SUSTAINABLE AGRO-SYSTEMS: A CASE STUDY IN A COFFEE COOPERATIVE ORGANIZATION

SANDRA MARA SCHIAVI BÁNKUTI
Adjunct Professor – State University of Maringá (DAD/ UEM)
Av. Colombo, 5.790- CEP: – CEP: 87.020-900 Maringá PR / Brazil
E-mail: smsbankuti@uem.br

LUCIANA ANGELINO GONÇALVES
Post-graduation student – State University of Maringá (DAD/ UEM)
Av. Colombo, 5.790- CEP: – CEP: 87.020-900 Maringá PR / Brazil
E-mail: luciana.uem@hotmail.com

FERENC ISTVAN BÁNKUTI
Adjunct professor - State University of Maringá (DZO / UEM)
Av. Colombo, 5.790- CEP: – CEP: 87.020-900 Maringá PR / Brazil
E-mail: fibankuti@uem.br

Abstract

Current competitive scenario, characterized extremely dynamic environments, emphasize flexible strategies, global perspective, competitive intelligence and innovation. In this sense, it turns important to consider competitiveness as the ability of competing in market and ensuring environmental, social and economic aspects. From agro systems perspective, the importance of institutional and organizational environments on chain coordination has been highlighted in many studies. The aim of this study is to analyze interactions in agro system for sustainability. It seeks to comprehend relationships among agents, through partnerships and collective actions, and their links to organizational and institutional environments towards to sustainable performance, specifically involving a coffee cooperative organization. Results permitted to identify a set of sustainable practices internally and externally developed by the organization. Agro-system coordination in that case is complex, comprising plural forms of governance. Different aspects related to sustainability could be found according do product and market concerned: for commodity coffee, specially sold in internal market, environmental stage follows legal conformity, focusing the importance of public institutions. On the other hand, transactions involving special coffee, generally directed to North-American and European markets, are designed in accordance to external market requirements, creating specific institutions through associations and groups connected to sustainable development. Besides, the achievement of sustainable performance is deeply linked to partnership and joint actions with associations and rural producers. Regarding institutional environment, cooperative is influenced by public and private institutions, although the latter are more important to direct recent sustainable practices. Thus, organizational environment is essential for sustainability along the chain, not only by directing coordination, but specially by designing institutions to regulated sustainable market.

Key words: *sustainable performance; institutions; organizations; coffee production; competitiveness*

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1. Introduction

Current competitive scenario, characterized by extremely dynamic environments, emphasizes flexible strategies, global perspective, competitive intelligence and innovation (HOSKISSON *et al*, 2007). In this sense, it turns important to consider competitiveness as the ability of "[…] fac(ing) up to market competitions whilst at the same time ensuring environmental, social and cultural sustainability based on the dual approach of networking and inter-territorial relationships" (FARRELL; LUKESCH; THIRION, 2000, p. 05) .

It is a consensus that environment is the source of productive resources, such as raw material, energy, soil, etc. Besides that, productive processes result in desirable and undesirable outputs, such as wastes and pollution. Thus, it is important to discuss organizational performance under different approaches, considering not only economic competitiveness, but principally environmental competitiveness.

Network concepts are useful do understand agribusiness systems, its configuration and strategies (FARINA; ZYLBERSTAJN, 2005). Mollenkopf *et al* (2010), for instance, emphasize the importance of actions along supply chains to mitigate negative environmental impacts, explaining the relevance of green supply chain strategies. From agro systems perspective, the importance of institutional and organizational environments on chain coordination has been highlighted in many studies (ZYLBERSTAIN, 1995; FARINA, 1999; LAZZARINI; CHADDAD; COOK, 2001; BATALHA; SILVA, 2007). Institutional and organizational environments, as well as collective actions and inter-agents relationships, are essential for sustainable performance. Furthermore, Watanabe and Zylberstajn (2009) points out the importance of governance and the influences of institutional and organizational environments when considering social and environmental issues in agro-systems.

Considering stakeholder perspective, strategic management should take into account the importance of environmental and social aspects to society, community, workers, Government and clients, among others. In agribusiness, such consideration is even more important, since legal requirements might imply changes in rural production area (e.g. livestock handling, technology adoption, and resource restrictions – soil and water).

Specifically concerning coffee production system and its importance,

> O café é um das "commodities" mais comercializadas no mundo e possui um considerável potencial de desenvolvimento no mundo. É um produto chave na exportação de muitos países em desenvolvimento e responde pelo padrão de vida de milhões de produtores rurais, sendo mais de 70% da produção mundial em fazendas com menos de 10 hectares (ABIC, 2009, p. 3).

