Social innovation for sustainability transformation and its diverging development paths in marginalised rural areas

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Conflict of interest

I declare that we, the authors, have no conflict of interest.

Data availability statement

The data that support the findings of this study are openly available in ZENODO repository at https://zenodo.org/record/3695734#.Xt-u1kUzaUk.

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Abstract

Social innovation is perceived as a collaborative response from civic society actors to societal challenges, and as such is increasingly being recognised as a drive to advance sustainable development. Social innovation promotes civic values, particularly in marginalised rural areas that are often struggling with biophysical and market limits, as well as shortages of public funding. In order to identify diverging development paths (DDPs) for social innovation, in this paper we use two large sets of empirical material from the SIMRA research project. Firstly, for meta-analyses of social innovation in diverse situations and contexts we use 211 validated social innovation examples. Secondly, we rely on 11 in-depth cases to reflect on the contexts and dimensions of social innovation. The elaboration of conceptualisation and deductive analyses result in the creation of a typology of social innovation DDPs, with four DDPs identified and explained. The paper provides an improved understanding of how social innovation emerges and develops, and how to capture processes and resulting changes in marginalised rural areas in order to turn such areas' diversity into

strengths. An important conclusion is that social innovation involves both local and external actors, yet cannot develop without specific internal local activity and local knowledge.

1 Introduction to the social innovation concept

Social innovation is being increasingly recognised as a drive to advance sustainable development, and enhance smart and inclusive growth (Castro-Arce and Vanclay 2020). As a product of policy discourses and a collaborative response to societal challenges, social innovation has become essential for delivering support to communities in places where markets and existing institutions fail (Mulgan *et al*. 2007; Moulaert *et al.* 2017; Millard 2018). Social innovation promotes civic values and may enhance sustainability transformation (Moore *et al*. 2014; Baker and Mehmood 2015; Bock 2016; Neumeier 2016), and is understood as a substantial change in social practices that result from their reconfiguration into a system modification (Avelino *et al.* 2019; Loorbach *et al.* 2020) or regime change, as analysed and described in our paper.

As an important element of sustainability transformation, social innovation has been addressed by many scholars (Haxeltine *et al.* 2017; Pel *et al.* 2019; Castro-Arce and Vanclay 2020). Our definition of social innovation concern "the reconfiguration of social practices, in response to societal challenges, which seeks to enhance outcomes on societal well-being and necessarily includes the engagement of civil society actors" (Polman *et al.* 2017; Kluvankova *et al*. 2018).

Although scholars have improved knowledge of social innovation and developed approaches for the definition thereof, much remains to be done to link social innovation with its desired outcomes (Koontz and Thomas 2006). Specifically, a knowledge gap exists in understanding how social innovations develop, and their driving forces in marginalised rural areas. Central to our paper is the question: what kind of paths social innovations can take to advance sustainability transformation? To contribute to answering this research question, and ultimately assist in the operationalising of social innovation in marginalised rural areas, we elaborate the concept of Development Diverging Paths (DDPs) to explain social innovation trajectories in the context of sustainability transformation. We add value to the literature on

social innovation by introducing and elaborating the concept of DDP to study the dynamic evolvement of social innovations. As applied here, the DDP concept is especially innovative via the proposed systematic typology to assess and understand social innovation DDPs, and their potential evolvement towards sustainability transformations.

The identification of DDPs is of high importance for regional policies and for their support instruments for rural development to be sufficiently robust in different local contexts and circumstances (Moore *et al.* 2015; Nijnik *et al.* 2020). In this paper, the conceptualization of DDPs is based on extensive empirical material on social innovation in Europe and beyond. The concept integrates ideas of social innovation and development trajectories that originated from theoretical project work (Kluvankova *et al.* 2017, 2018, 2020; Nijnik *et al.* 2018, 2019; Sarkki *et al.* 2019a), and were developed through the transdisciplinary co-production of theoretical, empirical, and expert knowledge. We have particularised DDPs, building on the database of social innovation examples and examining social innovations in the light of empirical evidence from 11 in-depth project case studies.

The paper is structured as follows. After the introductory section, we present the research methodology followed by theoretical constructs of social innovation dynamics and a typology of DDPs given the respective theoretical and empirical backgrounds. We then test the conceptualization of DDPs in empirical and expert contexts. We continue with a discussion section, and conclude by presenting this research's scope of applicability and main findings.

2   Methodological Considerations

2.1   Empirical material

In order to identify DDPs for social innovation in marginalised rural areas, in this research we used two large sets of empirical material. Firstly, for the meta-analyses of social innovation in diverse situations and contexts of marginalised areas in Europe and beyond we used 211 social innovation examples out of the 401 collected from the project website during the project duration and recorded in its database (Valero and Bryce 2020). All examples were assessed against the social innovation definition criteria (Kluvankova *et al.* 2017) to address the reconfiguration of social practices as a process that results in the redesign or emergence of new collaborations, networks, or governance structures as outcomes of societal wellbeing, and evidence of civic actors' involvement as described in Kluvankova *et al.* (2017). Those examples that met the criteria were classified as social innovations. The database contains a

collection of social innovation initiatives, e.g. projects or formal and informal institutions across Europe and the Mediterranean area). Secondly, we used 11 in-depth case studies selected from database (Valero and Bryce 2020) to short list of in-depth case studies (Marini Govigli *et al.* 2019a) and completed in depth qualitative/quantitative analyses that included interviews, focus groups, and workshop discussions as part of the comprehensive methodology (Secco *et al.* 2016). We used individual in-depth project case studies reports (Barlagne *et al.* 2019; Dalla *et al.* 2019; Dijkshoorn-Dekker *et al.* 2019; Marini Govigli *et al.* 2019 b, c, d; Melnykovych *et al.* 2019 a, b, c, d; Rodríguez Fernández-Blanco *et al.* 2019) as empirical material for our cross-case study analysis and validation of the DDP concept.

2.2 Analysis methods

We analysed the above-described material by applying content analysis based on Elo and Kyngäs (2008). While we mostly applied their technique in a standard way, the following modifications had to be applied in our approach (see Table 1).

The content analysis aimed to develop a description of examined phenomenon, and to result in novel concepts or categories that contributed to the research question being addressed. In the present paper, we applied content analysis to identify the typology of DDPs by using a combination of qualitative inductive and deductive content analyses (as envisaged by Elo and Kyngäs (2008)). Both inductive and deductive approaches include the following phases: preparation, organising, and reporting. The inductive approach is often used when theory on a topic is limited, while the deductive approach is used when prior knowledge is available. Elo and Kyngäs (2008) point out that an organising phase can start with the deductive approach before switching to inductive. In Table 1 we outline the analytical steps identified by Elo and Kyngäs (2008), and explain our adaptation and application of this approach. To complement Elo and Kyngäs (2008) steps for combined deductive and inductive content analysis, we added the following phases: verification of results, their expert validation, and their discussion (of wider relevance of developed DDPs typology). The added phases contribute to the reliability of results and explicate their wider relevance.

Table 1: Phases of content analysis

<Table 1 to be inserted here>

Source: Authors´ elaboration based on Elo and Kyngäs (2008)

3 Diverging Development Paths of Social Innovation

3.1 A theoretical framework and dynamics of social innovation

In this paper, we apply sustainability transformation theories (Ostrom 2009; Van der Have and Rubalcaba 2016; Loorbach *et al.* 2020) to address social innovation and embed its development into the systematic processes of socio-ecological changes (Fischer-Kowalski *et al.* 2012; Melnykovych *et al.* 2018). In the developed transdisciplinary framework, we recognise an action arena (Ostrom 1990, 2011) as the platform for the interaction of key actors to reconfigure social practices (Nijnik and Oskam 2004; Nijnik and Mather 2007; Kluvankova *et al.* 2018). The framework can accommodate diverse social practices and serve as a basis for analysing the diverse reconfiguration processes that underpin social innovations in marginalised rural areas (Figure 1).

The framework is based upon the theoretical conceptualisations of Murray *et al.* (2010), McGinnis and Ostrom (2014), Neumeier (2016), Haxeltine *et al.* (2017) and Kluvankova *et al.* (2018). Central to the framework is an action arena (upper part of Figure 1) in which key actors (with their knowledge) interact. While conceptual conditions imply the complexity and interdependencies of social innovation pathways, such conditions cannot be explained exclusively by the inner logic of the sector or thematic issue concerned. Yet they nevertheless form biophysical, social, and institutional system components that trigger behavioural change and initiate institutional change in a specific area (Kluvankova et al. 2018). In return, by capitalising on civic society activities, social innovations can change the contexts in which they operate (e.g. change human values or create new ones, Sarkki *et al.* 2019a). Figure 1 illustrates the following key contexts that shape social innovation pathways.

The *politico-normative* context determines governance systems, such as rules in use and norms as an institutional context, and relevant governance structures and policies, interlinked with actors and their participation in decision-making (Bowles and Gintis 2002).

The *socio-ecological* context relates to ecological and social assets and management systems (e.g. geographical limits, availability of resources, social and territorial disparities), e.g. the societal and natural basics that shape and/or delimit the prospects of people living in an area.

The *socio-economic* context refers to a range of economic and social factors, e.g. market conditions and actors' perceptions, and various forms of interaction, including patterns of leadership and entrepreneurship, as well as of social capital, that determine the performance of marginalised rural areas, and the socio-economic conditions in which social innovations develop.

Social innovation is shaped by institutional elements and the interactions between them and the deliberate agencies and actors within the system (Westley *et al.* 2013; Moore *et al.* 2014; Loorbach *et al.* 2020). As a form of social interaction, social learning is essential for advancing social innovation, which both influences and is influenced by formal and informal institutions (Lundvall *et al.* 2002), is part of collective and creative learning and mutual knowledge exchange (Bock 2012), and leads to changes in actors' belief systems and cultural precepts (Sarkki *et al.* 2019a).

