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Social Innovation in Marginalised Rural Areas

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Report D2.2

Transdisciplinary understanding of SI in MRAs

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Acronyms

CS	Case Studies
EC	European Commission
ESPON	European Spatial Planning Observation Network
EU	European Union
LEADER	Liaison Entre Actions de Développement de l'Économie Rurale
MENA	Middle East and North Africa
MRAs	Marginalised Rural Areas
OECD	Organisation for Economic Co-operation and Development
SI	Social Innovation
SIMRA	Social Innovation in Marginalised Rural Areas
SITT	Social Innovation Think Thank
STRM	Shuttle Radar Topography Mission



Executive Summary

Social innovation (SI) has rapidly expanded in the debates and agenda of the research and policy communities over the last decade (Adams and Hess, 2010; Baker and Mehmood, 2015; Neumeier 2016, Haxeltine *et al.*, 2017). There are considerable expectations of the potential of SI for addressing urgent societal challenges. Considering the diversity and complexity of societal challenges the potential role of social innovations to provide solutions has to be determined in a wider and transdisciplinary context.

The purpose of this deliverable (D2.2) of the SIMRA project is to develop **transdisciplinary understanding of SI in marginalised rural areas (MRAs)**. This creates an opportunity for addressing the challenges to be addressed by this deliverable and the SIMRA research community. A key question to be addressed is why communities in some MRAs respond to societal problems whereas others collapse? An important challenge is the identification and analysis of relationships, variables and trajectories of diverging paths in complex rural systems at different spatial and temporal scales. The principal concern of this deliverable is to determine the types of SIs which are likely to occur in MRAs, and what can be done to enhance the innovation potential across different types of MRAs. A transdisciplinary approach has been used, with direct involvement of experts and empirical knowledge exchange to shape development trajectories, and to inform those involved in policy design and implementation.

Building on the working definition of social innovation in MRAs developed in Polman *et al.*, (2017; D2.1) work undertaken in this deliverable follows 4 research steps:

1. The SIMRA definition of SI is *“The reconfiguring 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”*. This deliverable develops the understanding of the SI definition with respect to the MRA typology defined by Price *et al.* (2017; D3.1) and the checklist of characteristics of SI in MRA. The framework developed enables consideration of complex system dynamics of reconfiguration of social practice as essential elements of collective and collaborative action of actors, supported or constrained by institutional, socio-cultural and biophysical relations.
2. A theoretical conceptualisation of social innovation is undertaken based upon six theories. The approach is informed by innovation theory in which SIs are understood as outputs, novel ideas are transformed to products and services meeting social demand and potentially enhancing social well-being. SIs can be understood as processes in the social entrepreneurship, endogenous and regional development literature. Their dynamics can be described mainly by social capital socio-ecological system dynamics and transition.
3. A transdisciplinary framework is developed for understanding SI in MRAs, determining the conceptual and emergence factors of SI, and identify four stages of Si dynamic in MRAs as: i) development of novel ideas; ii) growth, testing and consolidation; iii) implementing, scaling spreading; iv) system change. The framework includes explanatory, conceptual and impact variables that determine key factors of SI performance. Finally hypotheses for the most prevalent trajectories for SI diverging paths are formulated: authority path, self-organisation path, social enterprise path, networking path, and knowledge transfer path. Each of diverging paths is characterised by different reconfigurations of actors' interactions. Empirical knowledge from 166 SI examples, collected in the SIMRA database (Bryce *et al.*, 2017; D3.2), has formed basis for development of this stage.
4. The trans-disciplinary approach of SIMRA addresses effective knowledge exchange for shaping development trajectories and to inform those involved in policy design and implementation involving the close involvement of members of the SIMRA SITT (experts



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representing the core actors in rural development, agriculture and forestry at international, regional and national levels). By engaging with the SITT from the outset of the project and work package research, a transparent and open-ended approach to problem framing is being created as a way of working by SIMRA. The involvement of SITT members in the development of this deliverable was in three steps: i) the development of an initial set of SI variables; ii) a checklist for defining SI; iii) a ranking of a final list of variables to formulate hypotheses of diverging paths. This resulted in co-production of (theoretical-empirical – expert) understanding of SI in MRAs addressing societally relevant problems.

This deliverable represents work in progress that will inform evaluation methods (Secco *et al.*, 2017; SIMRA D4.2), tested with empirical data in case studies (Work Package 5), feeding back into the further development of the theoretical understanding of SI in MRAs.



1 Introduction

1.1 Rationale and Objectives of the Deliverable

The main objective of the reporting in Deliverable D2.2 is to develop a transdisciplinary understanding of the dynamics of Social Innovation (SI) in Marginalised Rural Areas (MRAs). In particular, this report concerns the explanatory and conceptual variables that explain practical evidence of SIs in MRAs, and formulate hypotheses for explaining diverging paths of SI. These variables serve as a basis for work across the activities of the SIMRA project: developing evaluation criteria (addressed in Work Package 4), the selection of case studies in MRAs (Work Package 3), the evaluation of case studies (CS) (Work Package 5), the formulation of policy responses (Work Package 6) and operationalization of SI through pilot Innovative Actions (IAs) (Work Package 7).

The definition of SI as used in SIMRA (Polman *et al.*, 2017; D2.1) is: *“The reconfiguring 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”*. Following from this definition, the work in this report deepens and adapts the institutional framework for coherent analyses of complex, nested systems operating across scales, to the SI concepts, to construct a transdisciplinary framework for understanding SI under the complexity of MRAs in Europe, and Middle East and North Africa (MENA) countries.

The focus is on the types of SIs that are likely to occur in MRAs, and what can be done to enhance the innovation potential across different types of MRAs. It has been developed using desk-based surveys, and trans-disciplinary engagement of stakeholders, supporting effective knowledge exchange for shaping development trajectories and to inform those involved in policy design and implementation. Deliverable D2.2 concerns the identification of factors to explain diverging paths of SI (Task 3.3), and, in particular: i) create a list of explanatory, conceptual and impact variables; ii) a meta analyses of SI examples from the SIMRA database of examples of social innovation (Bryce *et al.*, 2017; D3.2) defined in Task 3.2.

1.2 Scope of the Document

Addressing the emergence and divergence of SIs in complex MRAs presumes that they can only be successful when a comprehensive approach to innovation is applied. The aim of the report is to identify the patterns that enable and constrain (lock-ins, path-dependencies) efforts for innovations to emerge, nurture and develop. The report is of work in progress, and does not imply that SI cannot occur in different directions. The findings will be tested in empirical contexts in case study areas, and further developed.

1.3 Structure of the Document

This report consists of four thematic sections. Following the definition of MRAs (Price *et al.*, 2017; D3.1) and SI (Polman *et al.*, 2017; D2.1), Section 2 defines SI for MRAs, and frames complex system dynamics of reconfiguration of social practice in the context of collective and collaborative action of actors supported or constrained by institutional, socio-cultural and biophysical relations. The transdisciplinary dimension of the research is also introduced. Section 3 expands on the theoretical foundations for analysing the emergence SI in MRAs. These theories are: innovation theory, endogenous development, regional theories, social capital, social enterprise and socio-ecological system dynamics.

Section 4 develops a framework to understand SI in MRAs following from examination of the theoretical foundations, as well as empirical evidence of examples of SI compiled by SIMRA (Bryce *et al.*, 2017; D3.2) and the expertise of the members of the SIMRA Social Innovation Think Tank (SITT).



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Section 5 presents the diverging paths of SI in MRAs and summarises the main results of the empirical analyses, knowledge and feedback from the SITT, and re-enforces the theoretical assumptions on the classification of SI in MRAs (Polman *et al.*, 2017; D2.1) and informs the evaluation of SI within SIMRA (Work Package 4).



2 Understanding SI in Marginalised Rural Areas (MRAs)

2.1 Marginalised Rural Areas

The complexity of MRAs, in particular the mix of physical, economic, demographic and social factors that impact on marginalisation and effect the economic, cultural, social and environmental potential of territorial capital, benefits from a systems approach to address those complexities and uncertainties. This deliverable builds on the definition of MRAs developed in SIMRA Work Package 3 (Price *et al.*, 2017; D3.1). In defining MRAs, the approach of SIMRA builds on the thinking of Strijker (2005), who pointed out that setting definitions in interdisciplinary analysis can be confusing due to different epistemological and theoretical foundations. This is especially true in defining the concept of MRAs, which comprises three elements: rural, marginal, and marginalised. The first step of the process was to define the extent of the areas which could be considered as rural (including intermediate rural). Then, the characteristics of marginality and marginalization were identified based on a literature review. As rural areas are complex systems, Price *et al.*, (2017; D3.1) concluded that marginalisation in rural areas results from the interaction of multiple problems that could be codified in various factors.

The core characteristics for defining MRAs within the SIMRA project are:

- Rural area based on population density (OECD, 2011);
- Areas that are marginal in terms of their physical geography (i.e. spatial marginality [Gurung and Kollmair, 2005]): a) mountainous – derived from the Shuttle Radar Topography Mission (STRM), following the process developed in ESPON GEOSPECS (ESPN and University of Geneva, 2012); b) limited connectivity as islands (European Commission, 1994; Eurostat, 2015); c) low agricultural potential due to aridity (Strijker, 2005) or excessive wetness, limiting primary sector dominance (Bock, 2016);
- Marginal in terms of limited access to infrastructure, using indicators of access to the internet from home; World Bank database); and accessibility by local road transport;
- Marginalised populations (cf. societal marginality [Gurung and Kollmair, 2005]): inhabitants with (very) low incomes (as measured by GDP).

2.2 The Transdisciplinary Research Approach to Supporting SI in MRAs

Transdisciplinarity is a reflexive, integrative, approach aimed at the transition of societal problems, and concurrently of related scientific problems by differentiating and integrating knowledge from various scientific and societal bodies of knowledge (Lang *et al.*, 2011). To be transdisciplinary, research requires to comply with the following: (i) focusing on societal relevant problems; (ii) enabling mutual learning processes among researchers from different disciplines (from within academia and from other research institutions), as well as actors from outside academia; and (iii) aiming at creating knowledge that is solution-oriented, socially robust and transferable to both the academic and societal practice (Lang *et al.*, 2011).

Transdisciplinarity should be a critical and self-reflexive research approach that relates societal with scientific problems. It should produce new knowledge by integrating different scientific and extra-scientific insights. Its aim is to contribute to both societal and scientific progress; integration is the cognitive operation of establishing a novel, hitherto non-existent connection between the distinct epistemic, social–organizational, and communicative entities that make up the given problem context (Jahn *et al.*, 2012).

The transdisciplinary research process is influenced by: (i) disciplinary issues; (ii) adaptation of project applications to fill the transdisciplinary research agenda; (iii) effective stakeholder



participation; and, (iv) functional team building and development based on self-reflection and experienced leadership (Angelstam *et al.*, 2013).

Arguably, SI research should be well-suited to transdisciplinarity. Consistent with transdisciplinary cooperation is social learning from each other, and building cooperation or networks for common aims. There is also a strong relationship between SI, transdisciplinarity and sustainability. Amongst crucial factors of transdisciplinary research is a participatory process as a tool to ensure the sustainability of the achieved objectives.

SIMRA has been using a transdisciplinary approach, drawing on the expertise and knowledge of members of the SITT. The SITT was involved in the preparation of the research reported here in three steps. i) In July 2016 they contributed to the identification and formulation of key societal challenges which formed part of the SI explanatory variables. ii) The first workshop of the SITT, held in Bratislava October 2016, created a platform for mutual learning regarding the role of variables in understanding SI in MRAs. iii) An online survey of SITT members (July 2017) helped to build understanding of the factors essential for SI success in MRAs. The SITT represents a multilevel, transdisciplinary structure of the Scientific Advisory Board (SAB) and the Stakeholders Involvement Board (SIB) consisting of European, Associated and non-EU actors and experts in forestry, agriculture and rural development. A total of 21 SITT members participated at the Bratislava workshop and 32 were involved through the online survey. One SITT member is a co-author of this deliverable.

2.3 Social Innovations in MRAs

A common definition of SI is desirable as a starting point for ensuring general conceptual agreement amongst members of the project team, and embracing the diversity of theoretical and epistemological approaches in use (for further details, see Polman *et al.*, 2017; D2.1). The definition of SI used in SIMRA (Polman *et al.*, 2017; D2.1) represents a work in progress, which is adopted here applied to the specificities of MRAs with the collaboration with the SIMRA trans-disciplinary laboratory.

In this report, an understanding has been developed of SI involving processes in which reconfigured social practices seek to enhance outcomes on societal well-being. The reconfiguring of social practices is part of the process taking place in SI initiatives, producing new social relationships and collaborations (i.e. networks, institutions, and governance structures) including civil society actors as central nodes. These are understood as necessary constituents of SI (Table 1). In a wider sense, outcomes could be social, economic or environmental, and would be based on the recognition that trade-offs among competing interests as response to societal challenges e.g. values, preferences and or crises, are likely to occur. SI can also be initiated by both public or/and private (individual or collective) and/or civil society agency.

We have approached the definition of SI in a simple and logical way by considering its essential characteristics and using a set of stepwise questions. We distinguish between process, product and outcomes. These characteristics were introduced to SITT members as part of Task 2.2 via an online survey (July 2017), from which we received suggestions for revisions, summarised in Table 1 below.



Table 1. A checklist for defining SI, together with theoretical consideration (see Polman *et al.*, 2017; D2.1 for further explanation of checklist) and feedback from members of the SITT.

SI as Process	Theoretical	SITT Members
Is there a process of reconfiguration of social practices (e.g. relationships, collaborations, networks, institutions and governance structures) in response to societal challenges, which seeks to enhance outcomes on societal well-being?	Necessary	Necessary
Does the novelty/reconfiguration take place in new geographical settings or contexts, or in relation to previously disengaged social group(s)?	Necessary	Possible but not necessary
Does the process of novel reconfiguration involve civil society members as active participants?	Necessary	Necessary
Does the process of reconfiguration result in new social practices that increase the engagement of civil society actors?	Possible? but not necessary	Necessary
Does the SI arise as a result of a crisis or apparently intractable problem?	Possible but not necessarily	Possible but not necessary
Can public agency be the initiator and/or driver of SI?	Possible but not necessarily	Possible but not necessary
Can SI be initiated by private sector agency?	Possible but not necessarily	Possible but not necessary
Is the SI process driven by certain values and ethical positions?	Possible but not sufficient and context-dependent	Possible but not necessary
SI as output		
Do new social practices engage voluntarily* civil society actors (in relationships, collaborations, networks, institutions and governance structures) as a result of the SI?	Necessary	Necessary
Outcomes/Impacts arising from SI		
Do these reconfigurations enhance outcomes on societal well-being, i.e. in relation to society, economy, environment or any combination thereof?	Desirable but not necessary	Necessary
Are trade-offs between types of benefit or beneficiaries likely to arise as a result of SI?	Possible but not necessarily	Possible but not necessary

Source: Polman *et al.* (2017; D2.1), and SITT consultation in July 2017. (*Voluntarily refers to bottom-up engagement).

