

innovation factor and managerial skills of the producers. Hence, creating social capital should be an essential part in projects for developing value chain as well as allocating resources to the participant groups. NGOs service provision should guarantee the no imposition of iteration models but promote organizational skills to develop market niches, sale and obtain training and specialized assistance in agricultural and non-agricultural skills. (Banco Mundial, 2010). Finally, it is worth mentioning that under this approach, the public sector should play a significant supportive role by improving infrastructure, facilitating access to national and international markets and to financial services, modernizing wholesale points of sale, connecting producers to modern market chains, improving educational levels and promoting counseling and extension services performed by NGOs.

METHODOLOGY

This article aims at proving the hypothesis which states the significant importance of the SCO role, specifically NGOs, in the associative and organizational strengthening as well as in technological transfer and natural resources management. It is by taking this new role in the provision of specialized services that an improvement in the access to the trade markets for the small producers and in general, optimization processes under the National System of Agricultural Innovation have been achieved. The methodology used is the case study based on compared national experiences which can describe the role of NGOs in the agricultural innovation processes. This choice is due to the importance of such methodology to provide important results and qualitative information which cannot be found by using other conventional quantitative methods because of the new study objective. By developing study case methodology, we aim at finding new evidence or situations related to the study objective, formulation and explanation of new theory of the social reality. According to Stake (1994), "the observation units- the study objective- are the realities intended to be observed. As such, they constitute in the investigation the global object of study and empirical data is obtained to corroborate the propositions or hypothesis with the reality" (Stake, 1994, pág. 157). A study case investigation, as evident, deals successfully with a distinctive situation where there are more interest variables than observational data and as a result, it is based on multiple evidence sources, with data which must conform to a triangulation style; as well as benefitting from previous development of theoretical propositions which guide the recolection and data analysis related to the study objective.

The methodology proposes three experiences in productive chains in the north of the country to be compared around the study objective. They correspond to three specific elements in the national system of agricultural innovation: agricultural, agro-industrial and water resource management sectors. The three of them also involve the commercialization sector which directly suffers the impact when there is intervention in any of those sectors.

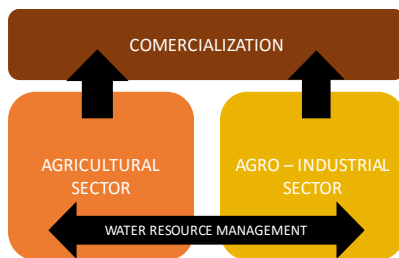


Chart 4. Component of the de Agricultural Innovation System

The analysis of productive chains is characterized by different criteria, worth mentioning among them: the supply and demand characteristic of the product (export evolution, main destination markets, export price, total national production, main exporters, size of the national and world market), the market conditions, actor mapping (main actors involved in the productive chain), the market SWOT analysis, facilitation mechanisms for innovation, lessons learned and information sources among others. The first two study cases are oriented to the analysis of productive chains: organic banana and panela while the third one deals mainly with water resource management. The first case -organic banana productive chain- falls within the agricultural sector, the second case-granulated panela productive chain in the agro-industrial sector and the third- irrigation- in the water resource management.

Organic Banana

The study object in this case (Maldonado, 2015) refers to small organic banana producers in the Small Organic Producers Net Fair Trade Peru (REPEBAN) from 2005 to 2010 in the Piura region. REPEBAN is an organization which comprises 2,810 small producers in 2,348 has (47.7 % of the total area cultivated in the Chira Valley), whose eight base associations have 1.380 workers and register an annual total income of US\$ 29'181,000, due to a container movement of 2, 598 annually. This makes it the most representative organic banana producers organization in the Chira Valley and in the Piura region. This is a successful case of associativity for fair trade, not only because it gathers the highest number of small organic banana producers (62% of the total of producers) but also because all of its base associations have access to the fair trade market and most of them (five out of eight) export their fruit directly.

The context in which the associative processes consolidated (incremental trends of the special markets) intensified the impacts of the associativity. Fair trade market is present in 58 countries worldwide, through 827 producer organizations and 1.2 million producers and workers. In Peru, fair trade organization representatives of producers and specialized shops are increasingly expanding. Regarding the organic market, Peruvian production has experienced a boom since 2005 which has reflected in export increase (370% in 2010). Organic banana shows a similar trend to the Peruvian organic exports: it is the second most exported organic product and registers an annual average growth of 32.3% in terms of value and 21.9 % in volume in 2005. Peru, sixth country with the highest number of producers implementing organic production, exported 95% of the organic production and fair trade to, mainly, the European Union and United States. Despite the great benefits of these products for the producer and the consumer, the national market does not respond to the organic and fair trade offer because of the little value given to it.

