Regional Innovation Systems and **Tourism**: a Conceptual Approach

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Abstract | This article aims at providing a conceptual framework for the analysis of regional innovation in tourism, linking the development of tourism destinations and geography of innovation fields of study. It discusses the evolution of innovation models towards interactive processes that highlight the importance of regions and regional actors in innovation and territorial development. Considering the nature and dynamics of tourism industry, Regional Innovation Systems theory was considered to be the most appropriated for this analysis. Bearing this in mind, the concept was applied to tourism destinations through: (i) the identification of tourism actors; (ii) the definition of tourism regions; (iii) the analysis of innovation networks in tourism innovation; and (iv) knowledge creation and transfer in tourism practices as crucial innovation processes. This analysis resulted in a conceptual model of a Regional Tourism Innovation System, which contributes to the understanding of the dynamics of tourism systemic innovation (helping the design of innovation policies) and provides a model for empirical research on tourism innovation.

Keywords | Regional Innovation Systems, Tourism Destinations, Innovation Networks, Knowledge, Innovation.

Resumo | Este artigo tem como principal objetivo fornecer um quadro conceptual para a análise da inovação regional em turismo, relacionando o desenvolvimento dos destinos turísticos com a geografia da inovação. Discute-se a evolução dos modelos de inovação em direção a processos interativos que destacam a importância das regiões e dos atores regionais para a inovação e desenvolvimento territorial. Considerando a natureza e a dinâmica do setor do turismo, a teoria dos Sistemas Regionais de Inovação foi considerada a mais adequada para esta análise. Desta forma, o conceito foi aplicado aos destinos turísticos, através de: (i) identificação dos atores do turismo; (ii) definição de destinos turísticos regionais; (iii) análise das redes de inovação em turismo e; (iv) análise das práticas de criação e transferência de conhecimento como os principais processos de inovação. Esta análise resultou num modelo conceptual de um Sistema Regional de Inovação em Turismo, o qual contribui para a compreensão das dinâmicas de inovação sistémica no setor (ajudando na elaboração de políticas de inovação) e fornece um quadro conceptual para a investigação empírica em campos de estudo relacionados com a inovação em turismo.

Palavras-chave | Sistemas Regionais de Inovação, Destinos Turísticos, Redes de Inovação, Conhecimento, Inovação.

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1. Introduction

The development of tourism destinations is a complex process, in which innovation plays a central role. The introduction of innovative products and services has impacts on the image of the entire destination, influences the global tourism experience, the performance of all regional tourism actors and economic growth. However, studies linking regional development, tourism and innovation are lacking or are still in an early stage, when comparing to manufacturing sectors. Furthermore, most studies are of qualitative nature, which calls for quantitative research providing solid empirical evidence on regional tourism innovative practices and performance and that provide validated frameworks of analysis.

This paper aims at providing this conceptual framework. In order to do so, the evolution of innovation concept is analysed, concluding that innovation models are walking towards integrated, networked and interactive practices, which stresses the role of territories and regions as the locus of innovation. Within these territorial innovation models, it was considered that Regional Innovation Systems (RIS) provide a valuable framework, suiting the systemic nature of tourism and its high involvement with territories, local businesses and communities. Therefore, RIS theory was applied to tourism. This was performed by (i) conducting an extensive literature review on the matter; (ii) identifying RIS components and internal and external dynamics; (iii) through the definition of 'region' and 'tourism region'; (iv) analysing the role of regional innovation networks and their benefits for tourism industry; and (v) understanding the processes of knowledge creation, transfer and collective learning as main innovation processes within RIS.

The conclusion of the conducted analysis was the development of a conceptual model of a Regional Tourism Innovation System that contributes both to tourism innovation practices and policy design and works as an empirical framework of analysis for a deeper study on this matter.

2. The Development of Tourism Territories

New trends in demographics, life styles, consumption patterns, purchasing power, new technologies and access to information, among other changes have been over the last decades influencing the shortening of tourism destinations life cycle. This demands for the development of new products and, more important, new travel experiences that must be introduced throughout all stages of destinations' development so that they can continuously reinvent themselves and remain competitive.

The development of tourism destinations is a complex process, as it varies among regions and depends on distinct factors. Rostow (1990) argues that, in order to development and growth to happen, it is necessary the existence of an element of modernization and innovation introduced in the society and economy. The idea of innovation as a central feature of development and economic growth is strongly related to the Schumpeterian theory of economic development.

