activities at the farm, being unable to meet an increasing demand
New market potential: a wider customer base could benefit local firms, shops and farms. Azucena could promote the value of sustainable agriculture and km0 produce	**Welfare services gaps:** austerity measures and the strain on local services, childcare and public welfare, would places significant burdens on families, particularly on women. This would prevent a full female engagement in economic and social activities, with further economic impact on family farms
Rural re-settlers: women returning to rural areas could bring with them fresher ideas and progressive values, enriching local culture and enhancing renewal and innovation	**Fragmented community and poor sense of belonging:** inconsistent and incoherent rural population would share little or no values, interests, potentially giving rise to conflicts
Technological innovation: digital platforms and online services linked to tourism, communication, business support could provide Matilda with much needed services which are not available in the area	
Community-led solutions: despite resource challenges, women could harness their embedded community ties to address environmental and economic issues collectively, such as through practices to restore land health.	
Sustainable living: disseminating knowledge about sustainable living with small, low-cost actions such as workshops, could reduce the potential impact of increasing demographic on the local resource base	

4.2 Enablers and barriers to future women-led innovation in farming and rural areas

The core of the discussion in the two workshops revolved around exploring and identifying, in the context of each future scenario, the enablers for and barriers to women entrepreneurship agriculture and rural areas (Tables 2-5). The factors presented in Figures 3 and 4 are the result of thematic analysis on the data in Tables 2-5, which have been elaborated on to summarise their content, refine the language, remove duplicates, and make them more generalisable to wider contexts. Finally, they have been categorised under different colours according to the STEEP criterion (Social, Technological, Economic, Environmental, and Political dimensions). Factors' categorisation is interpretative and many factors could be categorised under different dimensions, or under more than one dimension. The factors have been elaborated on summarise their content, refine the language, remove duplicates, and make them more generalisable to wider contexts. Their meaning and implications for women entrepreneurship are discussed in the concluding chapter (Chapter 5).

Figure 3- Enablers for women-led innovation in rural areas. Categorisation according to the STEEP method (Social: red; Technological: blue; Economic: Yellow; Environmental: green; Political/policy: grey). Source: authors' own elaboration.

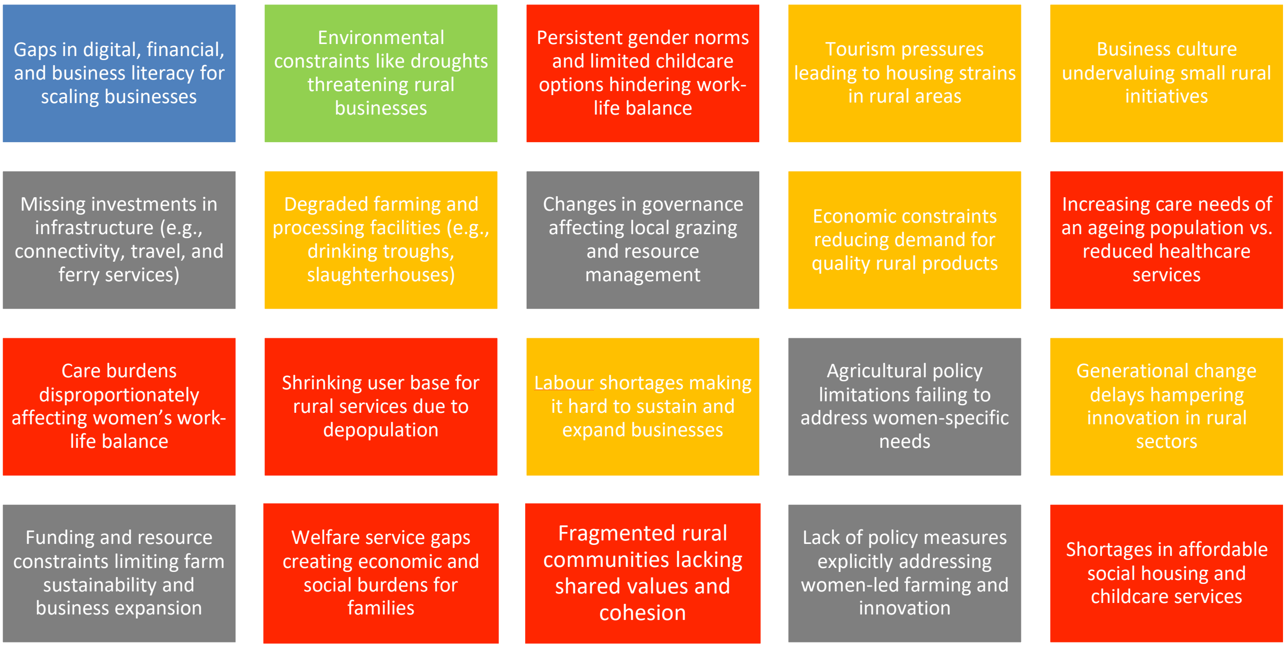


Figure 4 – Barriers to women-led innovation in rural areas. Categorisation according to the STEEP method (Social: red; Technological: blue; Economic: Yellow; Environmental: green; Political/policy: grey). Source: authors' own elaboration.

