

Abstract: The United Nations Sustainable Development Goals, particularly SDG 5, seek to attain gender equality and empower all women and girls. While rural women face multiple challenges, the innovative and entrepreneurial leadership of women in farming and rural areas can foster resilient and sustainable rural communities. Although studies on women and innovation are increasing, a clear definition of women-led innovation is missing. One objective of this paper is to outline what makes women-led innovations a distinct kind of innovation, and why that should matter for policy. Drawing on the conceptual framework devised for the EU Funded Horizon Europe FLIARA (Female-Led Innovation in Agriculture and Rural Areas) project, we propose a context to understand women-led innovation on farms and in rural areas within the geographical scope of the European Union, while also identifying a set of distinguishing features that make women-led innovation categorically different from other types of innovations. Furthermore, another key objective is to show how a better understanding of the distinctiveness of women-led innovations can contribute to policy by using the European Commission Long-term Vision for Rural Areas as an example. We conclude by advocating for an increased focus on women-led innovations in policymaking for a number of compelling reasons. Firstly, women have significant potential to drive progress in rural development, sustainability, and equality. They have a unique perspective and approach which can offer transformative solutions to the challenges facing rural communities. Moreover, supporting women-led innovations serves as a catalyst for revitalising rural areas in an evolving rural landscape. Additionally, prioritising equal opportunities for all individuals and genders in rural areas is not only an issue of common sense, but is a moral imperative. By making sure women have the same access to education, resources, and opportunities as their male counterparts, we endorse basic principles of fairness and justice.

Keywords: Women-Led innovation; Policy; Gender equality; Sustainability; Rural areas and Resilience

Highlights

- Successful rural women in agricultural and non-agricultural activities were identified
 - In-depth interviews focused on innovations of economic, environmental, social and cultural nature
 - Results were evaluated from the perspective of sustainability and gender equality
 - Substantial, procedural and normative reasons for embracing women-led innovations were suggested
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1. Introduction

The United Nations SDGs (Sustainable Development Goals) serve as a significant policy catalyst for advancing sustainability, even within rural areas. Among these goals, SDG 5 stands out, striving to attain gender equality and empower all women and girls (United Nations, 2015: SDG 5). A gender-inclusive approach is not just about achieving policy objectives, but about including and empowering people who can contribute innovative ideas and smart solutions to many key environmental, socio-cultural, and economic challenges faced in rural areas across the globe, including Europe.

In addition to policy, innovations are increasingly recognised as key drivers of sustainability (Silvestre and Țircă, 2019; Mariani et al., 2022) and can be understood or defined as new solutions to existing problems or old solutions to new contexts. Fuelled by creativity and the development of ideas (Taylor 2017), these innovations can pave the way for society to move towards a more sustainable future. They are evident not only in technological advancements but also in social, political, and organisational domains. However, achieving sustainability, or meeting the current needs of society without compromising the ability of future generations to meet theirs, requires an approach that gives recognition and power to grassroots

actors and processes, involving them within an inclusive, multiscale innovation politics (Leach et al., 2012). While grassroots innovations, or bottom-up initiatives have been targeted extensively, particularly within the social innovation literature (Mulgan 2006; Moulaert et al., 2019), mainstream innovation discourse often overlooks the correlation with gender. Evidence suggests that innovation in literature is often gender blind and may enable gender bias (Pecis, 2016). As such, women-led innovation has been defined differently across literature, with definitions including connection to women-led firms (Audretsch et al., 2020) to women's entrepreneurship (Mari et al., 2024) and to social innovation cycles (Sarkki et al., 2021). Yet, while women's role in innovations are starting to emerge, there is still a general lack of gender perspective in innovation literature not recognising properly the place (e.g., rural) and innovators identities constituting a gender gap in innovation literature (e.g., Belghiti-Mahut et al. 2016). Nonetheless, in the context of this paper, women-led innovations are viewed as progressions led by women, that pursue economic, social, technological, environmental, political, or sustainable solutions, and are influenced by societal contexts, which both hinder and facilitate collective female agency.

Matters of gender equality, power and social justice have not traditionally been key areas of interest in innovation processes. For example, gender and other socio-cultural dimensions have largely been neglected in energy innovation processes. Furthermore, Ranga and Etzkowitz (2010, p. 1) point out that although "issues pertaining to women's access, participation, advancement and reward" have begun to receive more attention also in the areas of innovation, technology and entrepreneurship, there is lack of knowledge about changes that are happening and mechanisms behind them. These fields have traditionally been "characterised either by gender-blindness or male dominance", which has impacted research and knowledge production regarding innovation processes (ibid). Inclusion of women into innovation processes can both, help to advance sustainability in general, and gender equality in particular. Furthermore, the need for inclusion of women to innovation processes should be self-evident, because women are 1) impacted by those innovations, and hence should have a role in their development, 2) representing half of the population, whose creative innovation potential can leverage innovations, and 3) often underrepresented in current innovation processes.

The objective of this conceptual paper is to understand what makes women-led innovations a unique kind of innovation and explain how they matter for policy. We do so, by drawing on the conceptual framework developed via the EU Horizon Europe FLIARA project and in turn developing a framework to understand the context where women-led innovations operate in rural areas, and how such innovations can enhance gender equality, rural resilience and sustainability. We also identify a set of distinguishing features that make women-led innovation categorically different from other types of innovations. Furthermore, we identify ways by which women-led innovations in rural areas can contribute to the Long Term Vision for Rural Areas (LTVRA or 'the Vision') (European Commission, 2021a). This accentuates the necessity of specifically recognising women-led innovations within the LTVRA and in turn within the Rural Pact and EU Rural Action Plan (European Commission, no date; European Commission, 2021b). In general, our paper contributes to a better understanding of the possible contributions of women-led innovation to sustainable development and gender equality in rural areas.

2. Background

2.1 The Gender Inequality and Innovation Challenge In Rural Areas

The Council of Europe (2015) establishes that gender equality is a matter of human rights. It includes both formal equalities, meaning that women and men should have the same opportunities, and substantive equality, which refers to equality in outcome, such as equal distribution of power and resources (Ahl, 2018). For example, a notable resource constraint pertains to childcare services, particularly in rural areas. This limitation results in the unequal distribution of caregiving responsibilities for both children and the elderly falling on women and potentially resulting in constraining opportunities for women on farms and in rural areas (Ní Fhlatharta and Farrell, 2017). The removal of such barriers to equal opportunities is essential, recognising that women and men may have different starting points. Achieving gender equality therefore requires affirmative action, the redistribution of power and resources, and structural changes.

Women play a crucial role in bringing about development and economic growth in many rural areas across the European Union (Bradshaw et al., 2017). Their contributions to local economies through entrepreneurship, agricultural practices and farm diversification are often central to enhancing overall community development and resilience (Mehan and Mostafavi, 2023). Despite their substantial innovative contributions to agriculture and rural resilience however, women are frequently underrepresented in leadership positions and encounter difficulties accessing training, loans, and other resources and services. Rural women and female innovators face a wide set of political, economic, socio-cultural, technological, and environmental challenges (Annex 1).

The lack of gender equality in rural areas has led to considerations of the structural barriers rural women face, and the contributions women-led innovations can have on these difficult situations. Firstly, von Braun and Gatzweiler (2014) emphasised the range of barriers facing rural women, encompassing restrictions within social, political, economic, ecological, and biophysical systems. These barriers, (including access to land, finance and suitable childcare, education and training, social and cultural norms and networking opportunities), play a role in restricting women's access to resources, services, and opportunities, limiting their independence and hindering their capacity for development. This literature reflects the reality of rural women, who are less inclined to engage in labour markets than men or urban women, more likely to be unemployed, and are prominent in informal and vulnerable employment. Secondly, Cornwall and Rivas (2015) discussed women's economic empowerment and the potential for community through investment in women, although they also acknowledge the limited attention given to structural barriers facing women, which hinder their personal development. Thirdly, even though more women act as entrepreneurs, they continue to face a "multitasking whirlpool, along with the lack of financial resources, marketing skills and support services, including poor access to business networks, technology and digital markets" (Kamberidou, 2020, p. 1). This literature collectively highlights a set of challenges rural women innovators confront in their endeavours.

While rural women face a distinct set of challenges, the innovative and entrepreneurial leadership of women in farming and rural areas is of paramount importance, particularly in the context of both the challenges and opportunities for fostering resilient and creative rural communities (Dalla Torre et al., 2020, Ní Fhlatharta and Farrell, 2017). Literature on women-led innovations is emerging for example in the fields of social innovation (Lindberg et al., 2015; Maguirre et al., 2016; Maestripieri, 2017; Haji Ali et al., 2018; Sarkki et al., 2021), on economic entrepreneurship (Demartini, 2018; Zeb and Ihsan, 2020; Audretsch et al., 2020; Zastempowski, and Cyfert (2021), technological environmental innovation (Le Loarne-Lemaire et al., 2021), and digital innovation (Sundermeier et al., 2018; Schmitt et al., 2020). In addition, social and digital innovation has been examined in the context of women entrepreneurs (Suseno and Abbott, 2021). Feminist approaches to innovation have also been examined, for example from the perspective of structures and institutional arrangements (innovation as a context) and by calling for innovating race/gendered relations from the margins (political intersectionality) (Pecis and Berglund, 2021). However, most of these studies focus on women-led innovation in a particular field (e.g., digital innovations), or a particular innovation category (e.g., social innovation), or in connection to a particular barrier (e.g., racial oppression), whilst a general and holistic understanding of what makes women-led innovation a categorically distinct kind of innovation is still missing. We are addressing this gap with this paper by adopting a broad lens on innovations and their contexts (economic, political, institutional, social, technological and environmental).

2.2 Distinctiveness of Rural Innovation

Innovation can be measured using indicators such as patents or investment in research and development and rural areas can present poorly if innovation is measured in these terms (OECD, 2014; Freshwater, 2016). Similarly, if we view the innovation ecosystem as a more formal space involving universities, government agencies and businesses, rural areas can be lacking (Freshwater, 2012). Rural areas can then be viewed as places where innovation and the potential for it is weak. This may also link to a lack of recognition by rural people and communities of their innovations (Dargan and Shucksmith, 2008). Evidence also links rural innovation with social change and alternative development pathways supporting

sustainable development. For example, the phenomenon of 'neo-rurality' is linked to a more circular, cooperative socio-economy where for example, nature and culture are recommended in farming (Ferraresi, 2018). Rural innovation is inherently diverse. Galliano et al. (2017) described how rural ecological innovation, and entrepreneurship can combine technological and organisational innovation. Similarly, Esparcia (2014) categorises various types of rural innovation, including new products, technological innovation, innovative processes, and attitudinal innovations.