The analysis of tourism development is usually undertaken under a geographical perspective. The assumption that tourism destinations are dynamic, evolving constantly through time has existed for many years. Several authors approach the topic of tourism destination development from distinct perspectives, each dealing with a part of the whole complex tourism system. Despite the variety of models, Butler's Tourism Area Life Cycle (TALC) (Butler, 1980) appears to be the most widely utilised, as it provides a useful framework to analyse the evolution of destinations within their complex economic, social and cultural environments (Cooper and Jackson, 1989). Moreover, it contemplates post-stagnation scenarios, demonstrating that destinations' life cycle can be highly dependent on policy and strategy formulation by decision makers.

The TALC model suggests that tourism destinations are dynamic and evolve through a process of rise, growth and decline modelled by an asymptotic (or S-shaped) curve, depending on factors such as

the changes in preferences and needs of visitors, the deterioration and replacement of physical structures or facilities and the change or even disappearance of the original attractions, responsible for the initial popularity of the place (Butler, 1980). The author characterises the development of tourism destinations according to six stages: exploration, involvement, development, consolidation, stagnation and decline or rejuvenation. Each stage is characterised by a varying number of tourists, provision of facilities, marketing and policy strategies, etc. It is widely assumed that, when entering decline stage, destinations should implement innovative strategies in order to rejuvenate themselves and to provide new experiences to potential or existent visitors. It is, however, our understanding that innovation should occur throughout all life cycle, resulting from the creation and consolidation of strong tourism innovation systems. Continuous interactive processes of innovation, knowledge creation and learning foster the creation of resilient and competitive tourism destinations.

3. The Evolution of Innovation Processes: from Products to Territories

As several other areas of study in social sciences, innovation lacks a common and consensual definition, remaining ambiguous and making difficult the understanding of its nature. This results from the fact that the concept is applied to different disciplines and that, in order to innovation to occur, a very complex process takes place.

One of the first and most prominent authors to focus on the importance of innovation in economic analysis was Joseph Schumpeter (1883-1950). The author defines the phenomenon as the setting up of a new production, covering new commodities as well as new forms of organisation. Innovation is "*(…) the carrying out of new combinations*" and embraces: (i) a new good or quality of a good; (ii) a new method of production; (iii) a new market; (iv) a new source of supply; or (v) a new form of organisation. He further stresses the economic significance of innovation, that is, innovations should necessarily involve the commercial application of a new idea, or else they will remain inventions (Schumpeter, 1934: 66).

The models underlying innovation processes have changed significantly in the last decades. Organisational forms, innovation inputs, drivers and barriers are evolving, in result of different socioeconomic contexts, competition, market changes and the dynamics between scientific knowledge and economic fabric. Early innovation models were linear in nature, that is, innovation resulted from a sequential set of events occurring within firms. In the 'neoclassic' or 'technology-push model', innovation occurred through a linear progression starting from science or research and ending on marketing and sales. Science and R&D were the privileged sources of innovation and leading to the creation and commercialization of more successful products and services. Innovation was proactive to the market. Kline and Rosenberg (1986) pointed some limitations to this model, one of which was the fact that innovation should be aligned with market needs. Thus, consumers should be the primary source of innovation. The second generation of innovation models ('demand-pull'), although still linear, seems to overcome this as it placed market's needs as the providers of guidelines for R&D, which gained a merely reactive role in innovation process. This practice led firms to perform mostly incremental innovations and to lose their ability to adapt to radical market changes (Rothwell, 1994). In response to the limitations of linear models, Kline and Rosenberg's "Chain-Linked Model" and Rothwell's 'Coupling Model' approached innovation as the result of an interactive process developed within and outside the firm, as a set of intra and extra-organisational communication paths that linked together firm's functions with scientific and technological community and to the marketplace, moving thus away from linear constructs (Kline and Rosenberg, 1986; Rothwell, 1994).

More recent approaches started moving to concepts set on the relevance of interactivity and networking. Beyond the integration of their functional units, firms also need to reinforce their connections to other organisations taking part on the system of innovation. Interaction and knowledge sharing are necessary, especially those deriving from linkages with other sources of knowledge, such as firms, universities, research centres, users and, suppliers. Information sharing is important, however, the acknowledgement of the importance of tacit knowledge for innovation led to a focus on the mechanisms that enable the creation, transfer and use of all knowledge types. Recent models are then based on knowledge (as opposed to information) and connectivity (as opposed to explicit formal networks) (Chaminade and Roberts, 2002).