Annex 5 - Complete list of personas cards and workshop templates

Grass Ceiling Foresight Workshop - 26th of September 2024

Persona Card

Silvia
53, High-School education

Household: lives with her husband; children work on the farm, but do not live in the same household.

Location: Northern coastal rural region of Croatia, economic development above Croatian average, rather good infrastructure, moderately warm, humid climate, terra rossa.

Paid work/Income sources: formally employed as a farmer (manager), which is her main source of income. Additionally, she educates children.

Care/Reproductive work: occasionally engaged in looking after her grandchildren.

Community participation: Member of the Croatian Chamber of Agriculture, president of EU rural women's association. Participates in the education of children on the farm.

Core values: commitment to work, honesty, openness to new things, adaptability. Preserving tradition, preserving the environment and love for nature and man. Continuous learning and improvement!

Grass Ceiling Foresight Workshop - 26th of September 2024

Persona Card

Mariana
42, highly educated (IT, AI, web design), several languages

Household: repatriated from America, lives with her husband and two children.

Location: hilly-mountain rural area, relatively isolated, far from large cities; cool summers and abundant snowfall in winter; less developed transport and production-market infrastructure.

Paid work/Income sources: Owner of a web shop that sells locally-produced products. Additionaly, apartment rental.

Care/Reproductive work: Takes care of children and elders in the family (but there are formal institutions - homes for the elderly and kindergartens).

Community participation: Active participation as tourist guide, is the chief of staff for civil protection and a member of the speleological association .

Core values: Not religious, but respects traditional values, without political affiliations, strives for a stable and safe environment (for work and life)

Grass Ceiling Foresight Workshop - 26th of September 2024

Persona Card

Birgit
50, high education, lawyer

Household:lives with her husband, one child and two dogs.

Location: rural area near the City of Zagreb, favourable resource and climatic conditions for agriculture, good transport connection with the city, developed production, market and social infrastructure.

Paid work/Income sources: family farm (fruit and vegetables) and agrotourism (mainly for young urban population). She plans to offer content for retirees. She is part of a producers' network and distributes their products. He owns a consulting company.

Care/Reproductive work: Taking care of parents and mother-in-law.

Community participation: Active member of the Croatian Chamber of Agriculture, the association for animal protection and the association for the promotion of animal rights and gender equality.

Core values: honesty, ecology, family, healthy life, openness to new knowledge.

Grass Ceiling Foresight Workshop - 26th of September 2024

Persona Card

Joanna Flynn
Late 30s, secondary school education

Household: Married with 3 children aged 5, 8 and 9 .

Location: a farm in the southeast of Ireland. Not isolated (15-minute drive from a motorway). The climate is temperate: the area has an extensive network of rivers.

Paid work/Income sources: full-time work on the family cow farm. She feeds the calves and lambs and takes animals to the vet. She didn't take maternity leave with any of her children but worked on the farm with them on a sling on her back.

Care/Reproductive work: primary caregiver to 3 children (school runs in different institutions, cooking, helping with homework): her husband occasionally "helps her babysitting".

Community participation: part of several networks, e.g., secondary school, Macra na Feirme (voluntary organisation for rural young people), a female discussion group for dairy farming, Network Ireland, rural entrepreneurship courses.

Core values: Family, sustainability and nature, commitment to local and small enterprises as her own.

Grass Ceiling Foresight Workshop - 26th of September 2024

Persona Card

Mary Kelly
Mid 30s, nutritionist

Household: Married with 2 children aged 2 and 4.

Location: based on family farm. The area has a temperate climate and is characterised by rivers and two mountain ranges.

Paid work/Income sources: owner of a network marketing business of aloe vera sales (main income source). She started a microgreen business. She grows vegetables for self-consumption.

Care/Reproductive work: she is primary carer for two children. She emphasises that she has no support from extended family and her husband has to take the day off work so she can attend the Living Labs. He works on the family farm (part-time) and as an electrician. She has some elder caring responsibilities, but she stresses that this is not too much work.

Community participation: She runs a network marketing business and engages with women around this as a business coach.

Core values: Family, Grow you own [vegetables], Gut health, sustainable technology; maintaining the scale of her enterprise, connection with customers.

Grass Ceiling Foresight Workshop - 26th of September 2024

Persona Card

Nella
35, high-school education

Household: Married with a 3 years old son. She has two brothers.

Location: She lives in a half-center area of a well-served town, part of a national park. Close to the metropolitan are of a city in South Italy, well connected with the airport.

Paid work/Income sources: She works on the family farming business and occasionally supports her brother's restaurant business to which she is attached.

Care/Reproductive work: Supports elderly parents and raises her son.

Community participation: She is a member of a voluntary association, an environmental activist, she is a catechist in the neighborhood church .

Core values: family, caring for the environment, caring about the others.

Persona Card

Sofia

35, university degree in Economics

Household: She is single and she is coming back in her native town. She has the support of her parents and she has a younger brother.

Location: She lives in a half-center area of a well-served town, part of a national park. Close to the metropolitan are of a city in South Italy, well connected with the airport.

Paid work/Income sources: She is a business consultant for companies involved in rural development. She loves traveling: she travels for working, often.

Care/Reproductive work: none [not specified].

Community participation: Participates in community life: she has maintained excellent past relationships with friends with whom she shares cultural interests.