If rural innovation is not recognised for its distinctiveness and supported with this in mind a huge opportunity is potentially missed. Atterton (2016, p. 216) for example argues: "rural areas could serve as important 'test beds' for exploring alternatives to pursuing economic growth as the key driver of individual and collective action, such as social justice, well-being or environmental sustainability". Innovation in rural areas can be empowering and allow rural populations to be at the forefront of innovations that address rural challenges. For example, a rural ageing population can be seen as an issue for rural areas, but rural innovation could "enable rural areas to be at the cutting edge of responses to population ageing" (Atterton, 2016, p. 228). Certain groups, including women, have also been pointed to as the drivers of rural innovation and entrepreneurship. These also include newcomers to farming (Monllor i Rico and Fuller, 2016) and return migrants (Richer, 2019). Place and context have a major influence on the ability of entrepreneurial individuals to thrive (Müller and Korsgaard, 2018).

2.3 Connecting Innovation and Policy With A View On Gender

Taking the above discussion into context, we call for a recognition of the diversity of rural women innovators, whose agency is often limited by a complex set of varying but persisting structural biases. These barriers are normatively, procedurally, and substantially hindering sustainable rural development, and are sought to be overcome by women-led innovations, and by a set of existing policies. Therefore, until gender equality is achieved, women innovators should be targeted by affirmative policies. We propose a general framework addressing women-led innovation and their contribution to gender equality and possibly also for rural sustainability. The framework considers that gender blind policy generates persistence and resilience for the status quo, where gender inequality prevails, and sustainability challenges are not eased, as shown in connection to gender mainstreaming efforts in European agricultural policies (Diamanti and Duncan, 2023). Therefore, in addition to being a desirable characteristic, resilience can also block sustainability transformations (Lyytimäki et al., 2023).

The framework presented below in Figure 1 acknowledges that policy and innovations are coupled, recognising that innovation processes rely on and are reinforced by supportive policies. On the contrary, successful innovations serve as proof for policymakers to establish supportive frameworks adapted to specific types of innovations and to foster the development of innovation ecosystems (Granstrand and Holgersson, 2020). Furthermore, our framework proposes that overcoming gender blindness in policy and innovation development is transformative and can contribute to easing sustainability challenges and gender equality. Gender blindness being a failure to recognise or give due consideration to gender differences and the inequalities that exist in social, economic and political contexts. While this is somewhat an ideal assumption, there is some evidence supporting it. Regarding gender equality, it can be argued that increased inclusion of women in innovation development and establishing appropriate policy structures to support that, can be justified in normative, procedural, and substantial arguments. Normative inclusion is reflected, for example, by UN SDG 5 on gender equality. The globally agreed policy goal thus works as normative justification for supporting women-led innovations. A procedural argument underscores the importance of unlocking the creativity of women, who constitute half of the global population (Ritter-Hayashi et al., 2019). As established by stakeholder theory (Reed et al., 2009), it can be argued that because women are impacted by the decisions and innovation processes, they should also be included into these processes as active innovators, instead of passive recipients of the outcomes of innovations. Substantial argument links to the assumption that women-led innovations can contribute to gender equality and ease sustainability challenges. While the link between women-led innovation and sustainability is not immediately apparent, there is emerging evidence supporting the contributions of women-led innovations to wider rural sustainability and positive resilience of rural communities

(Ravazzoli et al., 2021). Figure 1 considers that gender sensitive policy and women-led innovation are interlinked and represent an important pathway to initiate transformations towards gender equality and also sustainability.

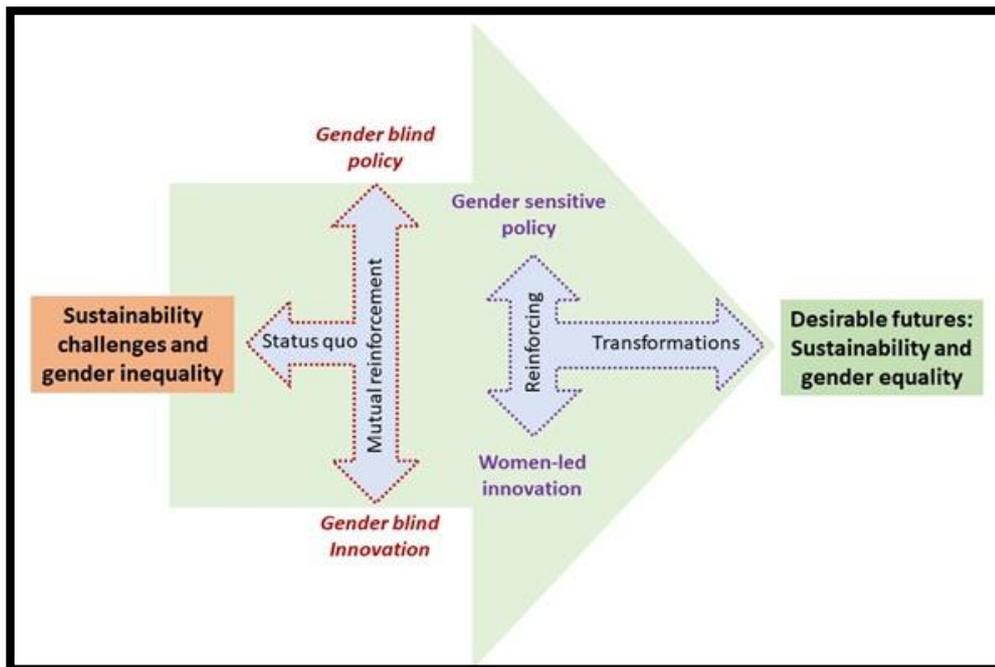


Fig 1. Framework to understand policy and innovations as drivers towards sustainability. Source: own elaboration

Hence, in the present paper, we put forward an alternative view of frameworks for innovation, because the current frameworks are often gender blind, and assume that innovation benefits a wide range of actors, while not recognising that an uncritical focus on innovation often masks and even reinforces structural inequalities (Tödtling and Tripl, 2018). We highlight that women-led innovations recognise the gender dimension, and diversity within women who innovate and who may benefit, or experience disadvantages related to the innovations (see Jiménez, 2018). We consider that women-led innovations are part of a larger fabric of inclusive innovation, focusing on women’s agency in driving innovation (Owalla et al., 2022). In order to do so, innovation frameworks need to address the type of innovations required, the actors involved and their interrelations, the type of learning they undertake and the institutional environment in which they operate (Foster and Heeks, 2013). Rural women are often in a more disadvantaged situation than males or urban women (see Annex 1 for challenges rural women encounter). Also, the role of place (e.g., rural context) is important for innovation opportunities for a diversity of actors, such as diverse groups of rural women and for promoting their participation in innovation processes essential for inclusive innovations (see Owalla et al., 2022). Inclusive innovation understands the diversity of actors and recognises structural factors, like societal expectations and roles, cultural norms, policies, that may place women innovators in unfavourable positions or even discriminate against them (ibid).

2.4 What Distinguishes Women-Led Innovation?

The term ‘innovation’ typically refers to something new and is strongly associated with technological, and market innovations (Edwards-Schachter, 2018). Nonetheless, it is important to note that innovation takes on various forms, encompassing political and social innovation. All of these forms of innovation are intertwined with the identity of the innovators, whether they are technology developers, market players, politically active people and movements, or civil society actors. Women are, without a doubt, represented in each of these categories. So, what distinguishes women-led innovation? Drawing on the conceptual framework developed for the FLIARA project, we suggest defining women-led innovations specifically and treating them as a unique category with a separate definition (Box 1).

Box 1. Proposed definition for women-led innovations in rural areas via the FLIARA Project.

Women-led innovations are processes led by women, that seek novel economic, social, technological, environmental, political, and/or institutional solutions, and that are embedded in societal contexts, which can block or/and enable collective female agency. Especially in the rural context, even small scale and otherwise conventional women-led innovations can be considered as radical and disruptive against patriarchal mindsets evoking opposition and resistance, with patriarchal referring to a social system, where men hold power and authority. The successful realisation of women-led innovations can thereby be linked to achieving goals that the innovators have, but also to questioning wider societal norms undermining female agency and gender equality.

In the following, drawing from the work of the FLIARA conceptual framework and utilising relevant literature, we make four arguments on what makes women-led innovations categorically different from other forms of innovations.

1. Innovators' Identity Matters: Diverse rural women are at the heart of our framework, showcasing their excellent practices and achievements. As such, it becomes important to allow these women to identify as innovators or entrepreneurs. The successful entrepreneur, or the “distinguished entrepreneur” regardless of gender, is an innovator; a visionary; a person who predicts and shapes the future; takes initiative; accepts change, risk, and failure; learns from it; and sees what others do not see, among other things (Carayannis and Stewart, 2013, quoted from Kamberidou, 2020). These individuals are visionaries who have the potential to shape the future, take initiative and embrace change, however, despite these shared characteristics, gender blindness persists in supposedly gender-neutral approaches to innovation (Belghiti-Mahut et al., 2016). These gender-neutral approaches, lacking intersectional understanding (people can be marginalised due to intersecting factors; gender, race, class, etc.; see Cho, Crenshaw and McCall, 2013) align with gender blindness, because they often neglect the identities of those engaged or excluded from innovation processes due to structural factors. This weakness disregards the unique challenges and opportunities that gender characteristics bring to the innovation process, shoring-up existing gender prejudices and imbalances. In considering this, we incorporate the intersectional feminist perspectives (DeFelice and Diller, 2019), recognising the complicated interaction of various social identities and approaches of domination. However, we also acknowledge the way in which social norms and beliefs influence women innovators' perceived gender identity, thereby shaping how gender influences innovation processes. Studies that show women innovators and entrepreneurs in China and found that gender stereotypes had a negative moderating effect on female opportunity recognition and development (e.g., Huang et al., 2022). This means that female gender identity significantly matters for innovation regardless of how the women identify themselves.

2. Collective Female Agency: Our framework recognises the communities of practice that women innovators may create and join. Such communities of practice or feminist coalitions can be based on caring for each other (Eleutério and van Amstel, 2020). Women's collective agency can also emerge from common subordinate experiences, serving as a means to pursue gender equality advancement (Sweetman, 2013). The women-led innovations present a paramount possibility for collective agency. Women cover half of the world's population, and therefore collective female agency can have major impacts on innovation processes, innovation ecosystems and diffusion of innovations. Rural women frequently face disadvantage, but women-led innovation has the potential to empower not only the innovator but also other rural women by promoting mutual or self-empowerment. Consequently, innovations by women, can set an example and have benefits beyond the economic situation of the innovators. In addition, individual women-led innovations are thus linked to the collective agency of women.