We suggest that among the key aspects of SI, the interaction among actors constitutes an essential point, aiming to achieve social impacts in a broader societal context, and as such it transcends individual level gains (Bock, 2016; Biggs *et al.*, 2010; Baker and Mehmood, 2015; Neumeier, 2017), modifying social practices which result in new networks, partnerships, collaborations or governance arrangements. While the emergence of SI can be initiated by individuals, the cooperation and collective action of a range of agents is likely to be required to achieve socially beneficial outcomes (Hermann *et al.*, 2008). Interactions between a large number of actors aiming for impacts beyond the level of an individual, to a broader societal context (Bock, 2016; Biggs *et al.*, 2010; Baker and Mehmood, 2015; Neumeier, 2016), cooperation and collective action are seen essential to achieve socially beneficial outcomes in the presence of free-rider incentives (Hermann *et al.*, 2008). In recent



years, the potential of cooperation for emerging SI has received increasing interest (Sanginga *et al.*, 2007). Real-world examples show that cooperative behaviour can be successful (Ostrom, 2005) if social and institutional environments are conducive.

We argue that the reconfiguration of social practice represents, in essence, the results of collective and/or collaborative action, which is then supported or constrained by the local environment and the societal challenges that affect the dynamics of changes within complex systems.

Collective action, in connection with existing local, regional, and/or national networks, has the potential for effective transfer of available experience across the boundaries of innovation emergence. The eventual outcome is greater efficiency and quality of the entire implementation (Baker and Mehmood, 2015; Kozova *et al.*, 2016; Poteete *et al.*, 2010; Ostrom, 2005).

The dynamics of SI have been rarely described in theoretical literature. Following Murray *et al.*, (2010) social innovation processes can be considered in several sequential steps.

Opportunities and challenges, and external institutional and broader material contexts, can lead actors to initiate innovation processes to generate and develop new ideas, and ways of working. New ideas emerge from groups or individuals, and, if developed up to collective actions, they can move on to a second stage where ideas are tested in practice. This second stage can be done through simply testing things, or through more formal pilots, prototypes or even (in theory at least) randomised controlled trials. The process of refining and testing ideas is particularly important because it is through iteration, trial and error, that cooperation and partnerships can be created and conflicts can be resolved. It is also through these processes that measures of success come to be agreed upon (Murray *et al.*, 2010).

When the idea expands to collective action, prototypes such as new institutions can consolidate to ensure more robust and stable practices, which potentially can then scale-up and create systemic change either at local level or in a large institutional setting. Systemic change, such as replacement of institutions by newly established or reconfigured institution is the ultimate goal of SI. Different paths leading to SI usually involve the interaction of many elements: social movements, institutional change business models, laws and regulations, data and infrastructures, and entirely new ways of thinking and doing, usually over long periods of time (Murray *et al.*, 2010) (Figure 1a). A similar approach has been documented in Haxeltine *et al.* (2017) as illustrated in Figure 1b. Such process we refer to as SI dynamics. The intensity and character of collective action thus determines SI dynamics, and the probability of system change.

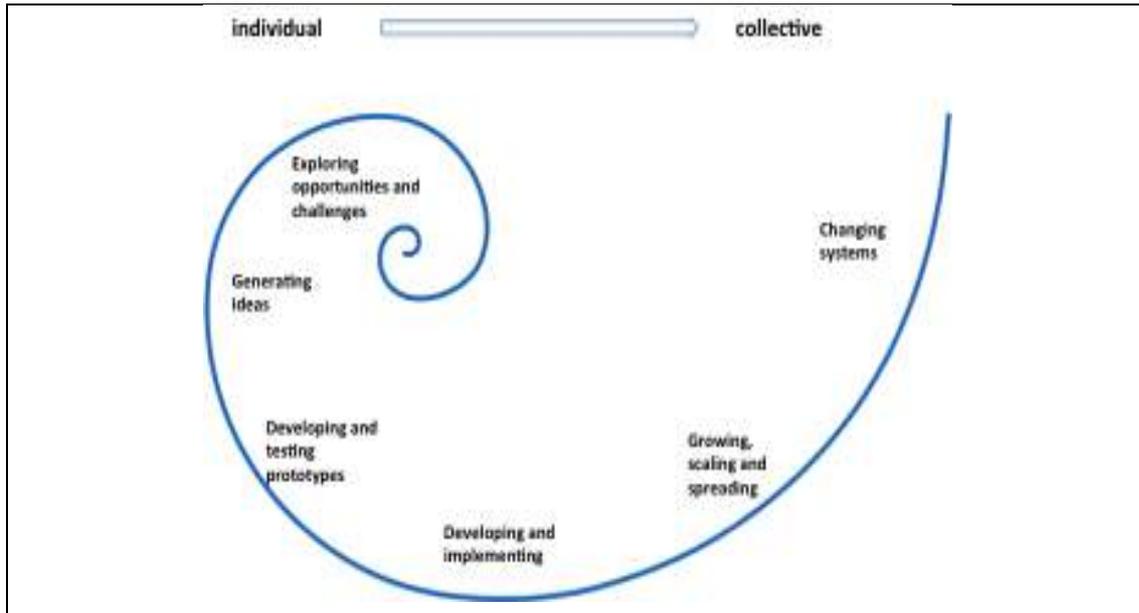


Figure 1 (a) Social Innovation spiral (source Murray *et al.*, 2010 modified by authors)

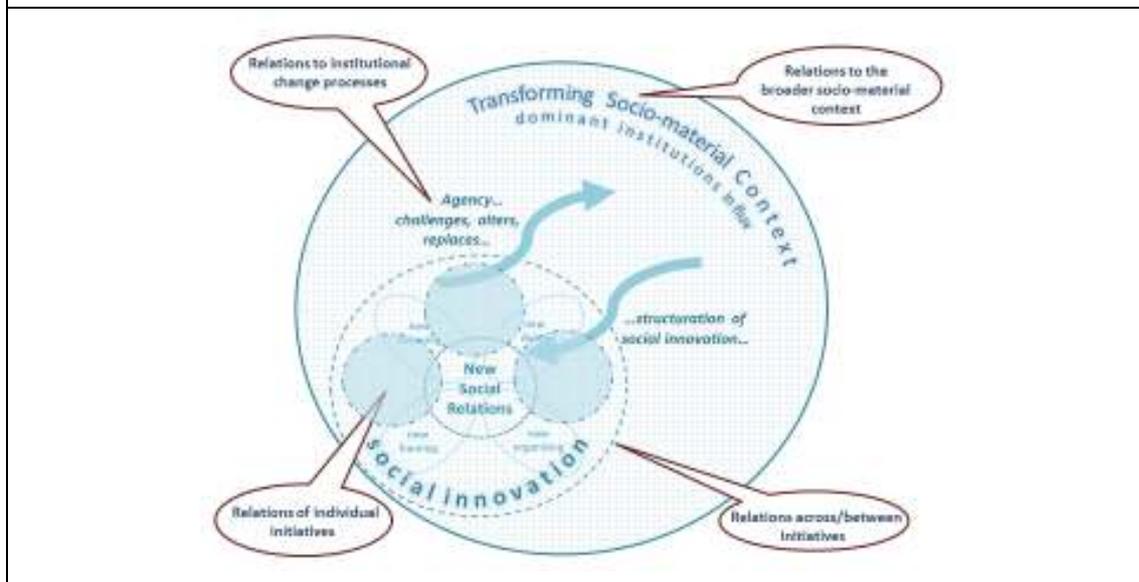


Figure 1 (b) A schematic visualisation of a mutual influence model of transformation of social innovation (source: Haxeltine *et al.*, 2017).



3 Theoretical Foundation for Analysing SI in MRAs

3.1 Theoretical Requirements

In this section, the focus is on the range of theories in the social sciences which inform the analysis of SI, recognising the diversity of such theories and the different facets of SI to which the theories apply. The review recognises that a rural context may be significant in some theories (e.g. endogenous development, socio-ecological systems, regional development theory), and absent in others (e.g. innovation theory, social capital, social enterprise). In some of these theoretical positions there are elements of hybridity and cross-fertilisation that result in overlaps, for example between endogenous development and social capital, or between social capital and facets of innovation theory. In developing a coherent theoretical framework, Cajaiba-Santana (2014) explicitly appeals for integrating disparate theoretical positions.

Several authors have attempted to explore the theoretical antecedents and underpinnings of SI (e.g. Moulaert *et al.*, 2005; Howaldt *et al.*, 2014; Cajaiba-Santana, 2014). Both Moulaert *et al.* and Howaldt *et al.* frame their conception of SI around ideas of social practice (Bourdieu, 1990) and make the point that changes in practice may advance ahead of theory.

We can surmise as to the questions that the theory might address. The following questions provide a starting point:

- Why and how has SI arisen as a powerful discourse in development thinking?
- What forms does SI take and how are these seen to vary over time and space?
- What are the preconditions that give rise to active SI and as a corollary, what impedes the emergence and development of SI?
- To what extent is SI endogenously emergent (an emergent property) or can it be stimulated by exogenous interventions?
- To what extent does the development of SI enable mutual learning processes?
- What factors enhance the durability and sustainability of the system and “up-scalability” and out-scalability of SI?

We can differentiate between high level (overarching) theoretical approaches and a more narrowly framed set of often mono-disciplinary theoretical framings. In the latter, SI is connected to an already established theoretical framing of uneven development or an explanatory force such as social capital.

Three main, high-level theoretical framings can be identified.

- (i) The structure-agency framework, in which the capacity for SI is framed by formal and informal structures and the capacity of agency in different forms, and at different levels, to both stimulate and accommodate SI.
- (ii) Transition theory, in which it is recognised that niches provide a testing ground for ideas that might supportive transformational changes towards sustainability and SI may comprise a particular type of niche.
- (iii) Sustainable development thinking, within which weak and strong sustainability can be identified and in which SI provides a means of enhancing societal welfare by creating either resilience or adaptability for societal change. However, we recognise that Sustainable Development may not constitute a distinct theoretical framing.

Taking a narrower conception of theory, and viewed from a rural perspective, we can identify at least six overlapping main bodies of work in the social sciences that underpin the emergence of ideas on SI (Figure 2), in which they often use the term ‘social’ in different ways.

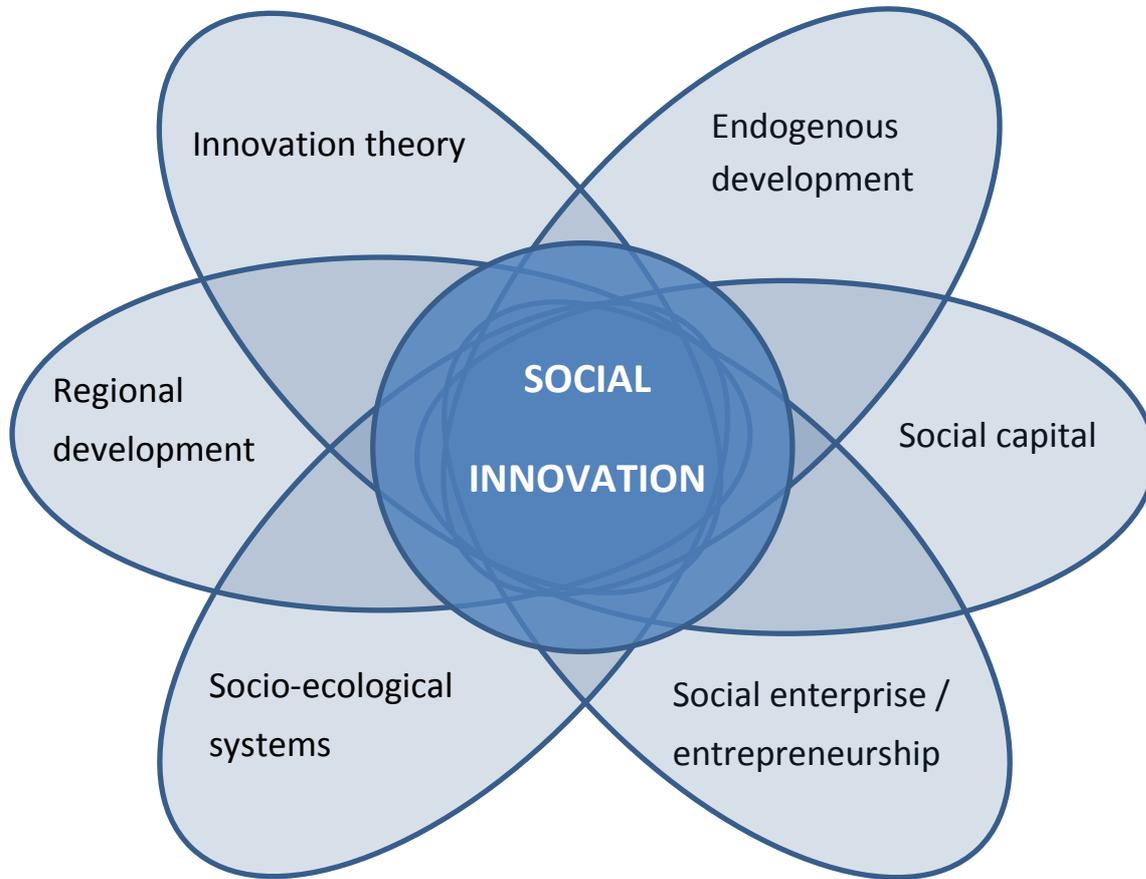


Figure 2. Six theoretical perspectives informing SI.