The investigation concludes that the **organization model** of REPEBAN as well as its **associative process conditions** explain the improvement in the conditions of access to the fair trade market by the small organic banana producers since 2005 until 2010 in the Piura region. This investigation was based on the development of a mixed methodology, which combines an information collection tool with a survey to all REPEBAN producers who have an influence on the decision making about associativity in 2011- and a qualitative information collection tool- an interview to 13 out of 14 representatives (in all, the 15 highest director and managerial positions) of REPEBAN and its associations. The information analysis results are oriented to explain which were the success factors in the organizational model and the associativity process conditions in REPEBAN to improve the access conditions to the fair trade market.

Regarding the **organizational model** of REPEBAN, the following success factors were identified: first, the autonomy of its bases (flexibility, power decentralization, resources and functions); democracy in the decision making; professionalization of management (interdisciplinary team) and finally, transparency and knowledge development. Regarding the associative process, two moments are distinguished: origin and consolidation. As to the Origin of the associative process, the Defense of common interests in a given circumstantial situation which explains the reasons to start the associative processes stand out, this did not necessarily guarantee its success. In relation to the successful consolidation of the associative process, factors such as social capital, leadership, transparency and control mechanisms stand out. With reference to the impacts of associativity, three were regarded as the most important. First, access to new markets: access to fair trade market responsible to a great extent of the associative success given the differential benefits of its functioning which allowed to join even more the collection action of the small producers: the accuracy and demand lead to a higher quality in the banana, the technical assistance professionalized and improved the productive capacity and the prime improved the working and living conditions of the producers. Then, a more powerful negotiation and finally, the improvements in the productive management.

Granulated Panela in Ayabaca

Granulated panela arrives in Peru in 2000 due to the interest of a small producer of coffee and sugar cane group from the north of Peru because of the low profitability they had with those crops. These producers from the Mountains of Piura decided to develop a new activity to foster their economy together with the Integral Program for the Coffee Development (PIDECAFE, later called PROGRESO), a non-profit organization which provides services to

strengthen farmer organizations and with the Piura Union of Coffee Makers (CEPICAFE) a second degree organization comprising producer associations, both located in Piura. Currently, panela is exported to France, Italy, Germany and there is still a high demand for this organic product, which has allowed small producers associated in the Northern Mountains of the country to integrate to the international market and energize their local economy improving their life quality. The next case has as study object the Piurana de Cafetaleros -Piura Coffee Producers- (CEPICAFE), organization comprising small producers of sugar cane and coffee in Ayabaca province, Piura region, between 2004 and 2009. This area has been selected due to the prioritization of sugar cane cultivation for the panela production, because of its high levels of productivity and the entrepreneurial attitude of the leaders of the association belonging to this province. The main purpose of this investigation is oriented to evaluate the determining factors and effects caused by the technological change which allowed the agricultural innovation with the introduction of panela in Piura in the international markets between 2004-2009. The selected case allows to know the degree of interaction between the actors, the investment in technology, connection to the market and organizational skills that would be necessary to effectively manage innovation.

The technological change in the panela production was possible due to an existing organizational platform which enabled the adoption of new technology and procedures having the producers trust in the investment of this project. The co-management between CEPICAFÉ and PIDECAFÉ (the NGO which supported technically and financially), and the incentives of fair trade and organic (price increase of panela in 65% and financing by paying in advance before delivering the product) had a positive impact in productivity and competitiveness in the organization.