As stated by Cooke and Morgan (1998:17), "*the wider environment of the firm – the social and political system in which it is embedded and with which it interacts – can play a vital role in facilitating (or frustrating) its learning capacity*". This line of though emphasises that innovation is a process that is socially and institutionally embedded and of systemic nature. Furthermore, firms rarely innovate in isolation, since innovation "*results from continuing interaction between different actors and organisations*" (Fagerberg, 2006:4), which highlights the fundamental role of networks and inter-firm relationships. These relationships among economic agents are fundamental for knowledge creation and transfer and for collective learning, crucial elements of systemic innovation (Lundvall, 1992). These dimensions are on the basis of the territorial innovation models and partly explain why organisations agglomerate in order to innovate.

Territorial innovation models emerged due to the valorisation of local and regional initiatives for economic development as alternative to national economic policy. Within these models, endogenous development is at the forefront of regional policies and local dynamics play a significant role (Moulaert and Sekia, 2003).

Territorial innovation models emerged in this context and due to the valorisation of local and regional innovation for economic development. Moulaert and Sekia (2003) agree that the most influential models are the Innovative Milieux, Industrial Districts, New Industrial Spaces, Spatial Clusters of Innovation, Learning Regions and Regional Innovation Systems. The two latter models are founded on a systemic approach to innovation process which emphasises the relationships among institutions and organisations and where innovation is understood as a process of production, diffusion and use of new and economically useful knowledge and of interactive learning (Lundvall, 1992; Cooke *et al.,* 1998). Despite the differences that characterise these approaches, they all share more or less the same principles, although with different levels of importance. Territorial innovation models are then built on agglomeration externalities (with a special focus on knowledge spillovers), endogenous capital, embeddedness of relationships, networking and collaboration as enablers of knowledge creation, transfer and collective learning, which are shaped and driven by the strong role of local institutional dynamics. Innovation results therefore from the dynamic intertwining of these dimensions, where local players assume a central and decisive role in the social and economic construction of territories.

4. Regional Innovation Systems and Tourism

The Innovation Systems theory is based on the interactive model of innovation. The capacity to innovate depends not only on the individual performance of organisations or their simple existence in an aggregative way, but how they interact with each other within the innovation system (Gregersen and Johnson, 1997).

The Regional Innovation Systems (RIS) concept was first introduced by Philip Cooke in 1992 and is nowadays widely used by several authors when stud-

ying innovation processes in regional economies. This systemic approach to regional innovation results from the evidence of several studies that highlighted the importance of regional level in economic development. The argument that geographic proximity between organisations facilitates the creation and transfer of knowledge through networking, personal relationships, local collective learning processes and the existence of a 'sticky' knowledge present in social relations, contributed to the development of Regional Innovation Systems theory. Furthermore, each region may be characterised by having specific and embedded routines, norms and traditions that play a fundamental role on the way organisations interact and cooperate with each other in order to innovate. Geographic distance usually decreases the intensity and frequency of interaction among them. Bearing this in mind, and considering the social character of innovation and learning, these processes are best achieved when actors are close enough to have frequent and personal interaction (Asheim and Isaksen, 2002).

Within this context, Gertler (1997) emphasises the geographical nature of innovation processes, that occurs due to three main reasons (i) spatial proximity increases frequent, close and face-to-face learning-by-interaction, (ii) regionally clustered firms share a common regional culture that can facilitate social learning (especially when shared knowledge is tacit); and (iii) this common language is supported by the creation of regional institutions that help to establish local rules and norms that regulate firms' behaviour and interaction.

Edquist (2006) claims that systems integrate two constituents: components and the relationships among them, they must always perform a function and they must have boundaries that allows to distinguish them from the rest of the world. Innovation systems' components can be viewed as their 'operating parts'. An innovation system's components are the actors (or organisations) and institutions that contribute to the overall function of innovating. *Actors or organisations* may be defined as formal structures that are created consciously and with an explicit purpose. They are players or actors of an innovation system. They can comprise firms (users, producers, suppliers) or non-firm organisations such as universities, research centres, financial institutions, government agencies, associations, trade unions, and can include sub-units of larger organisations (e.g. in the form of their R&D departments) and groups of organisations (industry associations). These agents are characterised by particular learning processes, competences, beliefs, goals, organisational structures and behaviours (Malerba, 2005).

While organisations are 'players', *institutions* are the "*rules of the game*". They shape human interaction and "*reduce uncertainty by providing a structure to everyday life*" (North, 1990:3). Institutions are resilient social structures, transmitted across generations and based on rules, norms, cultural beliefs, common habits, established practices, laws, standards, etc. Institutions emerge or are imposed by interaction among people or groups of people and therefore are preserved and modified by human behaviour (Scott, 2001).