3. Facing Negative Resilience: Our framework takes resilience as a central concept and notes that resilience can be both negative and positive. Negative resilience is characterised, for example, by persisting patriarchal values and norms in society, culture, economy, and politics that compromise gender equality and block women-led innovation (Ní Fhlatharta and Farrell, 2017). We term resilience of this kind

toxic resilience and propose that persisting patriarchal dominance is characterised by toxic resilience. In addition, women-led innovations are not apolitical. Even if not directly challenging patriarchal values, they often exemplify empowering roles for women thus indirectly challenging gender power structures.

4. Ethical Underpinning: As women-led innovations challenge gender power structures, they also have an ethical underpinning. Banerjee et al. (2023) proposes collectivisation and people-centered social innovation as an ethical approach aimed at respecting diversity and understand power dynamics. In the case of women-led innovation and the presence of unjust power dynamics, there exists a normative imperative for the often-disadvantaged half of the society to have an equal say in shaping social change. Therefore, women-led innovations form a distinct category of innovations that may encompass technological, political, social, and/or markets/economy-related dimensions. The distinctive feature of women-led innovations is their embeddedness in social structures and their potential to change existing societal gendered structures and common disadvantages that influence the lives of rural female innovators and other rural women.

3. Methodological Process

To understand how women-led innovations can contribute to policy objectives of gender equality and sustainability, we use the LTVRA as a testing stone. The European Commission acknowledges the fundamental roles that Europe's rural areas play, encompassing the provision of food, shelter, employment, and essential ecosystem services. To ensure that rural areas continue to fulfil these vital roles, the European Commission outlined the LTVRA, extending to 2040 (European Commission, 2021a). The Vision delineates areas of action aimed at fostering stronger, more interconnected, resilient, and prosperous rural areas and communities. To realise the objectives of the Vision, the European Commission introduced a Rural Pact and an EU Rural Action Plan with tangible flagship initiatives and innovations (European Commission, no date; European Commission, 2021b). The LTVRA aspires to enhance resilient, prosperous, connected, and stronger rural areas in Europe. However, it does not explicitly address the element of women-led innovations. The European Council approved the conclusions on the LTVRA, also highlighting the role of women in rural development: "Another social aspect taken into account by ministers in the conclusions is the role of women. The Council considers that supporting measures are needed to help create new work opportunities and better involve women in decision-making. The equal participation of women in farming is also an important goal highlighted by ministers in this regard" (European Council, 2023). This stresses the political relevance of understanding women-led innovations, and their potential to advance goals set for example by the LTVRA .

Our paper is conceptual, and hence it does not include bodies of primary empirical materials. Instead, we used insights from the process and output linked to building the FLIARA project's conceptual framework (Farrell et al., forthcoming). The process to generate the FLIARA framework engaged experienced researchers within the project from ten EU countries. Using a collaborative, multi-actor approach, six key perspectives were identified to develop the FLIARA conceptual framework, namely gender, rural, innovation, resilience, sustainability and policy and governance. Each concept was developed using "light touch concept notes" (short literature summaries) covering different aspects of the six key perspectives (e.g., for the Gender perspective: Gender and Social Constructs, Gender Equality, Gender and The Matilda Effect, Gender and Communication, Gender and Social Networks, Gender and Antifeminism, Gender Support and Training, Gender and Digital, Gender Conflict and Work Life, Gender and Extension Advisory, and; Gender Intersectionality) which were combined under the umbrellas of the six perspectives. Finally, the six perspectives were brought together in the final form of the framework. The process lasted six months in 2023.

In the present paper, the materials and ideas gained during the FLIARA framework building process are analysed to shed light on the linkages and contributions by policy and women-led innovations to achieve the LTVRA objectives, complemented by explicit focus on gender equality. Our analysis can add value to the discussions around the LTVRA, but it also functions as an illustration of the interrelations between policy and women-led innovation as displayed in Figure 1. We used a method to generate proposals for action on how women-led innovations and related policy developments can be used as a way to enhance

the LTVRA including its four objectives: (1) Prosperous, (2) Connected, (3) Strong, and (4) Resilient rural Europe. Backcasting is a method used widely in scenario literature and futures research (Bibri, 2018). It aims to create normative stepwise transformation pathways towards a desired future world. Backcasting helps to illuminate two key issues: the desirable future, and pathways towards that future. The desirable future objectives in backcasting are wide enough to allow a connection to diverse strategies and actions, but specific enough so that concrete measures to reach them can be identified. In the case of the present paper, the four objectives of the LTVRA complemented by gender equality offer the widely agreed, policy relevant and specific enough desired future points. The pathways towards those futures are identified by working backwards from a desirable future state to the present, in order to identify specific actions on the pathway needed to reach the desired state. In our case, we started to work backwards from each of the four objectives by asking for example: what needs to happen in terms of women-led innovations and policy in order to reach the objective of connected rural areas. We found that inclusive rural innovation ecosystems are important here. Then the next question was to consider what needs to happen in terms of women-led innovations and policy in order to reach the inclusive innovation ecosystems. These chainlike questions then allow us to identify transformation pathways consisting of specific actions from the present to the desirable future point. Furthermore, some actions may be shared across the four pathways towards stronger, connected, prosperous and resilient rural Europe. A common way to visualise the results of this backcasting exercise is a map of pathways with specific actions and arrows showing relationships between the actions progressing towards the desired future goals (Pihlajamäki et al., 2018) (Figure 2, Section 4.5).

We chose to examine our framework in line with the LTVRA because of its current centrality within the EU rural debate and its relevance in future policy discussions. Table 1 outlines four steps in backcasting and our application.

Tab 1. Four generic steps in the Backcasting method and our application in the present paper. Source: own elaboration

Steps in Backcasting (Holmberg 1998; Bibri 2018)	Application of Backcasting in Our Study
Step 1: Define a framework and criteria for sustainability that is supported by existing literature.	We propose a framework for understanding women-led innovations and their contributions to sustainability and gender equality in rural areas (Section 2.3). We also define criteria that distinguish women-led innovations from other types of innovations (Section 2.4). In doing this, we consider that dynamics between women-led innovation and gender sensitive policy can play a crucial role when working towards sustainability and gender equality in rural areas (Figure 1, Section 2.3 above).
Step 2: Describe the current situation in relation to that framework	We outline a set of challenges for gender equality and women-led innovations that are current reality in many rural areas (see Annex 1).
Step 3: Envisage a future sustainable situation	We adopted the general future sustainable situation from the LTVRA, which focuses on enhancing resilient, prosperous, stronger, and connected rural areas (section 4.1–4.4). We emphasise gender equality as an important cross-cutting theme for achieving these four goals.
Step 4: Find strategies and actions for sustainability	We screened the materials that emerged while developing FLIARA's conceptual framework (Farrell et al., forthcoming) to identify strategic actions that can enhance women-led innovations and gender equality in ways that help to achieve the four goals of the Vision. We then devised the linkages between the Vision and women-led innovations, and identified specific actions, which were then put in a timeline starting from the desired future points working backwards to the present (See Section 4.1, 4.2, 4.3, 4.4). The pathways are summarised in Figure 2 (Section 4.5, below).

4. Women-led Innovations and the LTVRA

The six perspectives grounding the FLIARA approach are presented in Annex 2. The approach places an emphasis on women-led innovation and can offer valuable insights for future discussions and policy developments related to the LTVRA . Below, we outline how women-led innovations link to the four key aspects of the LTVRA , with the objective of fortifying rural areas, making them more prosperous, connected, stronger and resilient. These objectives are connected also to gender equality with the Council of Europe (2016, p. 11) establishing gender equality as a “principle of human rights and women’s human rights as an inalienable, integral and indivisible part of universal human rights”.

4.1 LTVRA objective 1: Prosperity as Sustainability and Gender Equality

Rural areas can become more prosperous by diversifying economic activities to new sectors with positive effects on employment, and improving the value added of farming, agri-food, forestry, and other bioeconomy activities (European Commission, 2021a). Women-led innovations can potentially contribute to economic growth in rural areas through entrepreneurship and the development of economic practices. Furthermore, we advocate extending the concept of prosperity to consider sustainability and gender equality. This can take place by reimagining what sustainability means and by mainstreaming women-led innovations across rural areas. Women-led innovations have the potential to redefine sustainability and gender equality in rural areas. One of the primary drivers of gender inequality lies in the often invisible and hidden discourses of masculinity (Smith and Kimmel, 2005). Thus, new imaginaries of equality and sustainability, including those of masculinity and femininity could be a powerful agent of change. Beck et al. (2021) considers how sociotechnical imaginaries, or collective visions of a desirable future can contribute to understanding transformations towards sustainability. In terms of gender equality and rural sustainability imaginaries held and co-created by those in society who hold less power or influence can provide fresh perspectives on the essence and direction of equality and sustainability. In this context, promoting the co-creation of alternative imaginaries is pivotal in driving cultural shifts and encouraging women-led innovations to play a central role in reimagining equality and sustainability in rural areas.

Prosperity as holistic sustainability links for example to Agenda 2030 Sustainable Development Goals (SDG) by the United Nations (2015). SDG 5 is focused specifically on gender equality, but women-led innovations can help to drive broader transformative change towards economic, but also socio-cultural, environmental and institutional sustainability. Transformation for long-term sustainability means a radical change in social, economic and environmental systems to ensure the well-being of current and future generations (Haug, 2018). Understanding the complied socio-cultural and political systems where women-led innovations are either diffused or impeded is critical. Learning can be based on real-world experiments and experiences on the key issues facilitating or hindering diffusion of promising women-led innovation journeys, which can reveal important insights on how promising but isolated practices can be mainstreamed across society to initiate transformative change for equality and sustainability in rural areas. Ní Fhlatharta and Farrell (2017) demonstrated how female innovators can be viewed as development drivers in rural regions, bringing about positive changes in enterprise and employment creation, internal investment, and the positive impact of gender relations on the traditional patriarchal rural society. However, one of the existing challenges is that these female innovators are geographically excluded from sectoral enterprise support that their urban counterparts can access.