Thus, on one side the sugar cane producers decided to own a higher number of sugar cane hectares instead of coffee (increment of 40% in average against a decrease of 25 % in the number of coffee hectares). Then, the stock volumes increased in 26% in 2007 and 2008 achieving sale levels of 11,947 metric quintals in 2009 compared to 7, 708 quintals in 2004 (steady growth of 36%). As a main effect, the producers reached average incomes of S/ 3,600 in 2009 a 50% higher increase compared to the one in 2004 although there is still high disparity in the incomes in the associations of small crop and livestock producers (APPAGROP) in the same Ayabaca province, to this end a continuation of the diffusion of the innovation process is needed. Due to the high dependency in the interrelation between actors and resources, the methodology followed throughout the investigation corresponds to a mixed model, that is, qualitative and quantitative tools were used. With respect to the qualitative analysis, field work was performed in Montero district, where there is the highest number of granulated panela producers in Peru. This visit took place in September 2009 when the Panela Fair gathered all of the producers of the 94 base organizations with which CEPICAFE works. In this context, a photo registration showing the panela production was made and, through observation, every detail of this procedure was recognized. Likewise, interviews were made to the administrative staff of CEPICAFE and PROGRESO working in the production, commercialization, administration, certification and project areas. In Piura, the plant where CEPICAFE stocks all the panela from the producing provinces where its base organizations are located was visited (López H. , 2014)

With reference to the qualitative methodology, a data base was used. The main one deals with the CEPICAFE 2009 Annual Plan and collect the current production situation of the 94 base organizations. Within the scope of this investigation an **openness to technological change** among the agricultural producers in the north of the country stimulated by the **entrepreneurship and initiative of the private sector** was found, it strategically developed alliances and was able to offer the market a product with high acceptance: granulated panela (López, 2010). The investigation also accounts for the insertion of different types of innovation within the administrative, technological, product and process areas. The organizational platform of CEPICAFE, the panela market (fair trade and organic product market), technological change in the productive chain of panela and finally the developed innovation generated a clear impact in the small producers who benefitted the most from it.

The stock price increased at the beginning of 2007, creating a direct increase in the incomes of the sugar cane producers which has allowed them to continue investing in their crops in order to obtain organic certification. From the nine APPAGROP analyzed, eight of them showed percentage increase higher than 30% in the number of sugarcane hectares. Another effect found was the growth in the stock volumes in all of the APPAGROP. Although the sugar cane productivity in the area analyzed is low compared to other regions, this did not prevent the commercialized volume to increase. Between 2004 and 2007 a 36.07% growth in the panela sale was observed, this process was facilitated by the fact that CEPICAFE has a consolidated market in Italy (CONAPI), France (Exchange Equitable) and Switzerland (PRONATEC). In 2009, the productive chain of this product generated 47,627.50 daily wages in the crop management and the transformation process of the granulated panela in Ayabaca district. Moreover, the daily wages of the field operators raised from S/10 to S/15 and in the processing modules the specialized wages went from S/ 5 to S/ 35 (PROGRESO, 2009). Technology imported from Colombia, which has the most developed technology to produce granulated panela, was used. So, it can be concluded that the process that CEPICAFE underwent was a radical innovation, according to the Henderson-Clark model. On top of the four types of innovation proposed in this model, for the CEPICAFE case, and the panela innovation it is important to analyze the six types of innovation of Damanpour seen in the first part (Damanpour, 1996).

Among the main interactions, it can be mentioned the CEPICAFE relationship with financial institutions, clients and institutions of I+D. As mentioned before, CEPICAFE achieved articulation between demand for investigation and training due to the acquisition of knowledge thanks to its high willingness for institutional learning, although it has needed financing to invest in technology and raise productivity, among others. To achieve a connection with the involved actors CEPICAFE, proactively, has reached Government entities, private enterprises and the third sector. CEPICAFE has constituted as an innovation system and as a result, this organization has alliances and holds direct links with more than 40 organizations locally, regionally, nationally and internationally.

Water Management for the Sustainability of the Agricultural and Livestock in Ladera areas”- GASP AZOL

The study object of this case (Contreras, 2014) is the project “Water Management for the Sustainability of the Agricultural and Livestock in Ladera areas”- GASP AZOL which started execution in November 2005 and ended in September 2009 in Cajabamba, Cajamarca and San Marcos districts. It was aimed at the improvement in the water management, particularly, for agricultural activities in a total of 300 beneficiary families in the area of intervention.

The project was conceived to grant the beneficiary families an adequate irrigation system which allowed them to have irrigation water permanently, in humid and drought seasons. Thus, agricultural productivity is not halted but in permanent activity, allowing every family to improve its incomes and therefore its life quality. The general objective of the investigation portrayed in this study case was to deepen the ex post evaluation of the GASP AZOL project, based on the sustainability and possible replicability of the project. This was developed by analyzing the information obtained in the GASP AZOL project end of line; this methodology was used for the ex post project assessment required by the National Fund of Labor Training and Employment (FONDOEMPLO), organization which finances the project. GASP AZOL has been financed by FONDOEMPLO but also by other organization such as Cuenca Institute and Cajabamba, Cajamarca and San Marcos municipalities; as well as German Agro Action and the work force and money from the own beneficiaries.