Despite the fact that *networks* play a fundamental part of innovation systems, they can hardly be seen a component. Instead, they are the basis of the linkages and interaction between organisations and institutions, whose ultimate output is the production, diffusion and use of innovations. They represent the dynamics of an innovation system. Their role in regional innovation systems is analysed further.

4.1. Innovation in Tourism Territories

Tourism is composed by a set of interconnected, interdependent and interacting firms, organisations and institutions and therefore it cannot be defined as a simple 'industry'. A system is an indivisible whole with specific properties that none of its parts separately have. The behaviour of each element of the system will affect the other parts and the entire system as well. Thus, the systemic approach seems to

be a suitable premise to analyse and conceptualise the phenomenon of innovation in tourism. This implies that an innovation developed by a single tourism organisation will affect the entire destination. Tourism as a system is approached by authors such as Leiper (1979), Mill and Morrison (1985), Manente and Minghetti (2006).

Bonetti *et al.* (2006:111) consider that the tourism system's territorial dimension is "*capable of enhancing the surplus value which can be generated by a destination as a whole*" and may cover "*the evolutionary process which makes possible for a specific area to modify its vocation over time and express it by generating new products*", that is, to develop significant innovation processes. Approaching tourism destinations as systems: (i) helps to understand the dynamics and synergies between the elements and sub-sectors that compose it; (ii) once tourism is an open system, because it interacts with other environments or systems and is continuously changing, it permits to analyse these broader interactions; (iii) by furthering knowledge about how tourism destinations operate, it brings important insights to destination management, planning, collective learning and innovation development; (iv) fosters collective action towards commonly defined plans, actions and decisions; and (v) allows the analysis of tourism destinations' evolutionary process as a whole and to understand and design innovation processes that prevent destinations to reach stagnation and decline stages as predicted by Butler.

Besides these, (Macbeth and Carson, 2005) and (Bonetti *et al.*, 2006) highlight some issues that should be kept in mind when considering tourism systemic innovation, namely that complex relationships occur in interaction with other systems (regions or industries) preventing or counteracting lock-in and decline situations by injecting new knowledge into the system that originates innovation; there are strong links between generating and destination regions; it involves a multitude of actors with relations of interdependence and that the ties and interaction developed within the system will foster the creation of networked innovation processes which, if long-lasting, result in solid networks of innovation operationalising regional tourism innovation systems.

Especially important in the context of tourism innovation is the fact that tourism destinations are location-specific, made of natural, cultural and man-made resources hardly transferable to other location. In this context, regional innovation systems, due to their characteristics, are of significant importance for innovation at destination level because territorial specificities will determine the intensity and type of innovation, engagement in innovation networks, knowledge creation and transfer.

4.2. Boundaries: Regional Tourism Destinations

The existent models of territorial innovation, namely regional innovation systems, confirm the relevance and coherence of regions as privileged platforms for systemic innovation, as they counter the argument and practice of atomised business management models. Regions as the locus of innovation derive, among other factors, from the geographic proximity developed among regional actors, the creation of trust among them, the formation of networks and social capital and from the embeddedness of business relations. Lundvall and Borrás (1997) highlight that regional dimension is crucial for innovation because the capacity for developing human capital and for interacting with other organisations (as well as social capital) is usually localised and innovation can emerge from ideas resulting from individuals or organisations sharing the same perspectives (political, cultural, economic) or engaged in the same economic space or region.

Cooke (2001:953) provides an interesting definition of 'region', considering it as a "*meso-level political unit set between the national or federal and local levels of government that might have some cultural or historical homogeneity but which at least had some statutory powers to intervene and support economic development, particularly innovation*".

Often administrative boundaries do not correspond to functional spaces. Therefore, regions should not be artificially created or defined based on a mechanical practice. They should emerge from geographical areas displaying a high degree of coherence or inward orientation with regard to innovation processes. Edquist (2006) argues that a possible way of doing so is by identifying a minimal proportion of innovations that result from collaboration among partners within the region. Thus, functional regions should be determined by the frequency and intensity of economic interactions.

Considering the importance of governance structures and institutions for innovation, one ought to bear in mind that larger territories may contain wider diversity, but this will not conduct to innovation if there is not enough proximity (Gregersen and Johnson, 1997). In this case smaller tourism regions would be more suitable. Despite this, as the size of administrative regions reduces, the influence of and dependence on 'external' subjects, tends to increase (Evangelista *et al.*, 2002), which demands for stronger and innovative regions capable of competing globally for tourists, funding and resources.

