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Knowledge management: a key factor for productive chain evolution in the department of Cauca, Colombia

A case study of the fishing chain network

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Productive chain success is generally measured in terms of market access, since it implies enhanced competitiveness and innovation. This is why many initiatives, projects, and intervention strategies for productive chains are focused on how to improve product visibility to increase its demand. Even though this is an essential issue for any productive chain, in the development context the problem is often deeper, and other approaches are needed to foster the productive chain evolution. Low integration levels, lack of strategic alliances with external stakeholders and institutions, lack of competitive intelligence processes, as well as inadequate or lack of technology, environmental concerns, and knowledge management processes are some important issues that may prevent productive chains to become competitive and innovative enough to succeed in a demanding and changing world.

Nonetheless, in the department of Cauca, Colombia, small scale producers have achieved successes, accessing demanding and specific markets with high quality and innovative products. To achieve this, they have had go though long and difficult processes – most of them supported by external institutions – which have generated many important lessons and knowledge. However, through poor knowledge management, mistakes are often repeated, and efforts duplicated. As a result, the Centro Regional de Productividad e Innovación del Cauca (CREPIC), together with the University of Cauca, have started to include knowledge management as an indispensable component in research and development projects.

This case study describes the experience of the Fishing Chain, a network in the department of Cauca. It illustrates how appropriate knowledge management practices, supported by communication processes and Information and Communication Technologies (ICT), can contribute to the evolution of a productive chain to a value chain. The case was developed in the frame of the action research project *Integral Strategy to Improve the Competitiveness of Agrichains of Small Scale Rural Producers in the Department of Cauca,* funded by COLCIENCIAS.

The article describes the emergence, evolution, and current situation of the fishing chain. Next, the developed strategy for the case is presented, where networking has supported knowledge management processes. These processes have involved a specific communications strategy, supported by ICT-enabled information management. Finally, we share lessons learned and challenges related to dynamics and synergies of a productive chain, seen as a social network.

Emergence of a value chain

The Fishing Chain of Cauca is a group of organizations working together on the promotion and the continuous improvement of the departmental fishing sector. This productive linkage aims to generate benefits its members in such a way that it becomes a sustainable productive alternative with practices that cause a minimum impact to the environment, improve the quality of life of their members and contribute to the economic and social development of the region.

The evolution of the Fishing Chain into a value chain has involved the realization of systematic practices in the management of the knowledge flows held by the producers involved in the sector. Knowledge management has acted as a key element to strengthen the network dynamics, generating feedback between internal dialogues and the support organizations within the region. These knowledge management activities have proven crucial in the evolution of productive chains towards value chains: they are related to a social focus on learning, that "integrates the accumulation of knowing, the creation of knowledge, the direction towards a certain focus, the management of structures and procedures, the support to the emergence of creativity through flexibility, informal relationships and innovation" (Medina 2002). This knowledge management approach has allowed the producers to foster a learning environment, creating a trusting environment, exchanging stories and experiences, and sharing best practices.

Fishing activity in the department of Cauca has existed for almost 20 years and has been developed in an individual way by each fishing family. However, since 2003, a multi-stakeholder initiative[1] has been developing actions that seek to strengthen the networking between the fishing organizations and the support institutions, in order to facilitate more effective collective management systems. These efforts have contributed to a more coherent approach within the diverse fishing community and to the development of rural extension strategies, establishing three representative areas in the whole department[2]. In these areas, there are approximately 1200 families of diverse races and cultures: 'mestiza' (people of mixed ancestry), peasants, African-American descendants and the indigenous population (Guambianos and Paeces).

Networking as a way to approach articulation and competitiveness

> *"Networking is not a process of sensitization or tools, but the constant practice of the principles that build the trust."* (Rebolledo and Sánchez 2007a)

[1] Led by the Regional Centre of Productivity and Innovation of Cauca (CREPIC), with the support of CIAT, ONUDI, SDC, The Colombia Program of the Georgetown University, the Municipal Alternative Development Areas (ADAM) programme, and USAID with the participation of national institutions as Fomipyme, Colciencias and CRC.