Social innovation is considered through the entire cycle of the social innovation spiral model (Young Foundation, 2012; lower part of Figure 1) from ideas, prototyping and piloting, implementation, to upscaling (Young Foundation 2012; Moore *et al*. 2014; Kluvankova *et al.* 2018; Secco *et al.* 2019; Castro-Arce and Vanclay 2020). This cycle portrays the emergence of new ideas through to their growth, implementation, and marketing (e.g. new entrepreneur opportunities), and to innovative policy and governance mechanisms both within a scale and across scales (Weiss *et al*. 2011; Nijnik *et al.* 2019; Loordach *et al.* 2020). The reconfiguration of social practices in response to societal challenges (i.e. social innovation) could result in novel arrangements and regimes (Nijnik and Oskam 2004; Moore *et al.* 2015), and through scaling up or out could spread or transform a system (Nijnik and Miller 2014; Loorbach *et al.* 2020). A cross-analysis of social innovations through the innovation cycle – often referred to as 'institutionalisation' – reveals that seemingly similar innovation initiatives may take different courses in different contexts, including temporal and spatial, or depending on sectors (e.g. agriculture or forestry).

<Figure 1 to be inserted here>

Figure 1 A framework to understand social innovation dynamics

Source: Adopted from Kluvankova *et al.* 2018

3.2 Transformative Diverging Development Paths

The concept of development trajectories originated in evolutionary economics (Nelson and Winter 1982). It was adopted in research approaches to local and regional developments (Perlik and Messerli 2001; Perlik 2019), and in transformative research to identify the factors that influence human prosperity and societal well-being (Pel *et al.* 2019; Castro-Arce and Vanclay 2020).

Various factors and their characteristics (i.e. norms, values, types of knowledge and behavioural patterns) influence time-bound development trajectories (i.e. paths) of social innovation, which reach an open future from the past, without ever returning to the starting point. DDPs of social innovations may start under similar conditions and show similar features, but can take different courses under different influences, and end up with significantly different characteristics (Kluvankova *et al.* 2018). A social innovation may spark and fade out, or may get institutionalised as a marketable or public service, or a combination thereof. Social innovation may feature a curve of bounded growth and then stabilize. It may feature a curve of intermittent growth with stable periods, or explosive growth within a certain time span, which may also be followed by a phase of decline. In short, social innovation pathways are not predetermined but can be type casted, and a typology of DDPs can be theorized. The complex system dynamics of social innovation presume cyclical mechanisms of changes (with memories of the past, i.e. 'path dependencies', and visions of the future as indispensable parts of its presence), resulting in fast and/or slow-moving changes, with consequences for social interactions and/or societal transformation.

The contexts, as well as internal and external factors of influence of social innovation, are ever-changing. They are interlinked, provide a multifaceted description of facts and circumstances along the trajectories of social innovations, and are intricately intertwined with a range of dimensions that foster (or hinder) the emergence of social innovations and shape their diverging development paths.

4 Typology of Diverging Development Paths

4.1 Key dimensions shaping social innovation pathways

To reduce factual complexity and variability, in this paper we present the key dimensions that characterise social innovation processes. These are sufficiently generic to be applicable to

virtually all social innovations, yet also sufficiently specific to serve as a backdrop for variables through which the divergence of pathways can be explained.

4.1.1 Actors and knowledge

As shown in Figure 1, actors are at the centre of social innovations. A distinction was made by attributing key actors to their realm of activity (i.e. public, private, civil society), whilst recognising that these attributions may change over time. For example, a civil society-born initiative could morph into a commercial enterprise, or a social enterprise originating in the third sector could be taken over by public institutions (i.e. municipality, state) to assure long-term viability.

A nexus between actors and contexts predefines DDPs. Social innovations are brought forth in an action arena, where the actors agree on common principles and goals, and pursue collective actions based on negotiated decisions, which contributes to the development of networks (Howaldt *et al.* 2017). Knowledge is generated and conveyed during various interactions among actors within the action arena and with external partners (who can also be intermediaries, Menon and Pfeffer 2002). We recognise differences between tacit/implicit community knowledge and hands-on skills, and codified/explicit knowledge derived from academic research, educational knowledge production, or policy making. Codified knowledge usually advances through knowledge sharing and information transfer from external actors to the action arena, involving trans-local collaboration (Noack and Fewderwisch 2018). Knowledge often evolves through its co-production and as part of social innovation mechanisms via collective, creative learning (Bock 2012) when shared with/in the communities of practice (Metzger *et al.* 2019), and promotes social innovation with social capital playing an important role.

Social capital (i.e. bonding - within a community, and bridging - between a community and external actors) is stimulated within socio-economic contexts in both positive and negative ways. Looking at examples of social innovation through the twofold distinction of actors and knowledge, we identified the following types of actors with their knowledge, shaping the DDPs of social innovation in marginalised rural areas:

- Local actors with local knowledge (L1): Local decision makers based on local knowledge and bounding social capital (e.g. politicians, entrepreneurs, residents, farmers, foresters,

informal networks) initiating individual or/and collective actions to improve the well-being of communities.

- Local actors with external knowledge (L2): Local actors, sometimes supported by external actors and intermediaries (E), making decisions based on their internal and/or external knowledge as part of collective action and/or institutional co-evolution.

- External actors with local knowledge (E1): External actors, primarily based on local knowledge. An example is when new residents or entrepreneurs, civic agents, or academics start engaging in local actions and creating alliances with local actors.

- External actors with external knowledge (E2): External actors, primarily based on external knowledge and bringing in their social capital, and possibly also seeking to transform institutional structures and practices.

As seen in Figure 2, most examples of social innovations are initiated by and involve local actors, who are based either on their local or external knowledge (35% and 47%, accordingly). The role of local actors in the emergence and growth of social innovations was identified as being crucial for success (173 out of 211 examples). The role of external actors is evident primarily in social innovations that use local knowledge (31 examples).

4.1.2 Growth and expansion

Social innovation in a milieu can result in institutional co-evolution and/or institutional changes (as shown in Figure 1), involving diverse informal and formal institutions (Bromley 2006; Nijnik and Mather 2007). A variety of issues determines the emergence and development of social innovation, its expansion and advancement, with institutional regimes (Murray *et al.* 2010; McGinnis and Ostrom 2014; Neumeier 2016) playing an important role. Formal and informal institutions or durable rule-systems (Hodgson 2006) limit the probable scope of social interactions. Social innovation may be a spark that goes out. It may grow, evolve, and trigger cascades of changes that irreversibly shape the wider politico-normative and socio-economic contexts. The type of expansion thus determines the replication and scaling (Loorbach *et al.* 2020) of social innovation, and the character of the reconfiguration of social practices and processes (Kluvankova *et al.* 2018).

By analysing the pool of social innovation examples, we identified the following expansion types of social innovation:

- Colony or satellite formation, growing from a local core organisation to a larger organisation or cooperation system, the main purpose of which is the improvement of common well-being.

- Modular–polycentric expansion (or a hub-satellite type): budding and federating multiple organisations/nodes tied together by a set of core values and formal rules with collaborative and competitive relations.

- Viral expansion: spreading - spreading - independent replicas, prone to multiple variations and adaptation.

The types of expansion determine the occurrence and ways of social innovation to scale up or out (or to deepen). This observation, as supported by theoretical and empirical evidence from the project, is in line with studies by Murray *et al.* (2010), McGinnis and Ostrom (2014), Moore *et al.* (2015), Neumeier (2016) and Haxeltine *et al.* (2017).

Figure 2 shows that Type 1 of colony/satellite formation is dominant for social innovation growth and expansion (46.9% examples), followed by modular (29.8%) and viral (23.7%) types. This indicates the potential transformative character of social innovation in marginalised rural areas.

4.1.3 Forms of viability

Social innovation is not always 'successful' in the sense of what an initiative was designed for and how it prevails. It may turn out as non-viable if the innovation trajectory has not led and/or will not lead to the intended beneficial outcome, as illustrated in the upper part of Figure 1. The causes can be internal, e.g. opportunistic behaviours of key actors or a sectarian form of leadership, and external, such as political suppression or infiltration. These causes can include: rejection of the initiative by other "resisting" actors or a maladaptation to prevailing forces (Perlik 2019); inability of actors to develop a collective action due to a lack of formal institutions or policy support (Bock 2016; Ludwig *et al.* 2018; Živonijovič *et al.* 2019); purposeful institutional destabilisation or restructuring processes (Newig *et al.* 2019). Innovations may not always produce solutions but can create problematic or conflicting effects, as identified by Gillward (2000), Lindhult (2008), Moulaert and Mehmood (2015), Noack and Federwisch (2018), and others. Durable social innovation needs to be beneficial

for its main actors and be supported. Our analysis implies that social innovation can take the following key forms:

- Provision of marketable services or goods (coordination by demand and supply).
- Public goods provision with integration into the area of public responsibility (coordination by hierarchy).
- Civic engagement through an agency of civil society organisations and individual citizens (coordination by social solidarity).
- Hybrid - a combination of the above forms.

As shown in Figure 2, the social innovation examples collected in marginalised rural areas and analysed in this research primarily take the forms of civic engagement (47.4%) and markets (35.1%), rather than public goods provision (9%) or hybrid combinations (8.5%).

4.1.4 Depth of change

The depth of change dimension shaping social innovation pathways characterises the extent to which the reconfiguration of social practices in marginalised rural areas has changed the patterns of social interactions, relationships, and/or the whole institutional fabric. When an innovation helps to open a wide range of possibilities and triggers multi-actor long-term changes in social practices (Klein *et al.* 2014; Moulaert and Mehmood 2015), such changes can be considered transformative. However, the path towards transformation is often paved through a multitude of adaptive, incremental changes. Social practices developed earlier or elsewhere can be adaptive to meet needs and awaken the potential of a place and local people. However, at a certain point the quantitative build-up of small adaptations may result in a system change (transformation).

Adaptive social innovations can help stabilize a disadvantaged group of people in relation to mainstream society, or help reduce disparity between a lagging (marginalised rural) area and a prosperous area. Adaptation may consist of adjustments, supplementing, or complementing the traditional system to provide solutions where market and public services struggle to meet people's needs, thus increasing the resilience of communities (Bryce *et al.* 2017; Nijnik *et al.* 2019). Whether the social practices are new or renewed, in either case of their reconfiguration, the outcomes of social innovations would be beneficial.

Transformative social innovation requires substantive changes of social practices and results in whole-system modifications, as defined by Haxeltine *et al.* (2017) and Avelino *et al.*

(2019), the development of new trans-local practices (Loorbach *et al.* 2020), or regime changes (Nijnik and Oskam 2004; Kluvankova *et al.* 2017). Changes could directly influence power relations between the dominant and resourceful parts compared to other actors. As transformative social innovations often develop through a series of adaptations, they therefore occur less frequently (15.2% of examples, as seen in Figure 2) and usually later, especially for innovation processes in marginalised rural areas.