Tourism destinations are often (and sometimes wrongly) identified in accordance to administrative divisions that derive from former land rights, geology or political history (Laws, 1995). However, Buhalis (2000) argues that destinations constitute a global experience for tourists. Accordingly, they should be understood as perceptual concepts, subjectively interpreted by travellers according to the products and services which are offered. Bonetti *et al.* (2006) argue that the unifying factor that defines a region as a competitive and autonomous territory is its economic and cultural homogeneity as perceived by clients (rather than political borders).

This perspective is well explored by Costa (2001) who argues that destinations are usually delimitated in a 'space-product' perspective, in which tourism destinations are designed and commercialised according to administrative boundaries, and not in a more adequate logic of 'product-space', which recognises that in order to design successful tourism products and services, there must be an initial profound and rigorous knowledge of existent resources that will allow, subsequently, to identify clusters of tourism supply; that is, regional and local tourism products and destinations that are adequately structured and competitive in the global markets (see Figure 1).

If regional tourism destinations adopt similar practices, they will be able to: (i) foster an increased interaction among tourism related

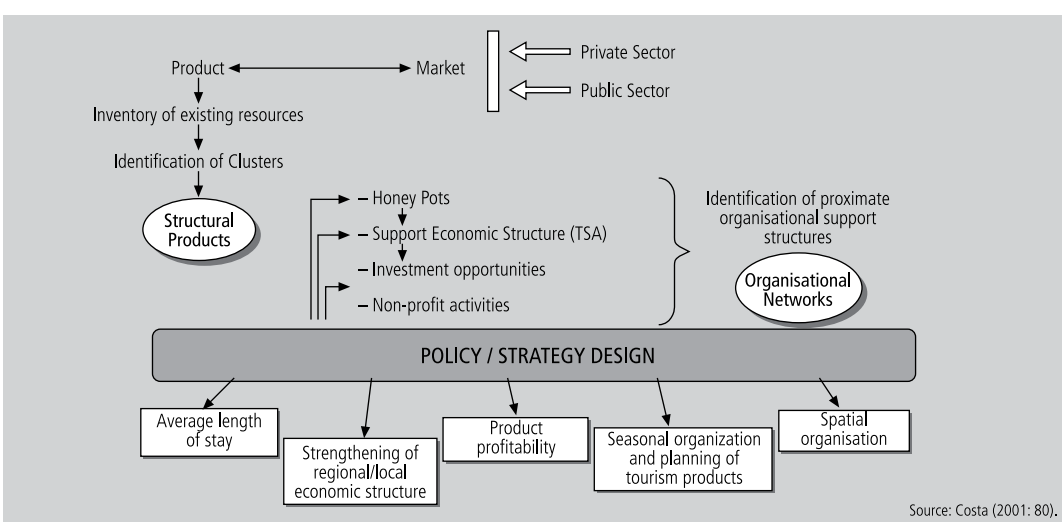

Figure 1 | The Product-Space Model.

firms and organisations (homogeneity within networks); (ii) develop a culture of regional identity and, subsequently, of mutual trust (developed in networks and resulting from social capital); (iii) create innovative products based on the uniqueness of places ('honey pots'), whose structure will be much more valuable in global markets; and (iv) following the establishment of a tourism regional innovation system, tourism destinations will have the sufficient strength to increase their outwards connections, renewing their stock of knowledge and introducing incremental or radical innovations throughout the territory (spillovers).

Regional and local level gains, therefore, strategic importance in overall tourism management, and particularly in tourism innovation. Moreover, when analysing tourism development, namely destinations' evolution through stages as portrayed by Butler (1980), it is suggested that this analysis is conducted at regional or local level. This should occur in order to fully understand the dynamic underlying the development of tourism destinations and the need for the constant creation of innovation.

For the purpose of systemic innovation, tourism destinations should be regarded as geographical regions which are *homogeneous* in terms of characteristics, offered experiences, resources, image, perception and a tourism governance structure (with its goals, strategy and policy), representing thus a *unique territorial unit*. Boundaries are not relevant for this distinction, which does not mean that they cannot exist defining an administrative region that coincides with the perceived tourism destination.

4.3. Networked Innovation

Several definitions of networks exist, each highlighting different characteristics. Based on these different approaches to network concept, Costa (1996) developed a comprehensive definition which suits the organisational and economic approach:

> *(…) network can be defined as an organisational structure whose operating philosophy may be placed between Weber's bureaucratic model and the neoliberal or market philosophy. Networks are based on two or more (usually administrative independent) organisations which decide, by a formal or informal commitment, to engage in a medium- or long-term cooperation process involving the exchange of products and services (…). A network is, therefore, underpinned by the premises that every organisation depends on the success of others and also that competition must be viewed beyond the region where an organisation is located"* (Costa, 1996:148).