Core values: traditions, innovations and family. She wants to create value for her native place.

Persona Card

Kotryna

30, higher education in information technology, influencer

Household: lives with her girlfriend and does not have children. The farm is jointly owned and managed.

Location: lives in the suburbs of a middle-size town, with well-developed infrastructure and excellent internet connection. .

Paid work/Income sources: freelancer in the field of information technology. IT-related work and earnings from social networks (content creation focused on agriculture, rural life, and farming). She cultivates culinary herbs and is building a smart, digitized greenhouse. She is transitioning to concentrate on agriculture.

Care/Reproductive work: does not have children, and her parents live far away, with meetings occurring only during holidays.

Community participation: actively involved in community activities, she supplies locally grown produce to a nearby restaurant.

Core values: innovation, openness, tolerance, community, and a strong connection with nature.

Persona Card

Saulė

40, high education (math and accounting), farm owner

Household: Married, 4 children (ages 6, 8, 12, and 14).

Location: rural area where closest neighbors are 500 meters away. It is 10 km to the district center. Stable internet connection, no public transport. She is not active on social networks.

Paid work/Income sources: works as a private tutor, but farming is the family's main income source (she inherited it, cattle farming, profitable). She manages the farm administration and work planning. Farming activities are carried out using industrial symbiosis principles. The farm generates electricity from its own resources, which is also sold.

Care/Reproductive work: Husband shares childcare responsibilities. Parents are of working age and sometimes help on the farm. Grandparents are active and take care of themselves.

Community participation: belongs to a charity organization.

Core values: national identity, ethnic culture, preserve traditional family values while also embracing innovation and self-reliance.

Persona Card

Annike

25, high education (MBO Technology)

Household: no kids, no husband.

Location: lives in the country in a house with several residents but they all have separate, independent facilities. .

Paid work/Income sources: She has 3 different jobs to maintain a living wage. She is a shoemaker/designer (25% income), fills supermarket shelves (25% income) and has consultancy jobs (50% income).

Care/Reproductive work: none [not specified].

Community participation: looks out for the neighbours and helps maintain the communal vegetable garden for children.

Core values: She believes in caring for others within the community. She also thinks it is important for children to understand where food comes from and how to eat a healthy diet.

Persona Card

Inger Marie

42, Bachelor's education, nurse

Household: Married, two young children (5 and 8). Lives on a medium size farm with her husband (his family farm). He is a full-time farmer. The in-laws live and work on the farm.

Location: Larger town, access to daycare, elderly center, schools. 20 min to city, 60 min to airport. Well-developed internet access, poor bus connections. Hard winter, more activity in the summer.

Paid work/Income sources: nurse (60-80% income). Seasonal farm work. Tourism in summer (local dairy-based food). 10-15 cows, trying out different milk products. Lots of ideas developing.

Care/Reproductive work: Her parents are healthy. Shared childcare with father, she organizes (e.g., kindergarten and primary school). The in-laws are close, but they are often busy.

Community participation: member of a female entrepreneurial group and various networks and projects. E.g., school's committee, kids' football and handball team, municipality's BoLyst project (well-being in the village, making it attractive).

Core values: family first, sustainability and taking care of nature.

Persona Card

Sara

32

Household: She lives with her partner and 2 children.

Location: rural area on the eastern side of the Netherlands.

Paid work/Income sources: Her paid work consists of caring for and maintaining nature and countryside, as well as producing quality food. She is a landlord and provides housing opportunities for others.

Care/Reproductive work: taking care of her children and elderly within her community.

Community participation: gives time and attention to the elderly and those in need. She combines care giving with the production of quality food for health. She has a leadership role within the community and connects people.

Core values: her core values are embedded in connecting nature, communities, food production and sharing her knowledge with others.

Persona Card

Julie Watts

Late 30s, tertiary level education

Household: married with two teenagers.

Location: remote island in an isolated part of Scotland. She lives on a croft beside a woodland trust (wood conservation charity). Very diverse terrain,coastal and mountainous regions.

Paid work/Income sources: off-croft work. Previously a teacher, and she is now an autism consultant, and an adviser for neuro diverse students. On her croft she has goats, pigs and hens (they sell the meat) and is developing other enterprises. E.g., breakfast packs to tourists, bee keeping. Many plans: activities for local children, croft tours, and courses (weaving, keeping bees).

Care/Reproductive work: responsible of children and housework.

Community participation: very involved. She does the social media for the woodland trust. Involved in weekly community meetings. She was involved with the primary school.

Core values: community, environment, family.

Persona Card

Amy Fletcher

Late 30s, secondary school education

Household: married with one 7 year old daughter.

Location: remote island in an isolated part of Scotland. The area's employment is reliant on the public sector and tourism. She lives on a croft close to a village with a school, pub and restaurant.

Paid work/Income sources: Income from the croft is low, her husband has a good income from his farm-related employment. She has native sheep (she shears the wool for felting and other wool products), berries, and intends to sell box meats. She hopes the croft will be more profitable in the future.

Care/Reproductive work: primarily her responsibility. She brings her daughter to school, cooks and cleans.

Community participation: very active. Chair of the Parent/Teacher Comittee. Involved in the Community Hall Committee, bakes for events in the Community Hall. Involved with a company that has a wind farm. Actively trying to access funds from the wind farm to get a shop and build some social housing.

