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**FACULTAD DE CIENCIAS JURIDICAS**

**ESCUELA DE ESTUDIOS INTERNACIONALES**

***Measuring the Impact of Swiss International Cooperation***

***Applied to the Project “Energy Efficiency in Artisanal Brick Factories in  
Cuenca”***

***Period 2010-2012***

**Graduation paper before obtaining a BA in International Studies with  
a major in Foreign Trade**

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**Cuenca, Ecuador**

**2013**

## **DEDICATION**

I dedicate this work to my parents for their unconditional support and to my brother and friends for their support and motivation.

Karla Carrillo Aviles

## **ACKNOWLEDGMENT**

I would like to express immense gratitude to all the people whose help made possible the achievement of this thesis. Thanks, Swisscontact-Ecuador Foundation, with special thanks to Mrs. Sandra Gavilanes who strongly supports the investigative process of this essay.

A special recognition should be given to the brickmaking area of the city of Cuenca for its collaboration and indispensable participation.

Lastly, a particular appreciation goes to my thesis director, Fabian Carvallo, for his guidance throughout the development of this study.

## **Table of Contents**

<b>DEDICATION.....</b>	<b>ii</b>
<b>ACKNOWLEDGMENT .....</b>	<b>iii</b>
<b>Table of Contents.....</b>	<b>iv</b>
<b>ABSTRACT.....</b>	<b>viii</b>
<b>RESUMEN.....</b>	<b>ix</b>
<b>INTRODUCTION .....</b>	<b>1</b>
<b>CHAPTER 1 .....</b>	<b>4</b>
<b>The Role of Swiss International Cooperation for Sustainable Development in Ecuador .....</b>	<b>4</b>
<b>1.1 Sustainable Development and International Cooperation .....</b>	<b>6</b>
<b>1.1.1 Sustainable Development .....</b>	<b>6</b>
<b>1.1.1.1 Description and Progress.....</b>	<b>6</b>
<b>1.1.1.1.1 Concept .....</b>	<b>6</b>
<b>1.1.1.1.2 Sustainable Development in International Relations .....</b>	<b>7</b>
<b>1.1.1.1.3 Priorities for Sustainable Development.....</b>	<b>9</b>
<b>1.1.1.2 Sustainability in Ecuador .....</b>	<b>11</b>
<b>1.1.2 Framework for International Cooperation.....</b>	<b>14</b>
<b>1.1.2.1 General Policies.....</b>	<b>14</b>
<b>1.1.2.1.2 Concept .....</b>	<b>14</b>
<b>1.1.2.1.3 Actors, Methods and Instruments of International Cooperation .....</b>	<b>15</b>
<b>1.1.2.1.3.1 Actors .....</b>	<b>15</b>
<b>1.1.2.1.3.2 Forms.....</b>	<b>16</b>
<b>1.1.2.1.3.3 Instruments.....</b>	<b>17</b>
<b>1.1.2.1.4 Background, Evolution of Paradigms and Progress in International Cooperation .....</b>	<b>19</b>
<b>1.1.2.1.5 Effectiveness and Impact of International Cooperation .....</b>	<b>24</b>
<b>1.1.2.1.6 Perspectives and the Future of International Cooperation.....</b>	<b>26</b>
<b>1.1.2.2 National Policy .....</b>	<b>27</b>

1.1.2.2.2	Constitution and Foreign Policy of Ecuador .....	28
1.1.2.2.3	Plan Nacional del Buen Vivir 2009-2013 .....	29
1.1.2.2.4	Sistema Ecuatoriano de Cooperación Internacional (SECI) .....	30
1.1.2.2.5	Outlook for Cooperation in Ecuador .....	32
1.2	Swiss Cooperation and Swiss Cooperating Actors.....	34
1.2.1	Swiss Cooperation Policies .....	34
1.2.2	Swiss Agency for Development and Cooperation (SDC).....	36
1.2.3	Swisscontact Ecuador-Swiss Foundation for Technical Cooperation.....	38
1.3	Development of Swiss International Cooperation for Sustainable Development in Ecuador .....	39
1.3.1	Description of Activities Implemented in Ecuador .....	40
1.4	Swiss-Ecuadorian Bilateral Relations in Topics of International Cooperation for Sustainable Development .....	42
1.5	Conclusion .....	44
CHAPTER 2 .....		46
Description of the Project “Energy Efficiency in Artisanal Brick Factories in Cuenca”....		46
2.1	Project Description .....	47
2.1.1	Initial Macro Project Context .....	47
2.1.2	Project EELA-Ecuador .....	50
2.1.3	Beneficiary Sector .....	52
2.1.4	Problems .....	53
2.1.5	Objectives and Proposed Goals .....	56
2.1.6	Actors Involved.....	57
2.2	Systematization of the Process .....	60
2.2.1	Methodology .....	60
	.....	61
2.2.2	Activities .....	61
2.2.2.1	Base Line.....	61
2.2.2.2	Production Processes.....	62
	.....	63

2.2.2.3	Work Conditions .....	69
2.2.2.3.1	Technical and Economic Aspects .....	69
2.2.2.3.2	Social Aspects .....	71
2.2.2.4	Technological Transference.....	72
2.2.2.5	Identification and Implementation of Best Practices .....	74
2.2.2.6	Training .....	74
2.2.2.8	Institutional Strengthening.....	76
2.3	Obtained Results.....	77
2.3.1	Description.....	77
2.3.2	Monitoring and Evaluation Mechanisms.....	80
2.4	Pilot Implemented.....	80
2.4.1	Definition of Methodology .....	80
2.4.2	Posed Activities .....	81
2.4.3	System Sustainability .....	82
2.5	Conclusion .....	83
CHAPTER 3 .....		84
Impact Analysis of the International Cooperation Project .....		84
3.1.1	Results 2010-2012.....	85
3.2	Process Interpretation.....	91
3.2.1	Implementation Evaluation .....	91
3.3	Project Impact Measurement.....	94
3.3.1	Methodology .....	95
3.3.2	Caused Effects.....	97
3.3.2.1	Technological Effects.....	98
3.3.2.2	Economy and Production .....	107
3.3.2.3	Social.....	112
3.3.2.4	Environment .....	114
3.3.3	Effects Not Considered.....	117
3.3.3.1	Culture.....	117

3.3.3.2	Destination of Savings .....	118
3.3.4	Project Rating .....	120
3.4	Sustainability .....	124
3.4.1	Sustainability Measures .....	124
3.4.2	Empowerment of the People Involved .....	126
4.	Conclusions .....	127
4.1	Conclusions .....	130
4.2	Recommendations .....	133
	BIBLIOGRAPHY .....	136
	WEB REFERENCES .....	138
	Graphic Index .....	144
	Photo Index .....	145
	Table Index .....	145
	ANNEXES .....	146

## **ABSTRACT**

By analyzing the project “Energy Efficiency in Artisanal Brick Factories in Cuenca”, as an applied example of Swiss international cooperation, it has been possible to determine the social, economic-productive, environmental, and technological impacts of this intervention in Cuenca’s brick artisan area. It has also been possible to demonstrate the role performed by Swiss international organizations like international cooperation agencies and NGOs as promoters for sustainable development in Ecuador. This impact study has been important to measure the relevance of Swiss international cooperation as an alternative mean and complement to national efforts to overcome the problems of a specific group.



## **RESUMEN**

Con el análisis del Proyecto “Eficiencia Energética en Ladrilleras Artesanales del Cantón Cuenca-EELA” como ejemplo aplicado de la cooperación internacional suiza, se pudo determinar los impactos sociales, económico-productivos, ambientales y tecnológicos resultantes de las actividades desarrolladas por dicha intervención en el sector ladrillero artesanal de la ciudad. Se pudo además evidenciar el papel que desempeñan los organismos internacionales suizos como agencias de cooperación internacional y ONGs en el país como actores promotores del desarrollo sostenible. El estudio de medición de impacto resultó importante para comprobar el rol de la cooperación internacional suiza como herramienta alternativa y complementaria a los esfuerzos nacionales para solventar las problemáticas de un sector específico.

## INTRODUCTION

This paper uses the project “Energy Efficiency in Artisanal Brick Factories in Cuenca,” with the primary objective of measuring the impact of Swiss international cooperation for sustainable development in Ecuador.

The analysis of the project EELA helps to show the project's impact on the social, economic-productive, environmental and technological aspects, verifying and highlighting the challenges and difficulties of the activities implemented in the target population. It also serves as a methodological guide for the project's process and it also indicates the role that international organizations, such as international agencies and NGOs, have in Ecuador.

The project “Energy Efficiency in Artisanal Brick Factories in Cuenca” is funded by the Swiss Agency for Development and Cooperation (SDC), implemented by the Swiss Foundation for Technical Cooperation, Swisscontact, and coordinated with the *Comisión de Gestión Ambiental* of Cuenca. The Regional Energy Efficiency Program in Latin American Artisanal Brick Factories (EELA) is intended to help mitigate climate change and improve the quality of life of the brick makers. In Ecuador, Cuenca has been chosen for the regional pilot program with the intent to later expand the program in other cities.

By analyzing the impact of the project, it is evident that international cooperation as financial and technical support is a feasible alternative and a complement to help mitigate climate change in developing countries and improving the quality of life of the population by allowing sustainable development.

The present study consists of four chapters which presents an analysis of international cooperation applied to a specific case. It begins with the theoretical framework, followed by the systematization of the project, its results, as well as an explanation of the impact of the intervention, and finally a presentation of findings.

The first chapter discusses the role of Swiss international cooperation for sustainable development in Ecuador. It is based on the theoretical foundation of sustainable development since the line of action of the project is closely related to this concept. Similarly, it studies the principles of international cooperation by analyzing global policy on the issue and the application of those principles in Switzerland and Ecuador. Subsequently, the actions taken by the Swiss cooperation in the country are described.

Chapter two describes the process of the project "Energy Efficiency in Artisanal Brick Factories in Cuenca," from the initial conception of the project through the stages of planning and implementation, to the presentation of the results achieved by the first phase of the project. This period goes from the beginning of the Regional Program in 2009 until 2012 where it was implemented on a national level.

After the systematization of the intervention, chapter three measures the impact of the Project EELA based on its results. It also measures the reaching of intervention the in social, economic, environmental, and technological aspects.

The final chapter presents the recommendations and conclusions of the thesis.