Networks develop according to different factors, resulting in different configurations and structures, which influences the way networked and systemic innovation processes develop and, subsequently, the innovative performance of regions. The nature, quality and type of ties between actors and networks' morphology strongly influence innovation patterns, namely: the creation of social capital (Coleman, 1988), the existence or absence of structural holes (Burt, 1992) and of weak ties (Granovetter, 1973), and the embeddedness of economic behaviour in social relations (Granovetter, 1985).

As already referred, Regional Innovation Systems are made of components (organisations and institutions) and of the relationships (networks) established among them. In the last decades, networks of innovators had suffered a considerable increase: *"(…) more and more of the innovation process takes place through networking rather than through hierarchies and markets. (…) only a small minority of firms and organisations innovate alone, and that most innovations involve a multitude of organisations"* (Lundvall and Borrás, 1997:106).

Network relationships can create and provide firms with unique and non-replaceable value as well as access to incomparable resources and capabilities of other organisations, which give them crucial conditions to innovate. Networks grant timely access

to external knowledge and resources otherwise unavailable to a single firm and at the same time they allow the testing of internal expertise and learning abilities (Vonortas, 2009). For instance, Acs and Audretsch (1988) highlight that knowledge spillovers resulting from regional networks compensate the lack of R&D by SMEs, which frequently do not have the financial or institutional means to engage in such endeavours. This situation is particular relevant for services, in general, and tourism in particular, as it is mainly composed of SMEs. In addition to the creation and transfer of knowledge related to innovation, networks allow firms to learn to innovate synergistically and to develop routines to that effect, such as technology transfer and to locate themselves in strategic network positions (Powell *et al.*, 1996). However, while regional innovation networks improve the access of small businesses to experience and knowledge, their true strength is in their ability to provide ties to global networks (Camagni, 1991).

Within this context, and according to Hotz-Hart (2000:434), the benefits of networks for the development of innovation rely on:

1. Better access to information, knowledge, skills and experience.
2. Improved linkages and cooperation among members.
3. Improved response capacity.
4. Reduced risk, moral hazards, information and transaction costs.
5. Improved trust and social cohesion.

Collaboration and networks of tourism organisations tend to increase the innovative performance of tourism destinations. This performance may enlarge as the collaboration patterns involve knowledge infrastructures such as universities and research centres, as well as public and private sector organisations. The diversity of actors in tourism networks is a necessary condition for the creation of successful tourism innovations and innovative destinations.

4.4. Knowledge Creation and Transfer

According to Cooke (2007:186) *"(…) in regional innovation systems work, innovation is the focus, but knowledge, especially from research, is the key driver."* But is tourism a knowledge-based industry? Despite the fact that linkages between knowledge producers (universities, research centres) and tourism organisations may be considered to be lacking, when compared with other industries, this type of linkages and cooperation is increasing, as universities and researchers are more close to society and engaged in solving its problems, and firms are less resistant to scientific knowledge. Moreover, firms are conducting their own knowledge creation processes, which in an ideal innovation system, should be transferred to other organisations in order to promote leaning and innovation.

Knowledge is intrinsically connected to innovation and learning. Innovation is an interactive process dependent on knowledge; it is its most fundamental resource. One of the assumptions of innovation systems is the existence of interactions that result in the production, diffusion and use of knowledge (Lundvall, 1992; Feldman, 1994). Innovation and discovery of the new involves using existing knowledge, which involves learning. In turn, innovation also involves sharing learned knowledge, resulting in a social constructed process of mutual exchange of knowledge and shared learning (Howells, 2002).

Several distinctions have been made in order to categorize different types of knowledge which are important for innovation. A seminal perspective is the one developed by Polanyi (1966) who distinguished codified (explicit) from tacit (implicit) knowledge, linked to the degree of formalisation and the need for physical presence in knowledge creation. Explicit knowledge is transmittable in formal language. Codification allows its transformation into information that is easily shared through formal means (e.g. written documents). However, "*we can know more than we can tell*" (Polanyi, 1966:4), and

this makes the distinction between codified and tacit knowledge. Tacit knowledge is related to experiences that are not codifiable. It represents a know-how that is acquired through the informal learning of behaviour and procedures. Informal means such as face-to-face communication, personal training and staff mobility are some of the ways through which tacit knowledge is acquired.