First, **innovation theory** explores innovation at a business level as one of the key drivers of a dynamic capitalist economy. Later strands of this work explore the adoption process and the social dimension in more detail (Rogers, 2003) in relation to industry clusters (Porter, 1990) and regional innovations systems (Asheim and Isaksen, 2002). Arguably, work on institutional innovation (e.g. Ruttan and Hayami, 1984) also belongs to this strand. Second, regional sciences and more specifically **regional geography** focus on innovation as a product of social and economic interactions between actors at regional level, as a means of explaining regional economic disparities (e.g. Myrdal, 1957) or exploring the impact of interpersonal ties and embeddedness (Storper, 1995; Camagni, 1995). Third, there is a body of work in **rural sociology** based on the idea of endogenous or neo-endogenous development (Bock, 2016; Cloke *et al.*, 2006; Van der Ploeg and Long, 1994). Fourth, there is a disparate literature on **social capital** with diverging epistemological foundations, often contrasting visions (see Putnam *et al.*, 1993; Coleman, 1988; Granovetter, 1985; Portes, 1998; Fukuyama, 2000; Bourdieu, 1990; Baker and Mehmood, 2015; Bhatt and Ahmad, 2017; Bhatt and Altinay, 2013; Faccin *et al.*, 2017). Fifth, there has been a rapid growth in, and parallel discussions of definitions of, the **social enterprise and social entrepreneurship** literature growing out of that of management science (Leadbeater, 1997; Lettice and Parekh, 2010). Sixth, builds on the **socio-ecological systems** perspective (Berkes and Folke, 1985; Ostrom, 1990) in which self-organisation,



complexity and system dynamics are seen as key features for development of SI (Baker and Mehmood, 2015; Ruiz-Ballesteros and Brondizio, 2013; Barnet and Anderies, 2014). Moore and Westley (2011) apply socio-ecological systems theory to social entrepreneurship. These six areas are reviewed in turn.

3.2 Innovation Theories

The first strand of innovation studies dates back to the work of Josef Schumpeter, who is often seen as the founder of modern innovation theory and the evolutionary view of economics (Schumpeter, 1911; translated from German by Opie, 1934) He studied the role of entrepreneurs in economic processes and postulated that entrepreneurship and innovation drive economic development. He defined innovation, broadly, as a discontinuously occurring implementation of new combinations of the means of production, and included five types of innovation: i) the introduction of a new good or of a new quality of a good; ii) the introduction of an improved or better method of production; iii) opening of a new market; iv) the conquest of a new source of supply of raw materials or half-manufactured goods; and v) carrying out of a better organizational model.

Early innovation studies often focussed on the innovation processes within firms, described as “new products development process”, aimed at “innovation management”. Typically, such studies were of large companies with explicit innovation strategies and carrying out in-house R&D activities. Later, scholars recognised that private companies and other public and private organisations, and economic, institutional or other frameworks are engaged in innovation processes. Attention was given to the diffusion processes of how innovations spread across the economic system and are adopted by other companies (Rogers, 2003).

Such systemic innovation models include the cluster model (Schumpeter, 1911; translated from German by Opie, 1934; Porter, 1998) and industrial districts (Marshall, 1920; Harrison, 1992), where the former focuses on rivalry between clustered companies, and the latter on collaboration. More recently, collective learning processes are put into focus and the role of partnerships, institutional environments and socio-cultural conditions are emphasised (Camagni, 1995; Cooke and Morgan, 1994; Asheim and Cooke, 1999). Researchers postulate that innovative regions or creative milieus have to be supported by business, social and political networks. The important role of social factors and interaction has been described for regional innovation processes or innovation systems and more broadly. While the triple helix model of innovation (Etzkowitz and Leydesdorff, 2000) postulated three major actor groups (research, industry and government), newer studies opened this up to further social groups or spheres. Leydesdorff (2012) argues for a potential N-tuple of helices corresponding to our society's specialised functionalities. The authors of the quintuple helix innovation model argue for a media-based and culture-based public and civil society as the fourth helix, and the natural environment of society as the fifth (Carayannis and Campbell, 2010). The quadruple helix represents our knowledge society but the quintuple helix recognises the need for a socio-ecological transition and makes the innovation model ecologically sensitive. In the quintuple helix model, the helices are seen as innovation drivers rather than societal actors (Carayannis and Campbell, 2010).

With a view beyond companies' boundaries, the classification of innovation types was broadened, including institutional innovations when institutional rules and frameworks are changed (Ruttan and Hayami, 1984) or SIs with the primary impacts on the social systems and relationships. Further, public sector innovation is also now receiving increased attention.

Overall, two notions of SI may be derived from innovation research: i) there are always complex and two-way interrelations between innovation processes and society, as innovations are always to some extent influenced by social factors and they will have repercussions on society; ii) SI can be



understood to be a specific type of innovation where the innovation is (or is connected with) a change of social interrelations.

3.3 Rural Regional Development

Regional development theory is in a state of flux. Differential performance and potentials over geographical space are regarded as accepted. However, past conceptions of agglomeration economies as primary causal forces leading to the resultant marginalisation of some regions have been replaced by a more refined understanding of factors driving differences in regional economic performance. In a recent paper, specifically relating to a rural context, Galdeano-Gomez *et al.* (2011) argue that “in the literature there is no a single exclusive model behind the driving forces of rural development. Instead there are multiple development trajectories resulting from various combinations of local, regional, national and global forces in specific circumstances.”

The structural forces of capitalism can be seen to create metropolitan cores and economically weak peripheries, which in turn create major economic differentials and powerful centripetal forces in core areas, and centrifugal processes in peripheries, driven by processes of cumulative causation (Myrdal 1957). Later writers explored internal colonialism, with remote rural areas often seen as exploited by externally controlled economic activity by the capitalist core (Gunder-Frank, 1966; Hechter, 2017) The profound economic differentials created by globalisation remain a major focus of attention.

The principal change has been a shift from relatively crude models of economic performance. These were either based upon factors of production, transport costs and agglomeration advantages, or centre-periphery theory in its various forms, which have undoubtedly driven the processes of globalisation, to those that pay increasing attention to social and institutional factors mediating different development outcomes in different places. Whereas the former offer a powerful and relevant discourse of economic differentials over space, the latter provides a more fine grained analysis of how developments differentials arise in what might be seen as areas of broadly similar potential.

MacKinnon *et al.* (2002) note that “work in economic sociology on embeddedness’ (Granovetter, 1985) has directed attention towards the importance of locally specific social and institutional factors in shaping economic development, particularly in terms of supporting innovation and entrepreneurship through the development of collaboration and trust between firms and organizations.” The work of the (Camagni, 1995) deepens understanding as to how collaboration amongst economic actors can enhance development potentials.

Much regional development work can be seen as built around sector-specific development, where particular industries benefit from agglomeration economies and operate as sectoral clusters (e.g. textiles, metal working, car production). Within the European Union in particular, the recognition of diversity within regions has underpinned a model of territorial development where geographical specificities may provide a potential for smart specialisation in economic activities. This is evidenced in the way that productivist agrarian spaces can be developed as in parts of Spain (Galdeano-Gomez *et al.*, 2011) and earlier in Brittany, although in both cases the industrialisation of agriculture has created adverse environmental outcomes. However, in general, the territorial model seeks to understand better the diversity of regions and build development on place specific assets, potentially including agro-food and other land-based sectors.

SI is not specifically mentioned in literature on regional development, but in the more nuanced models it is trust, informal ties and untraded interdependencies between actors which are seen as key factors determining positive differentials in economic performance. It can be anticipated that



such trust would cut across business and economics boundaries into wider aspects of social life and potentially underpin diverse forms of SI.

3.4 Endogenous Development

The third strand in the antecedent literature is rooted in contemporary rural sociology, and connects with literature in geography and regional development. At its heart is an assertion that there are alternative development pathways to the modernisation paradigm underpinned by a combination of traditional, and increasingly novel, social and land use practices (Ray, 2006). These alternatives are often founded in regional adaptations of farming or other production systems (Van der Ploeg, 1994), which arise from a mix of Indigenous Technical Knowledge (ITK) and the deconstruction of core knowledge and its adaptation to the often challenging biophysical environments of more marginal regions. Often there are legacies in marginal regions of older farming and food systems, as well as distinctive local cultures and practices. Development prospects in such regions are seen to be enhanced by blending core knowledge and local knowledge. The early work on endogenous development, which was often based on an exploration of deconstructed technologies, reconstructed into local adaptations, morphed into a wide ranging set of studies of the role of networks (Marsden and Renting, 2003) and webs (van der Ploeg and Marsden, 2008) in multifaceted rural development.

Emergent novel 'webs' in the rural (mostly agro-food) sector are seen as a consequence of the interactions of markets, novelty production, the governance of markets, new institutional developments, co-production of sustainability and social capital (Kanemasu *et al.*, 2008). The term SI is not used, but many such activities in endogenous development can be seen to be underpinned by SI. These different domains are seen as interacting in different ways, and with varying importance in different places, as evidenced to deliver enhanced development outcomes. Local agency is almost always seen as a crucial force. The authors argue for a "dynamic, actor-oriented context-specific analysis" of the unfolding webs of rural development (Kanemasu *et al.*, 2008:208).

The rural sociology antecedent to SI recognises the centrality of novelty, new forms of governance and locally based action in creating new development opportunities, whilst also rejecting a linear model of innovation as new ideas and technologies emanating from research institutions and then trickling down. Although initially focussing on the agro-food sector, the domain of interest now includes forestry, renewable energy and tourism as examples of these novel development practices. The clear implication is that the innovation that arises may be technical, institutional or social, but it is never simply technical. At its heart is an exploration of what the advocates of the endogenous development approach see as an assemblage of driving forces operating with different strengths and impacts in different places. This approach resonates with the agro-ecological approach of Altieri (2002).

Some of the rural sociology literature (e.g. van der Ploeg and Marsden, 2008) acknowledges the contribution of actor network theory (Callon, 1986). Callon notes how changes (perhaps consider as innovation) can arise through socio-technical moments of translation. Its emphasis on networks and interactions between actors and technologies, coupled with its strong focus on predisposing factors to moments of translation (i.e. changes in how networks adapt and evolve) connects strongly to an idea of innovation as something beyond purely technical change, mediated by social and economic forces.

The endogenous and neo-endogenous literatures on rural development are underpinned by the recognition that innovation is less about a diffusion curve or SI spiral and more about how social and technical systems can co-evolve to make more effective use of territorially specific assets and local knowledge, albeit increasingly in the context of markets that often transcend the immediate locality. Enhanced mobility and, in particular, tourism have 'opened up' remote areas where distinctive



cultures (of food, buildings, land uses) create a distinctive tourism offer, the provision of which is contingent on building local capacities to respond to the opportunities. Through policy means such as LEADER, these territorial specificities can be built on to provide a development platform. LEADER's partnership-based, multi-sectoral approach can be seen as a potential means of strengthening social capital and SI. SI can be seen as one important means of realising the new forms of collaboration and new networks which underpin this model of territorially based local development.

3.5 Social Capital

The fourth strand of literature reviewed is the concept of social capital. Social capital is often considered to consist of social networks, which are characterised by mutual trust and reciprocity between the actors (Putnam, 1993; Coleman, 1988; Granovetter, 1983; Fukuyama, 2000).

The existence of social capital has been used to explain success in economic development, evolution of communities, growth of entrepreneurship and enhanced socio-economic performance of diverse groups. The strength of networks and the building of trust as seen as critical in enhanced performance (Christoforou, 2017).

From a theoretical perspective two main traditions emerge: the Putnamian tradition focused on a conception of social capital connected to the social capital and political participation of individuals, and the Bourdieusian tradition which is centred on power relations, social inequalities, governance structure, and on the multi-dimensional and contextual aspects of social capital (Christoforou and Lainé, 2014).

It has been also suggested that social capital is inherited from previous generations thereby producing, and also reproducing, social relations of certain actors as Putnam's (1993) seminal work suggests. Similarly it could be that actors in MRAs inherit the existing social capital reproducing their marginal position undermining capacity for SIs.

The predominantly North American tradition of social capital differs somewhat from the Bourdieusian conception. Social capital, in the Bourdieusian tradition, provides a type of capital linked to the "possession of a durable network of more or less institutionalised relationships of mutual acquaintance and recognition ... which provides each of its members with the backing of collectively-owned capital, a 'credential' which entitles them to credit, in the various senses of the word [in the economic, social and cultural domain]" (Bourdieu, 1986, pp. 249–250). Thus social capital can underpin SI as a collectively-owned capital. This can also be true for MRAs.

Recent studies have clarified how MRAs can be endowed with forms of social capital that are based on mutual acquaintance and recognition, and that can be used as a possible resource in SI initiatives (Bhatt and Ahmad, 2017; Bhatt and Altinay, 2013). Nevertheless, power relations, local governance arrangements and social inequalities of marginalized rural areas could limit or work against these initiatives, despite well-intentioned efforts. Moreover, SI initiatives could shape the emergence of new power structures with either equal or more unequal distribution of resources among actors.

These different perspectives on how social capital can realise an opportunity for change requires an exploration of the paradox of agency: "as individuals, as social beings, people are both deeply conditioned by, and dependent on, the continuity and stability of the social systems they have invented. Additionally, they are capable of altering these through both conscious and unconscious effort" (Westley and Antadze, 2010).

Social capital explains SIs as social processes that emerge from individual and collaborative actions and may serve common goals. Social capital can also explain the birth and growth of SIs in MRAs by



its role in the building of trusting relationships between individuals towards the establishment of collectively owned capital.

3.6 Social Enterprise

Social enterprises and social entrepreneurship constitute a specific type of SI. The term social enterprise sums up a range of socially oriented types of business that are termed different things in different European countries (Borzaga and Defourny, 2001). These socially oriented enterprises operate in two main fields which often overlap: work provision and social and community care services. In some countries there are also social enterprises that address environmental issues. They can constitute arm's length extensions of public sector organisations managed by third sector bodies or more radical challenges to established ways of behaving (Zografos, 2007). There is a strong element of hybridity in some types of social enterprise, where municipalities or central government has been able to offload arenas of activity to the third sector but at the same time provides a proportion of their finance. Some, as in local development trusts in the UK, or Finnish village development co-operatives, directly address local social and economic development as umbrella third sector socio-economic development entities. Such agencies made up of citizen actors alongside formal agency representatives often act as "midwives" for social innovations.

Although Borgaza and Defourny (op. cit.) date the origins of social enterprise to the early 1970s and the economic crisis at that time, socially motivated interventions in standard business models have a long history in the UK, dating back at least as far as Robert Owen in the early 19th century who managed mills in New Lanark and delivered 'wrap around' care services for the occupational community (Woodcock, 1992). Many other examples of socially motivated commercial enterprise can be found in the early industrial period.