On the other side, eco-friendly food consumption has gained importance around the world, and also in Brazil, as highlighted by FIESP and ITAL (2010). According to this study, food trends consider social and environmental issues, in which factors as sustainable production, reduction of environmental impact, environmental certification and recycled and recycling products are concerned. Thus, production involving renewable sources, waste and pollution management, certification and environmental labeling and sustainable processes, among others, get to be more valuable. Product and process innovation, for instance, boosts

environmental strategic management in companies, triggering more efficient processes, improving value-adding and increasing competitiveness (FIESP; ITAL, 2010).

The aim of this study is to analyze interactions in agro system for sustainability. It seeks to comprehend relationships among agents, through partnerships and collective actions, and their links to organizational and institutional environments towards to sustainable performance, specifically involving a coffee cooperative organization.

This paper is structured as follows: besides this introduction, section 2 presents the methodological procedures; in section 3, we provide a theoretical research on sustainable agri-systems; section 04 is constructed to present results and discussion; in section 5, final remarks are presented; and, finally, we show the references in section 6.

2. Methodological procedures

The present qualitative descriptive research has been developed through a case study, involving a coffee cooperative organization and linked agents, such as coffee producers and organizations (such as associations, certification agencies and research institutions). Methodological procedures included literature review on sustainable performance and agro-system coordination, named in this paper sustainable agri-system approach. Primary data were collected via *in loco* interviews with those responsible for sustainability area in the cooperative. Specifically, interviews took place in the first semester of 2012, and involved the company's environmental coordinator, communication department, external market responsible, innovation department and top manager (director). Survey included questions concerning company's general market position and characteristics, environmental practices and environmental management, its relation to partnerships, sources of information and supply chain management. Also, advantages and restrictions to environmental management were examined.

Also, primary data were collected through observation in a rural farm, especially to observe sustainable practices and make data triangulation. Primary information was complemented with secondary information obtained in reports, press release and other institutional materials. Finally, data were analyzed through content analysis, supported by triangulation method.

3. Sustainable agri-system approach

Considering current competitive scenario, an appropriate environmental management is crucial for reaching competitive advantage. In this sense, Hoskisson et al (2009) highlighted a recent perspective in companies, guiding strategic management to stakeholders approach: stock market; product market and organizations. According to authors, company's performance is multidimensional, and value adding comes from stakeholders' balanced performance, steadying conflicts among groups. Thus, sustainable development concept is critical for company's performance.

While presenting the importance of measuring sustainable performance by companies, Ranganathan (1998) brought a scheme to illustrate interactions among social, environmental and economic issues within companies, as shown in figure 01. According to it, integrated

sustainability can be treated through the consideration of social, economic and environmental measures, simultaneously.

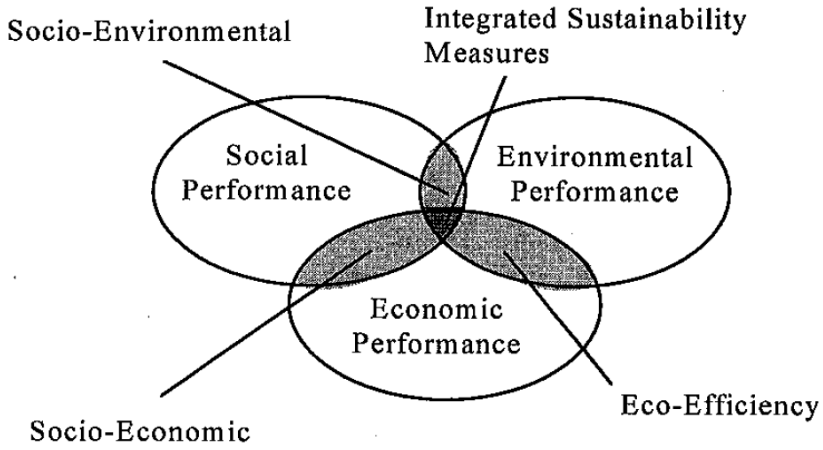

Figure 01 – Sustainability Measurement Schematic
Source: Ranganathan (1998)