Accordingly, this paper serves as a possible guide for future research conducted in the field of international cooperation and project evaluation. It is because the project analysis uses the theoretical current dynamics of international cooperation and the principles that support sustainable development. Also, it applies project formulation and evaluation techniques, thus allowing verification of the present study.

The development of this thesis uses the inductive-deductive research method. To this end, the study uses the EELA project reports as a primary source, noting the project's scope. For the impact analysis of the intervention, as well as its effects, field work was performed to gather information by the EELA group project participants. Surveys were used as a quantitative primary source and observation activities of participants were

done as qualitative primary source. Additionally, to complete the research, a review of publications was carried out relating to the project provided by the implementing NGO, as well as a review of physical literature, digital documents, press releases and internet articles.

## **CHAPTER 1**

### **The Role of Swiss International Cooperation for Sustainable Development in Ecuador**

Currently, the countries of the world face problems that go beyond the limits of national borders. One of the most worrying problems we can say is climate change, a progressive phenomenon resulting from the consumption and production patterns of humanity throughout history that has led to the breaking point of land exploitation. States are aware of this phenomenon and are now seeking solutions for mitigation and sustainable development for the world population. The International Cooperation is presented as a solution and as a complementary tool to the efforts of countries to act in sustainable development thus contributing to climate change mitigation. All of this is done by executing actions and policy coordination in order to achieve common goals at the international level (AGCI, 2012).

To achieve the commitment of countries and reach large goals as mentioned above, international cooperation includes various political, social, and economic world orders in this process. Among these world orders are states, international cooperation agencies, NGOs, and multilateral agencies, among others. These actors handle the different modalities of international cooperation in developing countries, unfolding as active participants in the dynamics of international cooperation.

Ecuador is a player in the international cooperation system acting as an agent for inbound and outbound support. Since the 70s, Ecuador began to organize a national system of international cooperation in order to meet the needs of the population and contribute to its development (Oetzel, 2008, pg. 9). Among the most important partners for Ecuador in international cooperation is the Swiss Confederation. The early relationship with the Swiss has allowed the SDC, Swiss Agency for Development and Cooperation, Swiss NGOs, and other major agents to perform great efforts supporting and guiding Ecuador in key areas of international cooperation (SETECI, 2012). Among

these, a priority for both Ecuador and Switzerland is the environmental area. In this area, the Swiss have developed a significant role internationally by coordinating programs and cooperation projects and actively executing actions in order to solve major environmental problems while creating better living conditions for the population.

Given the importance of Switzerland as a cooperating partner, it is important to examine the role of that country and its contribution to sustainable development in Ecuador. To this effect, it should be considered sustainable development as a guiding principle and theoretical basis for achieving development and climate change mitigation. It also describes the dynamic and global macro principles and policies of international cooperation and also the priorities and policies that determine the agenda of international cooperation in both the Republic of Ecuador and the Swiss Confederation.

## **1.1 Sustainable Development and International Cooperation**

### **1.1.1 Sustainable Development**

#### **1.1.1.1 Description and Progress**

##### **1.1.1.1.1 Concept**

One of the basic concepts that countries currently consider in implementing actions in the field of international cooperation is sustainable development. This item is included in the development agenda of most countries in the world and it is a reference framework for action by international agencies and NGOs that work today. It is therefore important to know the concept, its incorporation into international relations, and the progress that it has had.

Sustainable development is defined as "a development that meets the needs of present generations without compromising the ability of future generations to meet their own needs" (WCED, 1987, pg. 43). This concept had its heyday in the 90s and comes from the need for economic and social development compatible with environmental preservation. Specifically, the concept comes from the Brundtland Report of 1987 set by the United Nations World Commission on Environment and Development, in which sustainable development is presented as the only way of development to preserve life on the planet. Although this concept certainly has its limitations, sustainable development suggests that the use of technology, transfer of resources and assistance to less developed countries and better social organization with policies of population control could lead to responsible management of the planet's resources, giving way to a new era of development (Brundtland, 1987).

As mentioned above, it is essential to meet the needs of the population and furthermore the needs of disadvantaged people. However, in order to reach the needs of continually growing populations, countries produce a resource consumption rate which results in great pressure on the ecosystem. As a result of this pressure the progressive accumulation of greenhouse gases (GHG) affect global warming and give way to a serious phenomenon which we experience today, i.e. climate change. Therefore,

sustainable development is presented as a transition process in which the exploitation of resources, targeting of investment, and the orientation of technological and institutional changes should be consistent with the environment in order to meet the needs of present and future generations (Brundtland, 1987).

Within this concept, the distinction between growth and development is also explained. While growth refers to "the action of increasing in size as a result of assimilation of resources," develop means "to expand or perform the potential to lead to a better state, greater or more complete" (Goodland, et al, 1992, pg. 17). This differentiation is vital to the concept of sustainable development, because the first instance is to make a transition from the pursuit of growth to the pursuit of sustainable, responsible development of the environment through more efficient use of the planet's resources. This change, of course, is an absolute necessity, as mentioned by the authors of the Brundtland Progress Report on Sustainable Economic Development, "the planet will enter transition to sustainability: the choice is between organizing society to achieve an orderly transition or let the physical limits and environmental damage dictate the timing and trajectory of the transition" (1992, pgs. 16-17).

#### **1.1.1.1.2 Sustainable Development in International Relations**

In order to make it operational, sustainable development was introduced in international relations during the United Nations Conference on Environment and Development in Rio de Janeiro in 1992, also known as the Earth Summit. At this conference, participants shaped considerations as general principles which included sustainable development as a developmental goal. The Rio Declaration states that "human beings are at the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature." (Principle 1) in addition ". . . in order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation." (Principio 4)



It is on these principles that it was possible that several world leaders approved “Agenda 21”, a plan that sets out a series of actions to achieve a change to the current unsustainable model of economic growth of the countries, with activities that enable the protection and renewal of environmental resources that are essential for growth and development (UNCC, 2012). Similarly, the 1992 Conference marked the starting point in international negotiations to protect the environment by determining that "all goals of economic and social development must be defined in terms of sustainability, whether in developed countries or those developing" (Fundación Natura, 2003, pg. 6).

Agenda 21 was the first step in making the idea of sustainable development a global need. Later in 2002, the World Summit on Sustainable Development in Johannesburg (Rio +10) was held to assess the development, implementation, and enforcement of the commitments made at the Earth Summit. However, the outlook was grim due to the massive increase in poverty increasing natural resource degradation, and far from changing unsustainable patterns of production and consumption. Therefore, to renew commitment, countries signed the Plan of Implementation of the World Summit on Sustainable Development so that sustainable development could be applied in a more operational manner. However, the biggest limitation was the lack of political resolve of governments (Fundación Natura, 2003, pg. 110).

Fundamentally these two summits were dedicated to introduce and support sustainable development. The United Nations Conference on Sustainable Development held in June of 2012 in Rio de Janeiro (Rio +20) was assembled to see the progress that had been made in this field. This conference served to put into perspective the activities that have been implemented in order to achieve sustainable development, because as the social and economic progress of countries continuous, environmental problems also do. However, the results were less than encouraging due to the lack of political motivation and commitment of many world leaders.

It should however be emphasized that sustainable development came to the global forefront when the United Nations took steps to integrate this concept into all its policies

and programs, and by incorporating Millennium Development Goal (MDG) number 7: ensure environmental sustainability. This goal is based on the premise that the environment is an integral part of economic and social development.

#### **1.1.1.1.3 Priorities for Sustainable Development**

New priorities have emerged for sustainable development. Today, for example, there are important considerations for the “green economy,” an intersection between economics and environment. This green economy basically represents a nation that produces low carbon emissions, is resource-efficient, and socially inclusive. The Rio +20 Conference reviewed seven critical points for sustainable development: jobs, energy, cities, food security, water, oceans, and natural disasters. The conference aspired to achieve solutions that met the developmental needs of the population while also taking into account the environmental implications (UNCSD, 2012). Among the new priorities for sustainable development is the role of technology. The creation, transfer, and dissemination of technology is needed in order to achieve equity between development and environment.

For this, the importance of technology is seen as a transversal role in global policies for sustainable development. It is argued that technological developments have contributed to less consumption of natural resources for human activities. In this respect, the main objective is that technology implementations will promote a more efficient use of resources. Considering natural capital is now the limiting factor for economic development, technology is intended to reduce dependence on natural resources and minimize the environmental impact caused by overexploitation (Goodland, et al, 1992, p 50). Under this premise, several authors argue the importance of increased investment in technology to "replenish stocks and raise the productivity of natural capital" (p 64).

Similarly, the need to achieve sustainable development requires an accelerated shift to cleaner technologies. This shift is proposed by technological optimists who support the imperative of technological innovation (UNCSD, 2012). An urgent task for countries,

both rich and poor, is the discovery, introduction, and transfer of clean and sustainable technologies. The idea is to develop technology applied to production processes for the efficient use of resources, reduce of energy consumption and implementation of alternative energy sources. Applying this technology will can clearly alleviate the pressure on the environment and natural resources.

However, it is vital to keep in mind the different technological capabilities across countries. And so, the technology must have features that avoid marginalization of less developed countries. In order to apply or transfer technologies, “. . . they must be reliable, affordable, economically viable, socially acceptable, and environmentally sound” (Noticias Positivas, 2012). Under the above conditions, the technology implemented must be operated and owned by the poorest groups in rural and urban environments with which they can be utilized regardless of their economic difficulties.

Another important consideration when discussing technological development is that these technologies should be appropriate to cultural patterns, needs, and resources available to potential users. Conventional technology developed by highly developed countries is usually high cost, requires highly skilled labor, and sometimes maintain contaminant consumption patterns. It is therefore a priority for sustainable development technology to be adapted to create the conditions for local consumption and cultural patterns so they can be absorbed gradually and efficiently in the poorest populations in order to improve their quality of life sustainably (George McRobie, 2001, pg. 3).

To achieve sustainable development incorporating technology as a fundamental aspect it is necessary that it will adaptable to area where implemented and low costs. It is also necessary to take action and mobilize available financial recourses in order to facilitate a wider and more efficient use of technologies. It is in this aspect that the “North-South,” “South-South” and “triangular” cooperation is presented as a means to promote and disseminate the technology globally (Positive News, 2012). As proof of this, at the First Conference for Human Development Technology, it was evident that a significant percentage of projects and programs promoted in the field of international cooperation

have a clear technological element, “about 40% of the funds that OECD countries given as ODA were focused on improving social and productive infrastructure” (I Conferencia Tecnología para el Desarrollo Humano, 2001). Therefore, it is important to mention the relevance of technology as a means to achieve sustainable development and to serve the needy.