4.2 LTVRA objective 2: Enhancing Connectivity Through Innovation Ecosystems

Connectivity objectives encompass the maintenance and enhancement of public transport services and digital infrastructure to ensure better-connected EU rural areas (European Commission, 2021a). The FLIARA project proposes an expansion of this concept by introducing the idea of innovative ecosystems to further develop connectivity. Rural innovation ecosystems can help to revitalise the countryside and achieve balanced and sustainable development (Yin et al., 2022). An innovation ecosystem is a dynamic framework comprising a range of actors, activities, and artifacts, institutions, and relations, including complementary and substitute relations that are important for the innovative

performance of an actor or a population of actors (Granstrand and Holgersson, 2020). While gender mainstreaming is a key objective of EU rural policies, more targeted policies are also needed to secure entrepreneurial social spaces of innovation for women in rural areas. Furthermore, connectivity is also connected to digitalisation. There is a need to identify specific training needs for rural women innovators using digital solutions and considering accessibility, and broadband as equality issues.

Innovation ecosystems include a plausible leverage point for gender equality, by enabling women to assume diverse roles within these ecosystems, such as intermediaries, knowledge and solution providers, co-creators, innovators, adapters, and funders (Butzin and Terstriep, 2023). Women as Ecosystem Leader, Supplier, Assembler, Complementor, Expert, Champion, Entrepreneur, Sponsor and Regulator (Dedehayir et al., 2022) can actively contribute to enhancing equality and sustainability in rural areas, playing diverse and influential roles. However, biased innovation ecosystems may hinder women-initiated innovations. For example, women innovators often face additional challenges in establishing their qualifications, talents and achievements, and female role models within innovation ecosystems are often lacking. When women participate in various roles within innovation ecosystems, the likelihood of other women encountering discrimination diminishes, and their ideas and efforts are less likely to be undermined due to gender bias. In this way, innovation ecosystems can play a significant role in promoting gender equality and sustainability within rural areas.

4.3 LTVRA objective 3: Stronger Rural Areas Through Women-led Innovation

The concept and reality of stronger rural areas includes innovative solutions for services provision, leveraging digital tools, and fostering social innovation (European Commission, 2021a). We propose two themes to strengthen rural areas through inclusivity and empowerment, as advocated by women-led innovations, namely, performing against patriarchal norms and feminist governance.

Firstly, prevailing patriarchal values and gender roles represent one of the key root causes of gender inequality, especially in rural areas (e.g., Meyers, 2002). These patriarchal norms consisting of culturally constructed practices, stereotypes, roles, and expectations towards women may undermine women's opportunities. Women-led innovations can challenge and reshape these constructions by showcasing successful activities often not associated with the female realm. The concept of performativity, rooted in Butler's (1990), Gender Performance Theory, affirms that gender is an identity constituted and instituted through a repetition of acts, as part of processes that construct social reality via language, gestures, and symbolic social signs. The concept of performativity stresses that gender is not a natural identity, but instead is an ongoing or continuous state shaped by societal norms and expectations. The potential of performativity to induce change can be viewed as a bottom-up practice, where individual women, female collectives and female innovators initiate change by showing that things can be done differently (Sarkki et al., 2021). Examples of women-led innovations can show the benefits and change attitudes towards women engaged in innovative activities.

Secondly, affirmative governance, government directives or voluntary programmes that can identify and promote disadvantaged groups and overcome discrimination, could help to enhance gender equality and boost women-led innovations in rural areas. The idea is that affirmative governance is needed to provide equal opportunities for disadvantaged groups, like women, and so contribute to a more just world by enhancing the potential to act in policy, economy, innovation development, social life in a more just way. One practical policy solution for affirmative governance is feminist governance, which refer to the institutions and tools developed within political institutions to advance the inclusion of a gender perspective in policy making, while providing institutional continuity and stability to gender equality policy making (Elomaki and Kantola, 2022). A feminist governance framework encompasses institutions (e.g., gender equality bodies) and policy-making tools (e.g., gender mainstreaming, gender budgeting) within political institutions to promote policy making that takes gender into account. In a practical sense, this is illustrated for example by the inclusion of women into agricultural extension initiatives. Extension advisory in gender refers to the process of integrating a gender perspective into agricultural extension programmes and services to ensure that they meet the specific needs and priorities of both women and men farmers. The inclusion of the gender perspective tackles the specific barriers and challenges women

farmers might encounter (GFRAS, 2016). Therefore, innovations transforming the relevant political decision-making institutions can change the rules of the game and enable equality, sustainability, and facilitate subsequent women-led innovations in the future.

4.4 LTRVA objective 4: Resilience: Positive and Negative Aspects

Ensuring the green and digital transitions are equitable and considering the needs of all rural community members, including those from disadvantaged groups is crucial in strengthening the social resilience of rural areas. Making rural areas more socially resilient requires tapping into the full breadth of talents and diversity in our society (European Commission, 2021a). Thus, a key component of the LTRVA is resilience. Nonetheless, we stress that resilience, particularly sociocultural and political resilience, referring to the ability of a society to adapt or recover in the face of social, cultural and political challenges, can display both good and bad traits. Positive resilience is connected to collective action by and for women. Cornwall (2016) notes that: “when women are able to come together and organise themselves to make demands, build constituencies and alliances, they are more likely both to succeed in making changes for other women and also experience for themselves the empowering effects of mobilisation” (p. 352). Therefore, collective female agency can play an important role in female empowerment. Collective female agency encourages positive resilience by fostering innovation through acquiring and sharing knowledge and developing social capital between local rural women and external support agencies. Positive resilience can also be a characteristic of individual female innovators. Research has shown that the three psychological dimensions of resilience (toughness, resourcefulness, and optimism) predict entrepreneurial success, while resourcefulness is being the most important indicator of an entrepreneur's success (Ayala and Manzano, 2014). In essence, the resilience of women innovators can boost women-led innovations and serve as sources of collective female resilience. This contributes to overall rural development due to key roles women play for example in agriculture, food production and poverty eradication (UN Women, 2013).

We identify two forms of negative resilience undermining gender equality: maladaptation and toxic resilience. Maladaptation refers to a situation where exposure, vulnerability and sensitivity to disruptions increase due to action taken, instead of increasing positive development and positive resilience. Furthermore, maladaptation results in conditions that are worse than those that the original strategies were trying to address (Schipper, 2020). Examples of maladaptation are firstly that women invest extensive amounts of voluntary work to innovation development, or on social innovation with high hopes, however, as the time and unpaid and even uncredited work increases it leads to little or zero improvement of the women's situations. A second example is connected to the promise of women-only networks, which may enhance collective agency by women, but may also function as maladaptive ways of constituting 'feminised ghettos' with low-value businesses, or less-valued social innovations, thus reinforcing women's subordination.

Toxic resilience is interconnected to the persistence of toxic masculinity, which is defined as aggressive and dominant male behaviour, undermining both men's and women's roles and identities in society. Toxic resilience refers to situations where the prevailing socio-cultural system of beliefs and practices resists efforts to transform it towards greater equality and may be reinforced when it benefits those who profit from the existing status quo and women's subordination. Toxic resilience may manifest at various levels: in family dynamics, where gendered roles and tasks are relevant for equality; on farms, where gender stereotypes and biases restrict women's opportunities and influence; within innovation ecosystems, where women may face challenges in obtaining valued roles and positions; and at the societal level, where deep-rooted value systems and cultural norms resist change. The Matilda Effect, the lack of recognition of women innovators or scientists despite their outstanding achievements, is yet another example of toxic resilience (see Rossiter, 1993). Antifeminism is a more visible form of toxic resilience, which is a backlash and a counterattack in response to the real or imagined threat that feminists and emancipated women are supposed to represent for the legitimacy and stability of patriarchy, or to men's identity and interest (see Blais 2012).

Given the plausible negative implications of resilience, it is important that the LTVRA acknowledges this dark side of resilience and consider not only how to build resilience, but also how to erode negative resilience. There are also signs of erosion of toxic resilience regarding rural women. The traditional rural family has been for years an agricultural enterprise at the same time. The strongly patriarchal concept resulted, among other things, from property rights, where the eldest son always inherited the estate. However, under the pressure of the diminishing importance of family farms in favour of big business, the diminishing importance of agriculture in the rural labour market, and also in line with the democratisation of society, the patriarchal system has begun to erode. Its content also changed from the subordination of women to the persistence of the traditional division of labour.

4.5 Summary of The Potential Contributions of Women-Led Innovation To The LTVRA

Finally, we summarise the discoveries on potential contributions by women-led innovations into the LTVRA, and its four objectives. Figure 2 shows a set of actions that link to women-led innovation and that help to move towards the four objectives of the LTRVA. The four objectives of the Vision are displayed at the right-hand side that are enhanced by a set of actions linked to women-led innovations. Those actions are colour coded so that those actions written in black link to two or more of the four key objectives, while those actions written in colour link to one objective. It also shows actions that are relevant for several objectives. The actions on the left-hand side of the figure illustrate changes that are needed to kickstart the set of actions progressing towards the four objectives. Three immediate action points have been identified: fostering women-led innovations in rural areas, translating equality agendas into actionable policies, and substantiating the necessity for affirmative policies aimed at promoting women-led innovation. In so doing, this paper seeks to convey the message to policy makers on the pivotal importance of the women-led innovation for rural sustainability and gender equality.