Porter e Van der Linde (1999), when discussing environmental fitness and competitiveness dilemma, emphasized that environmental needs shall trigger innovations, which is related to competitiveness increase. According to them, we have to stop the conflict ecology versus economy, since eco-friendly practices are not necessarily connect to cost improvements. For example: environmental innovation can increase productivity, which can be a source of competitive advantage. Companies should wide their view, beyond traditional perspective, considering resource and effort wastes and value adding for clients. Economic competitiveness and environmental improvement are directly connected, as innovation is able to improve quality and simultaneously reduce costs (PORTER; VAN DER LINDE, 1999). So, novel concepts have emerged in business field, highlighting the named "triple bottom line" and more recently the "four-bottom line", considering 4 Ps: person (individual); people (social), profit (economic) and planet (environmental), as illustrated in figure 02. From multistakeholder approach to create value and improve competitiveness, organizational interactions with economic, social and natural systems are considered (BROWN; DILLARD; MARSHALL, 2006).

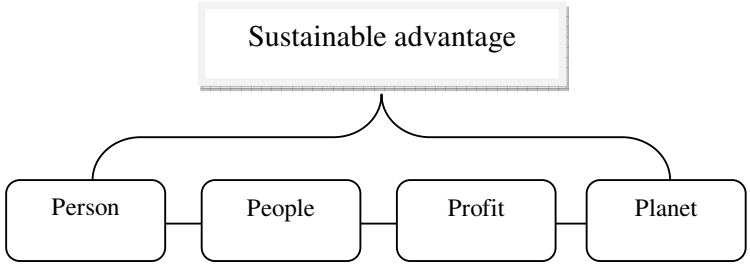

Figure 2 – The Four-Bottom Line
Source: Based in Almeida (2012)

Orsato (2002), when addressing the environmental strategic positioning, says that the choice of strategies to achieve better business performance depends on factors such as the

structure of the industry in which it operates, the company's position in the industry, the types of market the company serves and its internal competencies. Considering the competitive focus - product or process - and the source of competitive advantage - cost or differentiation, according to Porter's typology, the author illustrates that environmental strategies can be directed to: (a) increase resource productivity (focus on cost and process) through, for example, the reuse of waste and reduction of losses in process (b) environmental cost leadership (focus on cost and product) through environmental innovations that can generate products with low cost and economic / or environmental (c) transcend legal compliance (focus on differentiation and process), considering, for example, the implementation of environmental Management Systems such as ISO 14001 (d) eco-oriented products (focus on differentiation and product), generating goods that can provide greater environmental benefits or impose environmental costs lower than competitors.

According to North (1997), there are several benefits associated with corporate environmental management, such as: (a) cost reduction, linked, for example, to rational use of resources (energy, raw materials, etc.), recycling materials and manufacturing co-products, (b) increase in revenues resulted from product innovations and consequent increase in market share, creating new markets or increasing markup, (c) strategic benefits, by improving the company's image, renewing product portfolio, increased productivity, greater involvement and interaction among employees, better relationships with public agents and community, and easier access to foreign markets, among others.

Barbieri (2007) points out three perspectives of corporate environmental management: pollution control, pollution prevention and strategic approach. The latter, for the author, is a more advanced perspective, in which prevails proactive and anticipatory, with permanent and systematic involvement of senior management to achieve a competitive advantage and increase competitiveness. Within that strategic approach, environmental activities should be disseminated throughout the organization, expanding actions and environmental practices throughout supply chain. The company, in this case, should seek to leverage market opportunities and neutralize threats concerning environmental issues. Thus, the adoption of the strategic approach depends precisely on the existence of such opportunities and / or threats in the market in which the organization operates.

Strategies in the environmental area can occur at different levels. In an initial stage, for business survival, the company should seek legal compliance, which corresponds to fulfilling legal requirements. A second stage is related to regulatory compliance, with respect to meeting the voluntary technical standards and environmental management process, with any certification for competitive positioning in the market. In a third stage, the company may adopt a managerial position and proactively address environmental issues in an integrated way, considering assessment of environmental impacts, measurement of environmental costs and the principle of continuous improvement, seeking eco-efficiency through, for example, the adoption of cleaner technologies. Finally, the fourth stage corresponds to eco-business environmental compliance, in which the company seeks to enter markets in environmentally responsible, with research, generation and supply of sustainable products from significant technological advances to environmental preservation, in order to stimulate, intensify or expand their environmentally responsible businesses. We include there promoting biodiversity and creating committees and participation for sustainability (FIESP / CIESP, 2006).