It seems possible, therefore, to distinguish between a local, embedded, person-embodied and context dependent knowledge, from more global types of knowledge, or to what Markussen (1996) refers to as the 'stickiness' of some forms of knowledge and learning processes as the abilities of particular regions which are closely linked to territories and to people who comprise them. Local versus global knowledge issue and its consequences for knowledge creation and innovation is closely linked to the structure of networks. *Local buzz* (tacit knowledge transfer within local milieus) and *global pipelines* (codified knowledge travelling through worldwide communication channels), as defined by Bathelt *et al.* (2004), should co-exist in order to provide organisations with particular advantages and unique conditions for innovation and avoiding lock-in effect.

Bearing this in mind, one may conclude that industries that are more reliant on codified, scientific knowledge, present knowledge spillovers that are more globally widespread (as the knowledge involved is easily transmitted) and less geographically localized. Conversely, industries that depend on tacit knowledge, know-how, know-who and learning by doing, display much more localized knowledge spillovers (Howells, 2002). This is the case for tourism industry which, in addition to these features, holds a relationship with the territory that may be stronger than other cases, as it is its main resource and base for its development. Tourism firm are highly dependent on geographic location, as destinations are unique and tourism products are immobile. Therefore, tourism network agents should realise that a mentality of community and knowledge sharing as features of their organisational personality brings important competitive advantages, attracting new firms and fostering the innovation process.

The systemic and successful links within Regional Innovation Systems result from the sharing of tacit knowledge and the resulting embeddedness of social networks, which are crucial for innovation. These links are usually informal, implicit, relational and cultural among the network's different actors. Thus, networks are an extremely relevant source of knowledge creation and diffusion, enhancing learning and providing access to knowledge bases for innovation that would otherwise be unavailable. Accordingly, the degree to which firms learn, acquire knowledge and innovate is a direct function of the degree of active participation in the network. Tourism industry organisations are characterised by being rich in tacit knowledge, which is the basis of their competitive advantage. The generation and use of new knowledge (often emerging from other innovation systems) to boost innovation and new tourism products is critical for the competitiveness of both tourism destinations and enterprises.

4.5. A Conceptual Model for a Regional Tourism Innovation System

Considering the nature and multi-sectoral composition of tourism industry and destinations, innovation in tourism should be conceptualised and implemented within a systemic approach embracing firms, organisations and territories. Bearing this in mind and after the analysis made on territorial innovation models, Regional Innovation Systems appear to be the most suitable approach to the development of innovation in tourism destinations. It is, thus, necessary to develop a framework of analysis that provides support for empirical research, as well as in the design of policy and strategies regarding innovation in tourism (see Figure 2).

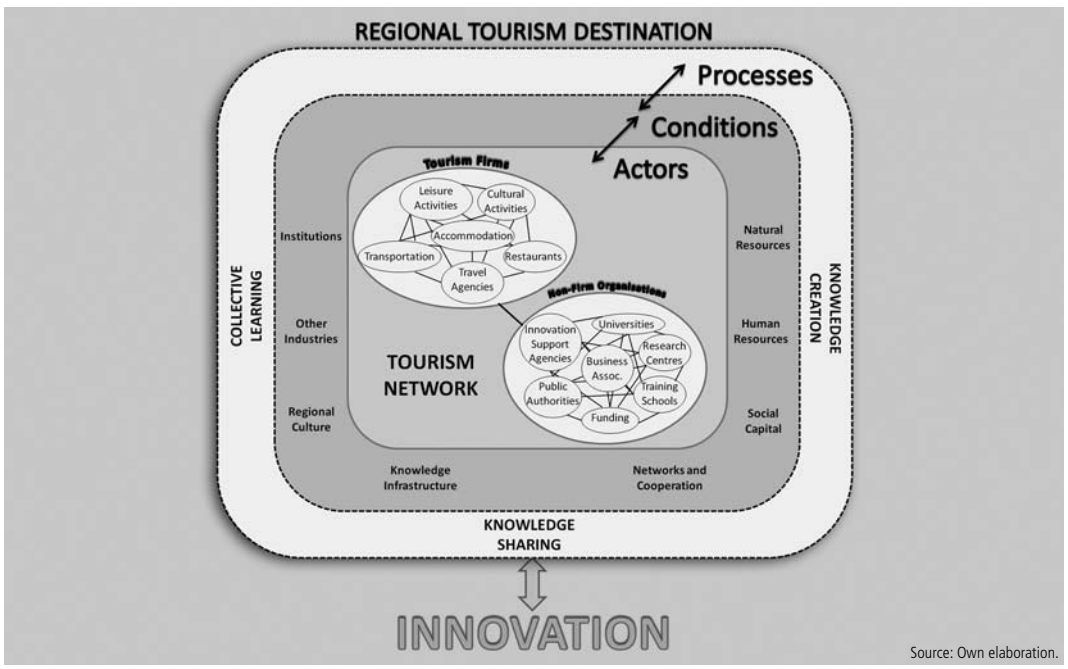

Figure 2 | Overall Framework for a Regional Tourism Innovation System.

