Addressing the ICT Innovation Challenges: A Social Innovation Intelligence Platform

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INTRODUCTION

The increased impact of events like economic crises, famines, floods, forest fires, hurricanes and droughts have triggered an increase in the need for an enhanced innovation process, and also highlights the multi-dimensional nature of any initiative that might be undertaken to find more resilient pathways to attain sustainable development, particularly for rural areas, home to 70 percent of the world's poor and hungry people. This initiative on the development of the Social Innovation Intelligence Platform utilizes a framework that can guide a coordinated approach by decision makers and operations from the many agencies involved in supporting sustainable development and improved livelihoods, and thus increase both the effectiveness and efficiency of their programmes and projects. Social and economic thresholds are certainly a requirement for addressing the challenges of assessing the possible effects and impacts of policies, climate-driven tipping points, land-use changes, and other driving forces on the economic and social vulnerability[1] and resilience[2].

The spectre of economic crises, natural disasters, earthquakes, climate change and a greater frequency of natural and socioeconomic shocks contribute to the growing interest in, and recognition of the value of a joint multi-sector approach to the enhancement of innovation-driven development to every aspect of the livelihoods of populations with a territorial perspective, particularly in terms of their productivity, income and the need for sustainable production-value chains. The Social Innovation Intelligence Platform described here provides decision-makers at all levels with a comprehensive package of tools to handle information about present-day (baseline) conditions of wellbeing and livelihood, risks associated with increasing prices, natural resource degradation, impacts of climatic events, economic crises, and production-chain risks, under and against a range of future scenarios. The framework includes user-based functionalities to compare selected options (trade-off s) for significantly improving the necessary coordination efforts required for promoting and enhancing innovation policy development and management interventions.

Sustainable development challenges can affect different people in different ways. The Social Innovation Intelligence Platform provides the mechanisms and tools for information exchange about the people (individuals, communities, countries) who are impacted by these pressures to enhance their innovation ability to respond effectively and adapt to fast-evolving changes. The components of the Platform also help to identify social and economic priorities in order to find the areas and communities where the need for support is greatest. In general, communities with different livelihoods face rather different kinds of risks, and have different innovation capacity to respond to pressures, so livelihood is a good starting point. The community's ability to cope with economic, environmental and social pressures is measured in terms of their capacity to respond (adaptation capacity) and the indicators of coping ability needs to be based upon a strategic analysis with explicit geographic reference. Dimensions like data, information and people are the foundations for introducing policy and socio-economic information into the decision-making process. This paper focuses on the need for integrated actions that concurrently permit the evaluation and instrumentation of social innovation to reduce risks, and the broadening of the response capacity of an ever increasing number of stakeholders to actually have an impact in terms of economic and social development, improved production-value chains and sustainability.

The perceived need for a coherent policy response to the development challenges facing rural populations is dependent on the need for a more effective and up-to-date information based coordination system. In this respect

[1] Vulnerability is defined as the potential for susceptibility to negative impacts in terms of the degree to which a system (for example, community) is susceptible to pressures and disturbances, such as climate change or socio-economic processes.

[2] In a Complex Systems framework, resilience is defined as an emergent property of an ecosystem that is presented in three main ways in the literature: as recovery, as stability and as transformation (Maguire and Cartwright 2008). This means that systems can evolve a capacity to recover from perturbations (extreme climatic events, forest fires, drought, over-grazing, floods, economic-food crises) by developing emergent resilience characteristics.

there is also a need for ICT innovations that can improve the harmonization and coordination of programmes, projects and support actions in terms of systems and criteria for the collection and collation of information at the community level, including productivity, trade, processing and marketing, financial and investment data.

For this purpose, local, national and regional innovation programmes need to be strengthened or developed where they do not exist, and to be better linked to the numerous decision-making and policy organizations. Linking up-to-date data and information with productivity information, crops and animal yields and market prices, the systems need to draw data from all levels, including community-level stakeholders. The Platform presented here provides support to the identification, generation and collaborative innovation development and policy-making initiatives that can significantly improve livelihoods. The Platform includes functionalities in the areas of Stakeholder Profiling, User Support, Vulnerability Research, Energy and Natural Resources Use, Livelihood Sustainability Spatial Analysis, Future Sustainability Scenarios and Territorial Analysis.

Countries around the world have expressed the urgent need for improved development coordination, taking advantage of information and communication technologies for the wellbeing and reduction of risks, particularly regarding the role of the Private Sector, and the need to establish cooperation mechanisms between countries, international organizations as well as NGOs. The entire body of agencies involved in sustainable development has also emphasized the need for integrated action at the regional level, with the inclusion of technical support for the assessment and reduction of risks, and private sector support to improve the innovation process and long-term development actions. In recent years multi-sector alliances with companies in the ICT sector such as SAP successful participation in the C@R[3] project have demonstrated the great potential for improving cooperation efforts in high profile initiatives, such as the Social Spaces for Innovation, where state-of-the-art technologies have improved the livelihoods of rural communities in South Africa and many other countries in the world.

THE SOCIAL INNOVATION INTELLIGENCE PLATFORM

The Platform provides the mechanism and tools to address barriers and innovation challenges that are not directly related to ICT, but are more associated with social, institutional and economic factors (like private sector involvement), that can impact the innovation process in rural areas and can have an important role in stimulating and enhancing the enabling environment to address social, economic and environmental challenges, and also stimulate trans-national competitiveness, and contribute to inclusive job creation and sustainable economic growth. The political will of countries represents a unique opportunity for establishing a partnership with Corporate Social Responsibility programmes to develop a Network Social Innovation Cooperation based on state of the art technological platform that would demonstrate the impact if improved coordination efforts across the entire production chain. This initiative will be promoted and publicized worldwide as a model for public-private partnerships that would give the highest public profile in effective collaborative coordination, which represents the biggest challenge for enhancing social innovation of populations worldwide.

From a holistic perspective, the complexity of the production-value chain sustainability and inter-relatedness of the social, economic and environmental systems generates a high degree of uncertainty in the possible impact of any social innovation programme, project or intervention. In practice, this means that any programme tends to affect the perceptions, interactions and dynamics among all the groups in society in an unpredictable way, and inter-sectoral linkages that can be the cause of otherwise unexplained social decline. There are many dimensions of social innovation considered as “external factors” such as economic, environmental, trade, or investment policies that need to be linked explicitly. These factors are aimed at generating growth through innovation and improving livelihoods, but there are many policies and programmes that do not make a connection between these dimensions, which limits their ability to consider the complex linkages among all the aspects in emergency risk reduction.