Finally, we emphasize the importance of sustainable development in the global arena as this premise has marked a new way of thinking about development, more holistic and comprehensive. Undoubtedly, the adoption of the concept of sustainable development globally is a huge environmental advancement and today is a macro reference for international cooperation interventions for development agendas for States, international organizations, and NGOs. However, it is necessary to make this concept more operational and to ensure its course of action, because although many countries and organizations have already adopted sustainable development in their agendas, many actions are still left to massify it.

#### **1.1.1.2 Sustainability in Ecuador**

In Ecuador there have been great advances in discussing sustainability since the 2008 Constitution. The current law states that nature has inalienable rights, ensuring its protection (Art. 71). The constitution also establishes as the development system as "the organized set, sustainable and dynamic economic systems, political, socio-cultural and environmental factors that ensure the realization of the good life, *sumak kawsay*." (Art 275). It is stated since the beginning the balanced coexistence of development and nature protection. However, even if there are significant limitations, especially economic ones, because it is imperative to improve basic living conditions of the population; development cannot be conceived without pointing out the future impacts on the environment. Many developing countries are increasingly aware of environmental values and a significant example is the case of Ecuador.

Additionally, when analyzing the current Ecuadorian Constitution with regard to sustainable development, Article 395 recognizes the following environmental principles: “The State guarantees a sustainable model of development, environmental balance, and respect of cultural diversity, which conserves the biodiversity and natural regeneration capacity of ecosystems, and ensures the satisfaction of the needs of present and future generations.” The article goes on to explain that the “. . . environmental management policies will be applied transversely and will be adhered to by the State at all levels and by all individuals or corporations in the country.” These items display Ecuador’s commitment to the fundamental principles of sustainable development and seek to apply it transversely in each of the activities executed in the country.

Concerning biodiversity and natural resource management, the Constitution promotes technologies that have a low impact and do not affect the environment. To this end, article 413 specifies that “The State shall promote technologies that are energy efficient, developed and used with environmentally clean practices and policies, as well as those that promote renewable energy; that are diversified, low impact, that do not jeopardize food sovereignty, the ecological balance of ecosystems, nor the right to water.” This article proposes alternatives that indeed seek to achieve a balance for development providing for a maximum responsible use of the resources available in the country.

Some of the standards applied on sustainability issues by the Constitution of 2008 have been considered advanced, including the establishment and guarantee of a healthy environment for the population as a right. In addition, as being supported by the Constitution, these rules are promoted by the Environmental Management Law and regulated through national institutions with special consideration by the Ministry of Environment as the agency that coordinates and regulates the national environmental decentralized management system.

Achieving a sustainable society in Ecuador involves changing the development model that the country has traditionally followed. Today when taking into account the legal support available to the State, it can be said that progress is important since they

represent tangible proof that it is possible to combine the need to preserve the environment with the development needs of the population.

Furthermore, as stated in the Brundtland Report (1987), the relationship between poverty and environmental degradation is undeniable. However, it cannot be required for less developed countries to stop making use of resources to achieve at least acceptable living standards. Similarly, it cannot be demanded that developed countries stop their economies. Though, it can be required to practice sustainable use of global resources, implement new technologies, and demand the assistance and guidance of the more developed countries to address the development needs of those in less favorable conditions.

It is imperative to develop a strategy for local and global development, taking as reference sustainable development and raise it as a goal and standard, as is the case of Ecuador. Certainly, there are major constraints such as economic factors as well as the political will. It is said however that “the transition to sustainability will only be achieved when there is a perceived need for the transition” (Goodland, et al, 1992). Global warming and the effects of climate change are a visible alarm to promote concrete measures and meet international agrees in favor of sustainable development. Indeed, it requires the commitment of countries to provide a global sustainable development, and to achieve this goal, an important point is multilateralism and international cooperation. That is, to act jointly between states, multilateral organizations, and NGOs to make decisions and execute policies supported in the partnership, in order to meet the needs of the population, generating development in harmony with environment.

After mentioning the basic principles of sustainable development, its importance in world politics and its importance in national politics, this principle is used to analyze the present study, and highlights its relevance for international cooperation. Although the priorities of international cooperation to and the needs of different countries evolve over the years, sustainable development remains a fundamental principle.

The following section discusses development regarding international cooperation, related concepts, dynamics, and prospects as a theoretical reference for this thesis.

### **1.1.2 Framework for International Cooperation**

#### **1.1.2.1 General Policies**

##### **1.1.2.1.2 Concept**

In an increasingly interdependent world with global issues that require joint solutions, international cooperation is presented as a solution and as a complementary tool to the countries' own efforts to solve existing problems and to act towards sustainable development. It is therefore of great importance that we discuss the dynamics of international cooperation by analyzing the components, evolution, and perspectives that are held within this branch of international relations.

Although there are a number of definitions in terms of international cooperation, we will use the notion that international cooperation is described as “the totality of the activities funded by the state, private sector and civil society in industrialized countries and development, as well as multilateral organizations in order to support the development processes and reforms in the world. These activities can be executed at on global, regional, national and local scale” (GTZ, 2012). The Secretaría Técnica de Cooperación Internacional of Ecuador (SETECI) says that international cooperation is "a fundamental resource of international relations between peoples. Cooperation is a complement to the efforts of nation states to promote development” (SETECI, 2012).

Thus, we refer to international cooperation as a system within the branch of international relations based on the principles of responsibility and reciprocity. International cooperation strives to achieve common goals on a global scale through the pursuit of actions, policy, and coordination among States (AGCI, 2012).

### **1.1.2.1.3 Actors, Methods and Instruments of International Cooperation**

The international development cooperation is a network of public, private, and civil society actions to promote international cooperation for development. It is one of the common mechanisms of international relations between North-South and South-South. José Antonio Alonso, professor of Applied Economics at the Universidad Complutense de Madrid, says, “Due to the increasing complexity in international relations and changing paradigms of international cooperation, there has been a steady proliferation of channels, modalities instruments and actors interacting with each other, helping to shape what today is known as the global system of international cooperation” (2010, pg. 3).

#### **1.1.2.1.3.1 Actors**

Actors or agents of international cooperation are bound by law to develop collectively beneficial activities; actors are characterized by their nature, functions, and capabilities with varied orientations. For the purposes of this study, actors are classified as: traditional and new.

Traditional actors recognize the States that perform cooperation directly from country to country, i.e. bilaterally. These types of actors include: national cooperation agencies, decentralized cooperation, as well as donors from emerging economies countries like India, Brazil, China, etc. (Alonso, J. Cámara; L. Ayllón, B., 2010). Traditional International organizations channel the cooperation of States through multilateral agencies, most of which are integrated into the UN system. There are three types of institutions and diverse nature objectives within these agencies: the specialized agencies, funds, and programs and institutions for humanitarian aid (2010, pg. 76).

Financial institutions are multilateral organizations and whose principal activity is the provision of loans to its member countries for the implementation of programs and investment projects, both in terms of markets and with different degrees of



concessionality. Within these institutions are the International Monetary Fund (IMF), the World Bank, and Regional Development Banks. These organizations are also an important source of technical assistance and many times provide financial grants (2010, pg. 74). Nongovernmental organizations (NGOs) are social, humanitarian, environmental, and technical organizations, independent of government and not for profit. NGOs have various legal forms such as association, trust, cooperation, etc. These organizations incorporate ethical principles which maximizes benefit to society (2010, pg. 99). This type of actor also contributes to social movements and organized civil society.

New actors include companies or corporate groups that are a type of public-private partnership for development; this new commitment is linked to corporate social responsibility. Also involved are philanthropic foundations and individuals from civil society that create charitable foundations or donate to different fields of development action (2010, pg. 119). In addition, universities and research centers represent a large contingent of experts, professors, and researchers who provide assistance, training, and support for cooperative activities, as well as specialized experts, technicians, and managers of international aid (2010, pg. 93).

#### **1.1.2.1.3.2 Forms**

The forms of international cooperation can be classified in different ways. First, depending on the nature of the actors participating, cooperation may be considered public, in which the state intervenes officially, by a governmental agency, or an international governmental organization. A private or non-governmental cooperation involves individuals, non-governmental organizations (NGOs), both national and international, companies, philanthropic foundations, individuals. Mixed cooperation is offered by private institutions but funded by public resources (Management and Information System of International Cooperation Department of Caldas Colombia, 2007).

Another form of classification is based on the number of parties involved. Bilateral cooperation is two countries or institutions of two countries work together as cooperation agencies or bodies. Multilateral cooperation refers to a public international organization. These multilateral agencies give or manage cooperation with their own resources or with funds provided by member countries for specific programs. Multi-bilateral cooperation is that which “involves two cooperating countries and a third country or an international organization that finances cooperation” (2007).

A final classification is based on the level of development of countries. This means that the horizontal cooperation is between countries with a similar level of development, such as in the case of South-South cooperation. There is also vertical cooperation which traditionally occurs between a developed country and one in development or less developed. Triangular cooperation is when two developing countries receive funding from a third more developed country; the developed country may transfer previously acquired knowledge or experience with international technical support (2007).

#### **1.1.2.1.3.3 Instruments**

The concept of Official Development Aid (ODA) refers to “concessional funds from developed countries granted to correct the manifestations of inequality and poverty at an international level.” This kind of help comes from the countries of the Organization for Economic Cooperation and Development (OECD) and is labeled as such when said country complies with certain conditions, such as: the recipient country must be qualified to receive aid development, resources must be from public sources, it must have a degree of concessionality, i.e. beyond a certain threshold which for the most general case is set at 25%, and the purpose of the funds must be for activities that promote economic progress and social development. Moreover, ODA which is transferred without any compensation or as a donation is called non-reimbursable cooperation. If the aid refers to a credit or debt, the cooperation is called reimbursable cooperation (Alonso, 2010, pg. 4).