[2] The most representative fishing areas include the Silvia Area: Silvia, fanning out towards Jambaló and Totoró; Salvajina Area: Suárez and Morales; Plateau of Popayán Area: Popayán; The tambo; Sotará; Cajibio; Timbío; Piendamó; The Sierra and Puracé (Technical Secretary of the Fishing Chain Piscícola, CREPIC 2007)

The Fishing Chain is a successful example of networking, reflected in the level of cohesion between its actors and the presence of a concrete strategic basis. This has involved different actors in the chain, from suppliers, traders, and managerial organizations to operational staff of development services, in a sharing and discussion space institutionalized since 2003, the *Technical Committee of the Chain.*

The combined action of the different regional actors was made possible due to the general immaturity of the productive activity at the time of the network inception: the stakeholders welcomed the initiative as a way to unify efforts and to design a strategic plan starting with the identification of the critical aspects: shared vision of the chain; trust relationships between producers and support institutions; appropriation of work group dynamics; adaptation of the services offered by the institutions and local government to local requirements; coordination between the national system of innovation and the research needs of the chain; access to large-scale markets; and pertinent technical assistance. Subsequently, the operational plan built collaboratively by the fishing producers determined a path for projects and resource management. This collaborative approach helped foster trust and greater cooperation among the different stakeholders.

As a result, from 2003 to 2007, the network has achieved concrete results, including:

- Consolidation of the fishing productive chain;
- Technical cooperation and sharing of practices among the actors of the managerial organizations from different municipalities of Cauca;
- Combined business or vertical networks involving producers, traders, suppliers;
- Self-supporting funding mechanisms for the chain;
- A 30% increase in production volumes;
- Market agreements with wholesale distributors and their participation in the chain committee for price negotiation; and
- 12 multi-stakeholder projects.

Knowledge Management: consolidating the fishing network

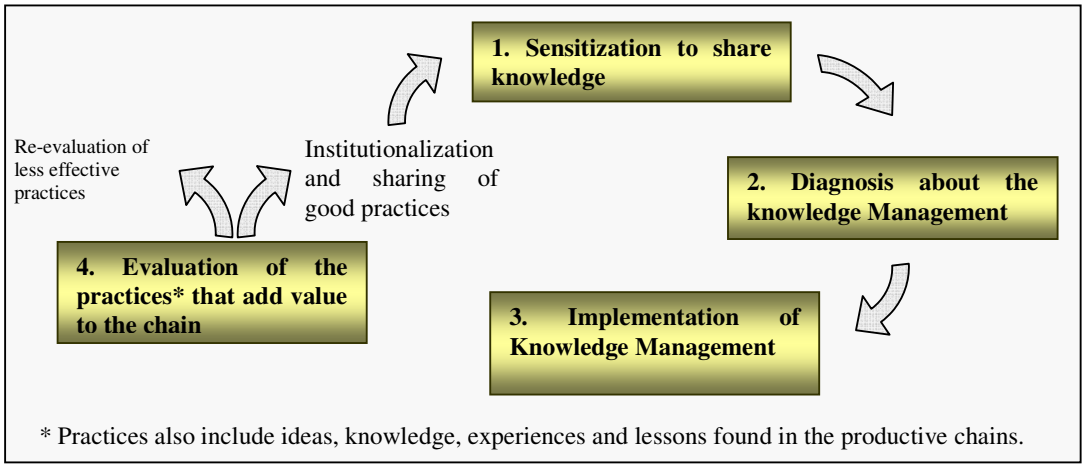
The social network structure of the fishing productive chain has required the development of a common language and the identification of concrete connection aspects, despite the heterogeneity of the community. “A productive chain that works under the principles of social networks is an organization in which activities and projects of high complexity, rational use of resources, enlarged coverage of services, and deepened impact of actions, will be generated with more fluency, due to the relationships built in the course of the process” (Rebolledo and Sánchez 2007a).

The social network focus has facilitated collaborative efforts, building a suitable environment to face the meso-competitive level, to achieve short term achievements, and leading ultimately towards reaching impacts on the micro-competitive level.