Core values: cooperative working, community commitment.

Persona Card

Rosa

35, agronomic engineer, farmer

Household: single, no children.

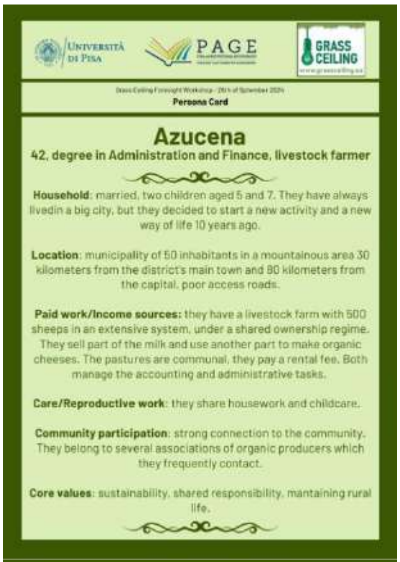
Location: she lives alone in a village of 200 inhabitants, 30 kilometers from the capital, close to her parents' home. She has lived there all her life. Two siblings, who migrated to larger cities.

Paid work/Income sources: 300 hectares dry-crop farm. Gradually introducing innovations (latest-generation tractor, GPS, new varieties of cereals, etc.). No employees, her parents help sometimes. She sells through a cooperative, she is in its executive board. Traditional agricultural model, no plans to introduce new crops, nor to cultivate organically. She receives CAP subsidies, which are essential for maintaining her activity. Additionally, she earns income by providing agricultural consultancy.

Care/Reproductive work: none [not specified].

Community participation: participates in the community life of her municipality; leader of the district's rural women's association.

Core values: traditional farming, rural life, adaptability.



Persona Card

Azucena

42, degree in Administration and Finance, livestock farmer

Household: married, two children aged 5 and 7. They have always livedin a big city, but they decided to start a new activity and a new way of life 10 years ago.

Location: municipality of 50 inhabitants in a mountainous area 30 kilometers from the district's main town and 80 kilometers from the capital, poor access roads.

Paid work/Income sources: they have a livestock farm with 500 sheeps in an extensive system, under a shared ownership regime. They sell part of the milk and use another part to make organic cheeses. The pastures are communal, they pay a rental fee. Both manage the accounting and administrative tasks.

Care/Reproductive work: they share housework and childcare.

Community participation: strong connection to the community. They belong to several associations of organic producers which they frequently contact.

Core values: sustainability, shared responsibility, mantaining rural life.

Persona Card

Sara II

35, Agricultural college

Household: Husband, 2 children 6 and 8 years old..

Location: small community somewhat isolated, 6km to nearest town. Dry due to less rain lately. Hilly with quite small farming land and forest.

Paid work/Income sources: Full time milk farmer together with husband, one employee.

Care/Reproductive work: Takes care of children when they are not in school/pre-school.

Community participation: Board member in a road association in the community. Active member in the local division of the Federation of Swedish Farmers (LRF).

Core values: Ecologically certified milk-production, whereas cows should be given 'good lives', implying certain demands on animal welfare, and where sustainability and preserving biodiversity in farming is important.

Persona Card

Violeta

61, primary education, livestock farmer

Household: married, three adult kids who moved out.

Location: She lives with her husband in the place where she was born, a semi-mountainous village that is the district's main town, 50 kilometers from the capital. Scarce and low-quality service provision, she never encouraged her children to stay in the village.

Paid work/Income sources: she works on a farm with 150 suckler cows in an extensive system, which her husband owns. The calves are sold for fattening. She has not introduced any innovations on the farm, as she feels it is too late for digitalization, which she finds difficult to understand.

Care/Reproductive work: has always been dedicated to childcare and housework.

Community participation: belongs to a livestock association. Due to childcare and workhouse, she had no time to be active and attend meetings or other events.

Core values: hard work, sustainability of farming and rural life, pessimism towards generational renewal.

Persona Card

Matilda

54, education in Economics in upper scondary school

Household: Husband, adult children that occasionally helps out at the farm with webpage and in farming.

Location: small community, not isolated. Dry due to less rain lately, otherwise more humid. Rather flat, large land areas with farming land and forest, lake nearby.

Paid work/Income sources: Runs a café and a small tourist business during summer time. Work in elderly care during the winter.

Care/Reproductive work: Takes care of children when they are not in school/pre-school.

Community participation: Involved in various different local associations, as well as an active member in the local division of the Federation of Swedish Farmers (LRF). Organises a group for physical exercise for women.

Core values: sustainability, growing organic food, health.

Figure 5 – MIRO Board template. *Personas* in the scenario contexts. Source: own elaboration.