The program or project as first instruments are the basic units of development and represent the central instruments of development aid policy. A project is a precise intervention in a host country with objectives, a time frame, and clearly defined resources. The advantages of this type of instrument are its remarkable versatility, allowing adaptation to its objectives and performance conditions to the circumstances of each case. Furthermore, its target population is clearly defined, and the intervention can be suited to technical, financial, and human resources available. The program refers to those actions that involve transfers of resources to carry out a set of unique projects. The aid program stands as an appropriate instrument to support reform purposes, and uses so-called “sectoral level” approaches (Alonso, J. Cámara, L.; Ayllón, B, 2010, pg. 5).

Technical cooperation incorporates transfer techniques, technologies, knowledge or experience of developed countries and multilateral organizations through consultancy work, training and institutional support, which are normally performed by international experts. This tool is a component of nonrefundable bilateral aid. There is also a financial cooperation which is, “. . . one that is developed through the allocation of financial resources, usually non-reimbursable projects in the form of support, donations, humanitarian aid, etc., in order to mitigate or address the most pressing needs of the population in developing countries” ( Management and Information System of International Cooperation Department of Caldas Colombia, 2007). Financial cooperation can also be on a reimbursable basis, this includes loans, concessional or otherwise, or a figure of credit granted on terms more generous than market (Alonso, J. Cámara; L. Ayllón, B, 2010, pg. 7).

Certain instruments include food aid, humanitarian aid, and emergency assistance. There is also cultural cooperation, scientific and technological cooperation, or cooperation through scholarships and grants. In short, these are the basic classifications applying international cooperation, and the tools used by the actors involved. Nevertheless, as it is displayed in international cooperation, many of its components and means may vary according to the policies applied in each country and by the changing dynamics of international relations.

#### **1.1.2.1.4 Background, Evolution of Paradigms and Progress in International Cooperation**

Having presented the general concept of international cooperation and its elements, it is necessary to recount its history and its progresses, considering that elements that constitute it have constantly changed according to the global reality. Indeed, there has been a change since its beginning after World War II, through the post war era, during the Cold War and up to the present day to what we know today as the international development cooperation. The dynamics of cooperation has evolved to adapt to the new global paradigms, changing priorities, processes, and even actors.

After the Second World War there was a series of modifications and major changes in the global landscape that marked the beginning of international cooperation. Therefore, it is important to recognize facts that influenced its establishment as such. Among those mentioned, it was the origin of the International Financial Institutions (IFIs) such as the IMF and World Bank, which played a prominent role in the architecture of international cooperation (Tassara, 2010, pg. 3). Another important event was the creation of the United Nations in 1945, a global organization formed with the primary objective of facilitating cooperation between partner countries. This was a milestone for multilateral action and the global consensus for cooperation (Charter of the United Nations, 1945).

Additionally, a highly influential historical event was the process of decolonization in the 1960's. Tassara explains that “newly independent countries needed financial and technical assistance for their own development plans, and international cooperation became a useful instrument to the powerful countries of the time” (2010, pg. 5). With the emergence of the bipolar world in the Cold War, international cooperation had a greater role on the international stage as a political tool. The reason for this was simply because the two blocks began to develop policies to channel financial resources and technical assistance programs to the extent that countries were transformed into areas of influence (2010, pg. 5).

These events marked the history that shaped and established cooperation policies that continue even today. However, the paradigms considered by international cooperation throughout history have varied according to the global reality in each historical period. In the 1950's, the dynamics of cooperation focused on economic growth. The vision was economic growth and increased production capacity as the only means to affect development in disadvantaged countries. With this vision, cooperation focused on an increase in the industrial capacity of third world countries to insert them into the world market (Tassara, 2010, pg. 7). However, the economic growth of these countries was in terms of gross inequalities, an increase in poverty and an increase in benefits for the ruling elite.

In those years, the type of relationship developing between countries was hierarchical between donors and recipients, an issue that overlapped the interests of industrialized countries upon those countries receiving aid. Also in the past, the first nongovernmental organizations (NGOs) were designed to promote cooperation first among countries affected by World War II and then with the Southern countries (Oetzel, 2008).

The 1960s were considered the beginning of development policy, starting with a greater role by countries of the Third World with the Non-Aligned Movement in world geopolitics, international relations, and in the United Nations. In addition, in 1961 the Organization for Economic Cooperation and Development (OECD) was established by most industrialized countries and within this organization the Development Assistance Committee (DAC) with a specific purpose of designing guidelines of coordinating the Official Development Aid (ODA) in poorer countries.

Also during the 1960s, making emphasis on development policy it was created state institutions for cooperation, for example: the USAID (United States Agency for International Development), the SDC (Swiss Agency for Development and Cooperation), among others. More NGOs also emerged which were characterized by a more critical approach to welfare. On the other hand, in terms of progress in the

dynamics of cooperation, no major changes occurred because the dynamics of interventions remained hierarchical and paternalistic (Tassara, 2010, pg. 11).

Later, in the 1970's after harsh criticism in the Pearson Report (1970) on the modalities of cooperation developed so far, there was a shift in focus of international cooperation with an emphasis on meeting basic needs and to recognize poverty as a basic challenge for development cooperation policies. For the 1970's, there was also an up rise in cooperation agencies, multilateral institutions, the UN and NGOs with new approaches. In these years the project was consolidated as the main operating mode of international cooperation and its management (Tassara, 2010, pg. 15).

In the 1980s, despite some progress in development, there was an implementation of a “neoliberal” strategy in sub-Saharan Africa and Latin America, due to the debt crisis, that contributed to a decrease in the amount of ODA (2010, pg. 18). What is important for these years is that it generated some criticism regarding the “vertical nature of cooperation, lack of dialogue, the low participation of civil society actors the high transaction costs of cooperation, and a lack of coherence between economic and development policies” (Tassara, 2010, pg. 18). Consequently, the CAD raised the need for donors to coordinate better with each other and help recipient countries. The CAD also began to take steps to increase the effectiveness of development aid and make civil society more of a protagonist in international cooperation (Carles, C.; Soler C., 2003).

The 1990s saw the failure of the neoliberal paradigm and structural adjustment plans since they had a very high social cost and neglected important factors for development, for example: poverty reduction and institutional strengthening of the South (Tassara, 2010, pg. 20). Thus, in this decade, there was a major change in the paradigms of international cooperation. On the one hand, with the development of the conceptual framework on human development, neoliberal conception was dismissed. The concept of human development stated that the expansion of human potential is the main objective of development and was established as a priority for overcoming poverty and inequality.

This concept was the foundation for the creation of the Human Development Index in the 1990s by the UNDP which formalized human development as a paradigm. Likewise in the 90s there was the rise of sustainable development as a paradigm for international cooperation and for development worldwide agendas. Furthermore, this new paradigm emphasized the need for economic and social development consistent with the preservation of the environment (WCED, 1987, pg. 43). With this philosophy, ODA supported projects and programs which were interoperable with the cultural, economic, and social aspects of the target population, as well as those with long-lasting impacts through the rational use of natural resources and environmental responsibility (Oetzel, 2008).

During the 1990s it was also seen an acceptance of new and innovative approaches that included new actors in the dynamics of cooperation. The first approach was an emphasis on dialogue and the participation of civil society actors. The second approach was a stronger partnership between entities implementing projects and local actors appropriating them. The third approach, with regard to sustainable development, was the need to use appropriate technologies considering environmental variables as well as prioritizing training and capacity building in developing countries. The fourth approach was of searching for greater coherence between economic and political cooperation. The final approach was a progressive decrease of “tied” and hierarchical cooperation, and the assessing of needs and interests of the countries receiving aid (Tassara, 2010, pg. 25).

The end of the 1990s saw a landmark in international cooperation framework. This milestone was the Millennium Declaration from which emerged the Millennium Development Goals (MDGs). The MDGs have become the minimum agenda of global development and international cooperation constituting the current ordering principles of development policy, reflecting strategies, and operational priorities of all international donors and multinational organizations. These eight ambitious targets scheduled through 2015 have, for the first time, quantitative indicators that allow a real verification of compliance (Oetzel, 2008).

Currently, the new paradigm of international cooperation highlights the interdependence of all elements of social, structural, human, administrative, environmental, economic, and financial development. And it maintains as the cooperation platform the MDGs for its relevance in all areas (Furlan, J., 2005). These new goals promote a new strategic vision of cooperation prioritizing the promotion of social equity, respect for environmental sustainability, human rights, and cultural diversity.

The new strategic vision includes the reorientation of assistance through projects via large scale programs and policies; it is no longer considered a unique project management tool. Today there is a strong emphasis on programs and networks that includes participation of traditional and new actors. Today, coordination and joint donor partners, beneficiaries of territorial, national, and international has great importance for preventing fragmentation of projects executed by the donor community. Also this paradigm shift changes the traditional donor-recipient relationship to a better relationship of partners in North-South and South-South manner.

The empowerment of beneficiaries and partners of civil society engagement is a basic point to ensure successful cooperation and to prevent development strategies that rely only on an administration or a particular government (Furlan, J., 2005). To accomplish this, the new modalities of cooperation are established so that counterparts can be given to run a program or cooperation projects. The counterpart is a contribution to the project or program by the beneficiary (public institution, NGO, or the target population) either economically or by labor inputs to ensure the participation of aid recipients and to achieve a greater impact of cooperation. These reforms and new policies for cooperation could provide a greater impact on interventions, more effective cooperation, and progress towards the development goal (ART-PNUD, 2008).

In the last decade there have been major challenges for cooperation such as: the promotion of the effectiveness of Official Development Aid (ODA), measurement of the



impact of interventions of international cooperation, and the fulfillment of the commitments of Official Development Aid (ODA) (CEPAL, 2010, pg. 3).

#### **1.1.2.1.5 Effectiveness and Impact of International Cooperation**

As mentioned above, one of the great challenges for international cooperation is the fulfillment of Official Development Aid (ODA) commitments and the effectiveness and impact in countries where it is conferred. There have been some ups and downs in terms of financial flows for international cooperation, so in 1961 the UN proposed an increase by at least 1% of Gross National Product (GNP) of donor countries to the net contribution of resources for international cooperation. However, with the pass of time, and due to economic conditions and policies, by 1980 at the UN General Assembly the international community pledged to contribute 0.7% of their Gross National Product (GNP) to Official Aid development Assistance (ODA), which were fulfilled only by five countries: Sweden, Luxemburg, Norway, the Netherlands, and Denmark (Oetzel, 2008).