<Figure 2 to be inserted here>

Figure 2 Key dimensions shaping the divergent development paths of social innovations

Source: Authors' deliberation based on data from the project database (Valero and Bryce 2020) of social innovation examples (n= 211)

4.2   **Delineating clusters and forming hypotheses of diverging development paths.**

The findings from analysing the examples of social innovation provided evidence that each social innovation is context-specific, featuring a spectrum of individual characteristics in manifold combinations that can be described by four dimensions (explained in Section 4.1). The examples were grouped based on similarities across these dimensions. The five types of hypothetical DDPs summarised below were derived using a combination of grouping and the deductive/inductive processes described.

Diverging development path of 'Local heroes' (DDP_1) (representing 24% of examples in the database) is characterised by the primary role of local actors who use their *local, community knowledge* (98%), and whose action (or reaction) is triggered by natural or social shocks, or policy failures. DDP_1 is primarily of *a colony or satellite type* of growth (69%), characterised by a *civic form* of viability (83%), with actors initiating and developing *adaptive social* innovations (83%). This DDP of social innovation (owing to its characteristics) is termed '*Local heroes*' and considered to function as informal civic institutions performing at local levels.

Diverging development path of 'Glocalists' (DDP_2) (28% of examples) is characterised by the key role in social innovations of *local actors*, but with *external knowledge* (52%) influencing decision-making. A *colony/satellite* type of growth dominates (46%) with polycentric formation observed in some (38%) cases. The viability of social innovations is

assured by *markets (98%). Adaptive processes (98%)* prevail, and owing to these predominant characteristics, social innovations are deemed to commonly represent socially-oriented, local level businesses.

Diverging development path of 'Pathbreakers' (DDP_3) (approximately 29% of examples) is characterised by the predominant role of *local actors* using *external knowledge* (more than 90%) conveyed via formal networks and/or new institutions of *colony* (36%) and *polycentric* (34%) development types. Social innovation viability is mainly assured by *civic* support (71%). *Adaptive processes* (73%) dominate. '*Pathbreakers'* are deemed to function as associative institutions.

Diverging development path of 'External System Changers' (DDP_4) (6% of examples) is characterised as an initiative driven by *external actors using external knowledge.* DDP_4 tend to proceed via the *viral or modular* types of growth. Viability is hybrid assured by a combination of public and civic coordination as formal institutions.

Diverging development path of 'Builders' (DDP_5) (17% of examples) can be characterised as an initiative of *external actors* who mainly use *local knowledge* (78%) to initiate and develop social innovation (e.g. public sector-oriented institutions of a network type) with *colony (44%)* and/or *polycentric (31%)* growth. Hybrid viability is assured by a *combination of public, market and civic coordination.*

The identified diverging development paths of social innovation in marginalised rural areas observed in the empirical context do not necessarily represent an exclusive list. The scope for modifications would require the further collection of empirical evidence and analysis.

5 Testing the Diverging Development Paths based on Evidence from Case Studies

The conjectural DDPs were tested in 11 case studies, and the results of the analysis confirmed the identification of four out of five DDPs. Case studies in marginalised rural areas in the EU and neighbouring countries and classified according to the DDP typology were grouped into four DDPs, as seen in Figure 3 and further explained in supplementary materials Figure 5 and Table 2.

<Figure 3 to be inserted here>

Figure 3 Diverging development paths of social innovation across project case studies

Source: Authors' deliberation

All types of hypothesized diverging developing paths except DDP_4 were observed in the analysed case studies (with locations across case studies shown in Figure 3).

Local communities that react to diversified triggers/shocks/policy failures and take opportunities to adapt or replicate novel social practices at the local level are represented by forest fire volunteers and local networks of forest defence groups in Spain, Austria, and the United Kingdom.

Local communities that create *new socially-oriented business with the help of external knowledge* which bring benefits to communities and/or disadvantaged groups and customers are represented by the Dutch, Greek, Italian (A), and Tunisian case studies.

Public/private groups and networks that adapt/coevolve a new social practice or transform an existing governance system towards the creation of novel multilevel governance relations in a marginalised rural area are represented by the Italian case study (B), which aims to create career opportunities for young people in Italy, and the Swiss case study where a network of regional actors promote comprehensive and sustainable regional development in Switzerland.

External actors who initiate a project/activity to improve the well-being of a community based on *local knowledge* are represented by the following social innovations: the Finnish case study cooperative, a network of environmentalists and locals opposed to a new nuclear power plant in Finland; the network of local fishermen and customers from the Greek islands; the network of diverse intermediaries supporting a UNESCO site in Slovakia; and the public-private partnership of dairy producers in Tunisia.

External actors with key knowledge from outside the community and who create a project/activity to improve the well-being of a marginalised rural area, and very likely transform it towards a new governance regime or develop new policy, are not represented among the project case studies.

The analysis confirmed the central role of local actors in social innovation development based on their local knowledge (L1) or partly based on external knowledge (L2). The

initiation of social innovations by external actors is evident, and primarily in those social innovations in which local knowledge (E1) is used. This implies that social innovation develops based on local knowledge involving both local and external actors, but cannot grow without specific internal local activity and knowledge. Local actors are thus dominant initiators of social innovations. External actors that primarily use external knowledge were not identified as being of importance for the initiation of social innovations in the analysed study areas.

Social innovation expansion of viral, modular – polycentric, and colony or satellite formation types are all represented in the case studies, creating a supportive environment for social innovation to grow and expand.

The viability of social innovation is commonly assured by civic engagement (coordination by social solidarity), followed by markets, and then by the public responsibility type. While adaptive changes prevail in the analysed case studies in cases where social innovation develops along the diverging development paths of 'Builders' and 'Pathbreakers', a transformative character of societal changes can be observed (e.g. in the Slovak and Finnish case studies). Thus, the scale of societal transformation likely depends on the level of social innovation development. The DDPs are explained further in supplementary materials Figure 5 and Table 2.

6 Discussion

The diverging development paths identified in this paper represent different and varying ways by which social innovations could develop towards making an impact on sustainability transformations. DDP dimensions are integrated into innovation cycles (illustrated in Figure 1) that offer divergent patterns for the development of social innovations.

The results from this study indicate that the impacts of social innovation relate to its ability to change relationships within a community, between a community and external actors, and among actors with different knowledge, expertise, and resources (Sarkki *et al.* 2019b). For example, bonding social capital is of major importance for local actions (DPP_1), while bridging social capital is important when social innovations rely on local-external actor relationships (DDP_3) and when it can enhance public access to resources. Thus, actors and knowledge have a central role within social innovation development.

Furthermore, the dimensions of growth and viability seem to depend on how well social innovation can maintain various relationships, specifically associated with the dynamics of the reconfiguration processes in an innovation cycle. Various mechanisms exist by which social innovation develops (Murray *et al.* 2010; Moore *et al.* 2015; Neumeier 2016; Haxeltine *et al.* 2017; Kluvankova *et al.* 2018; Pel *et al.* 2019; Sarkki *et al.* 2019a; Castro-Arce and Vanclay 2020; Melnychuk and de Loë 2020). Development may take various forms and stages from the emergence of social innovations via their growth towards their consolidation (Kluvankova *et al.* 2018) and/or to transformative change (Avelino *et al.* 2019) or/and a trans-local diffusion (Loorbach *et al.* 2020). Social innovation may also decline or proceed towards reinvention, as illustrated in Figure 1.

The endorsement of social innovation has proven a complex task. Evidence made available across our case studies indicates that social innovation may lead to transformation processes. New rules or/and institutions could eventually emerge, which may not be currently visible or represented in empirical examples at their earlier stages of development. Following Moore et al. (2014), "neutralizing or depoliticizing transformation processes is neither possible, nor even desirable, given that any durable transformation will require altering the dominant structures of power" (Pel *et al.* 2019; Castro-Arce and Vanclay 2020).

Therefore, we propose the social innovation triangle (Figure 3) in order to illustrate how social innovation may evolve under diverse contexts and can change relationships among civil society, policy, and market actors. The interconnection between key dimensions of social innovation occurs in the triangle. Actors and knowledge, being part of the action arena, endorse social innovation dynamics and determine the type of growth. Viability is associated with the domains of state, markets, and society. These three types of regime change have been identified, based on which social innovations are deemed able to influence societal transformation via/along the DDPs. Figure 4 illustrates the three general ways how social innovation could change the established roles of the state, markets and civil society, and/or change their inter-relationships.

<Figure 4 to be inserted here>

Figure 4 Social innovation within the societal transformation triangle.

Source: Authors' elaboration

From profit maximization to human-scale economy

While many social innovations occur as a response to market failure to secure social needs and improve the well-being of communities, social innovations could benefit from economic activities such as social entrepreneurship (Shaw and de Bruin 2013). However, in contrast with the typical commercial drive for profit maximization and economic growth, social innovations (and social enterprises) whose viability mainly relies on markets are more inclusive and socially tolerant, and perform in line with Max-Neef's (2010) concept of human-scale economy. This is reflected in the DDP_2 ('Glocalists'), an example of which is the Italian case study (A) of Learning-Growing-Living (Dalla *et al.* 2019) whereby the social innovation of offering childcare services enables women to combine farm work with family/ household work. The Green Care Farm case in the Netherlands offers inclusivity towards intellectually disabled people to work on social farms (Dijkshoorn-Dekker *et al.* 2019). The Box of the Sea case represents the building of connections between small-scale and sustainable fisheries, and environmentally-conscious consumers (Marini Govigli *et al.* 2019d). In addition, the Tunisian case study is about rearranging production systems by strengthening Producer Organization capacities to empower female farmers (Melnykovych *et al.* 2019c). All these case studies highlight that close relationships between producers and consumers are critical for the human-scale economy to develop. Even though this economy is not based on maximizing profit and self-interest, it can provide economic incentives to start and maintain the longevity of various socially-innovative initiatives. Market-based viability can also ease the common challenge for social innovations, i.e. the reliance on voluntary work.

From hierarchical government to community governance

Social innovations can change state-civil society relationships. For example, the movement from authoritative government towards a more socially-inclusive governance can be promoted by social innovation (Brnkalakova *et al.* 2019; Sarkki *et al.* 2019b). Furthermore, community-based governance could co-evolve with and complement state-based and market-based governance, that relies on social capital and community engagement (Bowles and Gintis 2002), as described by DDP_1 ('Local Heroes').