Arguably more recent market and policy failures and the withdrawal of the welfare state from certain fields of activity are major drivers of current social enterprise. However, individuals may also be motivated for personal reasons (e.g. a disabled family member) to set up a not-for-profit care organisation. The character and focus of social enterprises are likely to be influenced by national cultures, traditions and legal systems and it is noted that there are substantial differences between countries in Europe. Further, they seem to have distinct intra-national geographies, being strongly evident in the UK in both declining industrial urban areas and remote rural areas, both areas where market-based economic activity is often weak and public sector resources stretched.

Theories of social enterprise and social entrepreneurship are needed to explain the emergence and strengthening of these third sector bodies which have emerged as such a powerful force in areas marginalised by market conditions and the withdrawal of public services because of austerity policies. They comprise a specific form of SI where the resultant products or services are delivered by a huge variety of entities and are especially capable of reaching out to marginalised groups from refugees to poor people.

3.7 Socio-ecological Systems Dynamics

A social-ecological systems (SES) approach to sustainable human-environment interactions is an integrated system oriented approach capable of addressing socio-ecological complexity (Fischer *et al.*, 2015), focusing on the dynamic interrelationships of different elements that shape issues applied to complex, nested systems operating at multiple scales (local, regional, national, international). Moreover, it helps to explain how multiple forms of governance influence resource users at different scales, and how they affect resource systems that have diverse characteristics. The consequences of action situations may spread across scales.

Recent approaches to the SES approach highlighted that instead of treating SES as single unit of analysis, more focus should be placed on the resilience and durability or robustness of SES, in



particular on certain groups of actors by questioning for whom (Lebel *et al.*, 2006) and by whom (Kofinas *et al.* 2013). Resilience thinking (Berkes and Folke, 1985) expands the dynamics of change to the panarchy model (i.e. "a small shift in one thing can produce big changes in everything") and provides arguments for navigating change in complex systems using a systems approach.

When looked at from the perspective of SIs it can be seen that such system stability or durability is an important attribute that merits attention.

Adaptive capacity addresses how well the community and associated SES are able to create innovations that can secure enhanced community well-being. Therefore, SIs comprise one type of response to various on-going changes to maintain sustainable human-environment relationships. Well-functioning adaptive capacity can lead to enhanced social capital and relationships, economic benefits as well as sustainable SES. Adaptive capacity, or capacity to innovate to cope with on-going change, can be enhanced by learning to live and cope with change and uncertainty, by nurturing diversity within the given system, by combining different types of knowledge, and by enabling self-organization of the actors within SES (Resilience Alliance, 2016).

Numerous experiences of the SES approach provides analysis that included stakeholders perceptions of the problem, thus providing insights on the interactions between people, institutions, and biophysical systems that generate fragilities (Ruiz-Ballesteros and Brondizio, 2013; Barnett and Anderies, 2014; McGinnis and Ostrom, 2014). Those experience incorporate diversity of patterns of interaction amongst multiple actors and resource systems occurring in an action arena in the context of overlapping governance systems with diverse forms of learning and adaptation. With a better understanding of these complex interactions, actors were able to promote novel interactions and feedback that could lead to a more robust system.

SES approach enables exploration of multi-dimensional factors of marginalization of rural areas such as ageing of population, unemployment, physical isolation or socio-economic barriers. It also deals with dynamic changes at multiple levels, and their interactions, by considering the endowment of territorial capital, here defined as the system of territorial assets of economic, cultural, social and environmental nature that frames the potential for development of places.

More radical and far reaching innovations have been captured by the concept of transformability, which has been defined by Walker and Salt (2006) as the capacity to create a fundamentally new system when ecological, economic, and/or social conditions make the existing system untenable. Transformation processes benefit from networks, leadership and various strategies as documented, for example, in Westley *et al.* (2013) and Weis *et al.* (2011).

In conclusion, the SES and resilience literature considers that sustainable human-environment relationships are the goals of innovations, which also serve social needs. SES literature underlines that complex adaptive socio-ecological systems are capable of crafting their own rules that allow for sustainable and equitable management, and can address resource management problems without external authorities and even without any external financial incentives (Ostrom, 1990, 2005, 2011; Berkes and Folke, 1985; Poteete *et al.*, 2010). Successful innovation processes are understood to be systematic adaptive changes that can lead to transformations of the system and are dependent largely on the collective action of social actors and their interrelationships nurtured purposefully to secure a long term perspective.

3.8 Linking Theories to Key Questions about Social Innovation

At the beginning of Section 3 a number of key questions were raised about SI, the responses to which should be informed by the theoretical concepts reviewed above. Those questions are now linked to the different theoretical positions (Table 2).



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It is not intended to privilege one theoretical perspective over any other in this brief review. What each of these theoretical perspective shows is that SI either directly or indirectly informs the theory or is informed by the theory. Further, across these diverse theoretical perspectives, there is the potential to show that SI can be a powerful shaping force in development outcomes. In pursuit of more balanced territorial development and of a transition towards more sustainable development outcomes, SI is one potential means of delivering positive change. Different theories can help explore certain key questions relating to the emergence and resilience of SI. The position developed within SIMRA is that different theories inform different questions that are being asked of SI. It is therefore necessary to analyse the reach and range of each theory or approach to apply different theories or parts of them on specific research questions.



Table 2. Starting points of SI and their connection to different theories

	Innovation Theory	Regional Development	Endogenous Development	Social Capital	Socio-ecological system	Social entrepreneurship
Why and how has SI arisen as a powerful discourse in development thinking?	-	**	**	*	-	*
What forms does SI take and how are these seen to vary over time and space?	*	**	**	-	**	**
What are the preconditions that give rise to active SI and as a corollary, what impedes the emergence and development of SI?	**	***	**	***	**	*
To what extent is SI endogenously emergent (an emergent property) or can it be stimulated by exogenous interventions?	*	*	**	*	**	*
To what extent does SI development enables mutual learning processes?	**	**	**	***	***	**
What factors enhance the durability and sustainability of the system and “up-scalability” and “out-scalability” of SI?	**	*	*	**	**	*

Key: *** strongly informs; ** moderately informs; * weakly informs; - does not inform



4 Conceptualisation of SIMRA transdisciplinary framework

Understanding the mechanism of change in complex systems requires consideration of the dynamics of change and the identification of factors and spatial and temporal dimensions that systematically affect those processes. In this section we move from exploring the implications of related theories to the development of transdisciplinary framework for understanding SIs in MRAs. In Section 4.2, the conditions and properties of a model of SI dynamics are introduced for MRAs, and graphically interpreted in Figure 3. Section 4.2 presents the SIMRA transdisciplinary framework to better understand SI in MRAs (Figure 5), incorporating empirical evidence from the SIMRA database of examples of SIs, containing over 300 submissions and 166 validated examples of SI from the expert knowledge of SITT members and project partners.

4.1 Social Innovation Dynamics in Systems in Marginalised Rural Areas

The theoretical positions presented in Section 3 provide different conceptual framings and imply different scientific questions and policy responses. Even where social practice is ahead of theory, conceptual lenses still frame actions. The six conceptual families presented have the following implications for SI:

- i) SI can be viewed as a particular type of innovation that can be framed by innovation theory in which SIs are understood as outputs, and where novel ideas are transformed to products and services meeting social demand and potentially enhancing social well-being.
- ii) SIs can be understood as processes in social entrepreneurship literature rooted in management science, where entrepreneurial processes are key for understanding innovations.
- iii) SIs can be considered as the underpinning social processes behind endogenous development.
- iv) SIs can be considered as a set of socio-economic processes underpinning and catalysing regional development.
- v) SI could be seen as building closely on the presence of strong social capital.
- vi) SI can be seen as ways of enhancing system dynamics of MRAs and thus the capacity of social-ecological system to cope with change in innovative ways.

The SIMRA project builds on these six perspectives in the development of SIMRA framework to understand SI. Furthermore, following the work on the classification of SI for MRAs (Polman et al., 2017; D2.1) and the characterisation of MRAs (Price et al., 2017; D3.1), and Section 2 and 3 of this deliverable, we distinguish SI from technological, process, organisational innovations or other types of innovation in their Schumpeterian meaning that are implemented inside the business or organisation. Some authors recognise technological innovations in supporting social innovation (Neumeier, 2012; Cajaiba-Santana, 2014). However, as mentioned, the other types of innovations are outwith the scope of SIMRA.

SI in MRAs cannot be addressed in isolation or using mono-disciplinary approaches. Understanding SI in MRAs can best be addressed using a clear conceptual framework that defines the key variables of SI emergence, and visualizes its development and dynamics, interconnections, relationships, changes and feedback. Such thinking transcends disciplinary boundaries by focusing on the dynamic interrelationships of different elements shaping complex sustainability issues (Abson *et al.*, 2017). Abson argues that, in general, a framework provides the basic vocabulary of concepts and terms and gives the logical connection and interaction between concepts and terms that may be used to construct the kinds of causal explanations expected of a theory.

Following our previous arguments, and to address the transdisciplinary processes associated with the dynamics of SI in complex systems, the framework requires: (i) a system of parameters-variables



to analyse the mechanisms of change in spatial and temporal dimensions; (ii) flexibility to cope with diversity of complex systems; (iii) the effective integration of scientific and societal knowledge; (iv) methods for evaluation of SI in MRAs. It may also provide policymakers with a solution-based approach to promote or determine the expected transformation and change required to enhance societal outcomes.

A conceptual framework has been developed for use in SIMRA that can accommodate the diversity of examples of SI and provide a means for exploring their motivations, development and dynamics. It enables researchers from diverse disciplinary backgrounds, working on different resource sectors, geographic areas, biophysical conditions, and temporal domains to share a common vocabulary for the construction and testing of alternative theories, models and hypotheses. A first step in developing and interpreting SI dynamics in MRAs (Figure 3) is based upon the theoretical conceptualisations presented in Sections 2 and 3, in particular Murray *et al.* (2010), McGinnis and Ostrom (2014), Neumeier (2016) and Haxeltine *et al.* (2017).

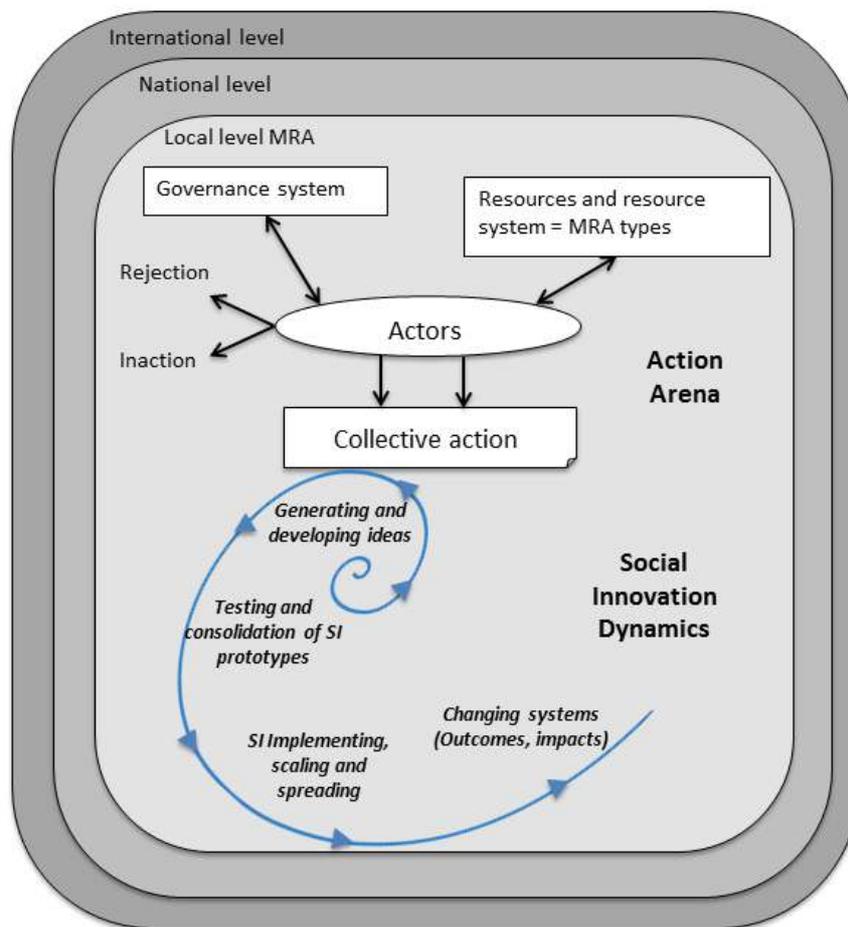


Figure 3. SI dynamics in MRAs (Source: Author's development, based on Murray *et al.*, 2010); McGinnis and Ostrom, 2014; Neumeier, 2016; and Haxeltine *et al.*, 2017; Secco *et al.*, 2017; SIMRA D4.2).

The central part of SI processes occurs in the **Action arena** where particular manifestations of biophysical, and institutional conditions interact with actors and jointly affect outcomes (Ostrom, 1990, 2011; McGinnis and Ostrom, 2014). The idea of the action arena, as originally designed by Ostrom (Figure 4) demonstrates actor dynamics in action situations as the most essential conceptual factors.

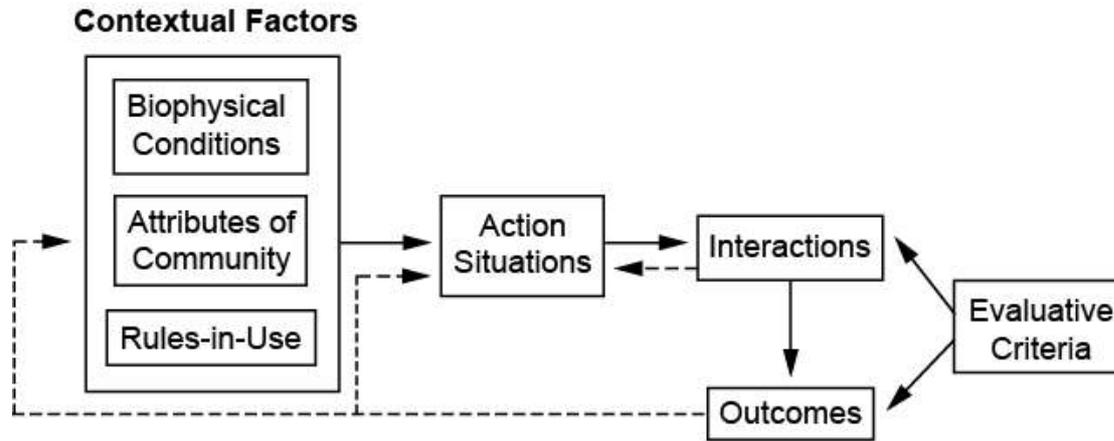


Figure 4. Action Arena. (Source: Adapted from IAD framework to analyse SES, Ostrom, 1990, 2011; McGinnis and Ostrom, 2014).