Due to the problem of declining resources to support development, the International Conference on Financing for Development in Monterrey, Mexico was held in 2002. However, little progress was made as international donors were limited to maintain the 0.7% non-binding obligations with no timetable for compliance. Later, the Rome Declaration on Harmonization summarized the compromise reached by the multilateral institutions, bilateral development agencies, and partner countries to increase the effectiveness of development assistance and contribute to achieving the MDGs. However, the Millennium Summit in 2005 displayed the lack of commitment of many countries to meet the 0.7% target for ODA. A single breakthrough was the decision taken unilaterally by the EU to increase its aid to 0.5% of the GNP in 2010 and 0.7% in 2015 (Tassara, 2010, pg. 27).

In terms of the effectiveness and impact of Official Development Aid (ODA), a milestone in international cooperation agendas was reached. This milestone was the Paris Declaration on aid effectiveness towards development. The declaration was signed

in 2005 by representatives of central governments, institutions of international cooperation, Southern countries, civil society organizations, NGOs, and private sector actors. The parties involved agreed on various principles and tools committing to continue and increase of efforts for cooperation, including improving the quality of aid and impacts on development” (PNUD, 2010).

The main objectives of the Declaration were: first, increase the effectiveness of development aid; second, tailor policies to the specific situation of each country; third, specify indicators, timetables, and long-term goals; and finally, monitor and evaluate the implementation of activities. This document also defines five commitments necessary to achieve this:

- Ownership: Partner countries exercise effective leadership over their policies and strategies and coordinate development actions.
- Alignment: Donor countries will base their support on the strategies, institutions, and procedures of partner countries.
- Harmonization: Donors' actions are more harmonized, transparent, and collectively effective.
- Management towards achieving results: improved processes, resource management, and decision-making primarily oriented toward results with the MDGs.
- Mutual accountability: Realization of a transparent management of cooperation based upon predictability, in this manner, facilitating the possibility of planning benefits of cooperation in partnership with development plans and donors. Furthermore, partners are accountable for developmental results.

In this context, there were implemented new mechanisms to achieve greater impact of ODA effectiveness, while looking for plans that the partner country implement as priorities both, local and regional and in vision and times (Oetzel, 2008).

Later in Ghana in 2008, Ministers of developing and donor countries responsible for promoting development, along with the heads of multilateral and bilateral development institutions in Accra, signed a Declaration, “. . . in order to accelerate and deepen implementation of the Paris Declaration on Aid Effectiveness” (Agenda for Action. Accra. 2008).

#### **1.1.2.1.6 Perspectives and the Future of International Cooperation**

Due to the economic crisis facing the world since 2008, in recent years the ability of many developed countries to meet the target of 0.7 of GDP for international cooperation has been limited. Because of this, industrialized countries and major donors may face difficulties when increasing its level of development assistance, directly affecting the amount of Official Development Assistance to the Least Developed Countries.

Although several powers like the U.S., France, Germany, Japan, and the U.K. are still the major donors, many of these show budget cuts for cooperation as is the case in Spain, an issue that could affect plans and budgets of recipient countries. Therefore, in order to increase the amount of resources available for development financing, ECLAC states, “it is necessary that the international community continue to explore additional and innovative forms of financing that will join the currently used ways and that they provide fresh resources to a situation of general shortage of funding as is currently seen” (CEPAL, 2010, pg. 4).

Moreover, regional integration is becoming increasingly important in the current context of the crisis. In Latin America, this new scenario presents an important opportunity to diversify instruments of cooperation, priorities and cooperation partners. It also represents an opportunity to strengthen the mechanisms for South-South and triangular

cooperation. Similarly, considering more dynamic emerging economies, new forms of cooperation should be strengthened as complements to traditional forms of development assistance. This path has been taken in the case of Ecuador, since lately its priority has been the promotion of South-South cooperation and more specifically, cooperation with countries of the region.

The following explains the theme of international cooperation, policies, systems, and priorities that Ecuador manages in this area of international relations.

### **1.1.2.2 National Policy**

Ecuador since the 1970s has organized a system of international cooperation. However, due to political and economic instability, the administration of international cooperation has passed several management institutions such as the Consejo Nacional del Desarrollo, the Ministerio de Economía y Finanzas, Miisterio de Relaciones Exteriores, through the Instituto Ecuatoriano de Cooperacion Internacional (INECI), among others. Due to difficulties in meeting the task of channeling international cooperation, the Agencia Ecuatoriana de Cooperacion Internacional (AGECI) was created in 2007, an agency with administrative and financial autonomy, under the Secretaria Nacional de Planificación y Desarrollo (SENPLADES). This agency has the charge of implementing strategies of international cooperation (Oetzel, 2008).

Since 2010, AGECI has become the Secretaría Técnica de Cooperacion Internacional (SETECI) a public management institution under the Ministerio de Relaciones Exteriores Comercio e Integración. It is responsible for negotiating, managing, and coordinating international nonrefundable cooperation when Ecuador negotiates with other governments. This secretary is responsible for working in the professionalization and integration of sovereign management of international cooperation within the state structure (SETECI, 2012.). In Ecuador international cooperation is currently handled through SETECI; however, for the realization of the cooperation within the country, it must be governed by different policies and national plans.

#### **1.1.2.2.2 Constitution and Foreign Policy of Ecuador**

The Ecuadorian Constitution of 2008 represents the maximum legal basis which all actions carried out in country must adhere to. It should be noted that international cooperation is linked to the field of international relations, which "are governed by the interests of the people of Ecuador, who will report to their managers and executors" as stated in Art 416, as for the principles of international relations. Similarly, the Constitution of 2008 projects international relations as a tool to promote and implement the principles and strategic objectives of the country, harmonizing internal development objectives with international politics.

It should be noted further that the constitution solidly promotes Latin American integration. Thus, Art 423 prioritizes integration and joint action among the countries of Latin and Central America, which is why there is greater emphasis on South-South Cooperation as a current trend in Ecuadorian cooperation. It should also be noted that the Constitution clearly states that "the State will not engage in agreements or cooperation agreements that include clauses that undermine conservation and sustainable management of biodiversity, human health, collective rights, and nature" (Art 403). This article relates to the power of the state to choose the kind of international cooperation agreements that apply as well as what priority areas that are implemented.

Thus the Constitution serves as a benchmark guide for macro cooperation. Also, international cooperation is part of the state's foreign policy. Likewise, Ecuador actions executed in the international arena are specifically governed by its foreign policy. For this, the Ministerio de Relaciones Exteriores Comercio e Integración coordinated the National Foreign Policy Plan for 2006-2020 in order to have a benchmark for long-term foreign policy of the state and Ecuador international relations. This document serves as a tool to consolidate the goals of the country's domestic agenda based on constitutional provisions, laws, and international treaties.

Indeed, this plan, also called PLANEX 2006-2020, establishes as a general objective in item number 7 as the "promotion of international cooperation for development in accordance with national priorities and the MDGs posed by the UN" (2006, pg. 26). In other words, international cooperation for development is a strategic guideline of foreign policy. To do this, the 2006-2020 PLANEX establishes permanent institute systems, impact assessment of international cooperation, and an incorporation of institutional mechanisms of accountability for entities receiving funds from international cooperation. In addition to promoting decentralized, triangular, and South-South cooperation, PLANEX also urges the adoption of sustainable production programs, especially those that promote technology transfer, job creation, and programs that address the needs of social groups historically excluded or those most vulnerable, taking into account the international responsibility in environmental issues and sustainable development. The plan finally intends to coordinate a common position with middle-income countries of the region to mobilize more resources for financial and technical cooperation for development (PLANEX, 2006).

#### **1.1.2.2.3 Plan Nacional del Buen Vivir 2009-2013**

The Plan Nacional del Buen Vivir 2009-2013 greatly influences regarding the priorities and the sensitive sectors of international cooperation in Ecuador. This plan, according to Art 280 of the Constitution, is the "instrument which shall be subject to the policies, programs, and public projects, programming and implementation of the State budget, investment, and the allocation of public resources, and coordinate exclusive powers between the central and autonomous governments. Its compliance is mandatory for the public sector and indicative for other sectors." This plan is described below in more detail for its relevance today in international cooperation.

In earlier times the country received cooperation contributions; but, due to a lack of a national development plan, they were assigned according to the agendas of cooperating partners, often ignoring the real needs of Ecuador. However, after the publication of the Plan Nacional del Buen Vivir 2009-2013, the State has defined the main subject of

cooperation in strategic sectors, as well as the 12 priorities for the country's development which includes specific goals for its achievement. The methodology of cooperation in the country has changed for projects, programs, and other interventions of international cooperation that support strategic sectors and help meet the goals and objectives identified by the National Plan. Currently, donors have to suit their interventions to the specific needs of the country. These guidelines seek to achieve greater efficiency and impact of international cooperation in the country; as it acts according to the principles and specific needs in order to harmonize them with the resources and tools available internationally.

#### **1.1.2.2.4 Sistema Ecuatoriano de Cooperación Internacional (SECI)**

In Ecuador, international cooperation is handled under the Sistema Ecuatoriano de Cooperación Internacional (SECI) which is composed of the Ministerio de Relaciones Exteriores Comercio e Integración, the Ministerio de Coordinación, the Secretaría Nacional de Planificación y Desarrollo (SENPLADES), as well as different cooperation actors such as: sources of bilateral and multilateral international cooperation, international NGOs, national sector institutions, provincial governments, municipalities, and other actors that relate to nonrefundable external financial resources. All these institutions are responsible for the stewardship, coordination, financing, and implementation of activities related to international cooperation. The Comité de Cooperación Internacional (COCI) who heads the SECI, is responsible for approving nonrefundable international cooperation policy for Ecuador, as well as strategies, plans, and instruments of matter, in addition to overseeing and approving management strategies for the SETECI (SETECI, 2012).

As mentioned above, the SETECI currently is the public body which is responsible for “managing non-refundable international cooperation while harmonizing national policies and objectives in accordance with the principles of transparency, efficiency, under standards of mutual accountability, and evaluation of results.” The SETECI is also responsible for applying the actions and policies established by the SECI. This

institution leads the negotiation and management of international cooperation, aligning with national plans and priorities. It also aims to plan and implement policies, regulations, and manage strategies of international cooperation, negotiate nonrefundable international cooperation, and sign international conventions and agreements of cooperation with foreign NGOs. And above all, it is accountable for the management of international cooperation in Ecuador, with the registration of programs and projects, in addition to general observation and evaluation in order to make efficient use of productive resources and nonrefundable international cooperation (SETECI, 2012).