To conduct this investigation an ex post assessment methodology was used to gather real information of accomplished goals and the positive or negative impacts of GASP AZOL, that is, a summative evaluation made at the end of the intervention (Navarro, 2005) whose main objective is to provide information about the project or program value, as well as informing about possible changes in the direct beneficiaries of the project (2005). This granted, this evaluation type is centered in the project effectivity, type of achieved experience and possible reproduction in other places (Navarro, 2005). The Project implementation has lasted about three years, its main and accomplished goals have been building 615 reservoirs of different capacities, 583 of them work properly and actively up to 2009. This has allowed in the beneficiary area an increase in 94% of irrigation water permanently and therefore an agricultural growth. Hence, the lands can be used for two seasons a year, one of traditional products (potato, corn and wheat) and new crops such as carrots, green onion, chamomille, garlic, among others. Consequently, the beneficiaries' incomes have raised in 123 % from the original linear base, that is, from S/ 112.5 to S/ 251.4 between 2005 and 2009. It is necessary to acknowledge that identification of sustainability and replicability factor in any development project enables the strengthening of the project axis, managing to guarantee the project really have a social sense and be assumed by its own beneficiaries.

RESULT ANALYSIS

Swisscontact Role in the Organic Banana Case

Based on the investigation on the organic banana (Maldonado, 2015), the role of the NGO Swisscontact is highlighting. It is considered to be the main supporting organization and even the main provider of technical assistance. Additionally, Farmers and Veterinarians without Borders (AVSF) in 2011 (AVSF, 2011) performs a part which addresses the support from public and private entities to small farmer organizations. In this way, it was found that the articulated producer organizations are supported mainly by public sector entities. In the last years, due to the organization development, the Government has paid more attention to the banana organizations. This support in the north of the country is given to producers with the CEPIBO and REPEBAN model (study object of the investigation conducted by Maldonado) too. There is even participation from institutions related to Dole. Agriculture and Production Ministries projects have been supporting organizations with training, commercialization and productive infrastructure installation support; many of these organizations have as counterparts the organization contributions, with resources coming from the Fair Trade Prime. However, in the case of CEPIBO, most contribution has come from private entities (NGOs) such as AVSF, CIPCA, CEDEPAS y PIDECAFE. In the case of REPEBAN, as a central organization, is supported mainly by a private entity, the NGO Swisscontact. Regarding this aspect, it is important to mention another investigation conducted by the Economics School of Piura University (Bayona & Zapata, 2011), whose methodological tool of primary information collection is a survey applied to the banana producer association directors in the Chira Valley. There, the subject axis of training and technical assistance to producers was described and the results show that 50% of the training was provided by NGO, and an important percentage of it from Swisscontact.

In the REPEBAN case results, it was found that the main determinant factors in the associative consolidation are the social capital, leadership, transparency and control mechanisms. Hence, Swisscontact and its methodology of intervention have played an important role in reassuring the conditions that guarantee this consolidation.

The effectivity of its cost and efficiency of its services have been proved through well documented and transparent monitoring procedures and quantification. Constant internal and external controls are proof of continuous and sustainable development of its experience, skills and practical knowledge (Maldonado, 2013). From Swisscontact, a reference is made regarding the achievement of an effective intervention, the development of integral socioeconomic systems is the main objective. With no intention to be the motive power, it is focused on empowering the local facilitators of the system (the co-parts of the projects) so that they can guarantee on their own an integral economic development. A core part of the systemic interventions is the development of global and local value chains ((Swisscontact Peru, 2009). Additionally, Swisscontact guarantees transparency parameters and accountability to its stakeholders because it is under the Corporative Governance for non-commercial organizations in Switzerland (SwissNPOCode). ZEW quality seal certifies it in the economic, efficient and defined goal use of resources. It also has a certification of the Société Générale de Surveillance (SGS) an inspection international company, approval granted within the NGO Benchmarking program. This makes SWISSCONTACT an important and dependable actor even within the decrease of resources from international cooperation.