In the Locharron case in Scotland, social innovation aims to meet local social needs by gaining ownership of woodlands that were previously state-owned (Barlagne *et al.* 2019). The Spanish case study of fire volunteers was initiated to cope effectively with environmental

risk from wildfires (Rodríguez Fernández-Blanco *et al.* 2018). These case studies are about environmental-social innovations - triggered by deficiencies in state-based woodland management in Scotland and state-based risk prevention and management in Spain. They represent movements towards community-governance by changing the decision-making structures that govern woodlands and their use, and forest owners' self-organization to protect property from fire. Community-type governance has also developed in the case of Hawaruhof, Austria, where producers and consumers are now interconnected to share risks, responsibilities, and rewards within community-supported farming systems (Melnykovych *et al.* 2019a). Local consensus about community needs and ways to achieve such needs is important for the (DDP_1) 'Local Heroes', because otherwise perceived trade-offs and contradictions among actors may compromise local support for social innovations.

From exclusive political economy to inclusive societies

Although inclusive societies that foster public engagement are a key policy goal, for example in Europe (Weaver *et al.* 2017), the existing political economy often marginalizes civil society actors (e.g. Nicholls and Ziegler 2017). Social innovation initiatives represent a "forward infiltration" - from civil society to policy and economy - emphasising inclusive practices, and offering viable alternatives to the "backward infiltration" initiated by states and powerful economic actors that penetrates civil society and often neglects social needs (see Klein and Lee 2019). Thereby social innovations can change dynamics and relationships between the state and markets, potentially leading to new and more advanced forms of civic participation and democracy (Swyngedouw 2005). For example, DDP_3 and DDP_5 (and the combination thereof) represent examples of how social innovation initiatives can change policy and the economy towards inclusive societal practices (Swyngedouw 2005; Nicholls and Ziegler 2017; Weaver *et al.* 2017; Klein and Lee 2019).

The Swiss case, Pro Val Lumnezia, highlights that youth-led 'resistance initiatives' initiated regional development's reorientation, which finally led to agriculture and tourism being advanced (Marini Govigli *et al.* 2019c). Through social innovation, the young locals changed the minds of decision-makers, including those who had initially opposed the initiative. This example can be considered as a model of how social innovation can diffuse, leading to the promotion of social inclusion in policy and economy. In the Slovakian case of Vlkolínec, external urban actors from a university and nearby city initiated a project in collaboration with local actors (Melnykovych *et al.* 2019b). This resulted in the expansion of bounding

social capital and the establishment of regional networking to address socio-ecological needs and promote the revival of a World Heritage Site that had long been marginalised. Another illustrative case is the Finnish Noidanlukko cooperative that opposes a new nuclear power plant, which has kept the issue alive despite the Finnish Parliament issuing a decision-in-principle supporting the project (Melnykovych and Sarkki 2019d). These cases highlight that social innovations can present and maintain their alternative and inclusive views about rural development, stimulated by urban impulses and, as also demonstrated by Noach and Federwisch (2018) and Bock (2012), can offer divergent perspectives on how development, human well-being, and sustainability issues should be pursued.

7   Concluding remarks

The findings re-emphasise that the reconfiguring of social practices is a process that produces novel institutional arrangements, such as new social relationships and collaborations with the relevant participation of civil society actors. Social innovations are highly case-specific, as are the challenges they address and the changes they introduce. Despite the high level of diversity, social innovations have the potential to complement governance instruments designed by states and markets, and can support the promotion of smart and sustainable living.

By building on the elaborated theoretical foundations and the empirical and expert knowledge advanced, a new understanding has been developed of the dynamics of social innovation processes in marginalised rural areas. Dynamics evolve through the following four stages: i) generating and developing ideas for social innovation; ii) growing, testing and consolidation of social innovation; iii) implementation and scaling; and iv) changing the system. The importance of the active involvement of local actors and local knowledge in the context of local areas was identified as crucial in the first two stages, while public support was subsequently identified as important.

The dimensions of social innovation divergence were recognized by building on the empirical evidence from (n=211) examples of social innovations. In spite of the high variability of examples, with many different dimensions shaping social innovation pathways, four principal dimensions characterising DDPs could be identified. The dimensions of *actors and knowledge* and *forms of viability* were recognised as most relevant for describing the divergence. The dimensions of *growth* and *depth of change* were identified as slightly significant for explaining the DDPs of social innovations involving external actors and

existing institutional networks. These were validated with local actors using the data from 11 project case studies. Combinations of dimensions could be identified and a set of *diverging development paths* formulated for social innovation in marginalised rural areas. These paths reflect social innovation emergence and development towards consolidation and implementation, or its non-viability. The four paths uncovered reflect the key role of local context and local action arena in adapting to new conditions through social innovation (DDP_1 'Local Heroes'); the relevance of novel forms of market-public partnerships, such as social enterprises (DDP_2 'Glocalists'); that local and external actors can form hubs or multilevel associative institutions (DDP_3 'Pathbreakers'); and that social innovation can develop at the local level with external knowledge brought in (DDP_5 'Builders'). The 'External System Changers' path of DDP_4 has not been recognized as viable in the analysed marginalised rural areas.

Therefore, the successful initiation of social innovations requires a thorough consideration of local contexts and the active engagement of local actors based on their local (as well as external) knowledge. The success of social innovations centred around the combination of external actors and external knowledge has not been empirically proven.

Finally, classifying specific social innovations as failures may be quite superficial and based on an incomplete understanding of the subtle influences that social innovations make as they progress along development paths. While social innovation may seem a failure, it may nevertheless still build capacities for future changes and act as inspiration for change in other contexts. Therefore, the theoretical and analytical approaches used in this paper (e.g. to examine DDPs) are needed in order to capture the processes that underpin changes to enable the recognition of how change - at whatever scale and context - may take place.

Changes introduced by social innovations can range in scale from impacting just a few people to the wider population, can be sector-specific and highly influential, which may or may not impact other sectors as reported in this paper. However, some social innovators have a holistic vision, with innovations aiming to improve well-being and deliver smart justice, either locally or by inducing transformative changes towards sustainability. The following three regimes were identified for social innovation to enhance societal transformation: i) from hierarchy towards a community type of governance; ii) from an exclusive political economy to inclusive societies; and iii) from markets to social enterprises and towards making the impact on the ground more explicit and durable.

We believe that the concepts elaborated in this paper are important both for the wider scientific audience and communities of practice (Metzger *et al*., 2019), yet the identified and explained diverging development paths of social innovation do not necessarily represent an exhaustive list (e.g. for Europe as a whole). Further work is needed to provide a subtler gradient of change where social innovation operates. It may also be necessary to capture connections between the key dimensions that shape social innovation paths, and to identify likelihoods of such paths in the context of European marginalised rural areas or other regions under investigation.

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Conflict of interest

I declare that we, the authors, have no conflict of interest.

Data availability statement

The data that support the findings of this study are openly available in ZENODO repository at https://zenodo.org/record/3695734#.Xt-u1kUzaUk.

8   References

Avelino, F., M., J. Wittmayer, P. Bonno, P. *et al.* (2019) Transformative social innovation and (dis)empowerment. *Technological Forecasting and Social Change* **145** pp.195-206

Baker, S and A. Mehmood (2015) Social innovation and the governance of sustainable places. *Local Environment: The International Journal of Justice and Sustainability* **20** (3) pp. 321-334

Barlagne, C., M. Melnykovych, R. Hewitt *et al*. (2019) Analytical Case Studies (Type A Case Study) Lochcarron Community Development Company – Strathcarron, Scotland, UK (led by HUTTON). Report 5.4j - Social Innovation in Marginalised Rural Areas (SIMRA) pp. 59. [SIMRA Internal report]

Bock, B. B. (2016) Rural Marginalisation and the Role of Social Innovation; A Turn Towards Nexogenous Development and Rural Reconnection. *Sociologia Ruralis* **56** (4) pp.552 – 573

Bock, B. B. (2012) Social Innovation and Sustainability. How to Disentangle the Buzzword and Its Application in the Field of Agriculture and Rural Development. *Studies in Agricultural Economics* **114** pp. 57-63

Bowles, S. and H. Gintis (2002) Social Capital And Community Governance. *The Economic Journal* **112** (483) pp. F419-F436

Brnkalakova, S., A. Udovc, T. Kluvankova *et al.* (2019) Carbon smart forestry in forest commons in Slovakia and Slovenia. Report 5.4n.Analytical- Informational Case Studies (Type B/C) led by CETIP and IFE SAS. Social Innovation in Marginalised Rural Areas (SIMRA) pp. 23. [SIMRA Internal report]

Bromley, D. W. (2006) Economic institutions and governance of the commons. In: M. Basili, M. Franzini and A. Vercelli eds *Environment, Inequality, and Collective Action* (Routledge)

Bryce, R., D. Valero and M. Price (2017) Creation of Interactive Database of Examples of Social Innovation, Deliverable 3.2, Social Innovation in Marginalised Rural Areas (SIMRA) pp. 24

Castro-Arce, K. and F. Vanclay (2020) Transformative social innovation for sustainable rural development: An analytical framework to assist community-based initiatives. *Journal of Rural Studies* **74** pp. 45-54

Dalla Torre, C., V., Gramm, M. Lolini and E. Ravazzoli (2019) Analytical Case Studies (Case Study Type A) Learning, growing, living with women farmers – South Tyrol, Italy (led by EURAC). Report 5.4d - Social Innovation in Marginalised Rural Areas (SIMRA) [SIMRA Internal report]

Dijkshoorn-Dekker, M., N. Polman and M. Melnykovych (2019) Analytical Case Studies (Case Study Type A) Green Care Farm – The Netherlands (led by DLO). Report 5.4c - Social Innovation in Marginalised Rural Areas (SIMRA) [SIMRA Internal report]

Elo, S. and H. Kyngäs (2008) The qualitative content analysis process. *Journal of advanced nursing* **62** (1) pp. 107-115

Fischer-Kowalski, M., W. Haas, D. Wiedenhofer *et al.* (2012) *Socio-ecological transitions: definition, dynamics and related global scenarios.* Institute for Social Ecology-AAU, Centre for European Policy Studies, (Vienna, Brussels)