RURAL DEVELOPMENT POLICY: A EUROPEAN PERSPECTIVE

[3] http://www.c-rural.eu/

We define ”rural development policy” as the set of actions aimed at promoting a scenario of equal opportunities and bringing the welfare state closer to inhabitants of rural zones, working towards making it similar to that of all citizens, regardless of their place of residence (Schaffers et al. 2010).

Development in a rural and regional context is defined as a process of structural change of whole social, economic and ecological systems (Clark, Pérez-Trejo and Allen, 1995). It entails qualitative changes in economic sectors, cultural shifts; the emergence of new forms and reconfiguration of political and administrative structures, the advent and adoption of new technologies. Rural development has a significant political context, and strengthening rural development policy for ensuring sustainable development is a formidable challenge. Rondinelli (1993) suggests that the policy process is best described as a sort of social experiment. By this he means that the policy process is less a matter of prediction, and more a matter of trial and error or learning by doing. This perspective highlights the importance of research in the policy process as means for providing feedback to all stakeholders and society in general, so that policy has a chance to readjust and adapt to unforeseen circumstances as it develops.

In an innovation context, rural development policies have changed from focusing on structural problems of the agricultural sector towards a more integrated approach covering all other economic sectors, environmental and social issues. A policy of particular relevance to this integrated approach to rural development is the experimental program that was launched in 1991, called LEADER (“Liaisons Entre Actions de Development Rural”). This program built on direct subsidies to rural territories aimed at improving living conditions. The program also constituted a methodological approach based on an active involvement of rural population to empower their own resources by the definition and management of their own development projects using a bottom-up approach. The three thematic axes are complemented by a methodological axis dedicated to the LEADER approach. In addition to the thematic axes, two important aspects are highlighted. On one hand, a new financial instrument is articulated, the European Agricultural Fund for Rural Development (EAFRD), in order to simplify the programming and funding system. From the perspective of EC-funded projects, the LEADER model and its focus on Local Action Groups is highly relevant, as they constitute an important platform for scaling-up user driven open innovation initiatives developed in projects such as C@R and HABITATS[4].

CURRENT ISSUES IN RURAL DEVELOPMENT POLICY

Competitiveness and prosperity of rural spaces depend to a great extend on the capacity of the people and social and economic agents to make the best use of available territorial assets (European Commission 2008). In a globalising and interrelated world economy however, the impact of local efforts depend to a great extent on supporting policies and strategies that provide the enabling environment for the initiatives to enhance the wellbeing of rural communities.

Cooperation along with the flow of technology and ideas as well as goods, services and capital is becoming an ever more vital aspect of territorial (and rural) development, and a key factor underpinning the long-term and sustainable growth and development of rural areas. In this global economic crisis the decision-making process and taken up by public debate, it might be expected that, as a result of this debate and reflection, the cultural assets endemic to rural zones will be incorporated into a new vision of progress. Therefore it might be expected a much more relevant role of rural development in a context of open and collaborative innovation in rural areas, benefiting its socio-economic development in a context of globalisation of work and business.

An Innovation Framework for Rural Development

In the context of rural development, innovation should be understood as a process which not only concerns technological and organisational innovations, but also include environmental, social and institutional dimensions that are essential for attaining more significant impact on the sustainability of the livelihoods and lifestyles of the population. From an economic perspective we may think of innovation in farming, fishery processes and local

[4] http://www.inspiredhabitats.eu/

government, but these innovations also imply changes in the way rural communities interact with the rest of the country and the world.

Such rural-based innovations imply changes in behaviour, lifestyle and in the relations among key stakeholders, which will change established structures, processes and behaviours of people, organizations and companies. In this sense innovation processes should be considered as cultural and socio-technical change processes in which social and psychological factors play an important role. Within the context of the C@R project, the focus has been on the development and testing of a methodological framework that can foster innovations of a socio-technical nature, emerging both from opportunities provided by advanced information and communication technologies and from the needs and objectives of rural environments. As regards the process of innovation illustrated in Figure 1, a valuable point of departure is the concept of human-centric open innovation of "Social Spaces for Research and Innovation".

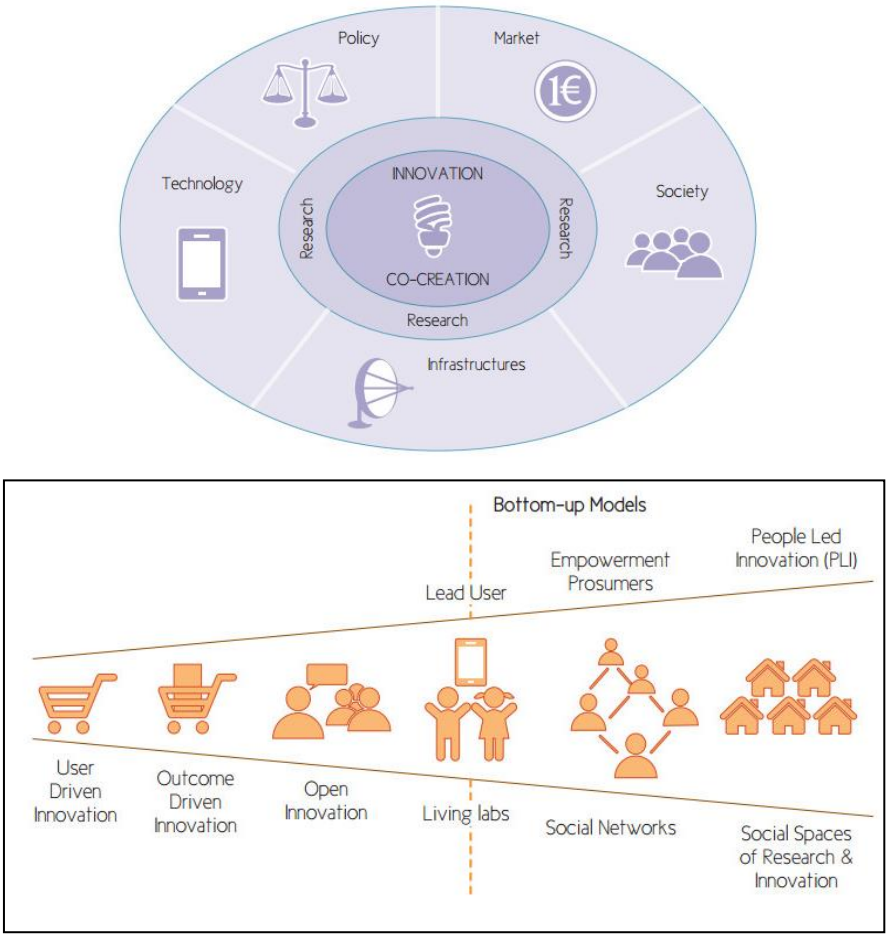


Figure 1. The innovation process in a Social Space for Research and Innovation

The impact of innovation policies and programmes towards attaining sustainable development can be seen as a constant interplay among several driving forces, such as technological innovations, population and migration trends, macro-transformations of production-consumption systems, energy use, land-use changes and spatial disparities in development patterns between rural and urban environments, changing political structures, as well as trade patterns (Clark, Pérez-Trejo and Allen, 1995, Kanbur and Venables, 2005).