The knowledge management strategy for the consolidation of this process was based on a simple cycle aimed at:

1. Sensitization of the actors to generate a suitable atmosphere for sharing the existing knowledge;
2. Identification of the supply and demand of information and knowledge in the chain;
3. Implementation of knowledge management processes, including:
    a. Communication and exchange processes;
    b. Generation and strengthening of informational skills of the actors in the chain; and
    c. Promotion of the use of ICT; and
4. Evaluation and sharing of successful and less successful experiences.

Figure 1. Methodological cycle of knowledge management for productive chains
(Source: authors)



The methodology is supported by a communications strategy and the generation of informational and ICT skills.

Communication: connecting actors for information and knowledge management
To consolidate the value chain, information and knowledge management of the existing connections are fundamental. Therefore, the communications strategy focuses on two priorities: first, sharing information, knowledge, perceptions, learnings and practices among actors in the chain. Second, to broker linkages between actors in order to ensure this sharing is optimized.

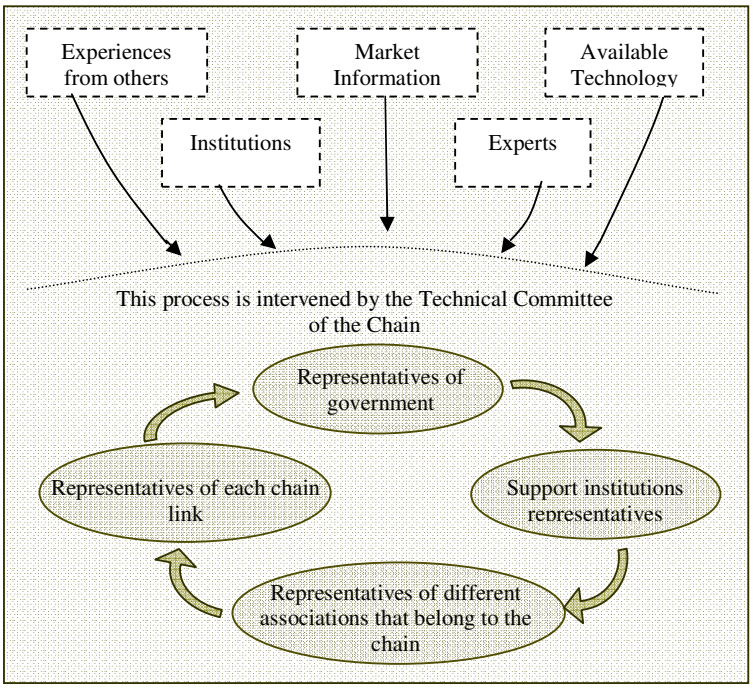
In this sense, the communications strategy contributes to generating trust, fostering connections and knowledge exchanges. This is done through two approaches: vertical and horizontal communication.

Vertical communication processes allow information and exogenous knowledge delivery throughout the chain. This involves various components:

- The Chain Committee, comprising institution representatives, and acting as innovative leaders or champions (Dart 2000) in terms of fostering trust and credibility among the other members of the chain. The committee members are 'bridges' in the communication, facilitating decision making and generating alliances for the chain.

- Training interventions, in which workshops and courses are developed and knowledge sharing is facilitated. These interventions generally focus on technical and traditional learning, aimed at the appropriation of new practices.
- The Fishing Week, an annual event to share information and practices about the fishing process. It is also a way to promote the sector's products.
- Thematic groups, comprising members of the Technical Committee. They are responsible for identifying and analyzing the best strategies for improving the productivity and competitiveness of the chain.