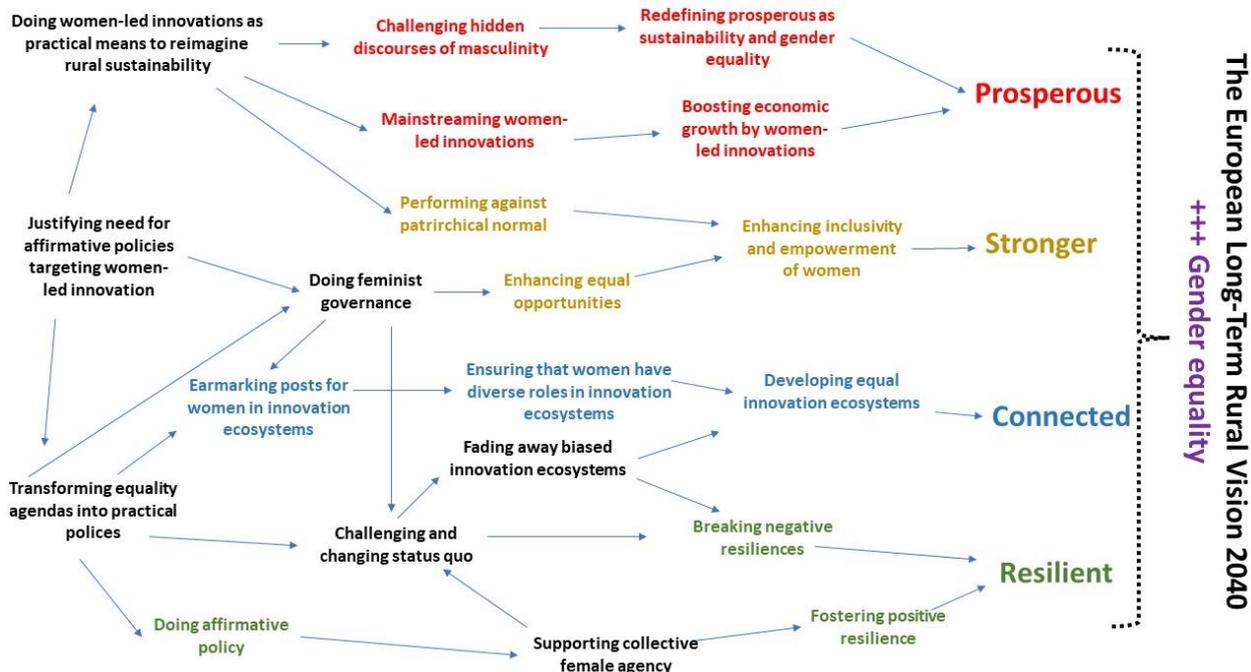


Fig 2. Causal diagram based on Backcasting exercise by authors on plausible ways women-led innovation can contribute to the four objectives of the LTVRA. Source: own elaboration

5. Discussion and conclusion

We have proposed features that make women-led innovation a distinct kind of innovation. We consider that (assumed) female identity, collective female agency, resisting negative resilience, and a specific ethical underpinning related to goals of gender equality make women-led innovations a distinctive kind of innovation. This distinctiveness also calls for partly different criteria to evaluate women-led innovations and their success. On the one hand, meeting the goals of the innovator is a common criterion for innovation success. On the other hand, with women-led innovations also performing against the “patriarchal normal” and showing examples of how innovation processes can be led by women functions as another criterion for success by showcasing positive female agency. This makes women-led innovations living examples of a movement towards gender equality and justifies affirmative policies targeting women. However, women-led innovations are not only to be supported by policy because of equality objectives. Instead, they can have major contributions to achieving also other sustainability and policy goals, as we showed with the case of the LTVRA.

This paper underscores a pressing need to advocate for the robust integration of women-led innovation into current policy discussions. While gender equality and related challenges are increasingly recognised in diverse policy developments in various European and global contexts, women-led innovations remain relatively marginalised in official policy documents. We have carefully detailed how women-led innovations relate to the four key objectives of LTVRA. Women-led innovations stand to revitalise rural areas, breathing new life into them and propelling them towards a future characterised by sustainability and equality. Considering this, we propose three compelling justifications for why the LTVRA should embrace women-led innovations (see also Annex 3).

Substantial Reasons: Women-led innovations have the potential to make substantial contributions to rural development, sustainability, and social equality. They can act as a driving force behind inclusive, sustainable and gender-equal rural development. Disregarding the innovation potential harboured by half of the population would be both imprudent and unjust.

Procedural Reasons: Embracing diversity in innovation types and actors can fortify rural development and prepare communities to confront an array of concurrent sustainability challenges, particularly in an age of polycrisis, such as climate change. In addition, the participation of women, who are key stakeholders in rural areas, in decision-making and innovation processes is key to effectively addressing the unique challenges that rural women face.

Normative Reasons: Aligning the objective of promoting gender equality, as outlined in the United Nation’s Sustainable Development Goal 5, we assert that as long as the innovation landscape remains unequal for women, affirmative governance measures are justified. Such measures are indispensable until a state of true equality for rural women is achieved. Recognising the current necessity for gender equity, affirmative actions are indispensable until such a time when gender equality prevails, rendering these measures obsolete.

The integration of women-led innovations into the LTVRA is not just an ethical imperative but can add value to the processes towards rural sustainability and gender equality. By doing so, we can pave the way for rural areas to flourish, bridging the gap between sustainability practice and equality.

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- [1] Ahl, H. (2018). The equality work that needs to be done. In Ahl, H., Bergmo-Prvulovic, I. & Kilhammar, K., eds., *Human Resource Management: A Nordic Perspective* (pp. 105–118). Abingdon-on-Thames: Routledge.
- [2] Atterton, J. (2016). Invigorating the New Rural Economy: Entrepreneurship and Innovation. In Shucksmith, M. & Brown, D., eds. *Routledge International Handbook of Rural Studies* (pp. 217–235). Abingdon-on-Thames: Routledge.
- [3] Ayala, J. C. & Manzano, G. (2014). The resilience of the entrepreneur Influence on the success of the business. A longitudinal analysis. *Journal of Economic Psychology*, 42, 126–135. DOI: 10.1016/j.joep.2014.02.004.
- [4] Audretsch, D., Belitski, M. & Brush, C. (2020). Innovation in women-led firms: an empirical analysis. *Economics of Innovation and New Technology*, 31(1–2), 90–110. DOI: 10.1080/10438599.2020.1843992.
- [5] Banerjee, S., dos Santos, L. L. & Hulgård, L. (2023). Intersectional knowledge as rural social innovation. *Journal of Rural Studies*, 99, 252–261. DOI: 10.1016/j.jrurstud.2021.04.007.
- [6] Beck, S., Sheila, J., Stirling, A. & Polzin, C. (2021). The governance of sociotechnical transformations to sustainability. *Current Opinion in Environmental Sustainability*, 49, 143–152. DOI: 10.1016/j.cosust.2021.04.010.
- [7] Belghiti-Mahut, S., Lafont, A. & Yousfi, O. (2016). Gender gap in innovation: a confused link? *Journal of Innovation Economics & Management*, 19, 159–177. DOI: 10.3917/jie.019.0159.
- [8] Bibri, S. E. (2018). Backcasting in futures studies: a synthesized scholarly and planning approach to strategic smart sustainable city development. *European Journal of Futures Research*, 6, 13. DOI: 10.1186/s40309-018-0142-z.
- [9] Blais, M. (2012). Y a-t-il un ‘cycle de la violence antiféministe?’ Les effets de l’antiféminisme selon les féministes québécoises. *Recherche Féministes/Cahiers du Genre*, 25(1), 127–149. DOI: 10.3917/cdge.052.0167.
- [10] Boström, M. (2012). A missing pillar? Challenges in theorizing and practicing social sustainability: introduction to the special issue. *Sustainability: Science, Practice and Policy*, 8(1), 3–14. DOI: 10.1080/15487733.2012.11908080.
- [11] Bradshaw, S., Castellino, J. & Diop, B. (2017). Women’s role in economic development: overcoming the constraints. In Besada, H., McMillan Polonenko, L. & Agarwall, M., eds. *Did the Millennium Development Goals Work?* (pp. 191–216). Bristol: Policy Press. DOI: 10.46692/9781447335719.009.
- [12] Bruno, I. (2014). Benchmarking. In: Michalos, A. C., ed. *Encyclopedia of Quality of Life and Well-Being Research* (pp. 363–368). Dordrecht: Springer.
- [13] Bullock, R. & Tegbaru, A. (2019). Women's agency in changing contexts: A case study of innovation processes in Western Kenya. *Geoforum*, 105, 78–88. DOI: 10.1016/j.geoforum.2019.07.007.
- [14] Butler, J. (1990). *Gender trouble: feminism and the subversion of identity*. London: Routledge.
- [15] Butzin, A. & Terstriep, J. (2023). Strengthening place attachment through place-sensitive participatory regional policy in a less developed region. *European Planning Studies*, 31(12), 2510–2530. DOI: 10.1080/09654313.2022.2156274.
- [16] Camp, R. C. (1989). *Benchmarking: The search for industry best practices that lead to superior performance*. Milwaukee, WI: ASQC Quality Press.
- [17] Carayannis, E. G. & Stewart, M. R. (2013). Obsessed maniacs and clairvoyant oracles: empirically validated patterns of entrepreneurial behaviour. *Journal of Innovation and Entrepreneurship*, 2(2). DOI: 10.1186/2192-5372-2-2.

- [18] Cho, S., Crenshaw, K. W. & McCall, L. (2013). Toward a Field of Intersectionality Studies: Theory, Applications, and Praxis. *Signs: Journal of Women in Culture and Society*, 38(4), 785–810. DOI: 10.1086/669608.
- [19] Cornwall, A. (2016). Women's empowerment: What works? *Journal of International Development*, 28(3), 342–359. DOI: 10.1002/jid.3210.
- [20] Cornwall, A. & Rivas, A. M. (2015). From 'gender equality and women's empowerment' to global justice: Reclaiming a transformative agenda for gender and development. *Third World Quarterly* 36(2), 396–415. DOI: 10.1080/01436597.2015.1013341.
- [21] Dalla Torre, C., Ravazzoli, E., Dijkshoorn-Dekker, M., Polman, N., Melnykovich, M., Pisani, E., Gori, F., Da Re, R., Vicentini, K. & Secco, L. (2020). The Role of Agency in the Emergence and Development of Social Innovations in Rural Areas. Analysis of Two Cases of Social Farming in Italy and The Netherlands. *Sustainability*, 12(11), 4440. DOI: 10.3390/su12114440.
- [22] Dargan, L. & Shucksmith, M. (2008). LEADER and Innovation. *Sociologia Ruralis*, 48 (3), 274–291. DOI: 10.1111/j.1467-9523.2008.00463.x.
- [23] Dedehayir, O., Mäkinen, S. J. & Ortt, J. R. (2022). Innovation ecosystems as structures: Actor roles, timing of their entrance, and interactions. *Technological Forecasting and Social Change*, 183, 121875. DOI: 10.1016/j.techfore.2022.121875.
- [24] DeFelice, K. A. & Diller, J. W. (2019). Intersectional feminism and behavior analysis. *Behavior Analysis in Practice*, 12(4), 831–838. DOI: 10.1007/s40617-019-00341-w.
- [25] Demartini, P. (2018). Innovative Female-Led Startups. Do Women in Business Underperform? *Administrative Sciences*, 8(4), 70. DOI: 10.3390/admsci.8040070.
- [26] Diamanti, G. & Duncan, J. (2023). *Gender and Agriculture: Policy tensions behind the EU gender gap*. Wageningen University and Research.
- [27] Edwards-Schachter, M. (2018). The nature and variety of innovation. *International Journal of Innovation Studies*, 2(2), 65–79. DOI: 10.1016/j.ijis.2018.08.004.
- [28] Eleutério, R. P. & van Amstel, F. (2020). Matters of Care in Designing a Feminist Coalition. In Del Gaudio, Ch. & Parra-Agudelo, L., eds., *PDC '20: Proceedings of the 16th Participatory Design Conference 2020* not paged. New York: Association for Computer Machinery. DOI: 10.1145/3384772.3385157.
- [29] Elomäki, A. & Kantola, J. (2022). Gender, Power and Corporatism: Complex Relationships and Analytical Perspectives. An (other) introduction to the special issue. *Politique européenne* 74(4), 38–52. DOI: 10.3917/poeu.074.0038.
- [30] Esparcia, J. (2014). Innovation and networks in rural areas. An analysis from European innovative projects, *Journal of Rural Studies*, 34, 1–14. DOI: 10.1016/j.jrurstud.2013.12.004.
- [31] Ferraresi, G. (2018). Sistemi territoriali di socioeconomia locali: il paradigma neorurale come fondamento. *Scienze del territorio*, 6, 70–76. DOI: 10.13128/Scienze_Territorio-24368Galliano.
- [32] Farrell, M., Sarkki, S., Holloway, L., Weir, L., Heikkinen, H., Lépy, É., Fransala, J., Nolan, N., McGuinness, N., von Muenchhausen, S., Santacruz, M., Herrera, E., Perello, M., Vingelli, G., Farrell, T., Garces Ortiz, S., Kinsella, A., Oprea, A., Incze, L., Mikolič, S., Kuhmonen, T., Korthals Altes, W., Štátná, M., Vaishar, A., Zloch, J. (forthcoming). D1.1 FLIARA Conceptual Framework.
- [33] Fhlatharta, A. M. N. & Farrell, M. (2017). Unravelling the strands of 'patriarchy' in rural innovation: A study of female innovators and their contribution to rural Connemara. *Journal of Rural Studies*, 54, 15–27. DOI: 10.1016/j.jrurstud.2017.05.002.
- [34] Foster, C. & Heeks, R. (2013). Conceptualising Inclusive Innovation: Modifying Systems of Innovation Frameworks to Understand Diffusion of New Technology to Low Income Consumers, *European Journal of Development Research*, 25(3), 333–355. DOI: 10.1057/ejdr.2013.7.