Gillwald, K. (2000) *Konzepte sozialer Innovation. WZB paper: Querschnittsgruppe Arbeit und Ökologie.* (Berlin)

Haxeltine, A., B. Pel, A. Dumitru *et al.* (2017) TRANSIT WP3 Deliverable 3.4: Consolidated Version of TSI Theory. Transformative Social Innovation Theory project. TRANSIT: EU SSH.2013.3.2-1 Grant agreement no: 613169

Hodgson, G.M. (2006) What Are Institutions? *Journal of Economic Issues* **40** (1) pp. 1-25

Howaldt, J., A. Schröder, A. Butzin *et al.* (2017) Towards a general theory and typology of social innovation. SI-DRIVE, Social Innovation: Driving Force of Social Change, DELIVERABLE D1.6

Klein, J.L., J.L. Laville and F. Moulaert eds (2014) *L'innovation sociale* (Paris: Editions Erès)

Klein, S. and C.S. Lee (2019) Towards a Dynamic Theory of Civil Society: The Politics of Forward and Backward Infiltration. *Sociological Theory 37* (1) pp. 62–88

Kluvankova, T., S. Brnkalakova, M. Spacek, M. *et al.* (2018) Understanding social innovation for the well-being of forest-dependent communities: A preliminary theoretical framework. *Forest Policy and Economics* **97** (C) pp. 163-174

Kluvankova, T., V. Gezik, M. Spacek, M. *et al.* (2017) Transdisciplinary Understanding of SI in MRAs, Deliverable 2.2, Social Innovation in Marginalised Rural Areas (SIMRA)

Kluvankova, T., R. Lukesch, M. Perlik *et al.* (2020) Operationalization of stakeholder engagement: a guide. Deliverable 2.3, Social Innovation in Marginalised Rural Areas (SIMRA)

Koontz T. and C. Thomas (2006) What do we know and need to know about the environmental outcomes of collaborative management? *Public Administration Review* **66** pp. 111-121

Lindhult, E. (2008) Are Partnerships Innovative? In: L. Svensson and B. Nilsson eds *Partnership – As a Strategy for Social Innovation and Sustainable Change* (Stockholm: Satéruns Academic Press)

Loorbach, D., J. Wittmayer, F. Avelino *et al.* (2020) Transformative innovation and translocal diffusion. *Science Direct: Environmental Innovation and Societal Transitions* **35** pp. 251 – 260

Ludvig, A., G. Weiss, S. Sarkki *et al.* (2018) Mapping European and forest related policies supporting social innovation for rural settings. *Forest Policy and Economics* **97** pp.146-152

Lundvall, B. Å., B. Johnson, E. S. Andersen *et al.* (2002) National Systems of Production, Innovation and Competence Building. *Research Policy* **31** (2) pp. 213–231

Marini Govigli, V., M. Melnykovych, E. Górriz-Mifsud *et al.* (2019a) Report on Social Innovation Assessment in Each Selected Case Study, Deliverable D5.3, Social Innovation in Marginalised Rural Areas (SIMRA) pp.38

Marini Govigli, V., A. Lopolito, A. Baselice *et al.* (2019b) Analytical Case Studies (Case Study Type A) VAZAPP' - Apulia, Italy (led by UNIFG). Report 5.4g - Social Innovation in Marginalised Rural Areas (SIMRA) [SIMRA Internal report]

Marini Govigli, V., M. Perlik and P. Herrmann (2019c) Analytical Case Studies (Case Study Type A) Pro Val Lumnezia - Surselva, Canton of Grisons/Switzerland (led by SAB-UNIBE). Report 5.4b – Social Innovation in Marginalised Rural Areas (SIMRA) [SIMRA Internal report]

Marini Govigli, V., A. Vassilopoulos and E. Akinsete (2019d) Analytical Case Studies (Case Study Type A) A Box of Sea – Lesvos and Leros, Greece (led by ICRE8). Report 5.4i - Social Innovation in Marginalised Rural Areas (SIMRA) [SIMRA Internal report]

Max-Neef, M. (2010) The world on a collision course and the need for a new economy. *Ambio* **39** (3) pp. 200–210

McGinnis, M.D. and E. Ostrom (2014) Social-ecological system framework: initial changes and continuing challenges. *Ecology and Society* **19** (2) pp. 30

Menon, T. and J. Pfeffer (2003) Valuing internal versus eternal knowledge: explaining the preference for outsiders. *Management Science* **49** (4) pp. 497-513

Melnychuk N. and R. de Loë (2020) Legitimacy assessment throughout the life of collaborative water governance. *Environmental Policy and Governance* **30** pp. 14–28

Melnykovych, M., M. Nijnik, I. Soloviy *et al.* (2018) Social-ecological innovation in remote mountain areas: adaptive responses of forest-dependent communities to the challenges of a changing world. *Science of the Total Environment* **613–614** pp. 894–906

Melnykovych, M., S. Egartner, J. Niedermayr *et al.* (2019a) Analytical Case Studies (Case Study Type A) Community Supported Agriculture (CSA), Austria (led by AWI). Report 5.4f - Social Innovation in Marginalised Rural Areas (SIMRA), pp. 64 [SIMRA Internal report]

Melnykovych, M., M. Kozova, M. Spacek *et al.* (2019b) Analytical Case Studies (Case Study Type A) Revitalising plans for Vlkolinec – Slovakia (led by IFE SAS/CETIP). Report 5.4k - Social Innovation in Marginalised Rural Areas (SIMRA), pp. 77 [SIMRA Internal report]

Melnykovych, M., A. Labidi, H. Chorti *et al.* (2019c) Analytical Case Studies (Type A Case Study) Supporting Dairy Producers Organizations through a Public-Private Partnership Programme Tunisia (led by FAOSNE). Report 5.4h Social Innovation in Marginalised Rural Areas (SIMRA), pp. 63 [SIMRA Internal report]

Melnykovych, M., Sarkki, S. (2019d) Analytical Case Studies (Case Study Type A) The Noidanlukko Co-operative - Pyhäjoki, Finland (led by UOULU). Report 5.4e - Social

Innovation in Marginalised Rural Areas (SIMRA), pp. 72. [Internal report]

Metzger M., J. Dick, A. Gardner *et al.* (2019) Knowledge sharing, problem solving and professional development in a Scottish Ecosystem Services Community of Practice. *Regional Environmental Change* **19** pp. 2275–2286

Millard, J. (2018) How social innovation underpins sustainable development. In: J. Howaldt, C. Kaletka, A. Schröder, M. Zirngiebl eds. *Atlas of social innovation–New practices for a better future.* (TU Dortmund University, Dortmund)

Moore, M. L., D. Riddell, D. Vocisano (2015) Scaling out, scaling up, scaling deep: strategies of non-profits in advancing systemic social innovation. *Journal of Corporate Citizenship* **58** pp. 67-84

Moore, M.-L., O. Tjornbo, E. Enfors *et al.* (2014) Studying the complexity of change: toward an analytical framework for understanding deliberate social-ecological transformations. *Ecology and Society* **19** (4) pp. 54

Moulaert, F. and A. Mehmood (2015) Analysing regional development: from territorial innovation to path-dependent geography. In J.B. Davis and W. Dolfsman eds. *The Elgar Companion to Social Economics.* (Cheltenham: Edward Elgar Publishing)

Moulaert, F., A. Mehmood, D. MacCallum *et al.* eds. (2017) *Social Innovation as a Trigger for Transformations - The Role of Research.* European Commission, Directorate-General for Research and Innovation

Mulgan, G., S. Tucker, R. Ali *et al.* (2007) *Social innovation: What it is, Why it matters and how it can be accelerated.* Working paper (Oxford Said Business School)

Murray, R., J. Caulier-Grice and G. Mulgan (2010) *The Open Book of Social Innovation.* (London: NESTA/The Young Foundation)

Nelson, R. and S. Winter (1982) *An Evolutionary Theory of Economic Change*. (Cambridge, MA and London: The Belknap Press of Harvard University Press)

Neumeier, S. (2016) Social innovation in rural development: identifying the key factors of success. *The Geographical Journal* **183** (1) pp. 34-46

Newig, J., P. Derwort, W.N. Jager (2019) Sustainability through institutional failure and decline? Achreotypes of productive pathways. *Ecology and Society* **24** (1) pp. 18

Nicholls, A., and R. Ziegler (2017) *An Extended Social Grid Model for the Study of Marginalization Processes and Social Innovation.* Chapter 2 of CRESSI Deliverable 1.1

Nijnik M., T. Kluvankova, A. Nijnik *et al.* (2020) Is there a scope for social innovation in Ukrainian forestry? In E. Ravazzoli, E. Górizz Mifsud, E. Pisani eds. Special Issue Impact of Social Innovation on Sustainable Development of Rural Areas. *Sustainability* ISSN 2071 – 1050

Nijnik M and A. Mather (2007) Analyzing Institutions and Public Perspectives to Identify the Future of British Forests. In K.M Reynolds, A.J Thomson, M. Kohl, M.A Shannon, D. Ray, and K. Rennolls eds. *Sustainable Forestry: from Monitoring and Modelling to Knowledge Management and Policy Science*. The Centre for Agriculture and Bioscience International, (Oxfordshire, England)

Nijnik M. and D. Miller (2014) Targeting sustainable provision of forest ecosystem services with special focus on carbon sequestration. In: R. Matyssek, N. Clarke, P. Cudlin *et al*. eds, *Climate Change, Air Pollution and Global Challenges: Understanding and Perspectives from Forest Research* (Elsevier, Amsterdam, Netherlands)

Nijnik M., A. Nijnik, S. Sarkki *et al.* (2018) Is forest related decision-making in European treeline areas socially innovative? A Q-methodology enquiry into the perspectives of international experts. *Forest Policy and Economics* **92** pp. 210-219

Nijnik M and A. Oskam (2004) Governance in Ukrainian Forestry: Trends, Impacts and Remedies. International journal Agricultural Resources. *Governance and Ecology* **3** pp. 116-133

Nijnik M., L. Secco, D. Miller D. *et al.* (2019) Social innovation to increase the well-being of forest-dependent communities and promote sustainability in remote rural areas. Special issue. *Forest Policy and Economics*

Noack, A. and T. Federwisch (2018) Social Innovation in Rural Regions: Urban Impulses and cross Border Constellations of Actors. *Sociologia Ruralis* **59** (1) pp. 92-112

