

# **FIRST GLOBELICS CONFERENCE**

***“Networks and interactive learning among academic institutions, firms and government: Knowledge based social capital for local development”***

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# Aim of the paper:

- To discuss whether the concept of social capital could be used to characterise what is happening in the creation of interactions among academia, firms and government, aiming at production and transference of scientific and technological knowledge among these sectors.

# Argument of the paper:

- The study of collaborations reveals a complex set of relationships that are proper to an interactive model of knowledge production.
- Creation of knowledge networks has been stimulated by the learning process among actors and a set of policy mechanisms applied at regional and local level.
- University-industry collaborations in Mexico are taking place on a regional basis, given the geographic proximity between research institutions and the specific problems related to local natural resources and industrial activities.

# Structure of the paper:

- Short review of social capital concept.
- General characteristics of analysed case studies are introduced, making reference to the geographic dimension in which they were identified.
- Aspects that could be used to define knowledge-based social capital are analysed.
- Discussion on the definition of social capital when applied to analysis of regional and local networking.

# On the concept of social capital:

- Community studies: satisfaction of social needs; highlight community responsibility in support of democracy and development.
- First theoretical developments: Bourdieu (1986), Coleman (1990), and Putnam (1993a, 1993b, 1996).
- Recent years, a set of investigations has been developed that consider the role of social capital in the innovation process at national, regional, and local levels (Cook and Wills, 1999; Fountain, 1997; Owen-Smith, et al., 1999).

# Definitions of social capital:

- “The characteristics of social organisations, such as trust, norms, and networks, that can improve the efficiency of society by means of well co-coordinated actions” (Putnam, 2003).
- “Networks with shared norms, values, and understanding that facilitate within and between groups”(OECD, 2001).
- From the perspective of R&D: the network of organisational actors at the regional and national levels (Ostrom and Ahn, 2003: 199-200).

# Definitions of social capital, cont.:

- One of the central ideas is that social networks are important because they have value (mainly for those that form part of them) and are oriented toward the solution of problems. In this sense (in microeconomic terminology), it could be stated that networks produce public and private benefits. Acting in a coordinated manner within networks, participants obtain more by time unit devoted to joint activities.

# Knowledge-based social capital:

- In this paper, it is assumed that collaborative actions among academia, firms, and government could be conceptualised as knowledge networks (Casas, ed. 2001), given that they involve the generation and transfer of scientific and technological knowledge, interactive learning, trust building, and the creation of regional and/or local knowledge spaces. These process are built on the base of an interchange of resources mainly represented by knowledge.