We are facing a Regional Tourism Innovation System when there are components/actors (firms and non-firm organisations), networked relationships among them, if these components and networks perform specific (innovation-related) processes that would not be performed if components were functioning in an atomistic way and if this structure could not be distinguished from the surrounding environments or systems.

According to the reviewed literature, actors are firms and organisations. Being tourism an industry comprising a multitude of businesses, it was necessary to identify the tourism-related economic structure. In what concerns innovation systems, this clarification is of crucial importance, as firms are the active innovation agents, locally embedded and highly involved in tourism innovation networks. If these are the main innovation agents, they should be clearly defined in order to conceptualise a Regional Tourism Innovation System. In order to do so, it was considered that Tourism Satellite Account's discourse is the one that is more proximate to the objective: to specifically define tourism economic structure. Accordingly, tourism characteristic activities and products can be summarised in (i) accommodation; (ii) restaurants; (iii) transportation; (iv) travel agencies and tour operators; (v) transport rental services; (vi) cultural activities; and (vii) leisure and recreation activities (UNSD *et al.*, 2008).

The considered non-firm organisations were those that influence tourism development, policy and innovation. These can be grouped in knowledge producers (universities, research centres and training schools) offering tourism courses and/or doing research in tourism, regional tourism businesses associations (such as hotels associations, restaurants associations), funding agencies (funding of innovation/ innovative tourism products and services), innovation support agencies, and public authorities with intervention in tourism (DMO's, municipalities, local and regional government institutions).

Firms and non-firm organisations should operate in an innovation network. This *tourism network*,

if working properly, will utilise *regional conditions* for innovation, benefiting each actor and the overall tourism destination. Regional innovation framework is determined by the specific characteristics of territories. Natural and human resources are or foremost importance for tourism innovation, not only because they are the 'interface' with tourists, but also because qualified human resources highly contribute to the creation and sharing of knowledge useful for innovation. The social capital resultant from the collaboration patterns will increase trust among network members, which in turn fosters knowledge sharing and, subsequently, regional innovation. When regional tourism actors operate in a well developed network and regions' specific conditions necessary for innovative practices are met, innovation-related *processes* emerge, and tourism destinations increase their competitiveness.

Collaboration, trust and economic behaviour are normalised by regional institutions and culture: some regions are more 'open' to partnerships, sharing and working together than others. Knowledge infrastructure refers to higher education institutes and research centres that contribute to the existence of scientific knowledge regarding innovation in tourism and, moreover, that share this knowledge with the community in a way that is easily understood and able to be applied by tourism organisations. Other industries play a relevant role in territorial innovation. Frequently, innovative practices are inspired by other industries with which tourism businesses have economic relations with. This allows for the entry of new knowledge in the system coming from other systems, helping to prevent situations of lock-in or decline. The same applies to the establishment of external links with other regional tourism systems, either at national or international level.

Firms that do not innovate, in time, will benefit from the knowledge creation and sharing and collective learning environment developed within the system and will increase their innovative capacity and subsequently their performance.

5. Conclusion

Tourism is a highly dynamic industry characterised by a systemic nature. The action of a tourism producer will certainly affect the entire destination. This condition should be capitalised for the development of joint innovations through the establishment of tourism innovation networks embedded in regional tourism destinations, where a strong involvement of local actors is observed. Regional Innovation Systems are the appropriated model, as they operate on a regional basis with a high link among the territory and local businesses, community and organisations. This enhances trust and subsequently joint knowledge creation, sharing and collective learning, the main processes leading to innovation.

The developed Regional Tourism Innovation System framework brings contribution at two different levels: first, it provides a model for understanding the dynamics of tourism systemic innovation, by identifying its main actors, the necessary conditions and emerging processes leading to innovation; second, it provides a conceptual model for empirical research on tourism innovation systems, as it identifies which actors to consider in the study, the dimensions to be analysed and the resulting processes to be verified and assessed.

This model is the framework for an ongoing quantitative study on regional tourism innovation, which aims at filling the existent gap in this field (a questionnaire is being applied to regional tourism actors). This will contribute to a better understanding of innovation at tourism destinations, its role in their development, performance and dynamics and how it may prevent destination stagnation and decline. It will also provide data on Portuguese tourism innovation and a method for collecting related information from tourism firms and non-firm organisations.

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