Ostrom, E. (1990) *Governing the Commons: the Evolution of Institutions for Collective Action.* (Cambridge: Cambridge University Press)

Ostrom, E. (2009) A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science* **325** (5939) pp.419-22

Ostrom, E. (2011) Background on the Institutional Analysis and Development Framework. *Policy Studies Journal* **3** (9) pp. 7–27

Pel, B., J. Wittmayer, J. Dorland *et al.* (2019) Unpacking the social innovation ecosystem: an empirically grounded typology of empowering network constellation. *Innovation: The European Journal of Social Science Research* **33** (3) pp. 311-336

Perlik, M. (2019) New and very old regionalism: false concepts under the conditions of global mobilities and distress. In book: Alpine Refugees: Immigration at the Core of Europe (Publisher: Cambridge Scholars Publishing)

Perlik, M. and P. Messerli (2001) Neuere Ansätze der Regionalentwicklung und ihre Implementierung in nationalen und internationalen Entwicklungsprogrammen. Study on behalf on the State Secretary for economic affairs (seco), Gruppe

Polman, N., B. Slee, T. Kluvankova *et al.* (2017) Classification of Social Innovations for Marginalized Rural Areas. Deliverable D2.1, Social Innovation in Marginalised Rural Areas (SIMRA)

Rodríguez Fernández-Blanco, C., E. Górriz-Mifsud, V. Marini Govigli et al. (2019) Analytical Case Studies (Case Study Type A) Forest Fire Volunteer Groups - Catalonia, Spain (led by CTFC). Report 5.4a - Social Innovation in Marginalised Rural Areas (SIMRA) [SIMRA Internal report]

Sarkki, S., A. Ficko, D. Miller *et al.* (2019a) Human values as catalysts and consequences of social innovations. *Forest Policy and Economics* **104** pp. 33-44

Sarkki, S., T. Parpan, M. Melnykovych *et al.* (2019b) Beyond participation! Social-ecological innovations facilitating movement from technocratic state to collaborative landscape governance in Ukraine. *Landscape Ecology* **34** pp. 1601 - 1618

Secco, L., E. Pisani, C. Burlando *et al.* (2016) Report D4.1 Guidelines to Identify and Analyse Existing Methods to Assess Social Innovation and Impacts, 2016, 48pp

Secco, L., E. Pisani, R. Da Re *et al.* (2019) Towards developing a method to evaluate social innovation in forest-dependent communities: a science-stakeholders collaboration. *Forest Policy and Economics* **104** pp. 9-22

Shaw, E. and A. de Bruin (2013) Reconsidering capitalism: the promise of social innovation and social entrepreneurship? *International Small Business Journal* **31** (7) pp. 737 - 746

Swyngedouw, E. (2005) Governance, innovation and the citizen: the Janus face of governance-beyond-the-state. *Urban Studies* **42** (11) pp.1991–2006

van der Have, R.P. and L. Rubalcaba (2016) Social innovation research: An emerging area of innovation studies? *Research Policy* **45** (9) pp.1923-1935

Valero, D. and R. Bryce (2020) Catalogue of Social Innovation Diversity in Rural Areas. (Final version). [data file] SIMRA: Social Innovation in Marginalised Rural Areas [producer]. Zenodo [distributor]. 10.5281/zenodo.3695734

Weaver, P., J. Backhaus, B. Pel *et al.* (2017) Transformative change for inclusive society: insights from social innovations and implications for policy innovation and innovation policy (TRANSIT working paper # 9), TRANSIT: EU SSH.2013.3.2-1 Grant agreement no: 613169

Weiss, G., P. Ollonqvist, B. Slee *et al.* eds (2011) *Innovation in Forestry Territorial and Value Chain Approaches* (CABI publ)

Westley, F. R., O. Tjornbo, L. Schultz, L. *et al.* (2013) A theory of transformative agency in linked social-ecological systems. *Ecology and Society* **18** (3) pp. 27

Young Foundation (2012) Social Innovation Overview: A deliverable of the project: "The theoretical, empirical and policy foundations for building social innovation in Europe" (TEPSIE), European Commission – 7th Framework Programme: European Commission (DG Research, Brussels)

Živojinović, I., A. Ludvig and K. Hogl (2019) Social innovation to sustain rural communities: Overcoming institutional challenges in Serbia. *Sustainability* **11** (24) pp. 7248.

Phases of the content analysis (by Elo & Kyngäs 2008: 110).	Phases applied in our study	Explanation
1. Selecting a unit of analysis	Deciding on a theoretical concept to be analysed	Reviewing relevant literature to create sufficient theoretical background on how divergent social innovations may lead to societal changes or even transformations (Section 3).
2. Making sense of data as the whole	Scanning and choosing available empirical materials.	Going through heterogeneous and extensive empirical materials collected during the project.
3. Developing analytical matrices	Operationalizing theory	Defining conceptual components of DDPs (Section 4.1) to be theoretically relevant (phase 1) and empirically applicable (phase 2).
4. Data gathering by the content		We omitted "data gathering by content" phase. We made sense on empirical materials already in phase 2, and therefore after developing conceptual components in phase 3, we started to group those project materials we considered relevant for DDP analysis.
5. Grouping	Grouping of the data and DDP typology	Examining the database of validated social innovations (n=211) (Bryce et al. 2017) to identify the DDPs dimensions with large N examples (4.1.) and grouping them into preliminary categories – dimensions of divergence by 2 persons independently (Section 4.1.).

6. Categorization	Categorization and quantification	Locking the categories of five DDPs, and doing quantitative analysis on how many % of the data base examples belong to each of the five DDP types (section 4.2)
7. Abstraction	Labelling	Developing names for the five types of DDP (4.2.)
8. Verification	Emirical verification of results by applying the developed categories to another data set.	Verification of the DDPs by checking them against11 in-depth case studies via semi-structured interviews (Section 5).
	Expert Validation of the results	Validation of DDPs by the Social Innovation Think Tank (SITT) at face to face meeting (October 2019) as part of the transdisciplinary knowledge co-production.
9. Novel models, concepts or categories	Novel typology	A verified typology of DDPs
	Wider relevance of the novel typology.	Discussing the relevance of the DDP typology in terms of how divergent types of social innovations may transform the relationships between civil society, policy and markets (Section 6).

Table 1 Phases of content analysis

Source: Authors´ elaboration based on Elo and Kyngäs (2008)

Table 1 SuppInfo Diverging development pathways identified in the SIMRA case studies

Overall 'Local heroes' (DPP_1): Predominance of local actors, local community knowledge and a colony type of growth; the social innovation can be adaptive or transformative, with mainly informal civic institutions assuring its viability.	
Forest fire volunteers (Catalonia, Spain)	The social innovation is represented by local networks - Forest Defence Groups - which are formed mainly by local farmers and forest owners with their local knowledge. They also collaborate with external actors to share knowledge. These collaborative and innovative activities have led to positive changes regarding forest fires. The viability of the Forest Defence Groups is assured by active involvement of the civic society (local communities) and significantly supported by public funding and legal framework. No significant regional downturn has been identified.
The Hawaruhof community farm (Austria)	The social innovation is mainly initiated and developed by local actors based on their local knowledge, with some influence of external networks from outside the community. The innovation replaces existing market mechanisms in agriculture by purely the community supported agriculture. Thus, it is now not a market but rather the community (civic society) which assures the viability of social innovation, although certain market elements remain. Therefore, it is a rather adaptive alternative for customers within the previously existed system. No significant regional downturn has been identified.
Lochcarron Community Development Company (Scotland, the United Kingdom)	The key for the development of social innovation are local members of the community and their local knowledge. Active community members and their civic engagement also assure the viability of social innovation. The Company has developed from a single core local organisation to a large organisation focusing on the well-being of the community. It also contributes to transformative changes in the legislation and this leads to the viral spreading of the innovation idea across Scotland and the establishment of the Community Woodland Association.
Overall 'Glocalists' (DPP_2): Predominance of local actors acting on the base of community knowledge, strengthened by the influence of external	

	knowledge; colony and viral type of growth, viability being assured mainly by market logics, social innovation being either adaptive or transformative.
Green care farm (Netherlands)	The social innovation is driven by the local community as an actor for the social purpose of farming and landscape maintenance. They primarily rely on local knowledge, but thanks to their openness also external knowledge contributes to the providing meaningful daytime activities for people with intellectual disabilities and bridging them into the labour market. Mainly viral expansion is present. Assurance of viability is secured by active involvement of the civic society in combination with the selling of products (markets). It is a rather adaptive alternative of farming within the existed market system. No significant regional downturn has been identified.
Learning growing living with women farmers (Italy A)	This social innovation employs local social capital which is based on local actors using their internal, local knowledge. However, some key local actors took an inspiration from abroad and adapted it to local conditions. The development of the innovation can be characterized as "colony", because it was developed from a single core local activity to a larger organization aiming to improve the community well-being. At the same time the innovation leaders have gained the power to influence policies, and they significantly influenced the provincial law on social agriculture, and thus contributed to changes of the entire system. Although the social innovation is based on active engagement of the civic actors – local women farmers, its viability is assured mainly by market mechanisms and public support. Due to the strong market orientation the social innovation activities are perceived as competitors for other farms. Otherwise, no other negative impacts of this social innovation has been identified.
A box of sea (Greece)	The social innovation is driven by members of Greenpeace Greece (an external actor) with the involvement of local fishermen and their knowledge. The combination of external and internal knowledge was an important factor for the development of innovative activities in the locality. Local knowledge has proven to be crucial for development of the social innovation and to find novel practices to deal with the overfishing and reduction in community incomes. The viability of the activities is based on civic engagement and novel market approaches which were integrated into the existing system. The social innovation is characterised by collective action with viral expansion. No significant social innovation deformation has been identified.