It is worth deepening in the role this NGO has had with producers in the north of the country. The Entrepreneur North project, a proposal from Swisscontact to help “promote the economic development of the rural small producers in the north of the country, articulating them into economic dynamics with a great market potential and inclusion ability through value chains” is significant. (Swisscontact Peru, 2009, p. 18). The action axes of the Entrepreneur North project show the role the NGO has had: commercial, organizational, technological, financial and institutional innovation. It is significant the clear focus of the project in promoting the innovation in the value chains in the north of the country. Those action axis have been part of the organizational learning process of Swisscontact, in a way by which it has achieved the institutionalization of an intervention methodology which has allowed it to perform parallelly in different value chains. From 2009 until 2012, length of the project, four value chains have been carried out: Organic Cocoa with Cocoa Producer Association of Piura (APROCAP), Organic Banana with the Organic Banana Small Producers Network (REPEBAN CJ Peru), Capsicum chilli with Naylamp Aquaculture and the District Organization of Yellow Corn Producers and others in the Morrope district, and Tabasco chilli with PROAJI and the Tabasco Chilli Producer Committee in Requena district.

The review of the specified services offer from the NGO shows a solid and developed methodology which even enables it to offer them to its actor-peers in charge of providing technical assistance. Thus, the NGO contributes to dynamize the specialized service market to promote innovation, also known as extension service markets. Finally, a relevant fact in this case is that Swisscontact as NGO has started since not long ago, 2013, to provide specialized consulting services in issues related to technical training and manuals, specialized services in skill strengthening, analysis and situational diagnoses, business promotion, enterprise articulation and others. Most of them are related to strategic lines of efficiency and promotion of PYMES ((Swisscontact Peru, 2011). It is worth mentioning too the counterparts which require the NGO services: Production and Environment Ministries. Specialized public entities and international cooperation (Swisscontact Honduras), international investigation centers (BPZ Energy) and international development organisms (WB or PNUD) and even other NGOs (Transitemos Foundation) (Swisscontact Peru, 2011).

Role of PROGRESO in the CEPICAFE Case

CEPICAFE, throughout all the years in which it interacted with the base organizations, had an important technical support which let it motivate the traditional knowledge of the small farmers: PROGRESO is a non-governmental organization whose main objective is to promote the development of attitudes, values, skills and participation of producers and coffee related families to use productive resources sustainably and to improve the surroundings ecologically. Its target group is the second level organizations such as CEPICAFÉ, CENFROCAFÉ, APROCAP among others; to which it renders training programs, monitors and develops projects aimed at improving the productivity and competitiveness of these organizations. Its working scope is located in the same regions where CEPICAFE works (Lopez, 2010). From the investigation, PROGRESO is considered a technological bidder whose critical factor of success has to do with the fact that being an NGO whose members were engineers from Piura University it had as a main concern to determine which was the technological demand regarding coffee, this allowed it to approach closer to the innovation area whose main factor is apart from novelty, a product or service with a high level of acceptance in the final client. (Torres, 2010). Also PROGRESO led the organization process of the atomized groups of small producers in the Piura Mountains, promoting the creation of the coffee central CEPICAFE.

PROGRESO was the main promoter of technology and innovation in the Northern Mountains of the country because the adoption of knowledge about sugar cane and panela abroad to its later application in Piura was the substantial factor which led to important processes of innovation. Through PROGRESO, projects which accomplished important financing to invest in science and technology were developed. It was in this way in which the innovation system that CEPICAFE consolidated, in which several public and private actors took place, the role of PROGRESO as the main technological partner was prominent as it, together with small producers, had a promoting role to produce the granulated panela. The investigation describes that the interaction between CEPICAFE and PROGRESO effectively promoted the development of a part of the national system of innovation locally around the productive chains of coffee and sugar cane. The investigation also enables the identification in the study case, according to the World Bank, the three phases which an innovation process in an organization undergoes: emergence phase, stagnation phase and a phase called dynamic system of innovation (World Bank, 2008). CEPICAFE has undergone the two first phases; however, in the last phase, the alliance between the public and private sector is remarkable. CEPICAFE has not accomplished a close cooperation with the public sector in the planning and implementation of the different innovation processes of the panela. This is due to the fact that some local governments in Ayabaca develop policies and plans without the support of civil society or private sector actors⁴.

2 An exception to the described situation refers to the role the national government played through INCAGRO it presented a good level of articulation due to the grant funds which enabled PROGRESO the access to execute co-financed projects to improve sugar cane productivity and adopting CIMPA technology.