In the SIMRA framework, the contextual factors that determine SI process in MRAs are preconditions for the emergence and development of SIs at the focal level of analysis. This determines the types of interactions and outcomes related to a particular resource system, and the governance systems that influence the behavior of these actors.

Resource systems are understood to be resources, resource management practices and attributes of the community in particular geographical units. In this context, we characterise SIMRA resource systems by MRAs following the characteristics developed in SIMRA (Price *et al.*, 2017; D3.1). Three types of resource systems, representing particular types of rural areas, defined as having population densities under the threshold defined by OECD (2011) were characterized as MRAs: mountains, islands, and arid areas. It should be noted, first, that these often overlap and, second, that all also contain urban elements, but these are not the focus of SIMRA. In the SIMRA typology of MRAs resources comprise natural, technological, economic, cultural or social resources. Each of the three types of MRA has a particular set of natural resources (e.g. land used for agriculture, forests, and protected areas, water resources, and the biological components of these). All present particular opportunities for particular types of activities, such as the generation of renewable energy, e.g. hydroelectricity and wind (mountains), solar (arid areas), wind and offshore currents and waves (islands). These various resources may also be defined in terms of ecosystem services, including cultural ecosystem services; for example, the value of these environments for tourism and recreation, the aesthetic value of landscapes, and the cultural identity of inhabitants. These may all be relevant for particular types of SI.

With regard to technological resources, two types of infrastructure were used to characterize MRAs: roads and internet access. Their relative availability may either foster or hinder different types of SI. They are further linked to a range of economic and social resources which may either foster or hinder SI. In the description of MRAs in SIMRA (Price *et al.*, 2017; D3.1), a number of these were explored, although it was only possible to do this at coarse spatial resolutions that are usually of little relevance to specific examples of SI. The availability and effectiveness of economic resources can be expressed in terms of GDP per capita, as well as people at risk of poverty or social exclusion. A further key resource is the availability of education and training; this was explored in terms of early school leavers. Finally, MRAs are often also areas with severe demographic handicaps, which link economic resources and the availability of health care; one indicator on which is infant mortality.



Governance systems include social and institutional arrangements such as rules in use, understood as rules that are practices in real situations, norms, governance structures closely interlined with actors. **Actors** include active participants in SIs, e.g. direct users, extractors, sellers of goods and services, regulators, intermediaries, consumers who affect the management of the resource systems. The ways in which actors engage may be many and varied, from the formation of interest groups and charitable bodies to collaborative engagement in informal institutions to active participation in formal institutions. It helps to understand social dynamics and processes that occur at local to global scales, how multiple forms of governance systems influence actors at different scales, or how they affect the environment and resources that have diverse characteristics. In general, scale considers administrative and institutional boundaries of territories (Cash *et al.*, 2006; Gibson *et al.*, 2000). We use the EUROSTAT subdivision, the “Nomenclature of Territorial Units for Statistics” (NUTS¹), that divides the European Union into 5 levels. Data used to characterise MRAs was typically analysed at NUTS3.

Complex system dynamics of SI in MRAs assume cyclical mechanisms of change, as introduced in Sections 2 and 3, resulting in fast and slow moving actions in the system having consequences for interactions and SI dynamics. Collective action occurs in the action arena to create innovation processes at four possible stages.

Generating and developing ideas

First stage implies the emergence of social innovations from the ideas of groups or individuals, which can be developed and implemented into collective action. Three major types of action can be considered: growing, testing and consolidating of SI; implementing, scaling and spreading of SI; changing systems. The rejection of novel ideas occurs when conditions of SI growth are not created. If actors in MRAs are not sufficiently active or powerful then a novel idea may result in inaction. If SI dynamics is present then collective action very likely enhance the development of SI.

Growing, testing and consolidating of SI

Following the emergence of novel ideas, SI can grow into prototypes, develop and stabilise. Some SI will evolve quickly, such as political economic and social disturbances², whilst others will develop slowly such as cultural norms, responses to natural disturbances, indigenous knowledge for participatory engagement (see Bromley, 2006, Leach *et al.*, 2013, Folke *et al.*, 2002; Gatzweiler and Hagedorn, 2002; Holling, 2004; Kluvankova-Oravska *et al.*, 2013; Roland, 2008; Vatn, 2005), beliefs and values (Moore *et al.*, 2012).

Implementing, scaling and spreading of SI

The feedback paths incorporated suggest that the consequences of action situations may spread to any of the other top levels of the system. This interaction generates products (such as relationships, collaborations, networks, institutions and other new governance arrangements), and outcomes (negative or positive) that can potentially change many, or perhaps all, of these input factors.

¹ NUTS derives from the French version *Nomenclature des Unités Territoriales Statistiques*. The current NUTS 2013 classification is valid from 1 January 2015. *The national level corresponds to NUTS1 (country – boundaries). The regional level corresponds to NUTS2 (region at sub-national level). The local level includes two levels of Local Administrative Units (LAU): the upper LAU level (LAU1) is not defined for all of the countries, while the lower level (LAU2) consists of municipalities or equivalent units in the 28 EU Member States*

² Disturbances are understood as any short term (shocks) and long term (stresses) events that affect the functions and structure of the system (Leach *et al.*, 2010).



Changing system

Changing system is characterised by system reconfiguration of social practices such as the rebuilding of institutions, managerial rules, and new governance arrangements as outcomes of collective action with potential effects or impacts on the well-being of the community. The intensity and quality of collective action in the action arena is influenced by biophysical and institutional factors and rapidly effect SI paths and probability of system change. This type of action is considered in this report as the most likely instigator of SI in MRAs. This does not mean that different actions or contexts could not also lead to successful implementation of SI.

Work on methods for evaluating SI (SIMRA D4.2) also uses the direct involvement of stakeholders in the formation and validation of the SIMRA framework. This may help to define the context in which SI arises and interconnect SI variables that can measure success and failure of SI in MRAs.

4.2 SIMRA Transdisciplinary Framework to Understand SI in MRAs

The dynamics of SI processes depend on a variety of variables essential for the success of the innovations. The SIMRA framework comprises three tiers of variables that influence emergence and divergence of SI. Following the theoretical foundation discussed in Section 3, informed by the SIMRA SITT workshop in Bratislava (October 2016), SI variables have been identified: i) exploratory variables, important for the emergence of SIs (individual and collective needs); ii) exploratory variables important for developing SIs (SI context); iii) conceptual variables of learning inside and outside MRA boundaries; iv) impact variables to determine sustainability and system change. The sequence of steps required to undertake this process is described below.

SI as defined by the SIMRA project, concerns the reconfiguration of social practices in response to societal challenges based on novel ideas and values. SI involves the creation of new institutional arrangements and partnerships recognising the likelihood of trade-offs amongst competing interests and outcomes and engaging civil society actors.

The SIMRA transdisciplinary framework for understanding SIs in MRAs enables robust analyses of diverse marginalised rural areas and the different processes that lead to SI. Its strength lies in its holistic approach to the analysis of the action arena and integrating transdisciplinary knowledge. SIMRA transdisciplinary framework is illustrated by selected SI example from SIMRA database in Box 1 below.

Ongoing global societal challenges of poverty, resource depletion, urban deterioration, unemployment and climate change are requiring more societal participation in research design for eliciting knowledge and integrating of science and society (Lang *et al.*, 2012). Transition literature (Geels, 2011; Ostrom, 2009; Piattoni, 2010) assumes systematic processes of change based on general and specific variables, and is applicable for complex systems (such as a business, a city, an economy, ecosystem, or eco-region) within or under a multilevel operation. Bekkers *et al.* (2013) distinguish: i) SI environment; ii) innovation as a learning process; and iii) innovation adoption mechanism. Baker and Mehmood (2015) argue that the emergence of SI reinforces three societal functions: i) basic individual and collective needs; ii) relations with SI environment; iii) capabilities to influence SI adoption.

Neumeier (2016) distinguishes: i) determining factors for the SI actor network; ii) factors influencing the participation process; and iii) factors influencing the success of the SI. Innovation adoption is defined as a process of re-innovation where the innovation is adjusted to the specific context in which a SI is implemented (Bekkers *et al.*, 2013) and is comparable to the participation process as referred to by Neumeier (2016).

SI variables for understanding SI in MRAs are system parameters to identify factor that influence mechanism of change /or are describing certain characteristics of social practice reconfiguration in



spatial and temporal dimension. In particular they are i) flexible, to cope with the complexity of systems and their factors of change; ii) where appropriate, solution based approaches to enhance societal outcomes. It is also apparent that growth, consolidation and sustainability of SIs as the collective action are contextualised by their surroundings and societal challenges, and affect the dynamics of changes in complex systems.

The formation of SI variables follows an abductive approach (Poteete *et al.*, 2010) and is a joint product of SIMRA Work Packages 2 and 3. The SI variables are likely to have influenced, or have the potential to influence, the future divergence and convergence of SI paths in MRAs. In particular variables can be used to test hypotheses. Initially, the variables for SI emergence and divergence have been identified based upon the theoretical foundations followed by consultations and advice of the SIMRA SITT, provided via online survey in June 2016 and consultation in the transdisciplinary workshop (Bratislava, October 2016). Twenty one SITT members discussed variables that affect emergence of SI in forestry, agricultural and rural development, and associated them with particular types of MRAs (e.g. mountains, arid areas, islands and sparsely populated areas). The set of SI variables identified as being of greatest relevance, drawn from the consultations (e.g. Figure 5) were presented and discussed in a closing plenary session.

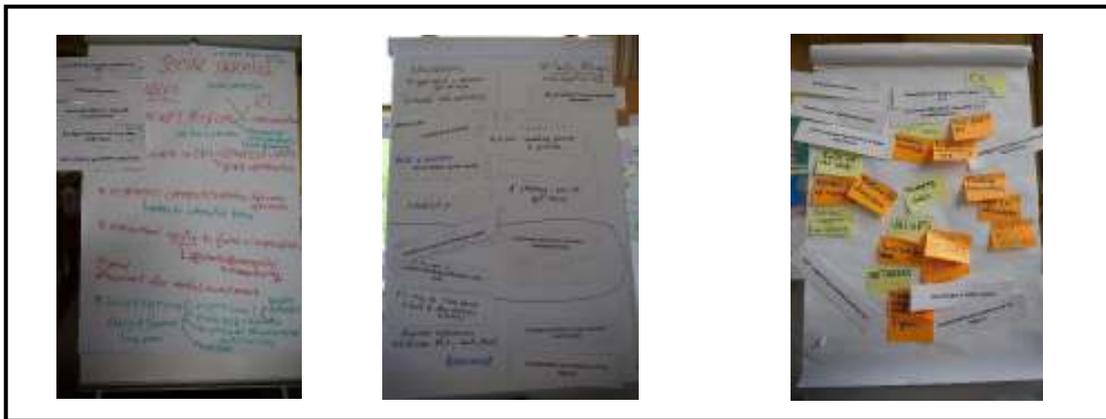


Figure 5. Examples of feedback from members of the SITT when discussing variables that affect the emergence of SI in: a) social farming (in arid areas); b) accessibility of health care (in sparsely populated areas); c) a polycentric network approach to forest fire management (in mountainous areas).

Inductive analyses of variables of SIs in MRAs have used meta-analyses of the full dataset of examples of SI, developed in Task 3.3 and the associated database (Bryce *et al.*, 2017; D3.2). The database contains over of 166 SI examples, validated in Tasks 3.2 and 3.3. Informed by these examples, a preliminary list of explanatory, conceptual and impact variables was determined.

The variables are presented in four categories. Members of the SITT ranked all the variables using a numerical scale for each category based on importance as part of the 2nd round of consultations (July 2017). The next steps in the use of these variables is to determine the major factors (variables) for each stage in the development of SI that affects the hypotheses of diverging paths, and inform the selection of CS for use in SIMRA Work Package 5, methods for evaluation of SI (Work Package 4) and to analyse policy processes (Work Package 6).

SI variables for MRAs form a final part of the SIMRA transdisciplinary framework. Derived from processes in the action arena, and addressing the interests of actors, SI variables relating to the dynamics of MRAs, in particular emergence, development and consolidation learning, scaling and impact through to the long term existence (Figure 6).

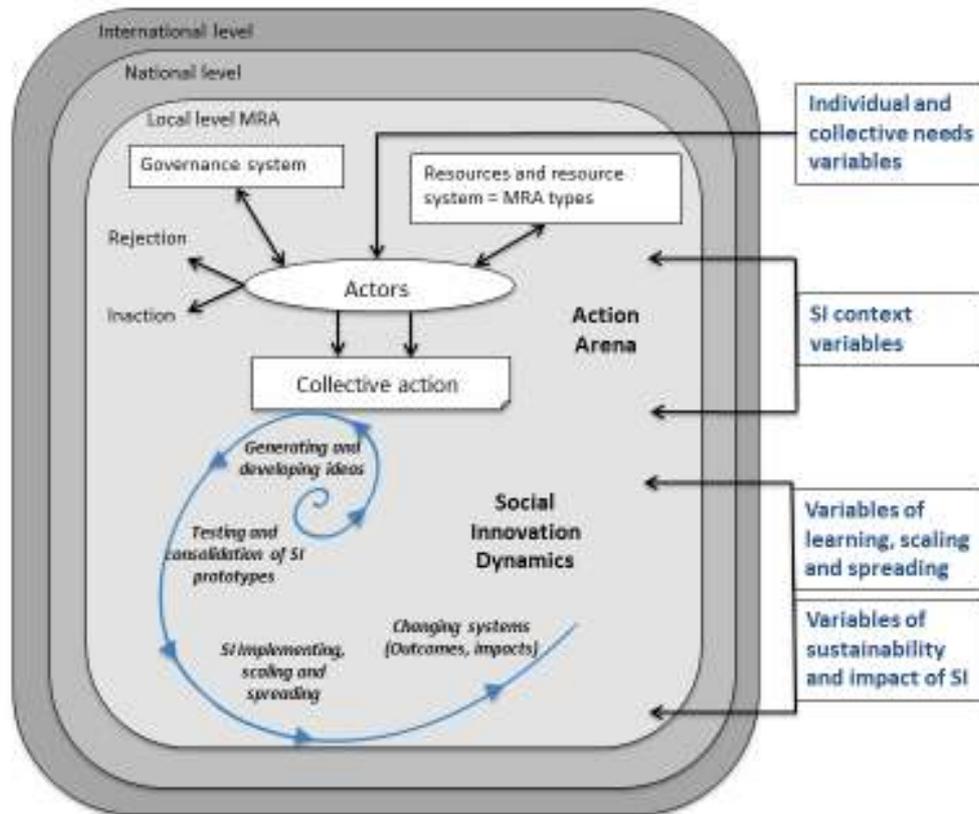


Figure 6. SIMRA transdisciplinary framework to understand SI in MRAs (Source: Author’s, based on Murray *et al.* 2010; McGinnis and Ostrom, 2014; Neumeier, 2016; Haxeltine *et al.*, 2017).