Thus, the Ecuadorian State manages international cooperation through SETECI. Additionally, it is important to note that the policies of SECI face a new paradigm where the state is the central actor of cooperation. Under this paradigm, the state assumes all related activities, from the spread of cooperation policies, to negotiation of resources, to monitoring of projects and programs, the democratization of information regarding the data of international cooperation (amounts , industries, and investments), as well as ongoing projects. All this is done in order to monitor the projects and to achieve information transparency and accountability of cooperation within the country.

Also, according to the new paradigm in the management of international cooperation, it must be governed by a framework, respecting the Constitution of Ecuador, the National Plan for *El Buen Vivir*, territorial development plans, and sectoral agendas. It must also take into account the declarations, agreements, and conventions, such as the Paris Declaration on aid effectiveness to development, to which Ecuador acceded in 2009, determining the relationship between the State and international cooperation based upon the four basic elements: ownership and alignment, harmonization, coordination and regional fairness, accountability, and responsibility. In addition to the Rome Declaration on Harmonization, the Millennium Declaration, the Accra Agenda for Action, and the declarations and conventions for the defense and protection of human rights. Similarly, today, to discuss the resources, cooperation should be allocated to ministries and priority thematic areas covered by the Plan Nacional del Buen Vivir in order to support social



development policies, economic growth, rational use of natural resources, and the strengthening of the capacity of national institutions (SETECI, 2012).

The information mentioned above were the policies, frameworks, institutions, and instruments governing the development of international cooperation in the country. Subsequently, the current situation of cooperation in Ecuador and future prospects should also be noted.

#### **1.1.2.2.5 Outlook for Cooperation in Ecuador**

Overall, thanks to diplomatic negotiations, international cooperation has evolved in positive terms for the country. However, due to the fact that Ecuador qualifies as middle-income country, eligibility for certain resources are limited even if this not reflects the reality of poverty and social exclusion levels that exist in the country. Furthermore, considering the current plight of other regions of the world such as natural disasters or financial crises, funding for development cooperation entering the country has declined. Nevertheless, because of Ecuador's economic standing, the concentrate of cooperation in addressing humanitarian crises could aim to address issues that require priority attention, especially in least developed countries, of which Ecuador is not part (PLANEX 2006-2020).

Given these facts, one of the trends that gains strength is technical cooperation among developing countries and South-South cooperation, which today, Ecuador supports completely. In addition, Ecuador is in continuous negotiations with traditional partner countries to define cooperation agendas according to national priorities by redefining goals and areas of intervention. It can also be recognized that there has been a process of centralization of international cooperation in the country, as currently there are concentrated resources to aid in the ministries and priority thematic areas covered by the Plan Nacional de Desarrollo del Buen Vivir.

Another strong trend is currently control of foreign NGOs. In 2011, Executive Order 812 with reforms of the SECI was enacted with new requirements for foreign NGOs that operate in the country. By decree NGOs are required to specify their course of action, to report the activities implemented, and allow the control and monitoring of their activities in order to obtain a Basic Operation Agreement. Also in the decree, NGOs are prevented to “intermediate, implement, or execute programs or projects funded by nonrefundable international cooperation of a bilateral or multilateral source,” nor “carry out different or incompatible activities that have been identified or that threaten the public peace and safety.”

Based upon this premise, there have been many reviews by representatives of NGOs; they say that the new requirements restrict the operation and lines of action of foreign NGOs and that “these measures may decrease international cooperation” (Ecuador Inmediato, July 2011). However, these requirements allow transparency and audit activities carried out by NGOs in the country. This is a positive idea because many NGOs are not accountable for their activities; many even operate incognito without adhering to Ecuador's cooperation priorities.

Another powerful trend at this time with the SETECI is in the handling of information of cooperation. Overall, the SETECI aims for democratization and transparency, especially in the processes, resources, and locations of these results. In conclusion, the international cooperation system in Ecuador is in the process of development and improvement in order to overcome current challenges and comply with international agreements for greater effectiveness and impact of cooperation. Therefore Ecuador try to manage sovereign cooperation that complements the national effort to help developing the country.

The above analysis describes the current dynamics, basic principles and strategies which respond to each of the plans, projects, programs, governing institutions, as well as trends and future prospects of international cooperation in Ecuador. The following discusses

Swiss cooperation policies, institutions, priorities, and perspectives in order to have a vision of both subjects of study in this chapter.

## **1.2 Swiss Cooperation and Swiss Cooperating Actors**

Switzerland is a state recognized worldwide for its humanitarian work and its cooperation for development. It has contributed to a number of countries in order to fight poverty, protect the environment, in addition helping in emergencies such as natural disasters, crises, and armed conflicts in many areas. Also because of its extensive history, it is one of the most experienced countries with a system that supports international cooperation. To perform these activities, Switzerland is supported by its foreign policy and constitutional principles, which are applied by the Federal Department of Foreign Affairs through its agencies and other institutions responsible for implementing international cooperation.

### **1.2.1 Swiss Cooperation Policies**

The Swiss Confederation is characterized as a state which enjoys close political and economic relations with various countries around the world despite its policy of neutrality and its historic reluctance to isolationism and political alliances with other countries. Today Switzerland is part of the Organization for Economic Cooperation and Development (OECD), the United Nations, among others, and has also signed bilateral agreements with States in several areas; including among these, international cooperation agreements (Federal Department of Foreign Affairs, 2012).

For the development of cooperation activities, the Swiss Confederation is based on the Federal Constitution Article 54, Page 2, which explains that, “Switzerland contributes significantly to relieve needy populations, to combat poverty, and to promote respect for rights, democracy, the peaceful coexistence of peoples, and the preservation of natural resources.” In addition, part of the Federal Law on Development Cooperation and Humanitarian Aid of 1976, formulates its foreign policy goals and thus employs

cooperation development as an instrument to achieve such premises. Also in 2008, the Parliament defined priorities for cooperation as: fighting poverty, reducing systemic risks, and contributing to a fair globalization, issues that today mark the guidelines for interventions (COSUDE, 2011).

In addition, Switzerland invests each year an average of 2.8 billion Swiss francs (2.9 billion dollars) in fighting poverty and promoting economic development both in developing countries and in the Eastern European countries (SDC PERU, 2012). However, Parliament has decided to raise funds for development aid of 0.41% (GDP) to 0.5% for 2012, since it is slightly below the average of the OECD countries of 0.49% (COSUDE, 2011).

Switzerland holds a bilateral cooperation with several partner countries and provides support to various multilateral organizations, through knowledge, technology and financial resources are provided. The fight against poverty and the Millennium Development Goals of the UN are the priorities of the Swiss development policy. Additionally, Swiss cooperation strategy focuses on the prevention and resolution of conflicts, social development, good governance, promotion of economic structures, and the preservation and sustainable use of natural resources. Its main objective is to strengthen individual initiative in partner countries, i.e. the subject of aid is to solve for themselves the problems they face in improving their capabilities and future possibilities (COSUDE PERU, 2012).

The factors that motivate Swiss international cooperation on the one hand respond to the need to solve “global problems such as: food security, climate change, and even the stability of the global financial system” (2011, pg. 1). Moreover, said factors also respond to a duty of solidarity with the poorest populations. This is a contribution in a highly globalized world that does not offer the same opportunities to all countries. Switzerland believes that a world is more equitable and prosperous when its business opportunities are multiplied. At the same time there is a heavy reliance on Switzerland in

the interests of many countries concerning objectives of developmental policy and international cooperation.

Swiss Cooperation is based on the before mentioned policies and principles for their development. Also, under the coordination of the Federal Department of Foreign Affairs of the Swiss Confederation, the institutions that manage cooperation are two federal agencies: the Swiss Agency for Development and Cooperation (SDC) and the State Secretariat for Economic Affairs (SECO).

The State Secretariat for Economic Affairs (SECO) acts as the lead federal agency in defining the position and strategy of Switzerland in the decision-making committees of the World Bank and regional development banks. SECO's priorities are to strengthen the competitiveness of countries and diversify its trade partners through the mobilization of domestic and foreign investment, improving basic infrastructure, and promoting a stable economic framework. This secretariat is the government agency responsible for all key economic policy issues. It coordinates closely with the Swiss Agency for Development and Cooperation (SDC) to achieve synergy between economic and foreign policy, with the instruments and forms of cooperation of Switzerland (COSUDE PERU, 2012).

The Swiss Agency for Development and Cooperation is the institution responsible for managing the cooperation within the Federal Department of Foreign Affairs. The following describes in greater detail the history and functions of the SDC.

### **1.2.2 Swiss Agency for Development and Cooperation (SDC)**

In 2011, the Swiss Agency for Development and Cooperation celebrated its 50 year anniversary. Today, SDC continues its work to become the Swiss competence center for cooperation. Among its lines of action are: development cooperation, humanitarian aid, and cooperation with Eastern Europe. The purpose of the SDC development cooperation is poverty reduction, considering it “fosters cooperation and economic self-government, contributes to improving production conditions, helps solve environmental problems,

and deals with facilitating better access to education and basic health care” (COSUDE PERU, 2012).

To this end, SDC implements projects, supports programs of multilateral organizations, and funds programs operating in four different fields. The first field is regional cooperation which directs bilateral cooperation with countries in the Middle East, Africa, Asia, and Latin America. Second, global cooperation is mainly concentrated in the multilateral sector, organizations of the UN system, and the World Bank, to implement programs in the areas of global climate change, food security, water, migration, etc. which provide solutions to global challenges. The third field, with the objective of providing humanitarian aid, gives direct support for natural disasters and conflicts. The last field is the cooperation with Eastern Europe, supporting democratic reforms for the transition to institution building, and support for market economy reforms for health, social, and environmental improvements (COSUDE, 2012).

Currently, SDC conducts about 1,000 projects worldwide. It focuses on 12 priority countries and regions and in 6 special programs, striving to achieve sustainable impact. At the multilateral level, SDC is constantly expanding its operation and collaboration with UN specialized agencies, the World Bank, and regional development banks. Furthermore, although in its infancy, support is given mainly in the construction of bridges, opening dairies, and developing mountain areas. Today, Swiss cooperation has diversified and is notable for its activities in the sectors of health, education, micro finance, democracy, and the environment. Switzerland’s methods have been based primarily on participation of affected populations in the design of projects, programs, monitoring, and professionalism in each intervention. This has allowed the Swiss cooperation to acquire global relevance (COSUDE, 2011).