- [35] Fraser, N. (1998). *Social justice in the age of identity politics: Redistribution, recognition, participation* [Discussion Paper, No. FS I 98–108]. Berlin: Wissenschaftszentrum für Sozialforschung.
- [36] Freshwater, D. (2012). *Rural Innovation – Crucial, But Rarely Systemic* [Working paper] Lexington: University of Kentucky.
- [37] Freshwater, D. (2016). Economic Transformation: Understanding the Determinants of Rural Growth. In Shucksmith, M. & Brown, D, eds., *Routledge International Handbook of Rural Studies* [pp. 142–151]. Abingdon-on-Thames: Routledge.
- [38] Galliano, D., Gonçalves, A. & Triboulet, P. (2017). Eco-Innovations in Rural Territories: Organizational Dynamics and Resource Mobilization in Low Density Areas. *Journal of Innovation Economics and Management*, 3(24), 35–62. DOI: 10.3917/jie.pr1.0014.
- [39] Gkartzios, M. & Lowe, P. (2019). Revisiting neo-endogenous rural development. In Scott, M., Gallent, N. & Gkartzios, M., eds., *The Routledge companion to rural planning* (pp. 159–169). Abingdon-on-Thames: Routledge.
- [40] Granstrand, O. & Holgersson, M. (2020). Innovation ecosystems: A conceptual review and a new definition. *Technovation*, 90–91, 102098. DOI: 10.1016/j.technovation.2019.102098.
- [41] Grin, J., Rotmans, J. & Schot, J. (2010). *Transitions to Sustainable Development: New Directions in the Study of Long-Term Transformative Change*. Abingdon-on-Thames: Routledge.
- [42] Hadden, J. & Seybert, L. A. (2016). What’s in a Norm? Mapping the Norm Definition Process in the Debate on Sustainable Development. *Global Governance: A Review of Multilateralism and International Organizations*, 22(2), 249–268. DOI: 10.1163/19426720-02202005.
- [43] Haji Ali, N., Muhamad, S., Jalil, M. & Man, M. (2018). Empowering Rural Women Entrepreneurs Through Social Innovation Model. *International Journal of Business and Economic Affairs*, 3(6), 253–259.
- [44] Haug, R. (2018). Transformation towards sustainability: a conceptual framework. *Sustainability Science*, 13(3), 697–710. DOI: 10.1007/s11625-017-0513-1.
- [45] Hautamäki, A. & Oksanen, K. (2016). Sustainable Innovation: Solving Wicked Problems Through Innovation. In Mention, A. L. & Torkkeli, M., eds., *Open Innovation: A Multifaced Perspective* (pp. 87–110). Singapore: World Scientific. DOI: 10.1142/9789814719186_0005.
- [46] Heijman, W., Hagelaar, G. & Heide, C. (2007). Rural resilience as a new development concept. In Dries, L., Heijman, W., Jongeneel, R., Purnhagen, K. & Wesseler, J., eds., *EU Bioeconomy Economics and Policies: Volume II* (pp. 195–211). Cham: Palgrave Macmillan. DOI: 10.1007/978-3-030-28642-2_11.
- [47] Holmberg, J. (1998). Backcasting: a natural step in operationalizing sustainable development. *Greener Manage International*, 23, 30–51.
- [48] Huang, Y., Li, P., Wang, J. & Li, K. (2022). Innovativeness and entrepreneurial performance of female entrepreneurs. *Journal of Innovation & Knowledge*, 7(4), 100257. DOI: 10.1016/j.jik.2022.100257.
- [49] Jiménez, A. (2018). Inclusive innovation from the lenses of situated agency: insights from innovation hubs in the UK and Zambia. *Innovation and Development*, 9(1), 41–64. DOI: 10.1080/215793X.2018.1445412.
- [50] Kamberidou, I. (2020). “Distinguished” women entrepreneurs in the digital economy and the multitasking whirlpool. *Journal of Innovation and Entrepreneurship*, 9, 3. DOI: 10.1186/s13731-020-0114-y.
- [51] Kline, S. J. (1985). Innovation Is Not a Linear Process, *Research Management*, 28(4), 36–45.
- [52] Könnölä, T., Eloranta, V., Turunen, T. & Salo, A. (2021). Transformative governance of innovation ecosystems. *Technological Forecasting and Social Change*, 173, 121106. DOI: 10.1016/j.techfore.2021.121106.

- [53] Lyytimäki, J., Teperi, A. M., Jylhä, K. M., da Silva Vieira, R. & Mervaala, E. (2023). Dark side of resilience: systemic unsustainability. *Frontiers in Sustainability*, 4, 1241553. DOI: 10.3389/frsus.2023.1241553.
- [54] Leach, M., Rockström, J., Raskin, P., Scoones, I., Stirling, A. C., Smith, A., Thompson, J., Millstone, E., Ely, A., Arond, E. & Folke, C. (2012). Transforming innovation for sustainability. *Ecology and Society*, 17(2). DOI: 10.5751/ES-04933-170211.
- [55] Le Loarne-Lemaire, S., Bertrand, G., Razgallah, M., Maalaoui, A. & Kallmuenzer, A. (2021). Women in innovation processes as a solution to climate change: A systematic literature review and an agenda for future research. *Technological Forecasting and Social Change*, 164, 120440. DOI: 10.1016/j.techfore.2020.120440.
- [56] Lindberg, M., Forsberg, L. & Karlberg, H. (2015). Gendered social innovation – a theoretical lens for analysing structural transformation in organisations and society. *International Journal of Social Entrepreneurship and Innovation*, 3(6), 472–483. DOI: 10.1504/IJSEI.2015.073540.
- [57] Maestriperi, L. (2017). Does Social Innovation Reduce the Economic Marginalization of Women? Insights from the Case of Italian Solidarity Purchasing Groups. *Journal of Social Entrepreneurship*, 8(3), 320–337. DOI: 10.1080/19420676.2017.1364289.
- [58] Maguirre, M. V., Ruelas, G. C. & Torre, C. G. D. L. (2016). Women empowerment through social innovation in indigenous social enterprises. *Revista de Administração Mackenzie*, 17(6), 164–190. DOI: 10.1590/1678-69712016/administracao.v17n6p164-190.
- [59] Mari, M., Poggesi, S., Abatecola, G. & Essers, C. (2024). Women entrepreneurs and innovation: Retrospect and prospect, *Journal of Innovation & Knowledge*, 9(3). DOI: 10.1016/j.jik.2024.100519.
- [60] Mariani, L., Trivellato, B., Martini, M. & Marafioti, E. (2022). Achieving sustainable development goals through collaborative innovation: Evidence from four European initiatives. *Journal of Business Ethics*, 180(4), 1075–1095. DOI: 10.1007/s10551-022-05193-z.
- [61] Mehan, A., Mostafavi, S. (2023). Building Resilient Communities Over Time. In Brears, R. C., ed., *The Palgrave Encyclopedia of Urban and Regional Futures* (pp. 99–103). Cham: Palgrave Macmillan. DOI: 10.1007/978-3-030-87745-3_322.
- [62] Meyers, D. T. (2002). Gender Identity and Women's Agency: Culture, Norms, and Internalized Oppression Revisited. In Meyers, D. T., ed., *Gender in the Mirror: Cultural Imagery and Women's Agency* (pp. 3–29). Oxford University Press.
- [63] Monllor i Rico, N. & Fuller, A. M. (2016). Newcomers to farming: towards a new rurality in Europe, *Documents d'Anàlisi Geogràfica*, 62(3), 531–551. DOI: 10.556/rev/dag.376.
- [64] Moulart, F., Maccallum, D., Van den Broeck, P. & Cabeza, M. (2019). Bottom-Linked Governance and Socially Innovative Political Transformation. In Howaldt, J., Kaletka, Ch., Schröder, A. & Zirngiebl, M., eds., *Atlas of Social Innovation – a World of New Practices* (pp. 62–65). München: Oekom.
- [65] Mulgan, G. (2006). The process of social innovation. *Innovations: Technology, Governance, Globalization*, 1(2), 145–162. DOI: 10.1162/itgg.2006.1.2.145.
- [66] Müller, S. & Korsgaard, S. (2018). Resources and bridging: the role of spatial context in rural entrepreneurship. *Entrepreneurship and Regional Development*, 30(1–2) 224–255. DOI: 10.1080/08985626.2017.1402092.
- [67] Ní Fhlatharta, A. & Farrell, M. (2017). Unravelling the strands of 'patriarchy' in rural innovation: A study of female innovators and their contribution to rural Connemara. *Journal of Rural Studies*, 54, 15–27. DOI: 10.1016/j.jrurstud.2017.05.002.
- [68] Norman, D. A. & Verganti, R. (2014). Incremental and Radical Innovation: Design Research vs. Technology and Meaning Change. *Design Issues*, 30(1), 78–96. DOI: 10.1162/DESI_a_00250.