Based upon the theoretical grounding presented, variables have been defined and in the following 4 categories:

- i) **Individual and collective needs** are exploratory variables reflecting the emergence of SI that mainly originates from external factors and drivers such as system changes, shift, or shocks from socio–economic crises, socio-economic disparities, value systems and beliefs. Natural disturbances could include climate change impacts of flooding and temperature extremes, and earthquake. Other relevant factors include demographic change.
- ii) **SI context variables are** exploratory variables that reflect internal drivers of system change for the growth and emergence of innovative ideas in MRA systems. It is represented as regulation or bottom-up processes, such as re-structuralisation confronted by long-standing and widely-recognised, sometimes “wicked” problems: market failure policy failure, failure of the state, regime failure etc. (See details in Table 3).
- iii) **Variables of learning, scaling and spreading** that enhance consolidation and scaling of SI. Derived from internal deliberative, participatory movement of the system to expand and provide room for the manoeuvre of actors based upon building trust, participation, knowledge exchange, and self-organising activities that mature into social capital.
- iv) **Variables of sustainability and impact of SI** are conceptual variables of impact and outcome which concern processes and responses that address system change of SI and its transfer outside the area of emergence. There it is accommodated in specific spatial and temporal contexts (e.g. MRAs) such as novel forms of partnerships and networks, entrepreneurship, coordination (reconfigured), resilience self-organised regime, etc.

Four groups of variables were identified as constituting an essential part of SI dynamics in MRAs, presented in Table 3. The frequency of SI variables associated with on-the-ground examples of SI



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recorded in the SIMRA database is shown in Figure 7, drawing on 164 examples that were validated for this analyses (6th September 2017).

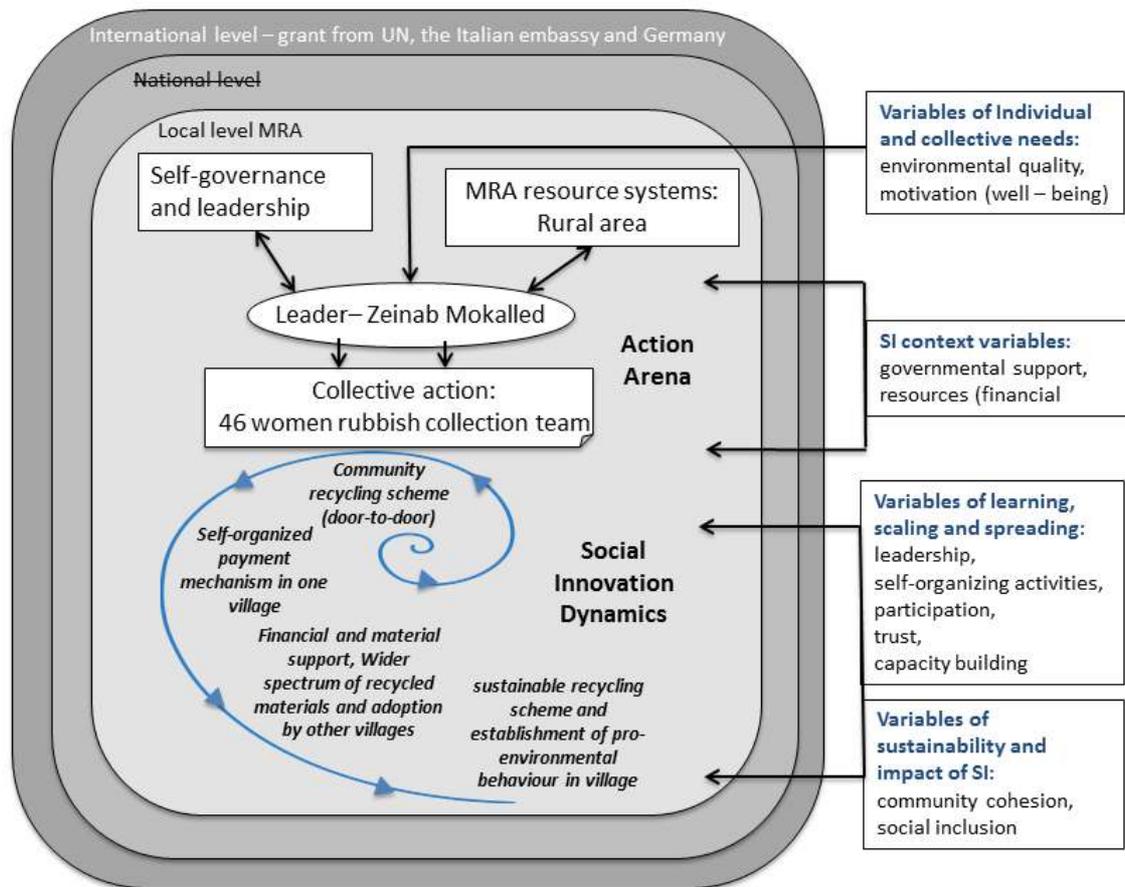
In the next step, a ranking of variables was conducted in a 2nd online consultation with members of the SITT (July 2017). Members of the SITT ranked the variables in four categories as listed above, and presented in Table 3 according to their relative importance. In Table 3, the mean scores of the SITT rankings are provided for each variable for each of the 4 categories. These represent the aggregated SITT ranking of variables. The future use of variables is to inform the formulation of hypotheses to explain diverging pathways of development and work in Work Packages 4, 5 and 6.

The SIMRA conceptual framework provides a basis to develop methods and approaches for the evaluation of process and products (in Work Package 4) that will be tested in the SIMRA cases studies and demonstrated through innovation actions (Work Packages 5 and 7), and to identify possible outcomes for various policies (Work Package 6).



Box 1: "Call of the Earth"

The "Call of the Earth" represents an example of environmental and human health inequality related to the dysfunctional waste management system in Arabsalim village (Lebanon). A community recycling scheme was developed on the personal initiative and leadership of a former teacher of Arabic (Zeinab Mokalled) at a local high school. She believed that only by sorting and recycling could there be effective disposal of waste in Lebanon. The problem was neglected by authorities, so she took the initiative and called on the women of the village to help her to collect waste, door-to-door. At the beginning, the all-woman rubbish collection team, set up in the mid-1990s, used Mokalled's back garden as a storage area for recyclable waste and a lorry bought by one of the volunteers. Collective action evolved via reciprocity, increasing reputation and trust into self-organised volunteers' payment mechanism (each of 46 members contributes c.US\$40 each year). They began recycling glass, paper and plastic. They then started collecting electronic waste, and have employed a researcher to find the best way of making compost from the materials being collected. After three years, this SI prototype proved to be contributing to improved community well-being, and local authorities started to participate and support the initiative with a land for garbage storage which enabled the building of new capacity. The initiative was able to rent another lorry and after 10 years they received financial support from the Italian Embassy to build a warehouse. They received support from Germany and the UN. The initiative contributed to improving social inclusion and community cohesion by empowering women. Now nearby villages are adopting similar schemes. For example, recently, the women of Kaffaremen have set up their own initiative, which is similar, except that it is funded by the villagers rather than the volunteers. The nearby town of Jaarjoua has decided to follow suit. This is mapped onto the framework in the Figure below.



Source: SIMRA database of examples of SI based on data available on September 6, 2017



Table 3. Characteristics of SI Variables in MRAs

VARIABLES OF SOCIAL INNOVATIONS IN MARGINALISED RURAL AREAS		
NEEDS	Exploratory variables for the emergence of SI: Individual and collective needs reflecting the emergence of SI that is mainly due to external factors and drivers such as system changes, shift or shocks from socio-economic crises, socio-economic disparities, value systems and beliefs. Natural disturbances could include climate change impacts of flooding and temperature extremes, and earthquake. Other relevant factors include demographic change.	
	Sources /Concepts	Variables with SITT Mean Scoring (7 as the highest and 1 as the lowest score)
	Markets and governance innovations (Biggs <i>et al.</i> , 2010). Conflicts (Slight <i>et al.</i> , 2016) Socio-political capability and access to resources (Moulaert <i>et al.</i> , 2005) Institutional change, (Roland, 2008, Hodgson, 2002,etc Socio-ecological resilience (Holling and Gunderson, 2002; Folke <i>et al.</i> , 2002) Drivers-Pressures-State-Impact-Response model (EEA,1999)	<u>Motivation</u> :, well-being, income philanthropy (6,24) <u>Demographic change</u> : population change (5,56) <u>Need to adapt</u> : survival after natural disturbance (4,47) <u>Need to adapt</u> : survival after social disturbance (4,18) <u>Problem coordination</u> : global coordination problems (4,06) <u>Environmental quality</u> : change in the quality of the environment (4,18) <u>Consumer preferences</u> : market, self-interest, other regarding preferences (3,76) <u>Food security</u> : quantity and quality of the food <u>Health</u> : human health <u>Culture/identity</u> : of the nation, MRA etc.
SI CONTEXT	Exploratory variables for the emergence and development of SI that contain internal drivers of system change for growth, and emergence of innovative ideas in MRA systems. It is represented as regulation or bottom-up processes such as re-structuralisation confronted by long-standing and widely-recognised, sometimes “wicked” problems: market failure, policy failure, failure of the state, and regime failure.	



	Sources /Concepts	Variables with SITT Mean Scoring (8 as the highest and 1 as the lowest score)
	<p>Social capital (Adler and Kwon, 2002; Brondizio <i>et al.</i>, 2009; Putnam, 2000).</p> <p>Participation/ Networking (community, equality) (Agarwal, <i>et al.</i> 2008)</p> <p>Social engagement and attitudes (Krlev <i>et al.</i>, 2014)</p>	<p><u>Resources</u>: financial, environmental, technological, human (6, 29)</p> <p><u>Governmental support</u>: EU, national, regional, local (4, 94)</p> <p><u>Vulnerability of MRA system</u> (4, 88)</p> <p><u>Institutional diversity</u>: flexibility of rules (4,44)</p> <p><u>Traditions</u>: norms, customs, habits, (3,76)</p> <p><u>Cultural diversity</u>: of the community, MRA (3,47)</p>
LEARNING	<p><u>Conceptual variables of learning scaling and spreading</u> that enhance consolidation and scaling of SI. Derived from internal deliberative, participatory movement of the system to expand and provide room for the manoeuvre of actors based upon building trust, participation, knowledge exchange and self-organising activities that mature into social capital.</p>	
	Sources /Concepts	Variables with SITT Mean Scoring (9 as the highest and 1 as the lowest score)
	<p>Participatory/Deliberation processes (Dryzek, 1990; Dryzek and Pickering, 2017; McGinnis and Ostrom, 2014)</p> <p>Self-organizing activities (McGinnis and Ostrom, 2014)</p> <p>Leadership (Westley <i>et al.</i>, 2013; Bund <i>et al.</i>, 2013, Bekkers <i>et al.</i> (2013) Ostrom, 2005) etc.</p> <p>Complexity (difficult to understand or use; Rogers, 2003; Ostrom, 2005, 2009, etc.)</p> <p>Triability (Neumeier, 2016)</p> <p>Forseability of results (Rogers, 2003 and Neumeier, 2016)</p> <p>History or past experiences (Chaffin and Gundersen, 2016; Neumeier, 2016; McGinnis and Ostrom, 2014)</p> <p>Ease of use (Rogers, 2003; Neumeier, 2016)</p> <p>Learning (by failures), Social learning (Garmendia and Stagl, 2010; Gunderson <i>et al.</i>, 2006 and Biggs <i>et al.</i>, 2010; Wals, Rodela, 2014). Coping capacity – see publications: IPCC AR5 (2014) or UNISDR (2009)</p>	<p><u>Knowledge exchange/social learning</u>: self-organised activity of indigenous or community actors (6,18)</p> <p><u>Leadership</u>: ability of an individual or collective to “lead and guide (6, 12)</p> <p><u>Participation</u>: collective action of individuals and the community (5, 94)</p> <p><u>Self organizing activities</u>: emergence of self-organisation via leadership, interpersonal trust etc. (5, 53)</p> <p><u>Capacity building</u>: existing skills and process of rising skills (can be centrally –externally introduced) (5, 51)</p> <p><u>Trust</u> -interpersonal/ collective (5, 47)</p> <p><u>Reciprocity</u> - a reciprocal arrangement or relationship (4,47)</p>



		<u>Coping capacity</u> - capacity of MRA systems to address, manage and overcome adverse conditions in the short to medium term (using available skills, values, beliefs, resources and opportunities) immediately react to changes (4, 06)
SUSTAINABILITY AND IMPACT	Conceptual variables of sustainability and impact of SI are those of impact and outcome which concern processes and responses that address system change of SI and its transfer to outside of the area of emergence. There is is accommodated in specific spatial and temporal contexts (e.g. MRAs) such as novel forms of partnerships and networks, entrepreneurship, coordination (reconfigured), resilience and self-organised regime.	
	Sources /Concepts	Variables with SITT Mean Scoring (10 as the highest and 1 as the lowest score)
	Social entrepreneurship (Bund <i>et al.</i> , 2013; Krlev <i>et al.</i> , 2014) Investment activities (McGinnis and Ostrom, 2014) Monitoring activities (Olsson <i>et al.</i> , 2006) Resource dependency in organizations and networks (Bekkers <i>et al.</i> , 2013; Krlev <i>et al.</i> , 2014) Allocation of resources (Bekkers <i>et al.</i> , 2013) incubation period (Biggs <i>et al.</i> , 2010). Networking and lobbying activities (McGinnis and Ostrom, 2014; Biggs <i>et al.</i> , 2010) Novel Property rights and regimes (Ostrom, 2009; Vatn, 2005).	<u>Community cohesion</u> : <i>compatibility and well-being of the community</i> (7, 62) <u>Cooperation</u> : <i>capacity of the community to cooperate and develop collective action, synergy effect with parallel collective action</i> (6, 58) <u>Self organization</u> : <i>as the product of matured, e.g. long lasting institution</i> (6,1) <u>Education / skills of the MRA</u> (6,00) <u>Social inclusion</u> – <i>capacity of SI to include vulnerable groups (e.g. social entrepreneurship)</i> (6,0) <u>Novel property rights and regimes</u> : <i>new property and management arrangements</i> (5,67) <u>Coordination</u> : <i>as capacity/product of matured institution</i> (5,38) <u>Resilience</u> of the MRA (<i>as Socio-ecological-technological systems SETS</i>) (4,38) <u>Competitiveness</u> : <i>at the global and local markets</i> (3, 58)

Note: Members of the SITT (in second online consultation –July 2017) ranked variables in four categories listed in the text above and table 3 according to their importance. The mean score of that ranking is shown in brackets and refers to the aggregated SITT ranking of variables importance scored *in each category*. Source: Author's analyses based on validated examples of SI from the SIMRA database (Bryce *et al.*, 2016; D3.2), accessed on 6th September 2017.