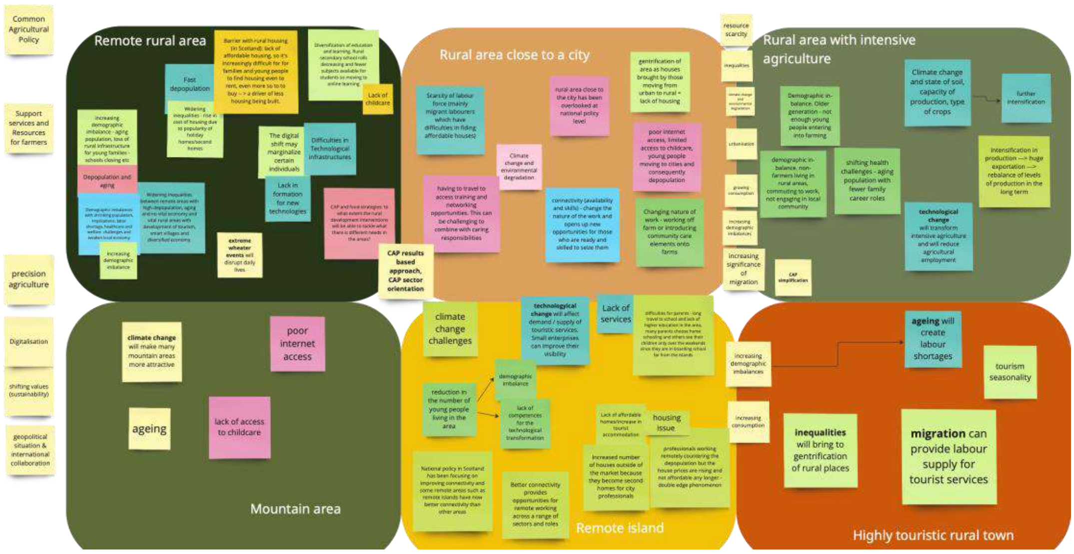


Figure 6 – MIRO Board template. Mega-trends and drivers per rural area typology. Source: own elaboration.

Annex 6 - Summary results from Phase 1 of foresight exercise in Living Labs

LIVING LAB IN THE SPOTLIGHT: EWE – Empowering Women Entrepreneur (Croatia)

Context: women entrepreneurs from three different rural areas in Croatia. The coastal area has relatively high-quality resources for agricultural production, good infrastructure, and developed tourism. The mountainous rural area has modest agricultural resources, small-scale farms, and low population density. The continental area has a developed agricultural production and transport infrastructure that connects it with Zagreb, where demand for ecologically valuable products is high. The activities developed by the women entrepreneurs are diverse, e.g., production and processing of fruits and vegetables, livestock farming, teaching, tourist accommodation, production of woollen items.

Main Drivers	Present Struggles	Future visions and challenges
Migration (outgoing, exodus). Rural development policies. Changing age structure of rural population (ageing).	Migration is a problem caused by the abandonment of rural areas. Global migration reduces labour shortages. Inhabitants of rural areas recognise that EU rural policy contributes to rural entrepreneurship and sustainable rural development. In Croatia, the ageing of the rural population has been intensified by the abolition of borders with EU countries. Many young people, more open to change than old people, leave the countryside.	The mockery for the 'new', e.g., new technologies, is passing. Access to knowledge, information and new technologies will have the biggest impact on women's entrepreneurship. Advisory services and scientists play a role: research should be connected with entrepreneurs through cooperation. EU policies will work in a positive sense. The state and local administrators should support local agricultural production by organizing purchasing centres where small producers could sell their surplus products. Awareness should be raised through media campaigns about the importance of women in entrepreneurship; projects where women gather, collaborate and network should be promoted.

LIVING LAB IN THE SPOTLIGHT: Living Lab: Ireland (Ireland)

Context: Waterford, southeast of Ireland. Intermediate rural area connected by the motorway, surrounded by river networks, a coastline and two mountain ranges. The mountainous part is hampered by poor internet access. Large agricultural areas on average, dairy and beef farming are predominant. Most Living Lab participants are involved in family farms and innovations with a dairy emphasis. The area's geography informs the businesses of the women innovators in e.g., focusing on short supply chains. The area has a progressive approach to agriculture and rural enterprises.

Main Drivers	Present Struggles	Future visions and challenges
EU/National policies; support and resources for farm families. Cultural attitudes around gender roles and the gendered division of farm and household tasks; importance given to women-led cooperative networks across all areas of rural life	Lack of support available to help with farm work (e.g., maternity, paternity, and parent's leave). Difficulties hiring staff when needed. Farmers' flexibility is not accommodated in current policies. Presence of regressive attitudes towards women and gender roles. Women are responsible for childcare and do not have time to develop socio-ecological innovations. Irish women's social role is being revised, but it will take time. Disadvantages of technology: devices breaking or inadequate, potential	Policy changes are required. E.g., a farm relief service offering 30-day farm help during busy periods and longer for Maternity and Paternity Leave. This service could be expanded, e.g., personal assistants for rural entrepreneurs, cleaners at home. Effective approaches to gender equality in EU and national policies could drive a progressive cultural attitude towards women and the gendered division of roles. Policies and funding could support women-led rural cooperatives, e.g., childcare and schooling. Technological opportunities, e.g., drones for product delivery, IoT to assist with childcare (Apple Air Tags in the shoes of children who continually lose them);

Technology: the internet of things; automation and robots.	negative health impact, e.g., Wi-Fi. Positive aspects: the Internet of Things (IoT), e.g. Siri, in organising daily tasks.	digital assistants like Siri to organise tasks; sophisticated versions of devices (e.g., cleaning robots); health-positive devices and broadband.