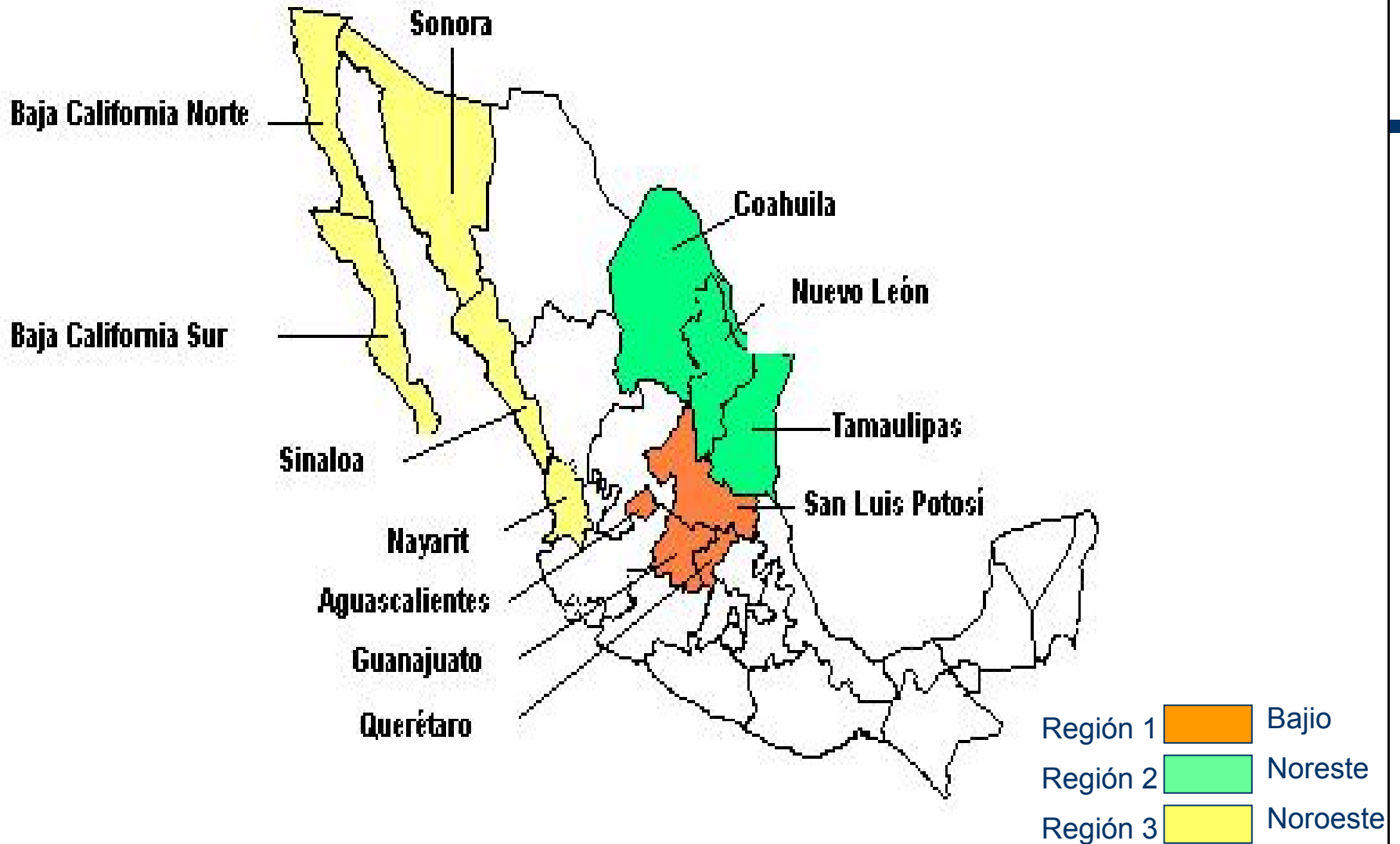
# Characteristics of case studies:

- Analysis is based on a set of collaboration projects, captured at a specific moment in their development.
- They have implied formal and informal interactions to mobilise scientific and technological knowledge for the solution of specific problems.
- Empirical work was conducted in research institutions and firms where knowledge networks were identified.
- Field work was conducted in two stages, the first from 1998 to 2000, and the second from 2000 to 2002.

# Location of case studies:

- The Bajío, the Northeast and the Northwest regions of Mexico are characterised by:
  - a)** knowledge capabilities accumulated in different research institutions;
  - b)** important productive sectors and,
  - c)** different kinds of networking among academia and several economic sectors, creating the conditions for knowledge-based social capital.

# Regions



# Processes Leading to Knowledge-Based Social Capital Creation

- ✓ ***Creation of coordinated actions (knowledge networks) based on informal and formal relationships***
- ❖ Networking experiences have an important basis in spontaneous and informal relationships. This clearly occurs in the material sciences field.
- ❖ Government has shown participation as a player in the building of knowledge spaces to the degree to which it has applied policies that have facilitated the creation of interactions between public research centres and industry. Specifically, in Guanajuato the state government during the end of the 1990s.
- ❖ Two different orientations of collaborations are identified in the case studies considered. The first deals with interactions that are basically built on bilateral relationships between academia (public research centres or universities) and large national firms. This situation is characteristic of Region 2. And those in which government participates in an indirect manner in some of these collaborations through financing research programs (Region 1 and 3).

## ✓ *Creation of coordinated actions (knowledge networks), cont...*

- ❖ It could be argued that networking is preferentially localised in specific states of the country. This implies that local knowledge networks are better built than regional networks.
- ❖ As for the objectives of collaborations, the majority of cases analysed are looking for improvement of processes and products, mainly in the fields of metallurgy, materials, and polymers, where participation of large enterprises is afforded.