The concept of “innovation systems” has become widely used in current innovation policy literature to describe the need for a much wider perspective on relevant policies and programmes to stimulate the innovation process in a more inclusive way.

The World Bank (2007) defines innovation systems as a network of organizations focused on bringing new processes and new forms of organization into social and economic use, together with the institutions and policies that affect their behaviour and performance. In this context innovation is not seen only as technological changes or products, but as the process through which knowledge is generated, linked through networks of organizations and applied in social and economic activities (Smits, 2002; Hall et al., 2004). The Living Labs programme of the European Commission represents one of the most ground-breaking initiatives to bring about innovations of social and economic significance, improvements in technical and managerial issues, institutional and policy aspects.

The rural development process is highly influenced by the institutional context. By institutions we mean the mechanisms and instruments that create and regulate the normative environment in which social and economic agents interact (Elster, 1991). The institutional framework includes the set of rules and instruments for their application, and also the ethical, cultural and legal norms that help to frame the behaviour of social and economic agents (North, 1984). This institutional environment is one of the determining factors that governs the innovation process, the effective dissemination of new technologies and also contributes to determine who benefits from innovation, and the eventual social and environmental impacts of the innovation-driven development process. Elements of the institutional framework include rules about property rights, antitrust regulations, human resources development, and provision of infrastructure. These elements generate the environment in which social and economic agents interact. But these interactions (socio-economic networks) are the result of complex behaviours of organizations, corporations, social agents that seek to influence policy-makers and political processes, following individual or common interests that can secure benefits from innovations in the market place.

Innovation generally tends to be associated with large conglomerates of science and technology institutions and corporations with vast resources and knowledge, largely driven by private sector interests. Recent developments in innovation focus on open and user-based innovation, such as the Living Labs Initiative of the European Union. The Rural Living Labs launched by the C@R project have become an effective platform for involving the rural citizens at all stages of the research, development and innovation process, which provides a platform for rural communities to contribute to European competitiveness and growth.

In the process of developing a methodological framework for establishing C@R Living Laboratories and assessing their impact on rural development it became apparent that technological innovation is only one of the dimensions of the innovation-driven development process. In fact, other key elements that play a fundamental role in community-based innovation have been identified, including society, markets, infrastructure, technology and policy. This lead to the development of a more holistic concept which has been defined as Social Spaces for Research and Innovation (SSRI) that focuses on an innovation-based approach to development with an explicit geographic reference aiming specifically at improving the well-being of the citizens of rural communities.

Another key element to consider in addressing sustainability is the need to consider the social dimension of adapting pilot-level results to the social realities of local communities, which requires addressing the governance dimension and new social and institutional arrangements among stakeholders and actors. For innovation in rural areas to benefit all sectors, this means creating a participatory innovation process where people in local communities including interested citizens and stakeholders engage in the innovation process. The open innovation process is supported by strategic partnerships with public, university-based or company R&D departments. They need to be focused on and within the community or society, and early engagement of citizens and small companies as users is essential to ensure sustainability in terms of improved livelihoods. The social innovation methodological framework aims at providing recommendations for policy-makers on the process of promoting Living Labs as motors of innovation driven rural development, and also for policy to support the scaling-up (systemic use and sustainability)

results that really have an impact on the well-being (livelihoods) of rural populations. A Social Space for Research and Innovation is therefore defined as innovation clusters constituted by different kinds of institutions and social actors. They provide the platform for the group of stakeholders to address all the dimensions of livelihoods assets (education, health services, infrastructure, income, finance, leisure).

KEY ISSUES

In today's globalized economy, rural areas are generally considered environments in crisis. It is clear that one negative consequence of the global economy and ongoing developments in terms of ageing and migration is the low value assigned to rural traditional activities done by rural citizens as food providers and environment keepers in developed countries. However there is clear evidence that rural areas possess enormous potential, capacities and resources in terms of their citizens and territories if we are able to find new business models and public-private partnership strategies that could certainly help in overcoming the current economic crisis. Rural development is about raising the living standards for rural populations with particular attention to the sustainable use of natural resources, the environment and the cultural heritage.

The challenge we face is to articulate methodological frameworks that allow technology, new or already existing, to flow into unexplored value-added niches through processes of citizen participation. We are witnessing economic, social and technological changes that determine a new rural development paradigm in which the principles of cohesion, interrelationship and complementarily of both territories, rural and urban, are shown as an opportunity in the twenty-first century. In this sense we can describe a significant contribution to the development and validation of a methodological framework, including architectures and tools for collaborative working and business, specifically adapted to rural development needs. The methodological framework represents a viable platform for rural open innovation, based on the social innovation concept. This has fostered a convergence process between Rural Living Labs, Local Action Groups and Social Spaces for Research and Innovation focusing more specifically on rural community development and social innovation. The approach has set the stage for scaling-up research and innovation activities benefiting rural areas. This has allowed us to enhance our insight into the complex dynamic world we live in, as a result of social, geographical and technological developments and interactions. Understanding the complex development process is one of the key elements for monitoring progress and scaling-up the results, which requires an interdisciplinary approach to ensure flexible and adaptable innovation strategies that address the diverse dimensions of the livelihoods of rural communities.

Policies and programmes that support rural development have had relatively little impact in rural populations. For example, rural people have abandoned many apparently promising approaches, owing to the limited access to financial resources, lack of an integrated approach to improving rural livelihoods, and insufficient support from key groups and institutions. Promoting an innovation-based rural development strategy and methodologies by mainstreaming them into local development programmes, education and media systems, will require a strong policy effort. Many rural development initiatives remain on a small scale. Scaling-up and promoting local innovation, can be a valuable and cost-effective policy strategy to achieve wide scale improvement of the wellbeing in rural communities.