According to Souza (2002), environmental management has gone through an evolutionary process in organizations. It has gone from a more reactive stance – in a "model

of compliance" in which environmental issues are considered a threat, to a more proactive stance, within a "strategic model" in which environmental aspects as companies face business opportunities. Organizational factors to such dynamics can be pointed: government, competitors, markets, institutions and suppliers, as well as the type of response of each company. The author asserts that evolution in environmental strategies is usually due to: (a) regulation, (b) civil society pressure, (c) market conditions - consumers more environmentally aware and fierce competition, and (d) scarce resources - water, energy, money, etc.

Recently, consumer has been highlighted as an important stakeholder in the process of creating sustainable enterprises. Akatu and Ethos (2010), for instance, while discussing perceptions and expectations of Brazilian consumers on social responsibility (CSR), point out some relevant environmental practices. Among them: (a) the promotion of education and information programs for consumers on environmental and social impacts related to consumption practices, (b) investments new technologies to post-consumption recycling, (c) programs for streamlining and optimizing consumption of water and energy, and (d) inclusion of social responsibility criteria in its supplier selection and evaluation processes. According to the same study, for 65% of consumers, the construction of an image of a socially responsible company depends on the adoption of environmental practices, which include management of environmental impacts, technological innovations and emission of greenhouse gases (GHGs). In those aspects, the study shows strong discrepancy between consumer expectations and Brazilian companies adequacy, because only 35% of companies surveyed have adopted such practices (AKATU; ETHOS, 2010).

According to Andrade (1997), companies can position themselves in three distinct strategic stages: (a) reactive strategy, minimally and reluctantly following current environmental legislation, considering environmental adaptations as costly and returnless , (b) offensive strategy, seeking to stay ahead of competitors by reducing pollution and the use of environmental resources, beyond what is legally required, via incremental changes in processes and products, taking environmental issue as a source of competitive advantage and (c) innovative strategy, anticipating future environmental problems, seeking environmental excellence, product and process innovations and linking environmental issues to corporate strategy (ANDRADE, 1997).

Highlighting the importance of public policy mechanisms to encourage environmental improvement efforts, Porter and Van der Linde (1999) argued that environmental regulation has competitive implications. For the authors, few companies provide proactive innovation for environmental improvement; often, environmental innovation comes in response to regulatory mechanisms. Thus, regulation is important for boosting such innovations. This is due to some reasons such as: pressure to generate innovations, improvement in environmental quality; alert companies about the inefficient use of resources and the need for technological improvement; incentives for eco-friendly innovations, promote competitive balance, ensure companies do not create competitive advantage from environmentally-aggressive actions.

Considering strategic environmental management along supply chain, according Mollenkopf *et al* (2010), green supply chain strategies are those related to efforts to minimize negative impacts of firms and their supplies in the environment. Broadly, the mechanisms for sustainable supply chain management are related to achieving better environmental performance, improving value chain. To leverage competitive advantage, it is necessary to establish alliances and partnerships between actors along the chain, since supply chain management approach is related to complexity, synergy and long term interactions.

In this context, two aspects can be highlighted. First, upstream, by considering environmental perspective for suppliers' selection and improvement. The encouragement and enhancement of eco-friendly practices in supply side can favor their own internal environmental management, by easing the achievement of cleaner processes, products that are less harmful to the environment, disposal reduction, better brand image, among others. Downstream, in its turn, reverse logistics may represent an important mechanism for environmental management.

According to OECD (2009), sustainable manufacturing practices along supply chain involve an expansion to life cycle thinking, which includes extending environmental responsibility to other agents. Considering agribusiness chains, Watanabe and Zylbersztajn support take in account agro-system approach and sustainability to illustrate interactions among agents along the chain and its institutional and organizational environments (Figure 03). According to the authors, "[…] sustainability is considered part of institutional arrangement and institutional environment as well" (WATANABE; YLBERSZTJAN, 2009, p. 08).

Watanabe and Zylbersztajn (2009) also highlight the interaction between private and public institution, in order to provide regulation and protect specific investments along sustainable chain.