As mentioned above, Switzerland is increasing its aid budget which has a definite impact. First, Switzerland intends to comply with a multilateral engagement of 0.7% of their GNP for ODA; this is intended to generate an effect on the types of projects that SDC has underway. As for the effects on the project, it is noteworthy that it is giving a

boost to projects and programs in concerning water and climate, i.e. in environmentally critical areas, which are a priority for Switzerland. Within these projects is the Regional Energy Efficiency Program (EELA) which aims to contribute to mitigating climate change, this will be discussed later on in this report.

Importantly, to run certain programs of national cooperation agencies, such as EELA, you need the commitment of civil society institutions, such as the commitment of NGOs to implement their own development projects. All this is required in order to complement efforts and carry out interventions in places with people in need. This is the mission of the Foundation for Technical Cooperation Swisscontact.

### **1.2.3 Swisscontact Ecuador-Swiss Foundation for Technical Cooperation**

With the slogan of "helping others help themselves," the Swiss Foundation for Technical Cooperation, Swisscontact, since the 1960s, has provided support to micro entrepreneurs in several developing countries. The work of this NGO is based on the creation and implementation of training programs, technical assistance to small and medium businesses, and the implementation of environmental improvement projects. The foundation also runs its work with the conviction that "private sector involvement in the development of initiatives is crucial to combat poverty" (Swisscontact Ecuador, 2012).

Swisscontact develops projects in 23 different countries in Africa, Asia, Eastern Europe and Latin America. In 1960 they started vocational training projects; later in 1980, they developed the first concepts of support for small and medium enterprises, as these companies have great difficulty in obtaining financing for operation and development. Also, in terms of the environment, Swisscontact engages in the creation of methods to combat environmental pollution, more specifically air pollution.

Swisscontact, as an organization of the Swiss private development sector, focuses on project management in four strategic areas: training, business support, financial services, and the environment (Swisscontact Switzerland, 2012). They do this with the objective

of strengthening the private business ties that generate long-term cooperation with local partners and that promote gender equality and environmental protection.

The Foundation is an international NGO accredited in Ecuador. In 1986, the General Agreement on Economic and Technical Non-reimbursable Cooperation between Swisscontact and Ecuador was established. This agreement is a main production line of support action (AGECI-COSUDE, 2009). Later in 2010, Swisscontact and the Government of Ecuador signed the “Basic Cooperation Agreement and Operation,” crediting its work in the country under the new requirements posed by SETECI rules and national policies. The new agreement establishes Swisscontact main objectives as: technical assistance in various areas, development of programs with technical and / or economic cooperation grants, and participation of public and / or private sector entities (Swisscontact Ecuador, 2012).

### **1.3 Development of Swiss International Cooperation for Sustainable Development in Ecuador**

In 2008, the Swiss Agency for Development and Cooperation (SDC) decided to reduce its list of priority countries from 17 to 12 for developing interventions, included in this reduction was Ecuador. SDC resolved to concentrate its efforts to increase the effectiveness of their cooperation in areas most critical in social and environmental issues and those that were vulnerable to political crises; thus, particular attention was given to Africa. For this reason, in 2009, the bilateral cooperation program Swiss-Ecuador ended, culminating 40 years of support towards poverty reduction. However it should be emphasized that the presence of Swiss cooperation continues in the country. SDC continues to support Ecuador through multilateral cooperation, humanitarian disaster relief, and also through contributions to regional programs and projects, such as the Regional Energy Efficiency Program (EELA).

The Swiss Confederation and the National Agency SDC seeks to combat poverty by emphasizing cooperation in specific areas such as health, education, micro finance,



environment, etc. These approaches also include sustainable development orientation that develops in their interventions. The following describes two successful cases of multiple interventions performed by SDC in Ecuador; these interventions have continued to bring results even after their departure in 2009.

### **1.3.1 Description of Activities Implemented in Ecuador**

The activities performed by SDC in the country are governed by the principles of sustainable development, as in it provides a joint strategy for poverty reduction, income generation, and environmental protection. The development of projects was mostly concentrated in the mountainous regions of Ecuador, working with the rural poor, indigenous people, women, and youth in the area. Support was given in the form of rural development, irrigated agriculture, environment, vocational training, and promotion of small industry. Later priorities for cooperation in Ecuador were established in: employment, decentralization and rural development, and environmental management.

One of the most relevant experiences for SDC Ecuador, and one which has had great continuity, is irrigation farming. The project was developed years ago in Licto in the province of Chimborazo. The project, under the demand of the population and its large water needs for productive activity, was the implementation of an irrigation system. SDC supported the construction of an irrigation infrastructure of 26 km, which supplied up until 2009, 1700 hectares; this benefited approximately 1,700 families in an area of unfertile land due to the scarcity of water.

The project at its intervention was based on workshops and training designed to motivate the population, in terms of the need for an irrigation system to improve their production conditions. Later, they worked with the people to develop the project. While the funding came from SDC, labor came from community work parties. The workforce was mainly children and elderly women, since most men migrated to other provinces in search of work. As a result of this collaboration, the community took a leading role, recognizing the value of their work, their rights, and the importance of making decisions at home and

in the community. As a result of this intervention, the local people were able to diversify crops, recuperate the soil, and create rural business. Finally, thanks to these businesses, the income of the beneficiary population increased dramatically, allowing a better quality of life for the community, and even a decline in the rate of migration in the area (COSUDE, 2009, pg. 25).

This experience, like many others executed by SDC in the country, maintains a focus on sustainable development involving environmental and economic aspects. It also includes cross-cutting issues such as gender and children and especially seeks to create sustainable projects and programs over time.

Another successful experience worth mentioning because of the impact it has had, is the case of the rural cheese factories. The project was implemented in Salinas de Guaranda and had an investment of approximately \$2 million. In the first instance, the SDC intervention focused on the creation of a credit union that allowed beneficiaries to start their own microenterprises. Some livestock owners were encouraged to combine their small production of milk and establish the first cheese factory. Subsequently, with the increase in production of the partners, cooperation focused on the transfer of knowledge and techniques for the production of cheese. Today, the cheese factory has nationally known brands such as Salinerito, a great distribution channel for marketing, and also the ability to export their products. At project completion, with a large share of new producers, *la Fundación Consorcio de Queserías Rurales del Ecuador* was established (COSUDE, 2009, pg. 41).

Indeed, the cooperative continued to support more micro agribusiness companies, bakeries, potteries, etc. Today, the development process is still standing in Salinas de Guaranda. Thanks to the cooperative loans supported by SDC, technical support was able to solve some of the production needs of several small producers, thus improving the quality of life of the population of Salinas and thus becoming a benchmark of development in the region, at home, and abroad.

Despite the departure of the Swiss Agency for Development and Cooperation, they were able to launch a strategy for knowledge management, a systematization of its work of 40 years of cooperation in the country, and above all a responsible exit strategy that ensured the sustainability of the interventions implemented. It is evident that the results of projects implemented several years ago in the country by the Swiss development cooperation are still in existence today.

These are palpable cases of actions implemented in the country by SDC. These examples highlight the commitment to poverty reduction and international responsibility to improve the quality of life of the people, without compromising environmental sustainability. The role of the Swiss Confederation is a commitment to the less developed nations in supporting the creation of opportunities and the provision of tools to make development viable and sustainable over time.

#### **1.4 Swiss-Ecuadorian Bilateral Relations in Topics of International Cooperation for Sustainable Development**

The Swiss Confederation and the Republic of Ecuador have maintained a long tradition of diplomatic relations. In 1888, they signed a treaty of friendship and commerce, even before the installation of diplomatic and consular representations (Dominguez, 2006). Swiss Relations focus on trade, investment, and a very important pillar, international cooperation. As a fundamental part of these relations, the “Agreement on Scientific and Technical Cooperation” was signed in June 1969, a framework agreement between the two countries for bilateral cooperation. This agreement made possible the development of programs and projects in the country for over 40 years until it officially ended in 2009 (Ministry of Foreign Affairs, Trade and Integration, 2012).

Under said agreement, and the subsequent signing of other agreements, programs were implemented in different fields such as health, education, water, agriculture, climate change, environment, economy, economic integration, governance, etc. Furthermore,

with regard to Swiss-Ecuadorian relations concerning international cooperation, additional agreements have been signed with Swiss NGOs operating in the country. Indeed, as mentioned above, Swisscontact was one of the first Swiss NGO's installed in Ecuador. Other notable NGOs include SWISSAID, Intercooperation, among others (AGECI, 2009).

Switzerland, as a cooperating partner, enjoys a remarkable reputation in the world due to their exemplary approaches; for example, sustainable development in their interventions. Also, as mentioned in the website for SDC, "Switzerland is a requested counterpart when it comes to coordinating development activities with other donors and agreeing with the policy of the beneficiary countries," all thanks to its many years of experience as well as its political neutrality "... whose activities do not conceal hidden ambitions of a commercial or geopolitical nature" (COSUDE, 2011).

Due to the before mentioned characteristics of Swiss cooperation and the long business relations with that State, the completion of a bilateral agreement between Switzerland and Ecuador and the exit of SDC from the country was essentially a negative decision. This is because the cooperative relations that remain today are indirect. Today, the programs and projects implemented under the initiative, with funding from SDC intended to be implemented in Ecuador, are operated from other Latin American centers where the Swiss agency has a direct presence, such as in Peru, Bolivia, Colombia, Cuba, etc., using programs such as the Regional Energy Efficiency Program in Artisanal Brick Factories.

Despite this situation, cooperation with Switzerland has not ended entirely in the country and there continues to be bilateral relations in different areas. In fact, the Swiss Foreign Ministry and the Swiss Secretariat for the Americas maintain a fluid political contact with Ecuador, which also includes dialogue on cooperation issues. An example of this continuity was the result of meetings held in early 2012 with the Swiss Secretariat for the Americas, in which cooperation had become closer on issues of knowledge transfer, science, and technology. In addition, there was talk of the possibility that "Switzerland is

involved in major national projects such as the Ciudad de Conocimiento and the Programa Prometheus, to share their experience and knowledge with Ecuador in different areas” (Letamendi, 2012). Indeed, bilateral relations with Switzerland have not ended at all, and even in matters of international cooperation, the agency manages its SDC programs indirectly. All in all, the Swiss still maintain their presence in the country as well as their commitment to sustainable development in Ecuador.