PRODUCTION-VALUE CHAIN ANALYSIS

Production-value chains are considered to be a strategic topic, also within new EU 2020 Strategy, aimed at improving environmental, social and economic sustainability by focusing production and consumption at the local level. Sustainability refers both to reducing and minimizing environmental impact and to support struggling rural areas which are affected by high rates of de-population and declining natural resources through land neglect and abandonment. Many rural areas are, in fact, characterised by local networks of small to very small farms which are unable to access modern distribution systems given the quantity of their produce and their dispersion over the local territory. The small farms within these networks rely on positioning themselves in niche markets seeking high-quality local produce which often requires high-labour production and significant know-how in production. These small farms within the local network also play a vital role in maintaining vast areas of agricultural land in the local

area which are essential to the preservation of the historic rural landscape. The employment that these small farms provides is also not to be overlooked and is particularly significant in those farms involved in the transformation of agricultural produce to create new products with added-value.

The Social Innovation Intelligence Platform can enable consumers to use a smart-phone App and/or any other social networking tool to find the best products they are looking for - and at the "right price" with a quality component, and the local producers will benefit from a virtual market-place to improve their sales, by specifying the quantity that they can offer. Consumers, on the other hand, are increasingly becoming more conscience of making healthier, environmentally and socially responsible food choices and as such demand for local produce made following traditional production methods is increasing.

There have been many initiatives in recent years to help bridge the gap between agricultural supply and new consumer demand. Farmer markets, farm-shops, the box scheme, agri-tourism are vivid examples of these initiatives and have gone a long way in bringing local produce to local markets. The Social Innovation Intelligence Platform represents a further step in these positive trends by cutting the cost of transactions between producers and consumers. The explicit spatial reference of the platform will allow all participants of the agro-food chain to be linked effectively, including the regional policy-makers, agencies and other key stakeholders, to have up-to-date and explicitly localized information on key driving forces they need to consider for ensuring the sustainability of policies and programmes regarding rural development, quality of life, land-use and environmental problems (soil conditions, climate impacts etc.), arising in diverse future scenarios, so they can be more effective in their expected impacts. The territorial approach of the Basilicata Pilot is based on the multi-disciplinary framework with explicit spatial reference, and oriented towards the needs and requirements of local communities, public authorities and key representative socio-economic actors such as farmers and SMEs to ensure impact and sustainability of the innovation process.

The Social Innovation Intelligence Platform offers:

- To provide a platform for a virtual market service for the BI Platform based on engagement and adaptive information delivery
- To have farmers provide economic, social and environmental information about their farms and neighboring context and suggest services and locations useful for their economic activity
- To facilitate consumers engagement and discussion on product quality, environmental protection needs, suggested services
- To utilise the suggested services data, both from farmers and consumers, to prioritise work programmes
- To adapt the innovation to the local needs addressing specific targets.

To achieve these aims, the project will work to engage with all key stakeholders during the initial phase of the project in order to engage them in the SSRI Social Validation process of the Platform. The technical team will develop the platform contents and functionalities based on the co-development process and stakeholders will provide a second round of feedback for fine-tuning the Platform. The project will work closely with both producers and end consumers in order to ensure specific objectives are identified and met. The project aims to closely monitor changes as the pilot program progresses and awareness grows and will adapt targets to meet changing requirements.

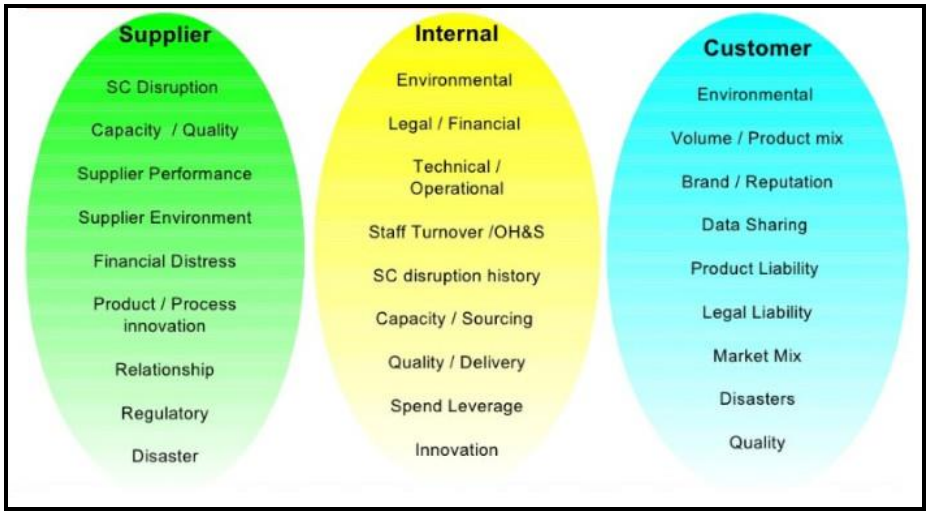


Figure 2. Production-Value Chain Stakeholder Challenges

The benefits for the different types of stakeholders to deploy user-driven open innovation and SSRI methodologies includes:

• For the citizens and the community: To be empowered to influence the local agri-food chain innovation process, the development of services and products which serve real needs for farmers, consumers and local government, and to jointly contribute to sustainable development through active participation in the social innovation lifecycle.

• For the SMEs, including micro-entrepreneurs as providers: developing, validating and integrating new ideas and rapidly scaling-up their local virtual market services and products to other markets.

• For the citizen: making the agro-food chain innovation process more effective by partnering with private sector actors and policy-makers, which are rooted in active user experiences, improving their livelihoods and wellbeing.

• For the research community, the economy, the environment and the society: Stimulating business-citizens-government – research partnerships as flexible service and technology innovation ecosystems; integrating technological and social innovation in an innovative 'SSRI culture'; increasing returns on local investments in ICT R&D and social innovation.