Moreover, the evidence of the crucial role of PROGRESO in the innovation process of CEPICAFE in the case of the panela production shows an incremental innovation type with the panela production since it has a high impact in the knowledge component and this had to immensely do with the PROGRESO contribution as a technological partner. First, the farmers had to learn the technical production process of panela due to the introduction of new technologies such as improved sugar mills, CIMPA burners, HACCP certification and all technical specifications of this product.

- i) Organizational Strengthening and Enterprise Management FORGEM
- ii) Local Economic Development Promotion PRODEL
- iii) Diversification and Food Safety DIVERSA
- iv) Quality Management and Certification CALIDAD
- v) Environmental Services and Water Resources Management

Cuencas Institute Role in the Integrated Management of the Water Resources in Cajamarca

Summarizing, the investigation conducted by (Contreras, 2014) aimed at analyzing two key factors within the project management, sustainability and replicability of the project once done. It is important to emphasize that the investigation is singular because it describes a project connected to water resources management in the agricultural productive activity, one of the most delicate activities which also uses this resource extensively. Thus, the NGO Cuencas Institute role in the project to achieve the investigation objective is relevant. With respect to the corresponding replicability factor analysis, as a creative replication concept of an experience with proved effectiveness it aims at systematizing two fundamental determinants corresponding to management technology and productive technology. Regarding the technological management, the associative organization recipient of the Project facilitates the technological transfer, quality control and the organization of the production commercialization. In these aspects, Cuencas Institute role as a promoter of social capital and development of the associativity through technological assistance and enterprise management consultancy has made a positive impact and has promoted the community association and organization. Hence, Cuencas Institute states as a mission to “contribute to change the survival economy of farmers into a competitive and sustainable economy for their environment; for this purpose, it integrates strategic alliances to formulate and apply sustainable development plans with local government as leaders...” (Cuencas Institute, 2015, p. 22)

Regarding the productive technology, it includes all of innovation systematization of the processes whose goal is the final products, this involves rediscovering the traditional knowledge of the community, the articulation of modern techniques, marketing strategies and the effects on the final clients. In this aspect, the good practices or quality practices in the productive process have a lot to do. The Cuencas Institute has had a lot of relevance in this aspect because it also has really specialized intervention axis focused on the water resources management and irrigation systems for agriculture. Therefore, on top of having a general methodology of intervention, it has managed to highly specialize in the technological area related to water resource management in the rural agriculture. Its strategic lines aim at a “rural training by installing family technical irrigation systems with ground micro reservoirs and conditioning sustainably the lands among other activities. Cuencas Institute has more than ten-year experience dealing with natural resources management issues, irrigation infrastructure, agricultural production, organic fertilizer production and technical training. Many of its projects are located in Cajamarca department so its knowledge of the GASPazol project area is one of its strengths. It has a technical team specialized in water management issues which according to the dimensions of the project can have eight to ten people and whose specializations vary between coordinators and managers of Agriculture and infrastructure, technical consultant or extension technicians and administrative personnel.

On the other hand, sustainability as an integral concept which gathers economy, social, environmental, financial, political, cultural and technological (Quiroga, 2001). All of the dimensions part of the concept and which evaluate criteria in the project assessment, have to be with the interdependency among dimensions since all of them are equally necessary to guarantee the continuation of the project in the future. In GASPazol case, 5 kinds of sustainability were considered in which the Cuencas Institute role is again relevant as an actor in guaranteeing the continuation of the project. The criteria analysis of sustainability of the project was possible thanks to the preparation of surveys at the end of the execution period of the project in charge of the National University of Cajamarca. It created the “Survey to create charts, graphic, diagrams of the technical manual and informative brochure for the promotion of the micro reservoirs in the Cajamarca region” and the Cuencas Institute, as the project executor elaborated the “Survey for the Project evaluation”. Finally, the main conclusions of the investigation describe the criteria of sustainability and replicability identified in the project which have a common aspect, they are oriented at the evidence of the commitment of the beneficiaries, infrastructure maintenance, profitability and feasibility of new projects and respect to the population identity. Being the executor of the GASPazol project and having consolidated a space with such characteristics after its intervention, Cuencas institute has played a fundamental role in promoting social innovation. Being innovation an endogenous and exogenous driving force that produces an original transformation in the service rendering or in the production of a good, with positive results for the common wellness and particularly to attend situations of poverty, marginality, discrimination, exclusion and social risk, with the potential to be replicable” (CEPAL, 2009), it is a process which guarantees replicable and sustainable experiences due to the impact it can generate in vulnerable populations.