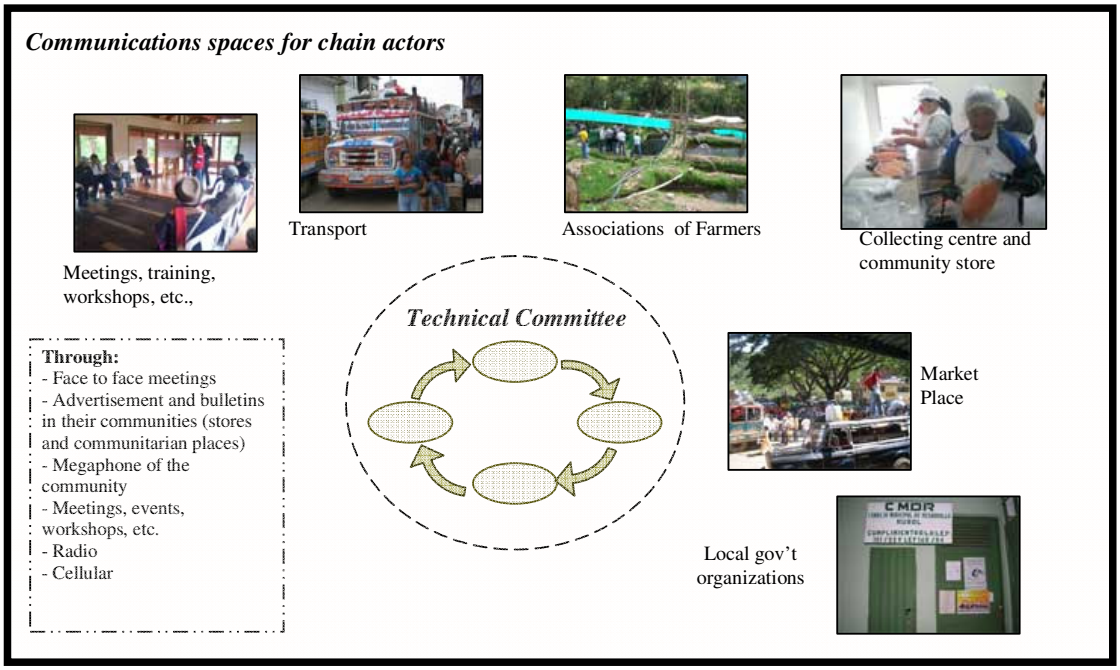
Figure 2. Vertical Communication (Source: author)



Processes of horizontal communication facilitate the development of social bonds that can evolve into relationships of trust. In the Fishing Chain these developed from the primary networks (Bossio 2004) among leaders, neighbors and relatives. These key actors have mediated when introducing new knowledge for the chain, mainly in a practical way, through:

- Days devoted to community work, in line with the articulated strategic priorities;
- An ancestral practice of the natives called 'mingas', whereby several producers, accompanied by their families, collaborate in the construction of the infrastructure required by the chain;
- Days devoted to learning and exchange, based on a topic identified as high-priority for the competitiveness of the chain. This involves the exchange of experiences among its actors, strengthening and recognizing the existent knowledge within the chain;
- Social networking and recreational spaces, provided to build and strengthen social capital through entertainment for the fishing producers and their families.

Figure 3: Horizontal Communications (source: author)



ICT: for accessing and sharing information

Diverse communication means, such as the network newsletter, have contributed to maintain the existing bonds in the Fishing Chain, strengthening the less strong ones (for instance between the committee and the associations/base of producers) and creating new ones. Internally, each association is formed by a group of people that belong to the same ethnos and culture, including associates, relatives and close friends. They are characterized for having stronger bonds, whereby face to face meetings prove to be the best way of exchanging information and knowledge. However, the great growth of the associations makes the incorporation of new communication ways and the use of existing ones such as radio and telephony be a high priority for the evolution from a productive chain to value chain, where the flows of information are intensive and not limited to a small group of actors. This is even more important among geographically dispersed associations, who are more heterogeneous in character, objectives, and familiarity with the network.

Particularly in such associations can ICT have a significant contribution, allowing the flow of information, a key factor in the processes of aggregation of value and access to markets, and thereby strengthening network bonds. ICT has made it possible to overcome geographical distances and travel difficulties, and have diminished the sensation of exclusion of some actors. Overall, ICT has allowed more people to directly access important market information – without middlemen – therefore improving the reliability and timeliness of the information.