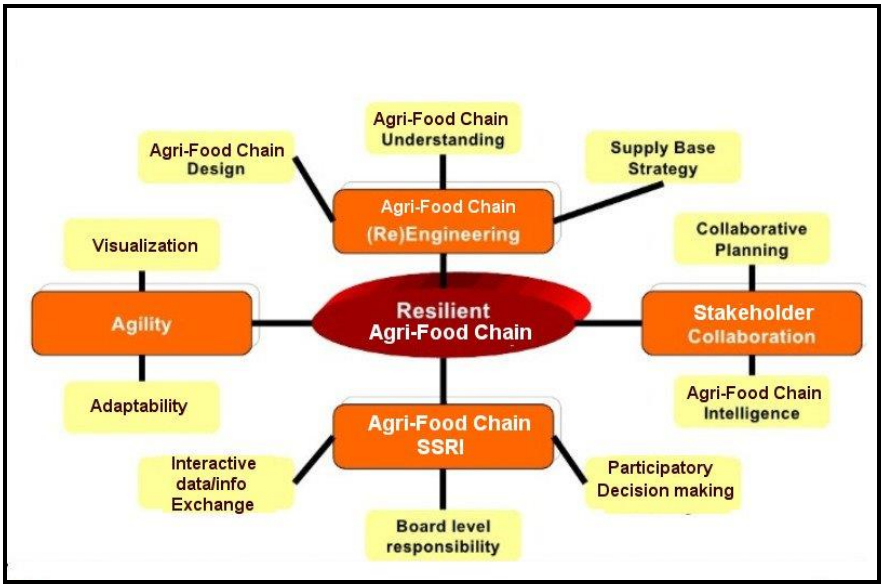


Figure 3. Resilient Agri-Food-Chain Strategic Components

with the support of the social validation methodology inputs the SSRI will provides a continuous feedback process from key stakeholders in the production-value chain to feed the co-development and co-design phase of innovation with explicit specifications on functionalities and services required to achieve the sustainability of the production-

value chain. The SSRI methodological framework includes the inbuilt impact assessment process based on social validation, which ensures a sustainable model that allows the scaling up of the results across the entire project, and a robust institutional structure led by representatives of the community of users, (Farmers Associations, SMEs, and Local Action Groups).

The phases of the Social Validation Process include:

1. **Community Building and Engagement: establishing Social Networks**

   The main approach of the Community Building and Engagement is to structure widespread participation in the BI Platform definition, functionalities and adoption processes using a social network.

   Initiating at the very beginning, it builds the core community around the shared objective of providing the initial state-of-the-art baseline and user requirements for the main functionalities of the Platform. The main active community will be established among the local stakeholders involved in the social validation process.

2. **Co-design and co-development of the Platform specific functionalities and service applications**

   The second Phase takes place as soon as the Platform functionalities have been defined, the data models, and the validation process has initiated the co-design phase. This phase focuses on the SSRI methodology for stakeholders directly participating in shaping the co-design and co-development process and thereby helping to define the Platform functionalities that will enable these innovative scenarios. The successful outcome of this phase is ensured by a built-in assessment process of the specific data model requirements and also the organizational framework and networking function of the SSRI in order to provide useful feedback on the progress of the platform. The mechanisms for monitoring and evaluation include quantitative and qualitative indicators derived from stakeholders' own definitions of success criteria.

3. **Assessment of co-design/co-development results: determining requirements and their implementation**

   With an eye on documenting the interim status of social validation activities, this Phase considers the current status of co-designed/co-development experimentations at each site, while considering main concerns, a facilitation method used during the consultation process will assess the degree of attainment of the expectations of each of the participating stakeholders of the co-design/co-development process.

4. **Assessment of the usability of the Platform and capacity to meet user requirements**

   The assessment of usability is done through an iterative consultation process with users and stakeholders, consisting of the 3 aspects described below:

   i) The social significance of stated goals. Do the specific development objectives correspond to what users really want? Are they fulfilling a need that is shared by the prospective end users and the broader community?

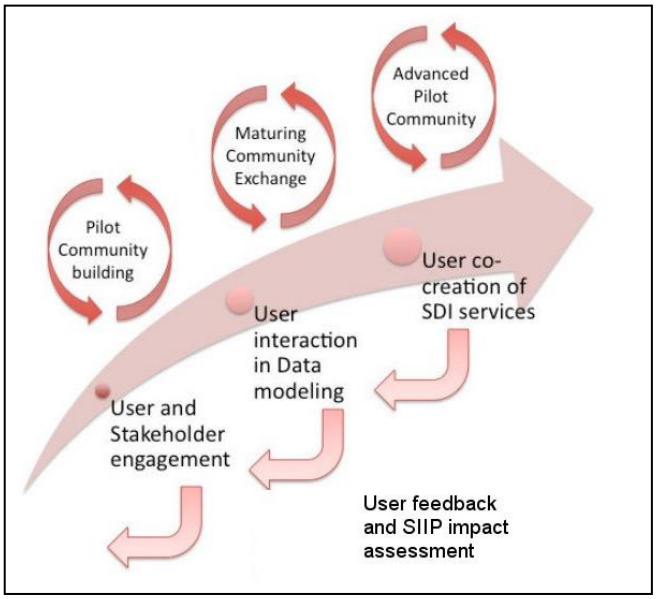
   ii) The social appropriateness of assessment procedures. How do users feel they are included in the development, implementation and assessment process? Do local stakeholders consider the procedures for their involvement effective?

   iii) The social importance of obtained effects. Are end users satisfied with the results, including any unpredicted ones? Do thematic experts value the effects and believe that they were indeed assisted (or facilitated) by BI platform? Does the broader community appreciate the outcomes?

Given that most community members and stakeholders are highly heterogeneous, and some of them have very few ICT skills and poor knowledge of the contents of the Platform and implications of social innovation, the specific requirement will be determined for a common framework according to which the added value of social innovation can be assessed using the new developments of the Platform. For each social validation type, and for each of the pilots involved a different set of evaluative questions will be developed, focusing on the real and pragmatic impact of the co-design/co-development process In response to the above, an impact assessment component of the Platform has been designed to facilitate impact data collection from surveyed users and stakeholders.

An important impact to be achieved by the Platform is to enhance the use of Public Sector information to ensure continuous and systemic agri-food chain sustainability, in which the citizens are protagonist of co-creation process, contributing to their effective integration into society irrespective of their physical location (rural or urban), or their personal circumstances or age or socio-economic condition.

The impact assessment methodology also helps to understand the processes and causal linkages between the objectives of the Regional programmes and the innovation changes that occur in the lives of people as a result of an intervention, policy, programmes or projects.



Description of the Social Innovation Intelligence Platform Processes for Responsiveness and Agility

Social innovation-driven Production-Value Chain stakeholders are more likely to ensure a participatory and proactive response to current sustainability and quality issues and challenges facing their future development. The Platform can provide the interactive data/information exchange and visibility for overcoming problems and risks of the supply chain. Specifically, consumers interact directly with local farmers for resolving potential quality and availability issues that can help in avoiding potential losses from the local market. The Social Innovation Intelligence Platform also provides the means for developing a more participatory and adaptable production-value chain planning process and enabling ICT infrastructure that makes it possible for them to respond to each other's needs and constraints.