Table 3 contains a full list of variables developed, upon the theoretical foundation, SITT knowledge, and qualitative scoring (see description of the process in Section 4.2 above). It confirms the validity and importance of variables for the dynamics of reconfiguration of social practice of SI. Following the classifications of Bekkers *et al.* (2013), Baker and Mehmood (2015), and Neumeier (2016) variables are grouped into four categories as integral attributes of the reconfiguration process of SI. The variables within each category are listed in order of importance identified by members of the SITT. This correlates with results of inductive analyses of SI examples. The SI examples represent empirical knowledge that complements the theoretical understanding of SI.

The frequency of the different SI variables which are associated with on-the-ground examples of SI is shown in Figure 7, derived from 166 validated examples of SI from the SIMRA database (accessed on 6th September 2017). The validated SI examples are empirical evidence that complement the theoretical understanding of SI set out above.

It is evident that motivation, in terms of improving well-being of the community, forms a key variable for emergence of SI, and of SI in general. Resources are seen as the most essential internal system variable to support the development of SI. Participation, knowledge and self-organizing processes as components of community learning form pre-conditions for SI growth and stabilization, whilst social inclusion cooperation and self-organization are key for adaptation and system change. This is consistent with results of the ranking of SI variables by members of the SITT, provided in Table 3.

Improving societal well-being is of the highest importance as a motivation for the emergence of SI in both inductive analysis and stakeholder judgment. Resources (financial, technological, environmental, human) were identified as most important factor for SI development and consolidation once the SI idea was born. Leadership, knowledge exchange, participation and self-organised activities were key for enhancing and guaranteeing implementation of SI in an existing institutional background and scaling-up of SI. Social inclusion and self-organisation were identified as major factors for sustainability and impact of SI. Additionally, the SITT attributed high importance to community cohesion, and cooperation, seen as essential to maintain SI dynamics in MRAs for achieving the well-being of the community.



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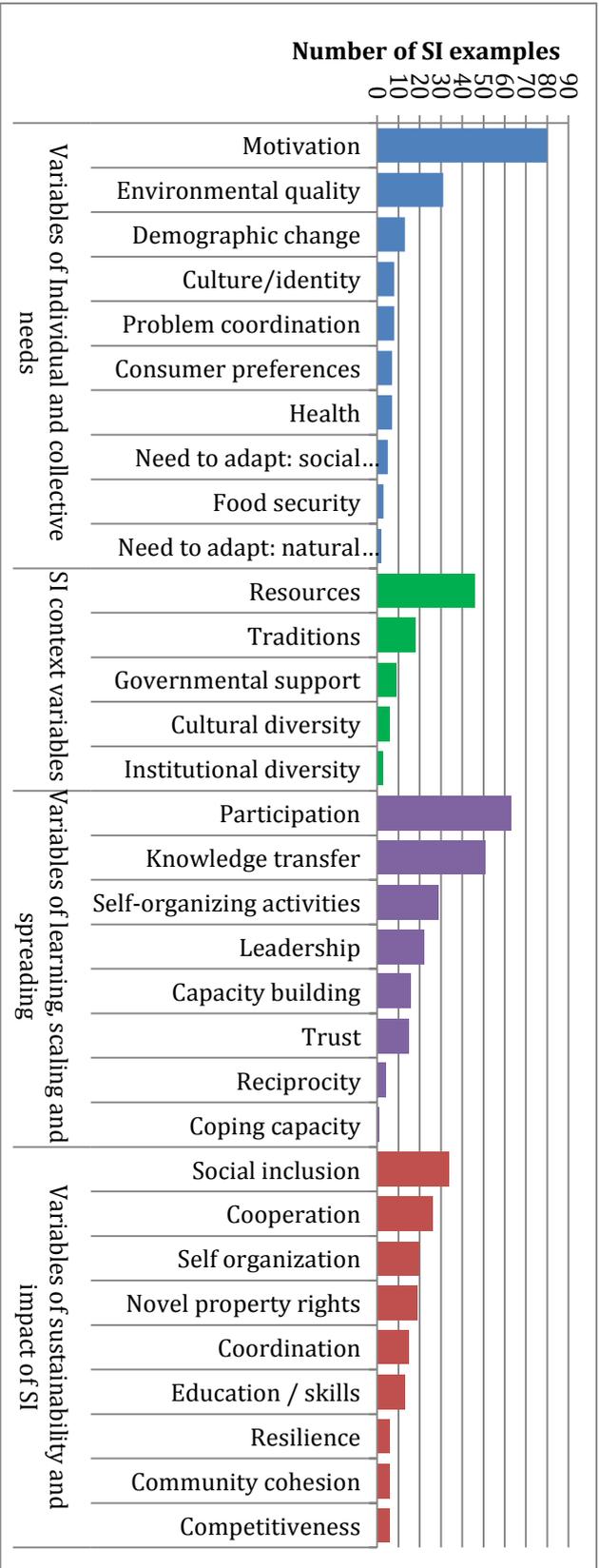


Figure 7. Variables of SI in MRAs (Source: SIMRA database of SI examples based on data available on 6th September 2017.



5 Factors to Explain Diverging Paths of Social Innovations

The aim of the SI variables identified is to characterise precisely the SI dynamics in MRAs, the aim of the diverging paths is to identify the key factors of SI development trajectories followed by SI in MRAs to develop and expand. Understanding diverging “paths” will inform the interpretation of SI mechanisms in case studies that should, in turn, help explain SI. System change means a complete SI cycle, with reconfiguration and changes in social practice over the long term, and with measurable impact on the community, as illustrated by the SIMRA Transdisciplinary framework in Figure 6. SI examples in different development stages of an innovation cycle demonstrate completed innovation processes, however consideration of future cycles of SI are beyond the scope of this study.

In several cases, SI do not deliver the sought after outcomes. Lessons learned from SI failures constitute an important basis for the study of SI success. Evidence of a failure in an innovation process is rare as such cases are hardly documented. However, analyses of SI examples and SITT consultations provide expert knowledge with which we can interpret likely major factors linked to SI failure in MRAs. Descriptors of failure of innovation are: i) no improvement in wellbeing of the local community; ii) the outcome of innovative processes does not expand beyond the boundaries of its emergence (e.g. sectors, level, etc.); iii) the timeframe of the innovation process is too short for impacts to be evident; iv) the expectations of SI beneficiaries are unrealistic and may result in disillusionment; v) legal constraints or unwillingness of authority to cede power.

The timeframe for successful innovation may vary from few months to decades (based upon data in the SIMRA database of SIs). However, a typical timeframe for whether a new idea has the potential to be developed to SI is between a few months to 2 years (based upon the SITT consultation, 2017).

Additionally, in a number of cases, mechanisms of development and growth of SI are weak, as a result of the quality of the institutional environment (e.g. social capital, trust, cooperation, participation, or negative-perverse subsidies).

Weak participation, for example, has been recorded as a major contributory factor of failure of social practice reconfiguration in new EU Members States from central and eastern Europe. This may be linked to the absence of deliberative practice and tradition of centralised and regulatory regimes results in lack of civic activities (Kozova *et al.*, 2016), or has been subject to institutional transplantation of western practice (Hamedinger, 2011). An example of failure is ‘Initiative CENTROPE’. In 2003, it was established as a network of 16 main cities and regions in central Europe to promote regional development. However, it was a top down process of political interest that did not obtain local support after external funding ceased (Jasso, 2009; Hamedinger, 2011).

The validated dataset of examples of SI only include positive examples of SI in MRAs. From this, the most frequent initial purposes or reasons for reconfiguration of social practice were identified, which were community well-being and social inclusion. Identity, belonging and environmental quality were identified as significant in terms of frequency of initiating SI (Figure 8), but these are specific to the character of validated examples (such as a focus on environmental improvement). Analyses confirm that, even although SI is primarily concerned with environmental issues, entrepreneurial activities, and the preservation of traditions, it is essential that it also creates social benefits for the community.

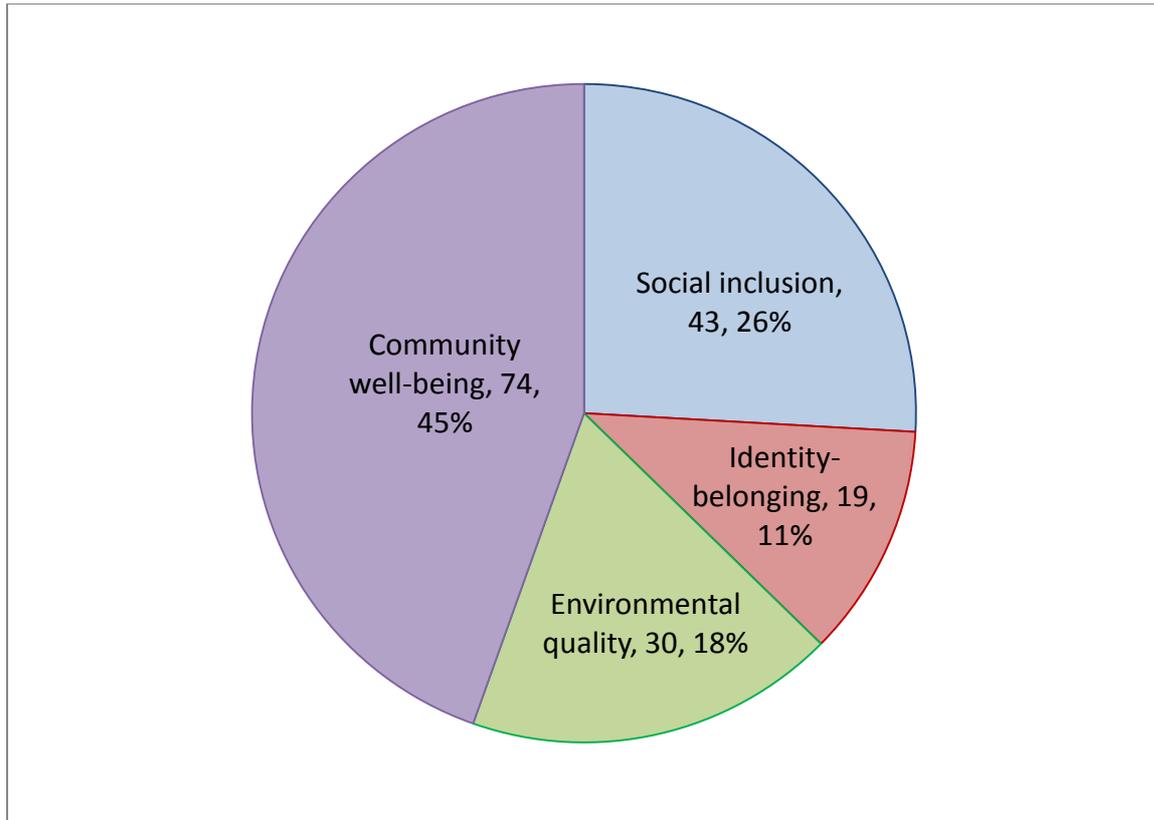


Figure 8. Factors that initiated the reconfiguration of social practice. (Source: SIMRA database of SI examples based on data available on 6th September 2017).

The main trajectories of SI performance in MRAs have been identified following a meta-analysis of examples of SI in the SIMRA database (Bryce *et al.*, 2017; D3.2). These trajectories follow:

- 166 validated examples of SI were analysed in four stages of the SIMRA transdisciplinary framework, and clustered with prevailing trajectories of SI development (diverging paths).
- Hypotheses were formulated regarding SI diverging paths
- The most frequent variables which determine the positive performance of SI were determined for each hypothesis of diverging path.

In total, five possible diverging paths have been identified: authority path, networking path, knowledge transfer path, self-organization path and social entrepreneurship path (Table 4). Each of the diverging paths is characterised by a different reconfiguration of the interactions between actors which was identified as a key aspect in diverging paths. Short definitions and examples of each type of diverging path are presented in Table 4, accompanied by an example of SI from the SIMRA SI database (Bryce *et al.*, 2017; D3.2). Figure 9 shows the frequency of variables for each type of diverging path as identified in the database of SI examples.



Table 4. Characterisation of diverging paths for SI in MRAs (* The titles used highlight the characteristics of different paths of SI).