The dynamics and synergies of the network

The inclusion of knowledge management processes in the fishing productive chain has allowed it to become more solid and more competitive in the three respects. First, knowledge management has helped strengthen the *human capital*. This has been achieved through individual and collective learning as central elements to generate innovation, through a

combination of scientific or codified knowledge with ancestral and tacit knowledge, through technological contributions, through organizational interventions and market dynamics itself. Second, knowledge management has contributed to consolidation of *structural capital*, starting from the definition of the life plans of the producers and the projection of their productive chain into the requirements of a value chain. This has been supported by a network organization, helping its members to work jointly, taking advantage of their experiences and better practices. Third, knowledge management has helped strengthen *relational capital*: the trust and the solidarity between the fishing producers and external actors of the chain has increased, starting from processes of sensitization, atmosphere and adaptation, to spaces of shared, valued cultural identity. This type of capital in particular supports the capitalization of traditional knowledge.

The network has enabled the exchange of ideas, information, and learning, based on a horizontal communication and building on natural, existing networks. This has helped economic relationships develop, contributing to the development of a value chain. The existent structures and social roles in the chain have been an effective mechanism to consolidate the "natural and spontaneous solidarities that build collective working" (Alfaro 2001). Its social network structure, supported by ICT, has allowed for a process of productive linkage, fostering an atmosphere of trust, and leading to concrete collaborative projects, resources and access to markets.

Overall, ICT has contributed to the evolution from the fishing chain to a value chain in terms of its ability to facilitate the flow of information and a greater involvement and participation of the actors. This benefit has only been possible, however, because of the network's social capital (its degree of trust, its associability level, etc.); although this doesn't guarantee the success in the incorporation of ICT, it makes full usage of its advantages far more plausible.

Challenges in the linkage

The Chain has been under constant pressure to achieve process sustainability. Over its entire life span, direct association of producers from different geographic zones has been a priority, in order to generate strong local management capabilities. Likewise, different chain actors are encouraged to attend committee meetings, in addition to the elected representatives, to ensure a diversity of stakeholder interests are taken into account.

Even so, many challenges still need to be addressed; the most pertinent ones identified by the Technical Committee include automation and the development of a coherent technical support plan.

Automation of information

Although team work in the productive, commercial and technical cooperation aspects within the Fishing Chain is thriving, it lacks managerial and administrative tools that strengthen the business along greater dimensions. Specific tools to support the context of rural agribusiness are sought, especially in terms of enhanced participation, improving members' negotiation and marketing skills, and overall, to support decision making based on effective information management.

The productive chain and the support institutions are working together on a proposal to obtain funding for the development of an ICT-based information management system (probably using mobile and SMS technologies) that allows the consolidation of information for decision-making on each productive link. This is supported by the Chain's overall communication strategy, and accompanied by a specific strategy aimed at encouraging the flow of information through competitive intelligence tools, which gather, analyze and validate market information (for instance on clients, prices, suppliers, markets and technologies). It is expected that this will contribute to better decision-making, and therefore fewer risks.

Technical support plan

The Technical Committee, based on an inventorying of exiting technologies in the Fishing Chain, made the decision of starting a technological planning process (see also Sánchez 2007) that guides the future actions regarding the development and use of new technologies aligned with the current strategic direction of the chain.

The most urgent needs are guided towards the improvement of the available capacity, the quality in the productive process, the introduction of environmental management to mitigate the impact to the environment, and micro finance, among others. The technical support plan proposes solutions to these needs; nevertheless, its focus on the short term makes a project-orientation on the medium or long term less evident.

It is expected that this plan will add value to the network by concentrating on the identification of appropriate technologies to generate innovation capacity, providing the stakeholders of the Fishing Chain with effective alternatives to tackle the challenging situations in the development of their activities.

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Abstract
This case study of the Fishing Chain in Cauca, Colombia, integrates and describes the results of the reflection processes that have been carried out in the frame of the action research project *Integral Strategy to Improve the Competitiveness of Agrochains of Small Scale Rural Producers in the Department of Cauca*. The project assesses the importance of a Knowledge Management strategy as a key principle of action for innovation, as well as participation of

the social actors belonging to the agro-chains. All this is mediated by active processes of communication and information management and is supported by the generation of informational and ICT-related skills.

In this case study, the productive chain is conceived as a social network, generating synergies that have increased the competitiveness of the chain and have led to stronger process ownership among the stakeholders.

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