In order to achieve sustainable production-value chains to overcome major obstacles and barriers and to increase their resilience, the stakeholders can participate in the co-design and co-development of the platform's functionalities for collaboration, visualization, online selling and quality assessment, and seamless marketing for succeeding in enhancing their local economy and livelihoods.

Knowledge Management - "Pro-Active Visualisation"

The Platform focuses on establishing stakeholder-based and explicitly geo-referenced visualization functionality for all participants to collaborate more effectively in every phase of the production-value chain. The visualization functionality includes core processes in the productin-value chain participatory management to support the creation of the infrastructure for effectively managing food production and distribution processes:

1) Inventory management processes to help create robust distribution networks, better quantity and reliability. This enables a farmer to reduce the likelihood of ending up out-of-stocks, improve demand and order fulfillment rates, and increase customer satisfaction.

2) Order management processes to help create a more seamless order entry and management process. An order management processing system will be key for processing orders faster when demand increases unexpectedly. The order management processing will also address a number of other factors that are important for enabling farmer to respond to a surge in demand faster, like supplier production capacity.

3) Demand management participatory processes for managing the risk of customer demand fluctuations, and the growing demand for raw materials causing shortages and price increases for small farmers, which will reduce supply

chain disruption risks and enhance supplier capacity to meet the buyer's demand. The processes will include functionalities for enhancing capabilities for demand forecasting and management, based on a participatory process to anticipate and manage customer requirements most effectively.

4) Production-value chain mapping visualization processes enable farming communities and consumers to monitor and have up-to-date information of their own situation in the production-value chain, and keep informed of events, milestones, food fairs, external competition that will be essential for operational decision making. These processes enhance their awareness of their supply chains to adapt and improve the impact of their collaborative efforts.

Performance Management Strategy

The Social Innovation Intelligence Platform will include the Apps and interactive tools for measuring stakeholders´ performance necessary for building a resilient production-value chain for collaborating more actively among all stakeholders to improve data quality and rate all suppliers more accurately and in a relevant time frame and explicit geo-location.

At the heart of this social innovation approach is the initiative on Corporate Social Responsibility as the mechanism for the Private Sector to become the protagonist of our efforts to improve the sustainability of the world economy and the environment, and also contribute to social inclusion and reduce poverty. This integrated approach to improve the effectiveness of CSR initiatives on sustainability by applying strategies and tools that link the availability of raw materials, waste management, energy efficiency, the environment, the value chain and social cohesion with an explicit territorial dimension as illustrated in Figure 5.

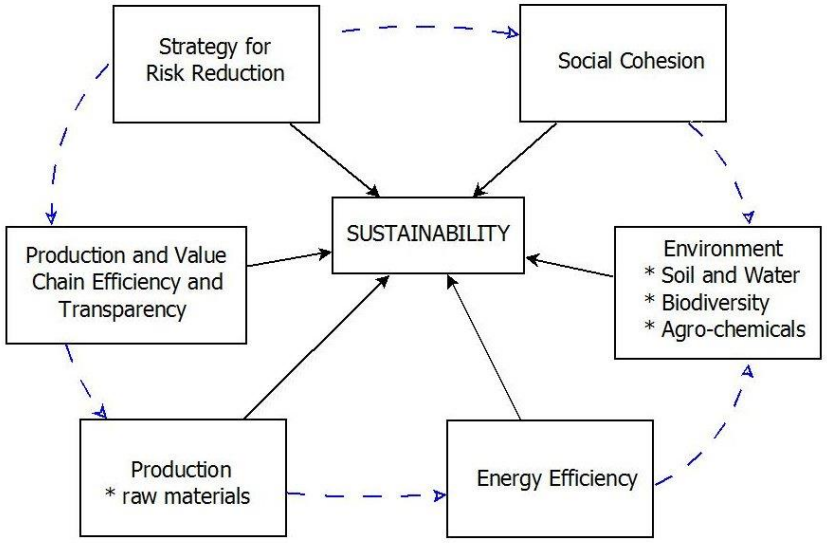


Figure 5. Key Elements for the Private Sector Sustainability

Through innovative approaches, using networking events, incentives and powerful Internet applications and Smart-phone Apps, the Platform can enhance the effectiveness of companies and foundations in activating and strengthening their CSR communication campaigns and positioning among key stakeholders and international relations, which determines the sustainability of the company in the medium to long-term.

The technological packages and methodological approach on sustainability represents an opportunity for companies to strengthen innovation capacities across the entire value chain, and enhance the capacity to face the challenges that threaten sustainability, such as climate change impacts on the production systems, water scarcity, financial and economic crises, rising energy costs, social exclusion, and mayor land-use changes.

Through a well articulated social innovation approach we can obtain tangible and well sustained results in terms of impacts of CSR programmes, including Internet Platforms on Sustainability for networking and promoting results among international relations, and obtaining more long-term results from stakeholder coordination and communication mechanisms with improved contents and instruments.

THE LIVELIHOODS APPROACH AS PART OF THE SOCIAL SPACES FOR RESEARCH AND INNOVATION FRAMEWORK

Participatory approaches are a key element for succeeding in achieving interoperability, but they do not in themselves guarantee that the data/information standards applications will be environmentally, socially and economically sustainable. Addressing the issue of the sustainability implies taking a long-term perspective, like the sustainable livelihoods approach (DFID 1999). Livelihoods are defined as the capabilities, assets, activities, and strategies pursued by people to develop and maintain a means for sustaining productive living and their wellbeing. Environmental sustainability cannot be dissociated from the well-being of populations. A sustainable society is one with a participatory focus, thus one that considers the citizen at the centre of sustainable development. In order to avoid environmental degradation, society must ensure that the population is given the necessary assets to make their livelihoods sustainable.

The literature generally defines five dimensions of Livelihoods Assets (Figure 6), including human, social, physical, financial, natural assets. We have added two additional dimensions that relate to the Social Spaces for Research and Innovation (SSRI) framework[5], which are essential for creating the enabling environment for open, community-based innovation as the motor of sustainable development; these are policy (local, regional, national, European, international), and the institutional framework (government, alliances, associations, partnerships). SSRI constitute a methodological approach that brings together citizens, experts, professionals, policy-makers, researchers, and organizations working in areas related to sustainable development, social inclusion, and eco-innovation[6]. The initiative on SSRI has become a point of reference for the innovation and development community as an evolving methodological approach for effectively addressing the social, ecological, economic and policy challenges associated with turning the innovation process into the driving force of sustainability and well being of citizens and communities with an explicit territorial reference.