LIVING LAB IN THE SPOTLIGHT: Bio distretto delle Lame Living Lab (Italy)

Context: Puglia region, 85% of the population live in rural areas. Mainly flatland, hilly in some parts, with a very long coastline. Rich historical and environmental heritage, strong tourist attractiveness (agritourism, wine, gastronomy, national parks). Agriculture, mainly family farms, cover 68% of the region's surface (olive oil, wine, fruits, wheat, and vegetables). Serious environmental (e.g., desertification) and social (e.g., generational renewal) problems. Significant presence of agroecological practices and multifunctionality, i.e., women are 1/3 of the organic operators.

Main Drivers	Present Struggles	Future visions and challenges
Availability of natural resources Connectivity (e.g., tele-work, gig-economy activities). Financial investments (e.g., access to finance, interest rates, farm investments, stability of markets for land assets).	The availability of natural resources creates fear and uncertainty. The topic is present in the women entrepreneurs' works (e.g., raw material management). Hyper-productivism is often questioned. Connectivity allows tele-work and the emergence of new businesses, which is useful to avoid depopulation (e.g., more young farmers). It allows the return of young people that left the South to study or to find new opportunities. Access to credit and the availability of financing are very influent, obstructing investments would harm rural areas. Volatile interest rates and unstable financial markets limit growth opportunities and innovation.	In 2040, the problem of the availability of natural resources will become increasingly pressing. China and India will face the same problems of pollution and environment that Europe is facing now. Connection is crucial, not only through technologies, but to network people. Remote villages are now connected with very fast broadband. Connectivity can foster young people's return to avoid depopulation. It will be necessary to listen to the suggestions from the grassroots to define a critical mass. Policies will be put in place to fill the generation gap that is being created. Unlike the past, no tool should be demonized. Connectivity in agriculture is related to data. Having much data is a great opportunity. People can make decisions and mistakes by experimenting and studying. Business models' sustainability will require creating networks of non-isolated good practices.

LIVING LAB IN THE SPOTLIGHT: Small farm social capital (Lithuania)

Context: rural region affected by depopulation stemming from internal and external migration. This Living Lab explores innovation requirements of women managing small farms and initiatives to strengthen social capital. Women cultivate small plots of land and haven't participated in the previous intensive agriculture that led to soil degradation and negative environmental impacts. There is potential for women to be socio-ecological leaders and innovators and to cultivate social capital and optimize community activities.

Main Drivers	Present Struggles	Future visions and challenges
Conflicts and crises, competition, access to resources etc. Attitude towards landscapes as public goods, multi-functionality and diversification of farming – i.e., leisure, tourism - openness to innovation. Availability of natural resources.	Farm operations and investment planning are affected by crises and instability. The economic situation is difficult to predict due to the geopolitical influence on prices, standards setting, trade, and sanitary measures. Environmental degradation, e.g., air and water pollution and decline of biodiversity, affects agriculture. The necessary sustainable transition might disrupt labour markets and create new jobs with implications for farming. Currently, insufficient attention is paid to soil quality and resource conservation. Expected increasing scarcity and competition for access (e.g., water, land, soil, minerals, fertilisers).	It is believed that future support for farms will be more tailored to regional and local needs. Increasing awareness among policymakers and farmers will create conditions for dialogue, improve the situation of the entire sector, and promote sustainable development.

LIVING LAB IN THE SPOTLIGHT: The Netherlands (NL)

Context: Living Lab participants come from different regions which qualify as integrated rural-urban/intermediate. Most of them live and work on dairy farms in the East, West and South-west of the country. Population dynamics are stable with some immigration from urban centres. Access to rural services varies; access to education, social and health care and transport is under pressure; most residents use private transportation. The topic of the Living Lab is to Identify the specific socio-ecological innovation needs of farm women and rural women, and the opportunities to combine their efforts in assuring the future of agriculture and the viability of rural areas.

Main Drivers	Present Struggles	Future visions and challenges
Prioritising environmental concerns with a growing population **Technologies, i.e., Digitalisation and AI.** The disconnect between food production and consumers.	The increased pressure on nature is destroying landscapes and biodiversity. Population growth increases housing and food needs and intensifies land pressure. Technologies create social tensions. E.g., too much time spent on mobile phones, difficulties to identify misleading information with the AI, solar panels having negative compensation agreements. People don’t understand where their food comes from. Difficulties to choose healthy diets: processed food is cheap; fresh food is expensive, i.e., problem of income. Farmers are not paid fair prices. These dynamics are also driven by supermarkets. There is a growing movement of individualism instead of solidarity, considerable loneliness experienced. Balance between economic and social welfare is needed.	Create conditions to ensure good health, i.e., mental and physical. Caring for one another needs to be a core value in society. Teach about health and welfare in schools; campaign for quality food to be affordable and universally accessible. Stimulate community power, promote alternative living arrangements. Actively encourage women farmers and enable them to flourish. Education should embrace multifunctional agriculture. Promote farmers as being central to communities so their role is appreciated. It needs to be clear what is ‘real’ and what is ‘fake’ news. There must be trust in building relationships between farmers and consumers. Promote visiting farms to connect with nature and the food process. Producers need realistic prices; consumers should spend more income in food. More local and Dutch food in supermarkets needs to be available. The environment must be at the core of a long-term vision. Increase the public's knowledge about sustainability. Farmers and households need to take responsibility to create a healthy environment.