Dairy producers public-private partnership (Tunisia)	The social innovation is mainly based on external actors with local knowledge which are personally connected with OEP (national level ministry). The governance innovation is based on a more effective coordination of interests in OEP through an intense cooperation among farmers from different professional organizations to regenerate the area. Thus, the reconfiguration of social practices can be characterised as predominantly modular/polycentric. The change is adaptive because the social innovation aims to make current practices more effective and improve the well-being of the local community. No significant social innovation deformation has been identified.
Overall 'Pathbreakers' (DPP_3): Predominance of local actors using local and external knowledge conveyed via formal networks and/or new institutions; type of growth being rather polycentric or via modular hub satellites, viability assurance is observed mainly in the public sphere: social innovation can be either adaptive or transformative**.**	
VàZapp´ (Italy B)	The development of VàZapp' is based on local actors, but local and external knowledge is being used. Local farmers together with actors with external academic knowledge created a rural hub. The initial expansion of this social innovation can be characterised by the colony scheme as it started in the single core and has developed into a larger organization/ network that continues operating on a local scale. However, in further stages of the development, it seems to be characterised by viral or modular expansion. The assurance of viability is through active and voluntary involvement of members of the civil society. It is also supported from public financial sources. The novel practices adapt to the existing system. No significant social innovation deformation has been identified.
Pro Val Lumnezia (Switzerland)	The social innovation represents a typical example of regional renewal due to a new generation of externally skilled social actors. In this case it was a group of young artisans who played the role of civic society in opposition to a static, predominant agricultural sector and value system. The innovation is based mainly on local actors with partly external knowledge and the aid of external experts. Civic society actors, becoming entrepreneurs, made local community reacting on the regime change from public driven regional development towards an entrepreneurial approach. Although the innovators had their origins in the

	entrepreneurial milieu, the viability now is assured by public institutions. This is due to the fact that the peripheral situation of the valley, the economic weakness and the demographic stagnation have not substantially changed. The initiative now has lost much of its dynamics but the new forms of cooperation, created by the initiative, have been maintained and have reduced the inferiority of the valley.
Overall 'Builders' (DPP_5): External actors using local knowledge; polycentric or modular types of growth; viability is assured by a hybrid combination of public, market and civic coordination.	
The Noidanlukko cooperative (Finland)	The social innovation is driven by a network of external and local actors primarily using external knowledge but having a deep knowledge of local concerns and problems pertaining to the nuclear power project. The growth of the social innovation can be characterized as polycentric, where multiple organisations are tied together by a set of core values. Innovative activities are considered as adaptive to the existing systems, even if they are challenging it. On the other hand, there is a potential to become more transformative. No significant social innovation deformation has been identified.
Revitalising plans for Vlkolinec (Slovakia)	Driven by the initiative of external actors (University) this social innovation initiative is mainly based on local knowledge of traditional farming practices personally connected with the local context of Vlkolinec. The reconfiguration of social practices is characterised as predominantly modular/polycentric. The change is adaptive because the social innovation aims to make current practices more effective and improve the well-being of the local community. No significant social innovation deformation has been identified.

Source: SIMRA case studies internal reports (Barlagne et al. 2019; Dalla et al. 2019; Dijkshoorn-Dekker et al. 2019; Marini Govigli et al. 2019 b,c,d; Melnykovych et al. 2019a,b, c,d; Rodríguez Fernández-Blanco et al. 2019)

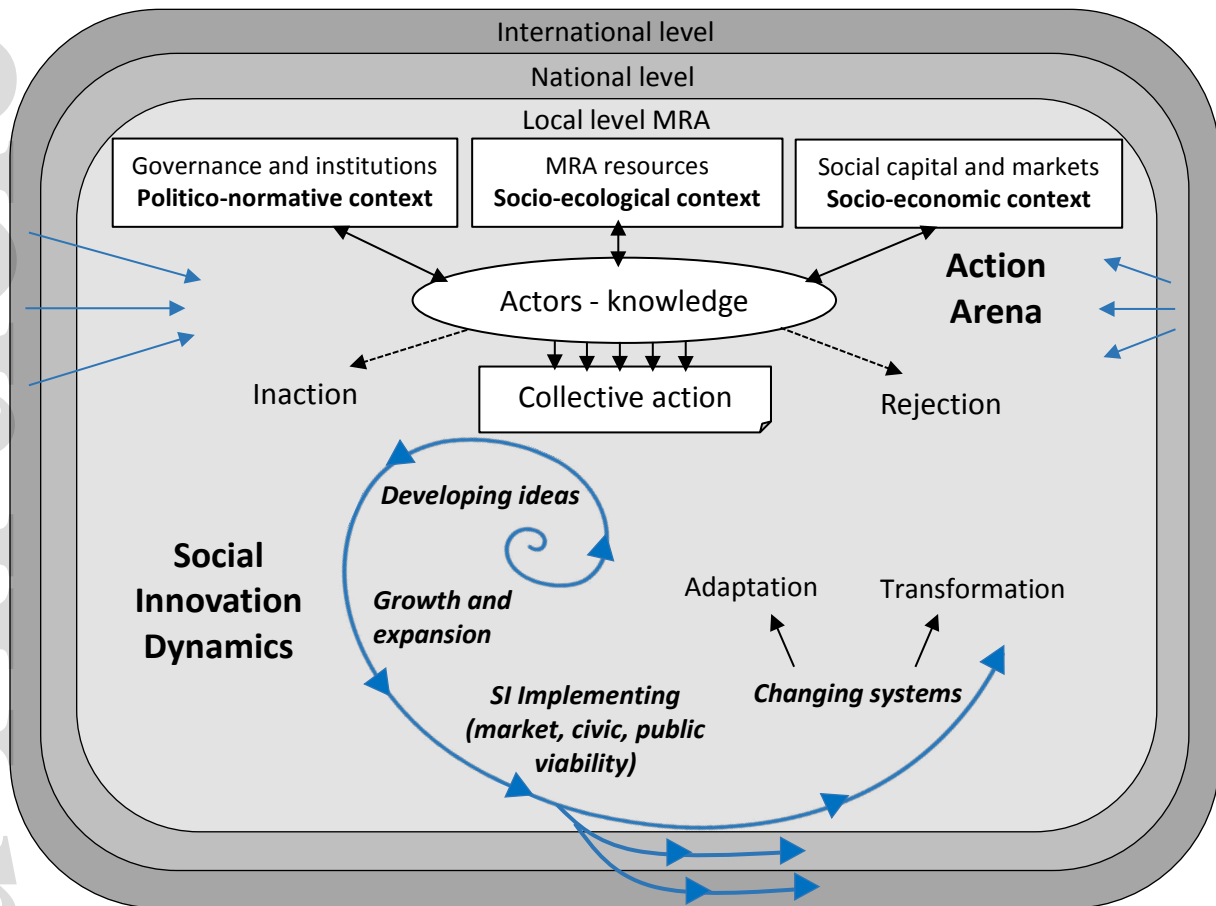**Figure 1** A framework to understand social innovation and its dynamics

Source: Adapted from Kluvankova *et al.* 2018

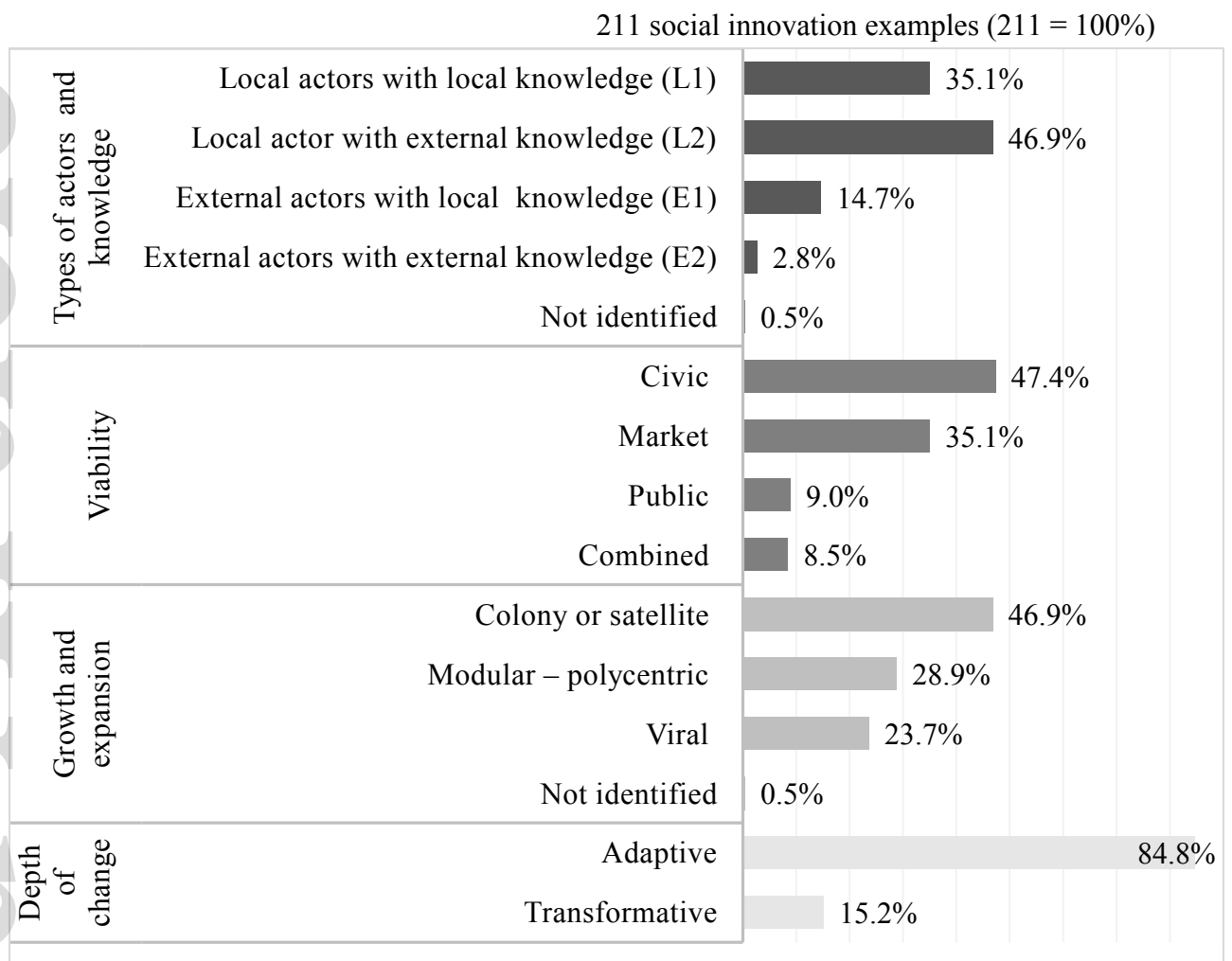211 social innovation examples (211 = 100%)