After analyzing the role of the NGOs in each of the three studied cases, it can be observed that within different investigations the NGOs play a crucial role related to dynamism of the innovation system in which they perform.

NGO	NGO role			
	SNIA	Unit in SNIA	Extension Service	Associativity & social capital
SWISSCONTACT	Organic Banana	Agricultural	✓	✓
PROGRESO	Granulated Panela	Agro-industrial	✓	✓
CUENCAS INSTITUTE	Water Resource Management in laderas areas	Water resource	✓	✓

Diagram 1. Summary chart of the NGO role in the innovation systems

Both in the agricultural innovation promoted by Swisscontact when involved in 5 types of innovation for the optimization of the value chain of the organic banana and in the innovation system, CEPICAFE together with PROGRESO as a vital technological partner established for the granulated panela and the successful process of social innovation for the integrated management of water resources in the agricultural activity in Cajamarca that Cuencas institute executed with sustainability and replicability criteria; they all portray the new and important role NGOs play as civil society organizations in the innovation systems. Thus, the following diagram shows the NGOs as civil society organizations in the fourth helix model in the system of science, technology and innovation. As a system, this involves knowledge generation processes, value generation and capital accumulation.

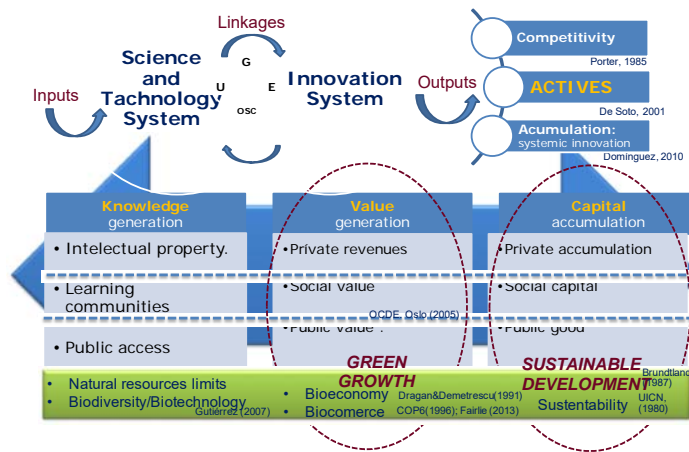


Chart 5. Fourth Helix Model. The new role of NGOs in the innovation systems

Regarding the **knowledge generation**, NGOs have started to develop processes of decentralization of knowledge, by means of, for example, Learning Communities (Vallaey, 2011) Within their new role, the NGOs do not perform replying to specific demands anymore but have started **generating knowledge** from their interventions. In this way, based on learnt lessons and good practices they have managed to generate methodologies specific to the services they offer and provide dynamism to the agricultural innovation system. Regarding the **generation of value**, the NGOs, given their intervention area and the target population create social capital because of their contribution to other initiatives whose goals are human, social and sustainable development. Providing specialized services to promote agricultural innovation contributes, due to the increment in productivity and competitiveness in the agricultural activity, to the generation of higher

incomes; which leads to a better purchasing power and expense capacity of the families, all of this contributes to the individual, familiar and community improvement of the life quality. Innovation per se is a generator of added value which means improvement in the living conditions and enabling opportunities. For example, the recognized as theory of action from FIDA proposes an organizational strategy which works under the statement of taking part aiming at promoting favorable innovation to the poor (Berdegú, 2005) Finally, the **capital accumulation**, the NGOs, in their new role, contribute to reinforcing the social capital. The social capital is one of the pillars for social innovation, given the fact that a community or organized group, with high confidence and an agreed and legitimated governance model can guarantee sustainability and replicability of the initiative to be executed. The concept of social capital refers to two fundamental aspects in the social relations. On one side, in regard to a social interaction way and on the other as a value system and shared regulations. From this perspective, the most basic concept of social capital refers to the social relations based on trust and reciprocity. (Mejía & Mendieta). The existence of these conditions in a system, as shown in the investigation made by Contreras for the GASPZOL project, guarantees that the initiative in which the community take part, result in continuous processes in time and with the potential to be replicated and escalate.