LIVING LAB IN THE SPOTLIGHT: Local Food Innovations (Norway)

Context: Trøndelag is an intermediate rural region with a rolling hill landscape. It contributes to 23% of Norway’s agriculture production. Around 60% of the region’s population live nearby its biggest city, i.e., Trondheim. The biggest categories of agriculture production are dairy and beef. Women-led innovations are often farm-based, e.g., small-scale food production, rural tourism, health, or education. Women are likely to participate in on-farm diversified activities. Their choices and preferences scape the classic understanding of entrepreneurship, with various internal (e.g., low self-confidence) and external constraints (e.g., the legal system).

Main Drivers	Present Struggles	Future visions and challenges
Support system, i.e., access to funding and advisors, relational support, network. National agricultural policy. Climate change: Changes rapidly. Drought/lots of rain.	Lack of people with the right skills to advise at personal and professional level. Lack of support from innovation companies; low access to networks. Despite the demand for a greater focus on local food, i.e., the government has set targets to increase sales of local food, national policies are poorly adapted to local food producers. Support is given to large farms; difficulties to compete. Political	Importance of support system to make companies work so women innovators can employ people and reduce their workload. Financial support is essential. Women innovators need advice with value-based life choices, e.g., reduce or scale up, make investments, taking care of children, etc. The call for local food from institutions must be prioritised and be given continuity so that women innovators can have some certainty. Raw material production must have profitability. National support schemes could target the processing of raw materials and products distribution. There should be more focus on branding schemes.

	fluctuations are perceived as unpredictable and as a thread. People are concerned with climate change at all levels. Unpredictable drought and heavy rainfall. The availability of raw materials is increasingly affected.	Use storytelling to lead by example. Tell the products' story and create pride around it. Locally produced public meals could help to make food more profitable and sustainable. Climate change awareness must expand faster. Women innovators must face change and use their networks to find solutions and opportunities. Women are quicker to adjust.

LIVING LAB IN THE SPOTLIGHT: Scotland Living Lab (Scotland)

Context: Ullapool, port village surrounded by mountains, located in a very remote northern area of the Scottish Highlands. The village has basic services and stores, but to access larger shops and the post office, residents need to go to Dingwall (50 miles) and Inverness (60 miles). Ullapool is an important port and tourist destination. Fishing and tourism are the main sources of employment; many people travel long distances to work or work remotely. The region's main agricultural system is crofting, a unique Scottish system of small landholding in the highlands and islands, with an average surface of 5 hectares. Most Living Lab participants live in a croft. Most crofters need off-croft income sources. Due to their small size, they are often managed in an ecologically sustainable way.

Main Drivers	Present Struggles	Future visions and challenges
Financial: difficult to access funds for small projects and enterprises. Housing: limited affordable housing. Education services: difficult to keep local schools and nursery services.	Difficulties of accessing micro finance compared to large funding. The available funds require extensive paperwork. Difficulties for young people to afford housing. High indebtment as a result. The attempts to build social housing face objections. Problem of keeping local primary schools open and nursery provision. Difficulties to find teachers because they cannot afford housing. Nursery carers are paid low wages. The lack of nursery makes difficult for women to have an employment. Women often step in as volunteers to ensure there is provision.	In the future it will be important to have access to micro finance, loans and grants for environmental management. Women demand a simplification in accessing funding, reduce paperwork, and harmonised application forms. If young people can afford to live in rural areas, there will be children for local schools and nursery provision. Need for teacher packages and incentives, e.g., rural living allowance. Affordability needs to be calculated based on local wages rather than on the price of houses in the area. Future policies should restrict second home ownership in remote areas. In the future, women's ecological innovations and volunteering should be properly rewarded. In that way, they would not need to have as much off-croft employment Women-only online forums could help to network, seek support, and share information about training and funding.

LIVING LAB IN THE SPOTLIGHT: Empowerment of women in the agrarian sector through innovation (Spain)

Context: focus on innovative women-led agri-food initiatives in uninhabited rural areas in Northern Spain. Women-led innovations have an impact on wealth and job creation, sustainable food production, territorial development, and social revitalisation. Mix of mountainous areas, with extensive livestock farming, and plateau areas with extensive (herbaceous crops) and intensive agriculture (horticultural crops and vineyards) and some types of livestock. Case studies focus on innovative agri-food initiatives managed by young women in family farms which integrate primary production and transformation. Apart from economic profitability, environmental protection and preserving rural culture are priorities. Agri-food associations and cooperatives are involved in the Living Lab.