## ✓ **Long-term interactive learning:**

- ❖ Mainly in the cases analysed in the fields of material sciences, polymers, biotechnology, fisheries, and telecommunications, in which interactions and collaborations were built among different actors.
- ❖ In general, networking between public research centres and local or regional firms or viceversa in Regions 1 and 3 have implied learning, an accumulative and long-term process among the sectors.
- ❖ Multidisciplinary networks built in Region 3 for shrimp aquaculture implied a long-term learning process beginning in the early 1970s when CIBNOR was built in La Paz, Baja California.

# ✓ **Trust development among actors:**

- ❖ **Geographic or physical proximity is a condition for trust building, but also the existence of mature research institutions and the demonstration that knowledge could be used to aid solving specific problems of productive sectors.**
- ❖ **In Regions 1 and 3, the processes of learning have passed through different stages and difficulties in the confidence generated among actors. Trust building is mainly based on the development of what can be called technical trust or technical confidence, which arises once the actors agree on a common goal.**
- ❖ **Processes of this sort are particularly relevant in Region 2, as large Mexican firms located in the State of Nuevo León have been involved in collaboration activities with state universities.**

# ✓ Interactive Flows of Scientific and Technological Knowledge:

- ❖ Existing knowledge based in universities and public research centres is important for improving productive process in firms: shrimp improvement, virus-resistant strawberry plants, the manufacture of specific parts for the sugar cane industry, and the achieving of the ISO 9000 quality norm.
- ❖ The creation of networks also leads to development of new knowledge, the recombination of knowledge, and in some cases to generation of knowledge at the forefront that becomes significant for the productive sectors: research in optic characteristics of paints, investigation on reactive extrusion in the field of polymers, and development of genetic engineering of shrimp and agave, among others.
- ❖ Codified knowledge is being exchanged into an important degree.
- ❖ Tacit knowledge is also an important input that is transferred in the cases analysed. This mainly consists of ideas, abilities, and experiences that reflect capacities incorporated in personnel that are acquired in formal and informal training.



## ✓ **Building Regional and/or Local Knowledge Spaces:**

- ❖ The existence of accumulated knowledge, incipient networking, and interactive learning process in specific regions or localities within Mexico is giving rise to the creation of what we call knowledge spaces.
- ❖ To designate regional spaces that have accumulated under-utilised knowledge—in specific fields relevant to social or economic development—and emergent knowledge flows among actors, giving rise to the building of knowledge networks. This process leads to the recombination of knowledge among public research centres and universities and by means of inter-firm relationships, facilitates the creation of social capital in specific and specialised research and technological fields.

# Final Remarks: From Knowledge Networks to Knowledge-Based Social Capital

- Importance of the complementarity that is being built between knowledge produced at public research centres and universities, and that accumulated in productive sectors and governmental actions.
- The importance that interactive and learning processes have in the creation and transference of knowledge between producers and users of knowledge.
- The building of knowledge networks based on formal and informal relationships, the interactive learning process, development of technical trust, and reciprocity norms and values based on interactive flows of scientific and technological knowledge constitute relevant aspects for building regional and/or local innovations systems.
- The mere existence of social capital based on knowledge generation, diffusion, and exploitation at the regional level is not the equivalent of regional innovation systems. This is so because such characteristics do not necessary lead to innovation activities, but are relevant to improving production problems, competition in firms, and social development.

# Final Remarks: From Knowledge Networks to Knowledge-Based Social Capital, cont...

- The knowledge-based social capital found in the case studies considered in this paper have not lead to the creation of regional innovation systems. We can argue that when social capital is limited, it could contribute to the creation of regional knowledge spaces, a condition that could lead to regional innovations systems if adequately supported by a strong regional innovation strategy.
- From a public-policy perspective. Long-term policies should consider the complementary relationship between the public and private sectors in the generation and transfer of knowledge, and on this basis seek social and economic development objectives at regional and local levels.
- From an analytic and theoretic perspective, it becomes relevant to analyse separately the set of characteristics that could be understood as social capital to preserve their richness. There is a trend in social and economic studies to sum up a large set of elements within the concept of social capital.