Social capital, according to Adler and Kwon (2002), would so consist of a relationship which enables the understanding of interdependency relations occurring among the actors of a system to mobilize the resources they have. (Adler & Kwon, 2002). Additionally, the contribution in the concept definition from the Coleman approach which refers to a bigger cohesion in the actors network, the bigger their innovation degree is remarkable (Coleman, 1998). Also, because the innovation processes are positively associated to the trust level in the relations, the higher the trust level among the actors, the bigger their ability to be part of the innovation processes. This is also demonstrated in the results of the investigation executed by Maldonado about associativity and its connection to the use of opportunities for fair trade. It was proved by the surveys applied to the REPEBAN members, that most considered trust as the principal factor for the association process in search of new opportunities within the fair trade. It has been demonstrated from the dimension of social capital as resource that collective and differential (belonging to every actor) social capital is a fundamental resource for the creation of value in a system and that it affects innovations positively in a value chain and even in a cluster. This was also evident from the investigation of Lopez, when analyzing CEPICAFE case, with the technological support and social capital promotion from PROGRESO, in the process of transformation and consolidation of an agricultural innovation system in granulated panela (Lopez, 2010).

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, after all of the above, it can be stated that NGOs within the National System of Agricultural Innovation take a new role at becoming a bidder in the market of specialized services for the innovation which sets the foundation for sustainable development. In this context, the demand bidders are the producer organizations and /or enterprises which could strengthen in the previous phase when NGOs were intermediaries and that now search direct financing in widened markets, in international cooperation or in the public programs since the intervention of the NGOS in their new role.

For this reason, they play a fundamental role in the promotion of productive and social innovations which facilitate the integration among the economic, social and environmental factors. In this way, the CSO are positioned as relevant actors to facilitate the knowledge management in the technological area which leads to innovations in order to generate social and public added value; as well as in the pursuit of sustainability strategies at a national, regional and local level. In this way, an improvement in the conditions of the access to the trade market for the small producers and, in general, development processes of the market services of technological extension within the National System of Agricultural Innovation have been achieved.

As recommendations, it is proposed, first, given the conditions and characteristics of the population to which the NGOs, within the agricultural innovation system, offer their services- vulnerable groups and population, characterized by the particularities of the rural area, family agriculture, and scarce organizational level- it is worth for the NGOs to define a **clear intervention strategy which will depend on the particular aspects of each population** as specified in the model analyzed by Berdegú. The Berdegú matrix allows the analysis of the specific needs in the forms of intervention by the NGOs to promote innovation services. Although the analyzed cases show the success in the NGO interventions in different agricultural innovation systems. In 2005, the renowned International Fund for Agricultural Innovation, posed as a strategy to become a more systematic promotor of innovations (Berdegú, 2005) and designed a specific strategy recognized for the consolidation of a well structured service portfolio for specific interventions. Second, the **reevaluation of promotion and social capital provision** as pillar to enable any sustainable innovation process and replicable to the population. It might be wished to consider an important effort in the creation of skills in all aspects, from the officers and members of the rural organizations as well as the project personnel, to improve their understanding of the innovation systems, apart from developing the necessary skills to facilitate the innovation processes. Moreover, more attention could be paid to the consolidation of strategic alliances and network conformation.

Third, **specialization** search, becoming a world leader in the promotion of innovation, any organization, within the FIDA, has to reduce their options and focus on a manageable group of issues. No organization can be world leader in favorable innovations to the poor in all the aspects which are important for the poor in the rural environment in the world. Lastly, to accomplish all of the above, any organization will have to have an efficient system of **learning and knowledge management**. In the last years, FIDA has elaborated several elements and tools which can be useful, such as the regional network system which now covers four regions in the world and more recently, the rural poverty website (www.ruralpovertyportal.org). How to gather these instruments in a functional learning and knowledge system is still a pending issue. The need to be able to develop knowledge management to have a solid offer of ad hoc services and not to react according to the demand was posed. Finally, the ability to understand themselves as organizations which will provide a promotion service and innovation process promotion knowing that the ones to lead the process are the central actors of the productive system. This has to be with recognizing that it is necessary to take advantage of the bonds already existing or of the informal structures which already exist, given the fact that in these areas the actors have spontaneously managed to overcome the burdens for the collective action. The relevance of understanding that nothing imposed by external actors will be sustainable in time should be the first to be considered in the strategy for the elaboration and determination of services to offer by the SCO.

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