Main Drivers	Present Struggles	Future visions and challenges
Political and regulatory factors, i.e., development and implementation of the CAP. Social factors, i.e., depopulation, aging, and	CAP support is indispensable for maintaining incomes. The variability of agricultural prices, external competition, rising costs, and climatic difficulties make the farms' profitability barely sustainable without CAP support.	The future leans towards better-sized farms and economies of scale to save costs and achieve higher performance, but the agribusiness model compromises both environmental and social sustainability. The integrative model and the cooperative model are clear examples of how these objectives can be achieved. The CAP and rural development policies will be very important, but changes are needed. Financial support should

the scarcity of basic services. Other policies, e.g., food and environmental policies.	Life in small villages is unattractive to young people because of the low provision of basic services. The uncertain generational renewal makes family farms, crucial for rural societies and the maintenance of traditions, disappear, while large agribusinesses proliferate. Environmental policies sometimes have conflicting objectives with agricultural interests.	be granted to farms with high environmental performance, e.g., extensive farming, regenerative agriculture. Greater aid or tax reductions should be granted to those who contribute to social performance, e.g., by residing in small villages. Digitisation and technological innovations are crucial to the sector's profitability. Funding and regulatory changes for the use of certain innovations, e.g., drones, are necessary. Women are committed to using new organic products which reduce costs and help produce larger quantities, while contributing to environmental sustainability.

LIVING LAB IN THE SPOTLIGHT: Sweden (Sweden)

Context: the Living Lab's focus region is Jönköping County. Many rural regions in Sweden experience out-migration, particularly of young women. Although Sweden is characterised by publicly funded childcare, health care, elderly care and social care, Jönköping is close to the bottom of 'gender equality lists' in the country, e.g., low share of women in municipal political bodies, high degree of gender segregation in the labour market, large gender pay gap. Men own four out of five farms, while forestry is more evenly distributed. The focus of Living Lab is working with women active in farming, forestry, and related activities to develop ideas and innovations that can meet societal and environmental challenges to contribute to a sustainable, equal and vibrant countryside.

Main Drivers	Present Struggles	Future visions and challenges
Climate change and access to energy. Remote work and technology intensive farming (AI, precision agriculture), connectivity. Caring for the environment, sustainability, and ethical aspects.	Climate change shows opportunities, e.g., possibility to grow new crops, and challenges, e.g., lack of fodder and water. The energy transition has risks, e.g., lack of electricity and rising costs, and opportunities, e.g., renewable energy production. New technologies improve the efficiency of farming, but and they require high competences, and progress is too slow in women-led sectors, e.g., horse farming. Better internet connection allows remote work. Awareness about animal welfare and sustainability are rising, but women farmers could be better.	Spreading knowledge about the demands on organic food production and eco-labels is important. Need not to import products which are produced locally, domestic flights should be forbidden. Change might hurt, powerful people should take responsibility, but individuals can also make a difference. Renewable energy sources, e.g., solar panels or biogas, can create employment opportunities in rural areas, which could be fostered by policies, i.e., taxes and subsidies. Better infrastructure, e.g., public transport, can contribute too. With urbanisation increasing, rural and food tourism could help people experience nature and 'travel through their bellies'. To avoid the 'disneyfication' of rural areas, teaching people about farming and getting close to farmers could help. Rural areas could serve as examples of sufficiency and sharing economies. Collaborations and sharing resources will be key in the future. Care services could improve with the use of new technologies and digitalisation.

Annex 7 - Template for facilitating the gathering of insights from Living Labs in phase 1

Foresight task – LL [name]

Name and country of the LL	
Date of the LL meeting	
No. of participants	
Name and email of LL coordinators	
Other details	

1. Short description of the Living Lab context (max 300 words)

[e.g. integrated rural-urban/intermediate rural/remote rural/remote mountainous rural; land use characteristics; agriculture characteristics; population dynamics; access to rural services].

2. *Personas:* the women entrepreneurs

Guiding question	**What are the main features of 1-2 women entrepreneurs living and working in your context? (These can be women from the living lab, a combination of women, or a fictional character)**
Persona 1 **Name and short description** **(max 150 words)**	- Name, Age and Education - Household characteristics - Location (e.g., Town/Region/Country, isolated or not, climate and physical characteristics) - Paid Work/Income sources (e.g., formal/informal, sector, role, income, etc.) - Care/reproductive work - Community participation (networks, associations, etc.) - Core values
Persona 2 **Name and short description** **(max 150 words)**	- Name, Age and Education - Household characteristics - Location (e.g., Town/Region/Country, isolated or not, climate and physical characteristics) - Paid Work/Income sources (e.g., formal/informal, sector, role, income, etc.) - Care/reproductive work - Community participation (networks, associations, etc.) - Core values
Any other detail	Share any other important information on the discussion, to provide further clarification (e.g. if they are or not actual women from the LL)

Foresight task – LL [name]

3. Driver identification and prioritisation

Guiding question	**What are the main drivers that impact the entrepreneurial activity of the women/ personas you identified? Pick three, these might be technology, remoteness, access to finance**
List of selected drivers (rename if needed) and description	☐ Add a short description for each driver ☐ ... ☐ ...
Ranking of drivers in your list based on their relevance	1. Most relevant driver 2. ... 3. Least relevant driver
Discussion about drivers – present	How do these drivers affect your activities in the present? Why are they relevant?
Envisioning the future	Considering current challenges, how do you imagine these challenges being overcome and transformed in 2040? What would help mitigate them? (e.g. which policy interventions)
Any other detail (optional)	Share any other important information on the discussion, to provide further clarification

Please, fill in and submit this template by 30/06/2024 to Sabrina Arcuri sabrina.arcuri@unipi.it and Pedro Navarro Gambin pedro.navarrogambin@phd.unipi.it

We are available for any clarification you may need.

Thanks very much from UNIPI team

Annex 8 - References

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