[5] http://ec.europa.eu/information_society/activities/livinglabs/index_en.htm
[6] http://www.espaciossociales.es/index.php?option=com_content&view=article&id=46&Itemid=1&lang=en

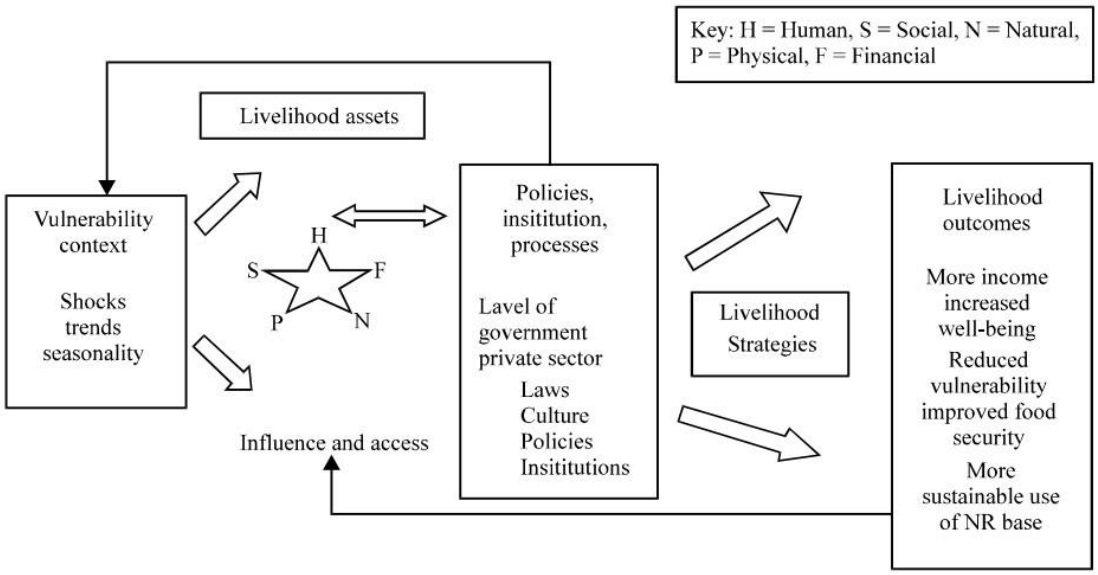


Figure 6. Dimensions of Livelihoods (Abdelhak, Sulaiman, and Saidatulakmal 2012).

Social Spaces for Research and Innovation (SSRI) are organizational ecosystems in which the Research and Innovation activities are guided by the necessities and constraints of the social communities that benefit from the results. These ecosystems shall involve, in a balanced way, all the actors present in the Research and Innovation chain value, i.e. the social communities mentioned before, companies, technology suppliers, and members of the local and national politics for the regulation and promotion of the results. Moreover, the SSRI needs to be carried out within a framework of sustainability, ensuring its viability beyond the end of the funding of specific projects and the adoption of an organizational base structure leaded by the user's communities like user associations, foundations, Local Action Groups, etc. The main objective is to guarantee a non-interruptible innovation habitat, in which the citizen, in its entire dimension, is the main actor in the process of co-creation, helping its integration in the new Information Society independently of its personal, cultural, geographical and/or socio-economic conditions.

In the SSRI innovation ecosystems, the innovation process and strategic alliances are directed by the needs and constraints of the communities benefiting from the results. These innovation ecosystems involve balanced participation of the various actors in the value chain of and innovation that can more effectively benefit rural citizens, linking them to local communities, enterprises, technology providers, representatives of research communities and policy makers that will ensure the equitable use and promotion of the use of the results. The SSRI methodological approach has proven very effective in developing a collective understanding the dynamics of our fast-changing world and a participatory policy assessment process that can bridge the existing gap between spatial data systems and policy impact.

The SSRI methodological framework includes an inbuilt impact assessment process which ensures a sustainable model that allows the scaling up of the results of the project, and a robust institutional structure led by representatives of the community of users, (Associations, Foundations, Local Action Groups.) The main impact to be achieved by SSRI is to ensure continuous and systemic policy exploration and evaluation, in which the citizens are protagonist of the open innovation process. The SSRI initiative has been supported by the European Union innovation programme[7], and has been funded by means of numerous projects, including C@R[8] and Habitats[9].

[7] http://ec.europa.eu/information_society/activities/livinglabs/index_en.htm
[8] http://www.c-rural.eu/
[9] http://www.inspiredhabitats.eu/

The potential impact and contribution at the global level is based on the approach of 'open innovation' as a main feature of SSRI, which goes beyond of the identification of end-users by involving them as protagonists of the innovation process from the beginning. The methodological approach conceives an inbuilt assessment process with stakeholders throughout the implementation of the project. This ensures the co-design of systems, tools and processes, based on the needs, expectations, links to livelihoods, and also guarantees the use and uptake of any effective measure as end users.

The main impact to be achieved by SSRI is to ensure continuous and systemic policy exploration and evaluation, in which the citizens are protagonist of the co-creation process, contributing to their effective integration into the environmental sustainability process regardless of their physical location (rural or urban), or their personal circumstances or socioeconomic condition.

THE LIVELIHOODS METHODOLOGICAL APPROACH TO INTEROPERABILILTY

Mapping livelihoods dimensions allow us to identify key elements of spatial data infrastructures and environmental management platforms to ensure environmental sustainability and the well-being of populations, and to determine new possible interoperability components for the INSPIRE Directive that should involve policy-makers, the private sector, and local agents in order to really have an impact on environmental sustainability.

The definition of what constitutes a rural area is usually based upon population density has serious limitations for formulating and implementing development policies that can ensure economic, social and environmental sustainability. Besides a demographically-based definition, other criteria are necessary to characterize rural environments in terms of factors related to the development process. These include factors such as physiographic features, occupation and use of space, the organization of its inhabitants and ecological factors that will provide a more effective typology of rural spaces in order to capture the enormous diversity and dynamic nature of the development of rural spaces and their inhabitants.