Figure 2 Key dimensions shaping divergent development of social innovations

Source: Authors' deliberation based on information extracted from the project database

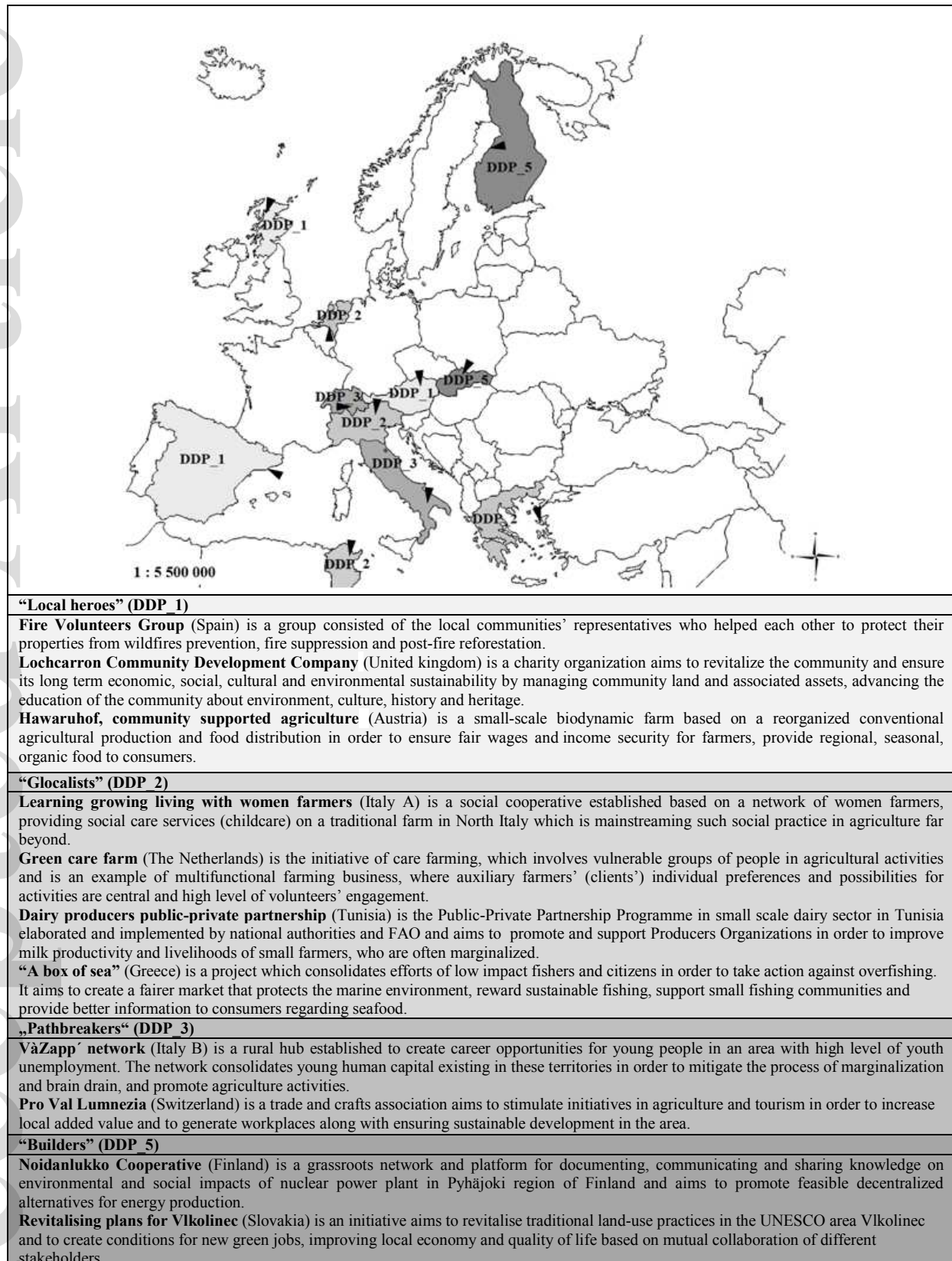(Valero and Bryce 2020) of social innovation examples (n= 211)

"Local heroes" (DDP_1)
Fire Volunteers Group (Spain) is a group consisted of the local communities' representatives who helped each other to protect their properties from wildfires prevention, fire suppression and post-fire reforestation.
Lochcarron Community Development Company (United kingdom) is a charity organization aims to revitalize the community and ensure its long term economic, social, cultural and environmental sustainability by managing community land and associated assets, advancing the education of the community about environment, culture, history and heritage.
Hawaruhof, community supported agriculture (Austria) is a small-scale biodynamic farm based on a reorganized conventional agricultural production and food distribution in order to ensure fair wages and income security for farmers, provide regional, seasonal, organic food to consumers.

"Glocalists" (DDP_2)
Learning growing living with women farmers (Italy A) is a social cooperative established based on a network of women farmers, providing social care services (childcare) on a traditional farm in North Italy which is mainstreaming such social practice in agriculture far beyond.
Green care farm (The Netherlands) is the initiative of care farming, which involves vulnerable groups of people in agricultural activities and is an example of multifunctional farming business, where auxiliary farmers' (clients') individual preferences and possibilities for activities are central and high level of volunteers' engagement.
Dairy producers public-private partnership (Tunisia) is the Public-Private Partnership Programme in small scale dairy sector in Tunisia elaborated and implemented by national authorities and FAO and aims to promote and support Producers Organizations in order to improve milk productivity and livelihoods of small farmers, who are often marginalized.
"A box of sea" (Greece) is a project which consolidates efforts of low impact fishers and citizens in order to take action against overfishing. It aims to create a fairer market that protects the marine environment, reward sustainable fishing, support small fishing communities and provide better information to consumers regarding seafood.

„Pathbreakers" (DDP_3)
VàZapp´ network (Italy B) is a rural hub established to create career opportunities for young people in an area with high level of youth unemployment. The network consolidates young human capital existing in these territories in order to mitigate the process of marginalization and brain drain, and promote agriculture activities.
Pro Val Lumnezia (Switzerland) is a trade and crafts association aims to stimulate initiatives in agriculture and tourism in order to increase local added value and to generate workplaces along with ensuring sustainable development in the area.

"Builders" (DDP_5)
Noidanlukko Cooperative (Finland) is a grassroots network and platform for documenting, communicating and sharing knowledge on environmental and social impacts of nuclear power plant in Pyhäjoki region of Finland and aims to promote feasible decentralized alternatives for energy production.
Revitalising plans for Vlkolinec (Slovakia) is an initiative aims to revitalise traditional land-use practices in the UNESCO area Vlkolinec and to create conditions for new green jobs, improving local economy and quality of life based on mutual collaboration of different stakeholders.

Figure 3 Diverging development paths of social innovation across project case studies

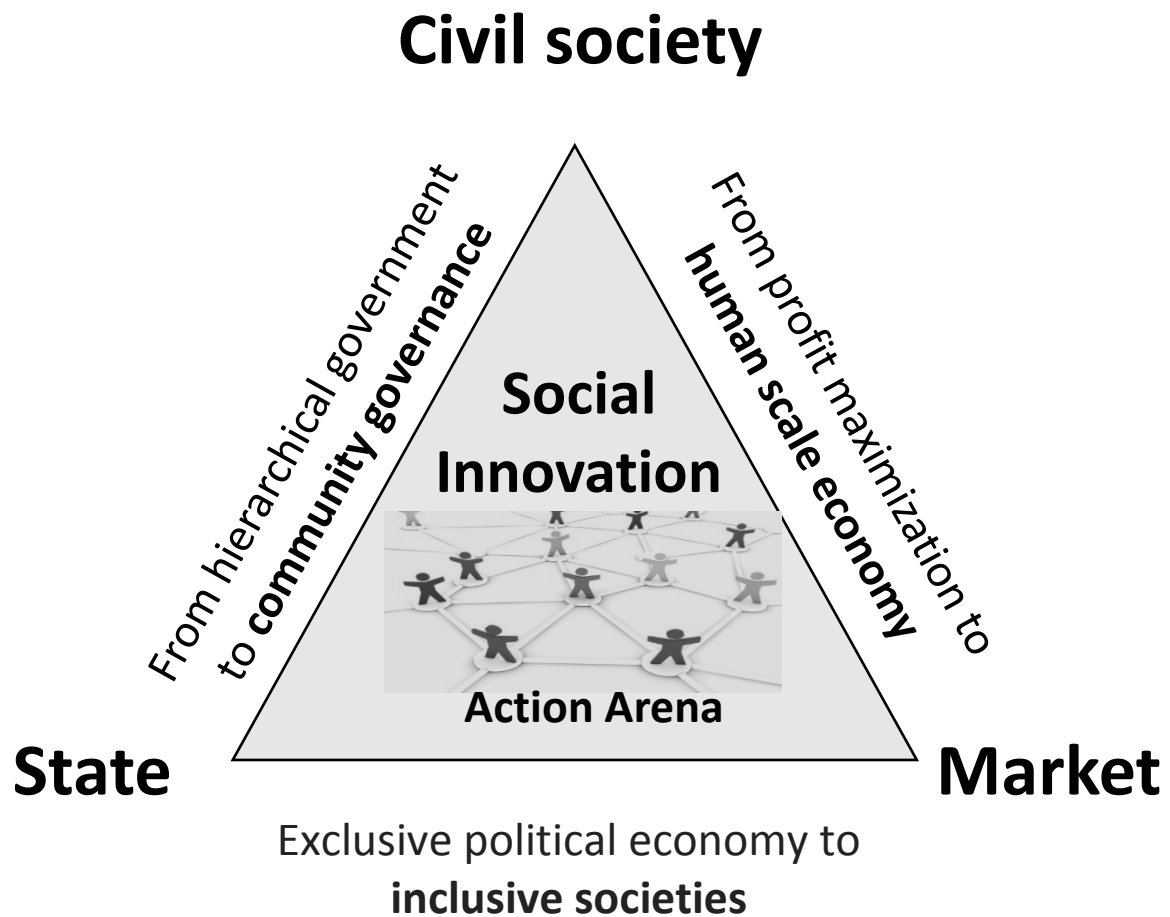Source: Authors' deliberation

Figure 4 Social innovation within the societal transformation triangle

Source: Authors' elaboration