- [69] Owalla, B., Vorley, T. & Smith, H., eds., (2022). *Gender, Diversity and Innovation: Concepts, Policy and Practice*. Cheltenham: Edward Elgar Publishing.
- [70] Pecis, L. (2016). Doing and undoing gender in innovation: Femininities and masculinities in innovation processes. *Human Relations*, 69(11), 2117–2140. DOI: 10.1177/0018726716634445.
- [71] Pecis, L. & Berglund, K. (2021). Hidden in the limelight: A feminist engagement with innovation studies. *Organization*, 28(6), 993–1017. DOI: 10.1177/13505084211015380.
- [72] Pihlajamäki, M., Sarkki, S., Haapasaari, P. (2018). Food security and safety in fisheries governance – A case study on Baltic herring. *Marine Policy* 97, 211–219. DOI: 10.1016/j.marpol.2018.06.003.
- [73] Ranga, M., Etzkowitz, H. (2010). Athena in the World of Techne: The Gender Dimension of Technology, Innovation and Entrepreneurship. *Journal of Technology Management and Innovation* 5(1), 1–12. DOI: 10.4067/S0718-27242010000100001.
- [74] Ravazzoli, E., Dalla Torre, C., Da Re, R., Marini Govigli, V., Secco, L., Górriz-Mifsud, E., Pisani, E., Barlagne, C., Baselice, A., Bengoumi, M., Dijkshoorn-Dekker, M., Labidi, A., Lopolito, A., Melnykovich, M., Perlik, M., Polman, N., Sarkki, S., Vassilopoulos, A., Koundouri, P. & Nijnik, M. (2021). Can social innovation make a change in European and Mediterranean marginalized areas? Social innovation impact assessment in agriculture, fisheries, forestry, and rural development. *Sustainability*, 13(4), 1823. DOI: 10.3390/su13041823.
- [75] Reed, M. S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., Prell, C., Quinn, C. H. & Stringer, L. C. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management*, 90(5), 1933–1949. DOI: 10.1016/j.jenvman.2009.01.001.
- [76] Richter, R. (2019). Rural social enterprises as embedded intermediaries: The innovative power of connecting rural communities with supra-regional networks. *Journal of Rural Studies*, 70, 179–187. DOI: 10.1016/j.jrurstud.2017.12.005.
- [77] Ritter-Hayashi, D., Vermeulen, P. & Knobens, J. (2019). Is this a man's world? The effect of gender diversity and gender equality on firm innovativeness. *Plos One*, 14(9), e0222443. DOI: 10.1371/journal.pone.0222443.
- [78] Rossister, M. (1993). The Matthew Matilda Effect in Science. *Social Studies in Science* 23(2), 325–341.
- [79] Sarkki, S., Dalla Torre, C., Fransala, J., Živojinović, I., Ludvig, A., Górriz-Mifsud, E., Melnykovich, M., Sfeir, P. R., Arbia, L., Bengoumi, M., Chorti, H., Gramm, V., López Marco, L., Ravazzoli, E. & Nijnik, M. (2021). Reconstructive social innovation cycles in women-led initiatives in rural areas. *Sustainability*, 13(3), 1231. DOI: 10.3390/SU13031231.
- [80] Slaughter, R. A. (1993). Futures concepts. *Futures* 25(3), 289–314. DOI: 10.1016/0016-3287(93)90138-J.
- [81] Schipper, E. L. F. (2020). Maladaptation: When Adaptation to Climate Change Goes Very Wrong. *One Earth*, 3(4), 409–414. DOI: 10.1016/j.oneear.2020.09.014.
- [82] Schmitt, F., Sundermeier, J., Bohn, N. & Morassi Sasso, A. (2020). Spotlight on Women in Tech: Fostering an Inclusive Workforce when Exploring and Exploiting Digital Innovation Potentials. In *ICIS 2020 Proceedings*, 6. Atlanta, GA: Association for Information Systems.
- [83] Shucksmith, M. (2010). Disintegrated rural development? Neo-endogenous rural development, planning, and place-shaping in diffused power contexts. *Sociologia Ruralis*, 50(1), 1–14. DOI: 10.1111/j.1467-9523.2009.00497.x.
- [84] Shreeves, R. & Zamfir, L. (2023). *Women in politics in the EU: State of play*. Strasbourg: European Parliament.

- [85] Silvestre, B. S. & Țîrcă, D. M. (2019). Innovations for sustainable development: Moving toward a sustainable future. *Journal of Cleaner Production*, 208, 325–332. DOI: 10.1016/j.jclepro.2018.09.244.
- [86] Smith, T. & Kimmel, M. (2005). The Hidden Discourse of Masculinity in Gender Discrimination Law. *Signs: Journal of Women in Culture and Society*, 30(3), 1827–1849. DOI: 10.1086/427524.
- [87] Sundermeier, J., Wessel, L. & Davidson, E. (2018). Can Digital Innovation Alter the Landscape of Women's Entrepreneurship? In *Thirty Ninth International Conference on Information Systems*, Atlanta, GA: Association for Information Systems.
- [88] Suseno, Y. & Abbott, L. (2021). Women entrepreneurs' digital social innovation: Linking gender, entrepreneurship, social innovation and information systems. *Information Systems Journal*, 31, 717–744. DOI: 10.1111/isj.12327.
- [89] Sweetman, C. (2013). Introduction, Feminist Solidarity and Collective Action. *Gender and Development*, 21(2), 217–229. DOI: 10.1080/13552074.2013.819176.
- [90] Taylor, S. P. (2017). What is innovation? A study of the definitions, academic models and applicability of innovation to an example of social housing in England. *Open Journal of Social Sciences*, 5(11), 128–146. DOI: 10.4236/jss.2017.511010.
- [91] Tödting, F. & Trippel, M. (2018). Regional innovation policies for new path development—beyond neo-liberal and traditional systemic views. *European Planning Studies*, 26(9), 1779–1795. DOI: 10.1080/09654313.2018.1457140.
- [92] Braun, J. von & Gatzweiler, F. W. (2014). Marginality—An Overview and Implications for Policy. In von Braun, J. & Gatzweiler, F., eds., *Marginality* (pp. 1–26). Dordrecht: Springer. DOI: 10.1007/978-94-007-7061-4_1.
- [93] Wilson, G. A. & Burton, R. J. (2015). 'Neo-productivist' agriculture: Spatio-temporal versus structuralist perspectives. *Journal of Rural Studies*, 38, 52–64. DOI: 10.1016/j.jrurstud.2015.02.003.
- [94] Yin, X., Chen, J. & Li, J. (2022). Rural innovation system: Revitalize the countryside for sustainable development. *Journal of Rural Studies*, 93, 471–478. DOI: 10.1016/j.jrurstud.2019.10.014.
- [95] Yuval-Davis, N. (2006). Intersectionality and Feminist Politics. *European Journal of Women's Studies*, 13(3), 193–209. DOI: 10.1177/135050680606575.
- [96] Zastempowski, M. & Cyfert, S. (2021). Impact of entrepreneur's gender on innovation activities. The perspective of small businesses. *PLoS One*, 16(10), e0258661. DOI: 10.1371/journal.pone.0258661.
- [97] Zeb, A. & Ihsan, A. (2020). Innovation and the entrepreneurial performance in women-owned small and medium-sized enterprises in Pakistan. *Women's Studies International Forum*, 79, 102342. DOI: 10.1016/j.wsif.2020.102342.

Other sources

- [98] Council of Europe (2015). Gender Equality Commission. Council of Europe, European Commission. <https://rm.coe.int/16805a1cb6>.
- [99] EIP-AGRI. Agricultural Knowledge and Innovation System. (2021). URL:<https://ec.europa.eu/eip/agriculture/sites/default/files/eip>.
- [100] European Commission (2021a). Long-Term Vision For Rural Areas: for stronger, connected, resilient, prosperous EU rural areas. https://ec.europa.eu/commission/presscorner/detail/en/ip_21_3162.
- [101] European Commission (2021b). Rural Vision: Action Plan. https://rural-vision.europa.eu/action-plan_en.

- [102] European Commission (no date). Rural Pact Community Platform. https://ruralpact.rural-vision.europa.eu/rural-pact_en.
- [103] European Council (2023). A long-term vision for the EU's rural areas: Council approves conclusions. Press Release, November 20th. <https://www.consilium.europa.eu/en/press/press-releases/2023/11/20/a-long-term-vision-for-the-eu-s-rural-areas-council-approves-conclusions/>.
- [104] Eurostat (2021). Gender pay gap statistics. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Gender_pay_gap_statistics.
- [105] EU SCAR AKIS (2019). Preparing for Future AKIS in Europe. Brussels, European Commission.
- [106] GFRAS (2016). The New Extensionist Learning Kit. Global Forum for Rural Advisory Services.
- [107] OECD (2014). Innovation and Modernising the Rural Economy. OECD Rural Policy Reviews. OECD Publishing. Retrieved on 11/06/2019 from <https://dx.doi.org/10.1787/9789264205390-en>.
- [108] United Nations (2015). "Goal 5: Gender Equality." In Transforming our World: The 2030 Agenda for Sustainable Development.
- [109] Council of Europe (2016). Gender Equality Glossary. <https://rm.coe.int/16805e55eb>.
- [110] United Nations (2015). Transforming our worlds: The 2030 agenda for sustainable development. New York.
- [111] UN Women (2013). The role of women in rural development, food production and poverty eradication. At: <https://www.unwomen.org/en/news/in-focus/rural-women-day/2013>.