One of the factors that have hindered the development process in rural areas is the lack of innovations that could significantly improve their economic development prospects. The capacity to innovate is considered one of the driving forces of economic growth and development. In today's globalized economy the capacity to innovate is seen as the most important single factor in fostering competitiveness of firms' and countries' economies by policy-makers and governments (Friedman and Soete, 1997, Tushman and O'Reilly, 1997, Peña, 2003). The conception of the innovation process has been evolving towards what Chesbrough coined as "Open Innovation" (2003) in terms of more complex socially distributed structures of knowledge production activities, which recognize the importance of the strong interplay between science, technology, society and policy (Freeman, Clark and Soete, 1982, World Bank 2007). This change has fostered a high degree of interdisciplinary networking and a growing diversity of knowledge generating organizational arrangements.

The development of this Social Innovation Intelligence Platform has been based on an approach to innovation and rural development that would empower citizens and transform the rural environment into productive and prosperous centres of the knowledge society, based on the innovative use of knowledge and the physical, ecological and human assets of the rural environment.

Table 1. Products, description and potential use

PRODUCT	DESCRIPTION	POTENTIAL USE
Livelihood maps	Map of areas on the territory characterized by one main type of land-use, income source, human activity	Provide an integrated perspective of the spatial distribution of production systems, ecological impacts, sustainability, dimensions of the limitations and obstacles for development, and potential partnerships and solutions from SSRI results in similar livelihood areas. A platform for improving the effectiveness of the coordination of policies, programmes and projects among all stakeholders
Livelihood profiles	A platform for providing an updated status map of the situation of the population and ecosystems in the territory within each Livelihood type, in terms of the 7 livelihood dimensions A platform to stimulate incentives for the population to become actively involved in updating and validating the data in each livelihood type in the territory (social validation)	Provide updated priorities for policy adaptation and impact assessment of programmes. Provide a framework for understanding and evaluating the effects and impacts of policies and programmes at local, regional , national ad European levels Provide a platform for strengthening governance mechanisms and instruments
Future Scenarios of Livelihood Dynamics	A platform to support the participatory process in developing and validating future scenarios (climatic, economic, political, institutional and stakeholder participation) A platform to provide the institutional memory for monitoring and guiding the policy process for sustainable development	Community members participate actively in supplying the inputs and suggestions to develop future scenarios of their livelihoods, systematically considering the influence of key driving forces at all levels, and identify key areas for open innovation projects in SSRI. Key stakeholders, including local, regional, national and European government, private sector, civil society, NGOs, academic and research organizations use the platform to as a monitoring tool to maintain a formal process of discussion and negotiation, based on an agreed set of indicators

CONCLUSIONS

Having described the nature and complexity of the development process, this paper has centered on a Social Innovation Intelligence Platform for overcoming obstacles and barriers to the ICT innovation process by assessing risks, vulnerability mapping, policy assessment and adaptation needed for enhancing and promoting the impact of policies and programmes on citizen's participation in the innovation process towards sustainable development. The methodological framework to attain this outcome includes the use of a strategic partnerships component that uses future development scenarios as well as social networks mapping tools, as a means for identifying and exploring the future interactions key stakeholders and rural development in all its dimensions.

The Social Innovation Intelligence Platform provides the means for:

The activation of the partners and key stakeholders to actively participate in generating the functionality and contents of the knowledge platform for good practices sharing of relevant project results (production systems; production-value chain sustainability; management approach for improved resources use, etc): The Platform provides the tools and means for facilitating the participatory process for the production of the of the current situation as a baseline, assessing the impacts at farm, territorial and regional scales; and formulating the future scenarios and follow-up of the implementation of policy options with explicit geographic reference.

Establishment and inclusive use of the Future Scenarios component of the Platform among all key stakeholders to support and monitor the progress in the formulation and implementation of effective innovations in livelihood systems and natural resources management to achieve sustainable development.

Strengthening of the Environmental and Food and Agriculture Innovation capacity among the key stakeholders at the territorial, national and Trans-national levels: This focuses on the identification of the inter-institutional gaps that can restrain the policy process that is essential for attaining sustainable levels of livelihood vulnerability reduction. It also deals with specific actions to strengthen the networks of organizations, institutions, civil society and government agencies involved in the future scenarios platform.

The Social Innovation Intelligence Platform has the potential for building an open community to pave the way to the sustainability and further impact of the Global Forum that will be able to evolve according to the different resources management scenarios of the future providing support to different and geographically extended societies. In addition to this, the information collected from the society and smart environments will turn into renovated and useful information returning to the same society creating a community based on collaboration and evolution being an active participant of the social validation mechanism.

The Social Validation mechanism described in the paper is the means for ensuring and enhancing the impact of the participatory innovation process to co-design and validate social inclusion with real citizens, rural communities and businesses. The social validation process addresses the implementation of the concept of 'impact' and introduces different approaches that may be considered to assessing it, considering different stakeholder perspectives, in particular the differences between assessing impact at the Policy level and using impact measures to manage services, including:

Strategic policy level evaluation, which will consider the impact of the Social Innovation Intelligence Platform with respect to ICT innovation in services produced and how it targets priority user groups and demonstrates the effectiveness in terms of social inclusion and sustainability. The Platform can be instrumental in the definition and application of the instruments and content needed by stakeholders; identifying evidence of partners benefiting from the contents available; and the impact of the project on regional, national & local strategies supporting citizen participation and sustainability of ICT innovation initiatives.

An assessment of the operation of the different Social Innovation Intelligence Platform participants to consider aspects such as cross-sectorial risk and vulnerability management, competencies and capacity building, partnership and collaboration, good practice in managing resources, and the impact of results.

Finally, the social validation mechanisms described in the paper can be used:

- To influence policy makers. This could be at a variety of levels, regional, national government, as when the case is made for strengthening the role of stakeholder participation in improving policy impact;
- Local government, where it may be necessary to show the positive impacts of public investment on local communities, or improve local vulnerability assets;
- Potential collaborators, for example in other institutions (research, policy), educational institutions or commercial enterprises, which need to be persuaded of the value to them of contributing to sustainable agriculture and food security;
- To understand better where impacts are being made (or failing to be made) so as to brainstorm options and then plan strategically for future scenarios intelligence options;
- To check whether policies are having the anticipated results - and to adjust plans and planning processes accordingly.
- To develop an understanding of how policies in other sectors might be adjusted to increase impact in agri-food systems and livelihoods sustainability;
- To develop insights into the different responses and needs of different livelihood groups with the active participation of local communities using the social validation process of the Social Spaces for Research and Innovation.

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