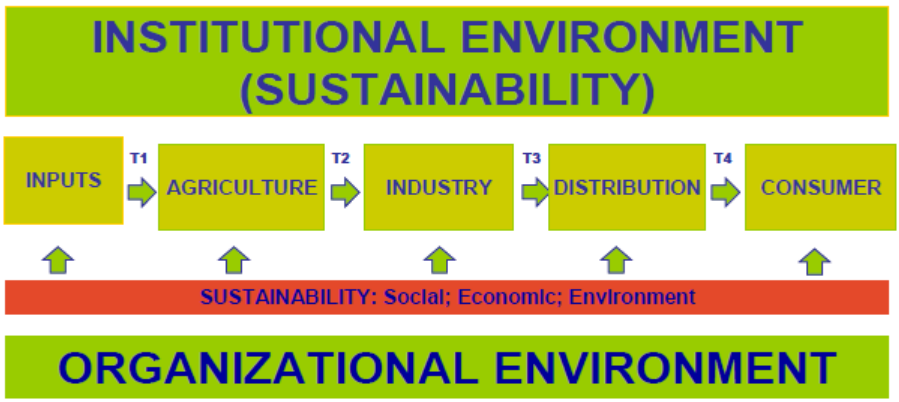

Figure 03 – Sustainable agribusiness system and typical transaction
Source: Watanabe; Zylbersztajn (2009)

It is clear, therefore, that the emergence of a new competitive scenario brings the need to adopt new attitudes by companies, leveraging sustainable competitive advantage from opportunities related to environmental improvements. Within a context of strategic environmental management, organizations can make use of various environmental practices, considering the more distinct stakeholders, and generating multiple benefits, including being able to associate environmental financial gains and increased competitiveness. Specifically to agri-systems, the interconnection among agents is influenced by organizational environment and by public and private institutions.

4. Results

The company in study is a coffee cooperative located in Minas Gerais. Currently, it counts with 12.000 coffee producers and about 1.900 workers, and receives coffee from 200

different counties. Coffee producers are grouped according to production, in small, medium and large scale producers. In this sense, 85% of cooperators are small, producing up to 500 bags of coffee; 14% of producers are classified as medium (501 to 2.000 bags of coffee) and 1% are large producers, delivering over 2.000 bags of coffee. Main clients are located in Europe, specially Germany, Switzerland, England and Italy, and United States.

According to field research, higher profitability is due to core businesses, related to coffee selling and roasting and grinding of coffee. In 2011, greater efforts were directed to invest in technology, innovation, sustainability and coffee production quality, which has resulted in market share and revenues. For the near future, plans involve investments in technical courses, new technologies, sustainability and environmental practices, as well the development of new market channels.

Strategically, in the search for achieving market growth and profitability, the company identified certification as an important mechanism. In coffee sector, sustainability is strongly connected to higher levels of certification, showing the cooperative the importance of working in that direction. Greater attention has been given for innovation and sustainability in the company, through the conception of specific departments for new markets, innovation and sustainability. Coordination and information flows about those subjects were enhanced due the new structure, favoring tighter external relations, new external clients and information about innovation and sustainability.

The company sees that those three areas – new market, innovation and sustainability, are intrinsically connected. In the search for growth through new market development, they could find the opportunity for ultrapremium products, comprising sustainability. To do so, company had the task of creating new products, new processes and new organizational forms. Another example related to innovation and sustainability is related to a project to use a low-quality coffee, taken as residue, to produce coffee oil for the cosmetic industry, turning into a value-added product though innovation efforts.

According to interviews, a series of projects related to sustainability are developed, such as waste reduction and rural training for programs reinforcement. In 2011, of 2.4 million bags of coffee exported, about 1.7 million were verified and certified according to environmental standards. Most quality and sustainable normative guidelines are related to external market requirements. Regarding the stage of development of environmental management, the cooperative was identified as a company in the stage of implementation of environmental management. Interviewers emphasized that sustainable issues are considered in annual reports and top management are concerned to environmental and social directives.

According to primary information, the company has paid more attention to standardization of environmental policies and formulation of these within the cooperative, mainly due to international trade requirements aimed for quality and uniformity of products. In this sense, according to ISO 9000 quality standards have been achieved since 1998, and within ISO 14000 standards.

Specifically concerning ISO 14000, the company is adequating its internal processes and its producers to full implementation. According to the environmental coordinator, it a complex work to adapt rural producers to ISO 14000 framework, which requires the adequation, implementation and monitoring of vertical practices. The system is maintained through the commitment of all involved employees and senior management, conducting internal and external audits, and taking corrective and preventive actions, seeking continuous improvement. Also, interviewers highlighted the importance of internal interaction and the involvement of all linked departments, besides production, HR and environmental areas.

HR department is directly involved in pointing internal deficiencies and HR improvement through a development program, with post-graduation courses and other training programs. In environmental area, failures are solved with specific courses.

Concerning specific sustainability programs, the cooperative carries programs in different levels, according to producers' capability for adequation. The organization is a member of 4C Association (Common Code for the Coffee Community), comprising all of its coffee producers. The program concerns the involvement of different stakeholders in good management and agricultural practices, in the search for efficiency, profitability, transparency and sustainability along the chain.