Path Titles*	Description	Prevalent Variables	Illustrative Examples of SI (The number is the entry in the SIMRA database of examples of SI)
<p>Authority path (12 examples in SIMRA database)</p>	<p>Authority path can be derived from both internal members of a related community who represent the key initiators of SI emergence or external actors (e.g. academics) who bring innovative ideas and/or stimulate the SI emergence and development in the community.</p>	<p>Individual and collective needs: motivation</p> <p>SI context: resources</p> <p>Learning, scaling, spreading: leadership, self-organizing activities,</p> <p>Sustainability and impact: social inclusion</p>	<p>193 - Novel citizenship for wellbeing and sustainability of Adriatic islands (Croatia)</p> <p>Numerous Croatian islands suffer from marginalisation due to massive migration over the 19th and 20th centuries due to extreme weather, decline of agriculture. Recently, tourism has made these islands highly attractive destinations, and immigration back to the islands from 2nd and 3rd generation inhabitants who have renovated and cultivated abandoned land and settlements. An example is the Vidovici settlement on the Island of Cres, where the leadership of a resident (a former ship captain Ivo Saganic) facilitated the re-integration of Croatian migrants addressing issues of community identity and belonging to increase social cohesion and sustainable tourism. Individual activity has developed to community action, resulting in increased population and socio-ecological modernisation, but keeping traditional cultural and environmental limits. Novel forms of citizenship are evolving to re-establish resilience of rural marginalised settlements.</p>
<p>Networking path (41 examples in SIMRA database)</p>	<p>Networking path concerns creations of novel partnerships/connections between different actors from usually different sectors/levels/countries to stimulate knowledge sharing, better</p>	<p>Individual and collective needs: motivation, environmental quality</p> <p>SI context: resources (financial, environmental, technological)</p>	<p>172 - ARCHE NOAH - Preserving and Developing the Diversity of Cultivated Plants</p> <p>ARCHE NOAH was established as an initiative of heirloom gardeners, farmers and journalists, concerned with the future of dramatically decreased seeds and heirloom varieties due to the industrialisation of agriculture (more</p>



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	<p>coordination, new initiatives and projects.</p>	<p>Learning, scaling, spreading: participation, knowledge transfer, self-organizing activities</p> <p>Sustainability and impact: cooperation, coordination, self-organization</p>	<p>than 75% have been lost). The activities comprise the ARCHE NOAH Seed Bank, the Seed Network, participation in different international Lifelong Learning Projects (e.g. EU Project Grundvig, Leonardo Project), a show-garden, political campaigning, training and workshops, and publications.</p>
<p>Knowledge transfer path (34 examples in SIMRA database)</p>	<p>The main aspect for development of SI is knowledge transfer brought by actors usually from outside to the community – “from those who know to those who do not know”. Such innovative transfer is the key factor of SIs. s</p> <p>Sometimes the knowledge transfer of the community directs to outside actors.</p>	<p>Individual and collective needs: motivation, demographic change</p> <p>SI context: resources (financial, environmental, technological)</p> <p>Learning, scaling, spreading: participation, knowledge transfer/social learning, capacity building</p> <p>Sustainability and impact: education/skills, social inclusion</p>	<p>225 - Gemeinsam Leben Lernen (Learning Living Together)</p> <p>The project is a language café based on integration approaches amongst peers and designed for refugees to gain a foothold in the country. This is promoted through language learning and cultural exchange. However, it is not just about language acquisition, it is also about sharing experiences.</p> <p>Every week approximately 20 students and 5 teachers of the Bludenz High School meet unaccompanied underage migrants in their school to learn/teach German and to discuss everyday life experiences. Through this project it is possible for young refugees to get to know the language, the culture and the people, so they can be a part of it.</p>
<p>Self-organisation path (39 examples in SIMRA database)</p>	<p>Self-organization: spontaneous order arising from internal system interactions defined in natural sciences by Maturana and Varela (1972) for leaving cells, applied to social systems for example by Ostrom from commons (1990 and others).</p>	<p>Individual and collective needs: motivation, environmental quality</p> <p>SI context: resources (financial, environmental, technological), traditions</p> <p>Learning, scaling, spreading: self-organizing activities,</p>	<p>143 - Carbon smart forestry in self-organized forest commons regime Slovakia-Slovenia (and other locations around Europe)</p> <p>Following a series of natural and social disturbances resulting in economic decline of the community and degradation of natural values there was a call for multi-functionality of forest management reflecting the sustainability of forest stock. This initiated a change of traditional forest</p>



	Self-organized activities driven by common interest evolve in collective action for community benefits.	knowledge exchange/social learning, leadership Sustainability and impact: novel property rights, self-organisation, cooperation	management practices to more sustainable and effective carbon smart forest. The role of self-organised and matured forest commons was found crucial in the transformation to carbon forestry as a long term relationships to land and resource, local knowledge transfer in leadership, and collective action to rule making and decision making.
Social entrepreneurship path (40 examples in SIMRA database)	Social entrepreneurship is a market mechanism oriented towards delivering, often non-marketable, goods and services (social and others) to market. These are competitive externally but think socially internally. A social enterprise is an organisation that applies commercial strategies to maximise social impacts together with profits (see also Ludvig <i>et al.</i> , 2017; D6.1, p.8). There is a need to compete with other enterprises, whilst also reinvesting significant social or environmental aspects or revenues back into the community.	Individual and collective needs: motivation, environmental quality SI context: resources (financial, environmental, technological), traditions Learning, scaling, spreading: self-organizing activities, participation, knowledge transfer/social learning Sustainability and impact: social inclusion	280 - A box of sea (sustainable fishing) The project, "A Box of Sea", brings together low impact fishing (i.e. fishermen and citizens) who want to take action against overfishing. The aims of this coalition are to create a fairer market which protects the marine environment, rewards those who fish in more moderate ways, supports small fishing communities, and provides better information to consumers regarding the seafood that is sold in retail or restaurant outlets. Supporters receive home delivery of fish caught daily by 'low impact fishermen'. The aim of the initiative is to protect and regenerate marine life while rejuvenating small fishing communities

Source: SIMRA database of examples of SI (based on data available on 6th September 2017)



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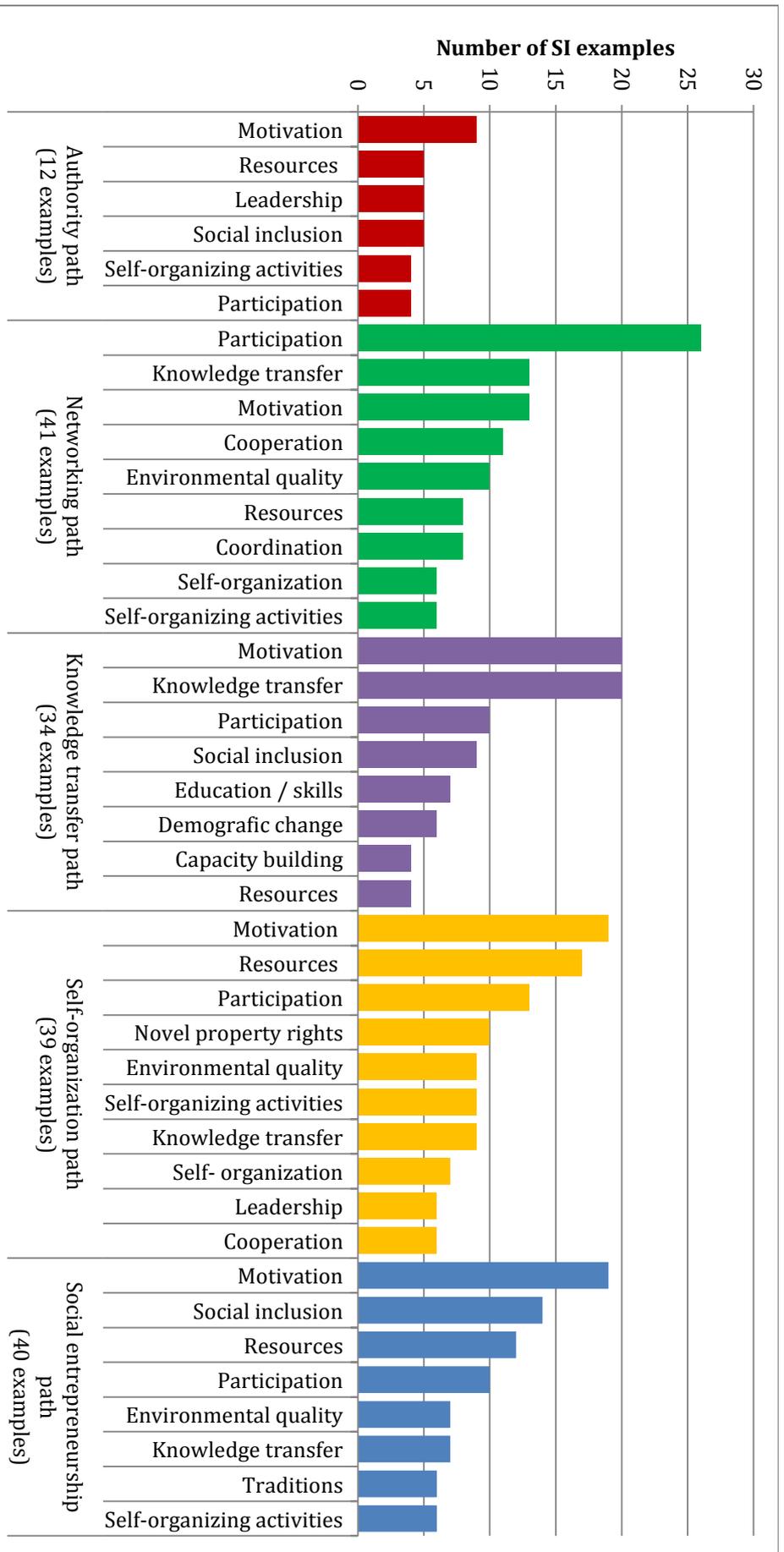


Figure 9. Most frequent SI variables in each type of diverging paths, derived from SI examples (Source: SIMRA database of SI examples based on data available on 6th September 2017).



Combining theoretical knowledge from Sections 2 and 3, and other research activities within SIMRA, expert assessment of members of the SITT described previously, and empirical knowledge from the database of examples of SI (Bryce *et al.*, 2017; D3.2.) we deduce the following working hypotheses of SI diverging paths in MRAs. These represent possible trajectories of SIs as described in Section 4.1. Formulated working hypotheses will be tested in SIMRA case studies: accepted, expanded or disproved.

HYPOTHESIS 1:

Well-being as a motivation for SI emergence is the most important factor (as reported previously in Section 4). Accordingly, resources are essential, in particular to enhance growth of SI in the second stage of the innovation cycle.

HYPOTHESIS 2:

Individual and collective skills such as self-organisation, leadership and participation are important factors for SI dynamics in Authority and Self-organisation diverging paths. These are SIs that often arise from informal institutions where activity of the leader and/or collective action of the community and its members are essential for developing ideas for SI that lead to the reconfiguration of social practices. An important aspect is that these diverging paths arise naturally from bottom up and are characterized by the high commitment and determination of an individual or a group of individuals.

HYPOTHESIS 3:

Social inclusion as target of reconfiguration is significant for a Social entrepreneurship path. An important role is played by the development of community social inclusion into a formalized market structure. Participation and exchange of knowledge are also relevant.

HYPOTHESIS 4:

Institutions of cooperation and participation that are more formal in nature are related to success of SIs, together with education and capacity building in Networking and Knowledge transfer paths. In these diverging paths external actors are expected to initiate SI via formal and informal networks. Transfer and exchange of specific knowledge related to the MRAs or topic of SI is essential.



6 Conclusions

This deliverable of the SIMRA project has presented a preliminary explanation of the SIMRA transdisciplinary framework for understanding SI in Marginalised Rural Areas. This has built upon a theoretical foundation of six theories developed in Sections 2 and 3, applied to empirical analyses of examples of SI Sections 4 and 5.

The approach is informed by innovation theory in which SIs are understood to be outputs, underpinned by novel ideas which are transformed into products and services that meet social demand, and potentially enhance social well-being. SIs may be understood mainly as processes in the social entrepreneurship, endogenous and regional development literature. The dynamics of SIs can be described mainly by social capital socio-ecological system dynamics and transitions. Transdisciplinarity, in the context of SIMRA, refers to an approach to engaging expert and empirical knowledge exchange.

Meaning of transdisciplinary assessment

The aim of the transdisciplinary approach in SIMRA has been to develop and maintain systematic knowledge exchange with a diversity of experts who represent the core actors in rural development, agriculture and forestry at international, regional and national levels (SIMRA SITT members). Engagement with the SITT has been from an early stage of the project, and development of the work in the research activities (e.g. Work Packages 2, 3, 4), creating a transparent and open-ended approach to problem framing and the integration of views on the design and implementation of SIMRA objectives based on their level of influence, possibilities of the convergence of interest groups, and ranking of alternatives. The involvement of SITT members in the development of the content of this report was in three consecutive steps (survey June 2016, workshop October 2016, and July 2017). This resulted in the co-production of (theoretical-empirical-expert) understanding of SI in MRAs, addressing societally relevant problems of MRAs; establishing the SIMRA transdisciplinary framework as a mechanism for mutual learning amongst diverse research disciplines, and actors from outside academia. With their involvement, SIMRA has also built a shared learning process over the duration of the project to date, and looks to develop that further through the remainder of the project and beyond. Further to the development of transdisciplinary assessment, the framework offers the prospect of creating solution-oriented knowledge.

Main findings and methodological limitations

Building on the theoretical foundations, and the empirical and expert knowledge described above, we have obtained new understanding of social innovation process as dynamics, in particular for rural and marginalised areas (Section 4). A preliminary version of the SIMRA trans-disciplinary framework for understanding SI in MRAs builds on a number of interactions with diverse actors in the action arena affected by physical and institutional factors. The dynamics evolve in four stages: i) generating and developing ideas for SI; ii) growing, testing and consolidation of SI; iii) SI implementing, scaling; and iv) changing system.

In conclusion, the development of a transdisciplinary understanding of SI in MRAs endorses the definition of SI developed for SIMRA (Polman *et al.*, 2017; D2.1) and the use of a checklist as a valuable tool for diagnosing examples of reconfiguration of social practice. It reinforces the original definition in two aspects: i) Expert and empirical analyses support well-being as a necessary factor in the SI cycle from emergence to system change; ii) Members of the SITT underline that **reconfiguration resulting in new social practices that increase the engagement of civil society actors constitutes necessary condition to define an action as SI.**

The findings presented are preliminary, based upon the empirical evidence mapped onto the most relevant theoretical concepts. However, this does not exclude the possibility that some different



action may lead to successful SI. The conclusions derived are interim and await conformation from the in-depth empirical analysis of SI in the case studies (SIMRA Work Package 5). The SIMRA transdisciplinary framework will contribute to the preparation and completion of the evaluation of SI case studies and their analysis.

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