Annex 1. Overview of Challenges Women Innovators Face via FLIARA project

Categories Of Challenges	Challenges For Gender Equality and Women-Led Innovations In Rural Areas
Political	<p>Government Policy – Women’s rights</p> <p>While the EU strives for gender equality in the policies it adopts, the diversity among the members and the tensions between national sovereignty and supranational political framework create disparities between the rights that women have in the EU countries.</p> <p>Women’s Political Participation and Representation</p> <p>The data shows that women continue to be under-represented in politics and public life, in the European Parliament, but also in national parliaments, governments and local assemblies (Shreeves and Zamfir, 2023).</p> <p>Political Stability – The Rise of the Right Wing</p> <p>Political stability, depending on the political orientation of the dominating parties, may reduce women’s rights in the respective countries,</p>
Economic Factors	<p>The Gender Wage Gap and Income Disparities</p> <p>Women in the EU continue to earn less than men, with an average gender pay gap of 12.7% in 2021 (Eurostat, 2021).</p> <p>Women's Roles in the Informal Economy</p> <p>The informal economy is a significant source of employment and income in rural areas, and women often play a crucial role in this sector. However, informal work is often undervalued, low-paying, and lacks social protections such as healthcare and pension benefits.</p> <p>Women and Employment</p> <p>Rural women are globally less likely to participate in the labour market than men or urban women, and they are more likely to be unemployed.</p>
Socio-Cultural Factors	<p>Socio-cultural norms</p> <p>According to the FAO (2017) challenges for rural women include: social norms that limit women’s agency, lack of education, and lack of legal and financial entitlements.</p> <p>Lack of Attention to Structural Barriers</p> <p>Many development discourses fail to adequately address the structural obstacles that rural women encounter. Structural obstacles are the institutional, social, and economic constraints that consistently disfavour and constrict possibilities for demographic groups, particularly rural women.</p> <p>Lack of Attention to Women’s Rights</p> <p>Although there has been progress in recognizing the value of gender equality and women's empowerment, there are still large gaps in how women's rights are effectively addressed and prioritized within development frameworks.</p> <p>Patriarchal Values and Roles</p> <p>Traditional gender roles, manifested for example in the dominance of men in political bodies, or men’s influence over women and control of their decisions, for example not allowing women to work outside the home.</p> <p>Cultural Prejudices</p> <p>Prejudices may include scepticism about women-led innovations and their benefits, social and cultural boundaries regarding women in business, perceptions that a woman’s place is at home, not in business and in the public sphere.</p>

Technological Factors

The Accessibility of Technology for Women

In some rural areas, women may have limited access to technology due to infrastructure challenges (e.g., insufficient broadband internet connectivity) or social norms that limit their use, which can limit their ability to access information, connect with markets, and adopt more sustainable and efficient farming practices.

Gender Bias in Technology Design

Technology solutions can be designed with unconscious gender biases that can make them less accessible or less effective for women. For example, precision agriculture tools may be designed for larger-scale farming operations, which can exclude smallholder women farmers.

Access to Finance

Women in rural areas may have limited access to finance, which can make it difficult to invest in technology. This can be due to gender-based discrimination in access to credit or a lack of collateral, which can limit women's ability to access loans.

Technology as a Driver of Change

Technology can be a powerful driver of change in rural areas, but it can also reinforce existing gender inequalities. For example, the adoption of labour-saving technologies can free up women's time for other activities, but it can also reinforce traditional gender roles that assign women to domestic work.

Environmental

Access to Resources

Women's participation in agriculture and innovation may be hampered by their lack of access to resources like land, water, credit, and technology. Cultural traditions, unfair inheritance rules, and unequal resource distribution can make it difficult for women to acquire and manage these resources.

Knowledge and Information Gaps

Women's ability to learn about cutting-edge agricultural methods and technology may be hampered by unequal access to information, training, and extension services. These disparities are made even worse by the absence of gender-responsive and tailored extension programmes.

Natural Resource Management and Climate Change

Women living in rural regions have difficulties as a result of climate change's effects on agriculture. It may be more challenging for women to innovate as rainfall patterns change, extreme weather events occur more frequently, and the environment is degraded.

Annex 2. Six perspectives Grounding the FLIARA Approach

1 Rural Perspective

Rural areas have specific histories and development pathways that have implications on gender equality and sustainability. In addition to differences between women and men, there are a set of different factors that influence rural women's opportunities to pursue a good life. We acknowledge that rural women cannot be categorised into a single group since they have a variety of needs, networks, and access to resources. They are also vulnerable to a variety of stereotypes, prejudices and taken for granted positions. The rural perspective highlights a set of important understandings that are underpinning our framework. First, rural areas are constantly evolving places and spaces influenced by globalisation, de-globalisation and localization including development of new industries and economic development. The rural is a distinct space and place diverging from urban areas and having also particular types of challenges, such as. outmigration to cities, and lack of employment and education opportunities. A specific issue for gender equality is that patriarchal attitudes, values, roles, and stereotypes prevail in rural areas more strongly than in the cities. These are relevant at multiple levels including individual actors, families, farms, innovation ecosystems, policy, and socio-cultural systems. Some rural studies literature has focused on considering that rural landscapes are driven by productivist, post-productivist, or multi-functionalist rural restructuring ideas. Extending on these ideas, diffusion of rural women-led innovation could plausibly lead to post marginalized ruralities characterized by gender equality and sustainability.

2 Gender Perspective

Our framework combines two lines of gender research: the empiricist line and the social constructivist/poststructuralist line. The empiricist line consists of mapping inequalities between women and men, of which rural areas are ripe. However, these inequalities are most often based on discriminatory, gendered social practices that can be changed, and which is the focus of a poststructuralist investigation. The concept of gender as socially constructed is fruitful in showing, first, the myriad ways in which gender structures social life, and second, how gendered social structures, practices and representations imply certain gender orders that subordinate women to men. Making such arrangements visible through research has made it possible to challenge and change them. Gender research is thus inherently political.

Our framework focuses on women-led innovation yet recognizes that such innovations are positioned and treated by multiple socio-cultural constructs. Especially, our framework proposes that policy, innovation ecosystems, visions of sustainability and equality, gender roles, stereotypes, and related norms can be reconstructed to enable transformations towards sustainability and equality in rural areas.

3 Resilience Perspective

The FLIARA framework seeks to understand the potential contributions of women-led innovations on gender equality and rural sustainability. As such, the question is about change, and also stability, and their interplay. For this purpose, FLIARA employs the concept of resilience, which is generally understood as the ability of a system, organization, individual or an enterprise to maintain its core functions and processes in the face of disturbance. Any resilience assessment needs to ask resilience of what, to what, and for whom. The 'for whom' is interesting as it points to power relations and the inherently political nature of resilience. As such, resilience can be both positive and negative. It can be positive when, for example, the women innovators and their businesses are resilient against discriminatory practices, which treat them unfairly, in society, due to their gender. Resilience can be negative for example when prevailing societal constructions are resilient against change driven by women-led innovations. In that case, resilience maintains prevailing power relations and status quo and works for those who benefit from the existing situation. FLIARA considers resilience as a background, meta level concept, that can explain some positive and negative features linked to possibilities for women-led innovations to create change towards equality and sustainability.

4 Sustainability Perspective

The sustainability perspective starts with a recognition that rural areas include sustainability challenges regarding economic, social, cultural, environmental, and institutional dimensions. The FLIARA conceptualization of sustainability is open and includes economic, environmental, social, cultural, and institutional dimensions without conceptual restrictions. The key is to map also potential innovations that may contribute to achieving the visions. Gender equality is a key aspect of sustainability. Generally, gender equality has three elements: recognition of women's knowledge, norms, and values, fair distribution of benefits and costs between women and men, and the opportunities for women to participate in decisions concerning their own lives. FLIARA will examine how the three elements of gender equality are interlinked with dimensions of sustainability.

5 Innovation Perspective

The FLIARA framework adopts three key aspects from the innovation perspective. Firstly, the FLIARA framework recognizes that women-led innovation journeys include a series of steps. The innovation journey starts from aspirations related to enhancing rural lives or responding to existing sustainability challenges and / or to emerging diverse crises. Yet, innovations might sometimes simply be motivated by individual career and family well-being considerations, even if they eventually end up benefitting more people. Secondly, the framework considers that women-led innovations evolve and are developed within innovation ecosystems, which may provide support in form of resources, expertise, knowledge, and networks for women innovators. Yet, it is also recognized that rural innovation ecosystems may be resilient *against* women-led innovation processes. Thirdly, the idea of scaling women-led innovations is an important aspect of the framework. Scaling implies different forms by which women-led innovations can diffuse across society and there a variety of different forms of scaling (e.g., scaling-up, scaling down).

6 Policy and Governance Perspective

The FLIARA framework also considers the policy perspective. An effective policy and governance framework can facilitate women-led innovations. Yet, policies are not only about boosting innovations but may also provide structure and security to people, including women innovators. Furthermore, legal frameworks have a long history of patriarchal principles, which in the EU context mostly have been abolished in principle, but not in practice. On the positive side, the idea of gender mainstreaming may boost also women-led innovations. Gender mainstreaming implies the consideration of gender in all decisions. Other promising tools for developing policy to enhance gender equality include affirmative action, feminist governance, and policy benchmarking.

Annex 3. Substantial, procedural, and normative reasons why women-led innovations need to be recognised in the LTVRA.

Four Aspects of the LTVRA	Substantial Reasons	Procedural Reasons	Normative Reasons
Prosperous Rural Areas – Diversification of economy; sustainable food production.	Because women-led innovations can lead to new types of businesses and diversify rural economies and food sector.	Because women-led innovations can help to reimagine what sustainable rural areas are and can be.	Because of the requirement to ensure equal (economic) opportunities for diverse actors and genders.
Resilient Rural Areas – Social and environmental resilience; resilience against climate change.	Because practices linked to women-led innovations enhance diversity of rural innovation contributing to resilience.	Because the ability for societal renewal is enhanced by women-led innovation processes contributing to resilience against multiple future sustainability challenges.	Because social resilience is not a neutral characteristic of the system but benefits some more than others. Women-led innovation can break “bad” unjust resilience.
Connected Rural Areas – Digital connectivity, mobility and transportation.	Because digital solutions may have different implications for genders, and women-led innovation can make digital solutions more accessible for women.	Because rural innovation ecosystems supporting women-led innovation, contributes also to network building and social capital in rural areas.	Because digital and mobility solutions are for all, and women-led innovation can enhance connectivity and mobility specifically for women.
Stronger Rural Areas – Empowerment, social innovation; access to services.	Because access to services (e.g., childcare; farm substitutes) for rural women can be enhanced by women-led innovations that link to service innovations.	Because collective female agency is enhanced by women-led innovation and contributes to empowerment processes in rural areas.	Because inclusivity of women also in terms of opportunities for innovation is a normative requirement and important aspect of empowerment.