A higher level of requirement is related to AAA program, which includes 60 coffee farmers and is directed to a specific client in Europe. It represents in the organization the highest level of sustainability and product quality. The program is related to ultrapremium coffee production, regarding quality, environmental and social attributes.

Other specific programs involving environmental issues were highlighted during interviews, such as C.A.F.E Practices for Starbucks and Rainforest Alliance certification, all related to sustainable practices for coffee supply chain. Specificity is related to clients and market niches, in those cases. For the company, it is important to answer to particular demands when working in focused markets. In this sense, we observed even locational specificity, since some programs are directed to regional products, such as Cerrado Mineiro coffee.

To implement such programs together with producers, the cooperative has been engaged into internal and external actions. Internally, the company has had the need for training in order to appropriately process coffee; besides that, some parallel actions were put in practice to support sustainability, such the use of paper bags in the stores and waste sorting for recycling. Externally, they have had a hard work with producers, principally including innovation and conduct change, considering legal conformity and also normative qualification.

Through this research, some aspect could be observed. First, different stages of sustainability are adopted by the company. For commodity coffee, directed to internal market, legal requirements are followed, and internal and external obligatory practices are motivated. Thus, we could say that, for that market, company is in accordance to legal conformity, focusing the importance of public institutions (figure 04).

On the other hand, special coffee, directed to external market, involves other requirements, specific to particular clients or related to labels by organization (such as 4C Association). Thus, we can highlight normative conformity and a greater importance of coordination (supplier selection, training, controlling and monitoring and problem solving). In this cases, organizational environment is strictly connect to the development of private institutions, shaping models to sustainability and being responsible for monitoring practices (audits).

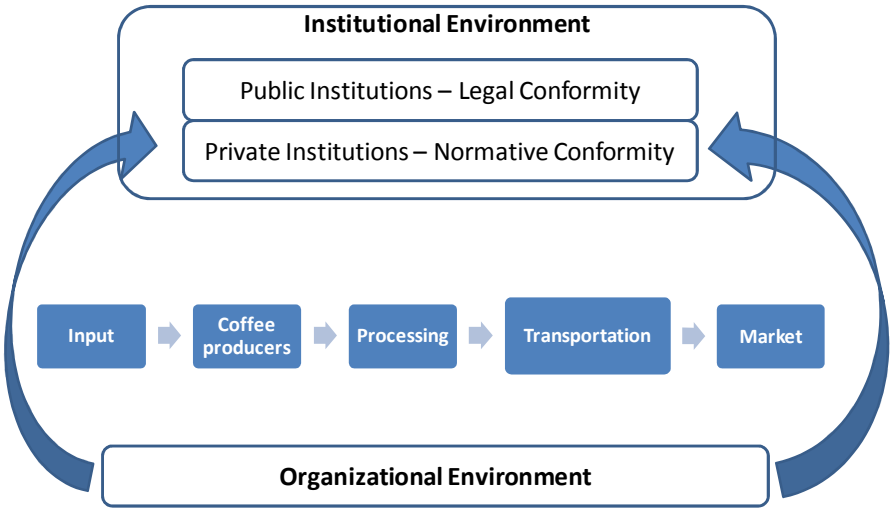

Figure 04 – Sustainable coffee chain: a coffee cooperative case
Source: elaborated by authors, 2012.

Thus, the organizational environment is essential for sustainability throughout the supply chain, not only by directing coordination, but especially by designing institutions for sustainable regulated market. Moreover, sustainability is intrinsically linked to supply chain performance in agri-systems, requiring strong coordination, which could be observed in the importance of partnerships with rural producers, associations and other groups related to sustainable development.

5. Conclusion

After results discussion, some final remarks are highlighted. First, we could observe the importance of organizational environment in creating institutions for sustainable markets. Since certification involves assessment, monitoring and control along supply chain, related to a belief good, coordination is especially important to follow external market requirements. When considering different market needs and consequently different regulation parts, complexity gets even greater. Especially concerning standardization, probably due to diversity in market requirements, the implementation of ISO 14000 is limited up to now, requiring models to connect all programs.

Moreover, specificities involving different programs (scope, region, coffee type, producer groups, markets and supply chain management) help to increase complexity in supply chain coordination, which requires greater effort. Finally, a synergic connection between strategic management and sustainable innovation is observed, and sustainability is considered a core for strategic success in the company.

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