## **1.5 Conclusion**

In summary, Swiss cooperation had a rather remarkable role while it had a direct presence in the country, and even in the villages where there were programs, technical cooperation, and / or financial interventions. Additionally, Switzerland is a highly experienced cooperating partner that has contributed, and continues to contribute to address global problems such as poverty and climate change, by supporting productive projects, environmental management, among other areas, especially with its focus on sustainable development and with particularly successful cases in Ecuador.

To understand the importance of Switzerland as a cooperating partner, it was essential to analyze the dynamics the system of international cooperation and the political elements that supported interventions, since each program or project implemented is supported by this system. Also, with the Ecuadorian policy analysis, we were able to see the requirements for interventions in the country, highlighting the current trend of Ecuador of implementing sovereign cooperation, as well as international cooperation that is used as support for the process of national development. Similarly, analysis of the policies of both countries on issues of international cooperation allowed us to understand the order in which to continue the developmental agendas of Switzerland and Ecuador, as well as cooperation priorities for each of these states.

The theoretical basis presented above serves as a support for the continuation of this paper. In general we have been able to locate and connect with regard to the issues of sustainable development and international cooperation, both domestically and globally,

thus enabling us to understand the background of the EELA Project in Ecuador, from the guidelines that govern them, to the actors involved, to the cooperation methods and instruments used, as well as the relationship between the project objectives and sustainable development.

## **CHAPTER 2**

### **Description of the Project “Energy Efficiency in Artisanal Brick Factories in Cuenca”**

The project “Energy Efficiency in Artisanal Brick Factories in Cuenca” (EELA-Ecuador) is a tangible example of international cooperation with a focus on sustainable development. This project is characterized as part of the “Regional Energy Efficiency Program in Latin American Artisanal Brick Factories” (EELA), a regional cooperation program designed and financed by the Swiss Agency for Cooperation and Development (SDC). This program is implemented in nine Latin American countries by different implementing agencies, which in the case of Ecuador is the Swiss Foundation for Technical Development-Swisscontact. The EELA project follows the regional program and aims to contribute to mitigating climate change and improving the quality of life of the brickmaking sector (COSUDE Peru, 2011).

As previously mentioned, the project is closely related to the premise of sustainable development as its integral goal. The project manages economic development for the brickmaking sector, environmental protection based on the reduction of greenhouse gas emissions and the consumption of resources and further social development for the sector. It responds to the current dynamics of international cooperation, which handles the elements, actors involved, and goals sought in the previous chapter. This chapter describes the project “Energy Efficiency in Artisanal Brick Factories in Cuenca,” also called EELA-Ecuador, from the initial conception of the project, through the stages of planning and implementation, to the presentation of the results achieved in 2012 in the first phase of the project.

## **2.1 Project Description**

### **2.1.1 Initial Macro Project Context**

In 2009, Swisscontact Peru performed an on-site diagnosis of the brickmaking sector in the countries of Argentina, Bolivia, Brazil, Colombia, Ecuador, Mexico, and Peru at the request of SDC to identify the state of the sector. As a result of the study, they realized the precarious situation of brick producers. Furthermore, it was concluded that the fuels used in artisanal brickyards had a high environmental impact in low efficiency kilns which affects air quality, the health of the villages near the brickyards, as well as health of the artisans. In addition, it was discovered that the use of polluting fuels and inefficient kilns emit a lot of greenhouse gases (GHG) that impact climate change.

With the results of the diagnosis, they proceeded to plan a regional program to address this situation. First, meetings were held to get more information and “. . . a clearer view of the institutional context, production, target, partners, and donors working in the field” (Swisscontact, 2011). This information was central to planning by establishing Phase Plan Project 2010-2013 as well as specifying the structure of the organization, management models, the role of partners, lines of action, and the program's budget. The program represents the instrument of cooperation which also includes implementing specific projects in each participating country.

Finally, after having a diagnosis and planning a program, on January 28, 2010, CDS approved the “Regional Energy Efficiency Program in Latin American Artisanal Brick Factories” for implementation. Development objectives for the program were established to “contribute to the mitigation of climate change by reducing emissions of greenhouse gases (GHG) in the Latin American artisanal brickyards and improve the quality of life of the brick makers.” Another general objective was made to “promote the reduction of emissions of greenhouse gases (GHG) in artisanal brickyards by implementing a comprehensive energy efficiency model based on the learning generated by the exchange between countries, as well as through the impact on national public



policy” (COSUDE, 2011). By signing an agreement, the program was commissioned by Swisscontact Peru and was designated as Regional Coordinator of the EELA program.

The countries involved since 2010 are: Argentina, Bolivia, Brazil, Colombia, Ecuador, Mexico, and Peru as the coordinating country. However, since 2012 there has been an expansion of the program to include countries in Central America, mainly Nicaragua and Honduras. To implement the projects, strategic alliances with a number of public and private partners in each country were established. These institutions were put in place as technical secretariats responsible for implementing the project in the host country and represent a type of technical cooperation. In Ecuador, in the city of Cuenca, in the province of Azuay, the project is implemented by Swisscontact - Ecuador and the Municipality of Cuenca (COSUDE Peru, 2011).

Graphic 1: Location of Projects



Source: Swisscontact 2012. EELA

The technical secretariats and institutions with which they have partnerships must meet macro program achievements in order to verify the impact established as regional achievements, the whole program consists of:

1. One energy efficiency pilot project of brickyards run in each participating country.
2. 30% increase in energy efficiency in 970 brickyards.
3. Increased use of cleaner fuels in at least 970 brickyards.
4. Two methodological proposals for market access of carbon from brick makers.
5. 1,300 artisanal brick kiln companies optimize marketing business strategies.
6. Service provider market for artisanal brick production in 6 countries.
7. 6 countries incorporate at least one new policy and strategy for the artisanal brick making sector.

The technical secretariats should work under these parameters in the participating countries. They should work on a large scale so that their program objectives raise a course of action to be applied in countries where the project is developed and they should have the following specifications:

1. Promotion of technologies and processes that are more energy efficient and have less polluting fuels that contributes to GHG reduction.
2. Baseline diagnosis of social, gender-sensitive, child, economic, environmental, and technological areas of project intervention.
3. Methodological proposal for carbon market access in artisanal brick maker sectors.
4. Impact on sector policies promoting artisanal brick making and comprehensive energy efficiency management.
5. Capacity building in the brick business and artisanal service providers to be included in the value chain.
6. Training and technology improvements with artisanal brick kiln companies, knowledge of their costs, and a record of basic information to make better business decisions.

In general, these are the guidelines of the regional program. However, each country through the technical secretariat has the ability to independently plan and choose the

activities to achieve the objectives and meet the main goals of the first phase of the program.

The duration of the first phase of EELA is for three years from the signing of the agreements with the countries involved. To develop the program, the first phase has a total budget of \$ 6,023,766.43, broken down into \$ 4,932,414.36 dollars from Swiss Cooperation (SDC) and \$1,091,352.10 from the countries in the form of compensation. These funds are administered by the Regional Center of Peru and given to the Technical Secretariat of countries to implement interventions. Funding for EELA by SDC cooperation is nonrefundable (COSUDE Peru, 2011).

For the year 2013, a second phase of the program is being planning that will be a replica of the pilot projects in other cities of the participating countries. The second phase, which is currently in the process of planning, is meant to give a more productive approach to the project, emphasizing the marketing process as it represents a bottleneck for the brickmaking sector. A continued strengthening of implementations in the pilot cities is also planned.

### **2.1.2 Project EELA-Ecuador**

In Ecuador, the Energy Efficiency in Artisanal Brick Factories (EELA) is being executed in the city of Cuenca- Azuay, following the signing of an agreement between Swisscontact-Peru and Swisscontact-Ecuador in March of 2010. This document establishes the Swiss Foundation for Technical Cooperation-Swisscontact-Ecuador as Technical Secretariat in the country to implement the EELA project in the Cuenca artisanal brickmaking sector.

Later, as a requirement of the Regional Program EELA, an agreement was signed on May 26, 2010, between the Technical Secretariat Swisscontact-Ecuador and the Municipality of Cuenca as a public leader. Under the agreement, the municipality assigned to the Comisión de Gestión Ambiental (CGA), jointly with the Technical

Secretariat Swisscontact, to run the project to benefit the sector of the city brick makers. Thus, already counting on the recognition and support of the public body, the EELA Project became effective in Ecuador.

In the beginning, Cuenca was chosen as a basis for developing the regional pilot program due to certain characteristics of the city and its relationship with the brick making sector. A major reason was the large number of artisanal brickyards that focus on the areas surrounding the city, compared with other parts of the country. Cuenca was also considered due to the quality of life for the artisan brick makers, and the working conditions in the area. Additionally, the relevance of the production of bricks and tiles was considered. These products are of great cultural and historical representation in the city, as the brick and tile are significantly valued in the architectural heritage of Cuenca. This city was chosen also due to the high demand of the products in the construction sector of the city, since currently there is an increase in construction activity. Thus, due to tradition, product demand, and market needs, Cuenca was chosen as the pilot city, before the project could be reproduced nationally.

The budget for EELA-Ecuador is a total of \$ 572,990.00. The amount consists of the SDC contribution corresponding to \$ 438,790.00 dollars and \$ 132,200.00 local contribution (Swisscontact Ecuador, 2010). The project can be classified into several types of patterns from the characteristics presented. The actors involved incorporate both public and private institutions for project implementation. This cooperation includes mixed financing because the funds come from the SDC as well as public and private funding resources when considering local counterparts, all of which are classified as non-reimbursable cooperation. The program responds to the characteristics of triangular cooperation on one end and developing countries cooperate on issues related to technical transfer of technology and knowledge acquired, while receiving funding from a third, more developed country.

In general, the project is subject to and supports the Plan Nacional del Buen Vivir 2009-2013 in Ecuador, since its goal is related to key sectors and aims to solve the same

objectives. For example, the project relates to Goal 4, which aims to ensure the rights of nature, and promote a healthy and sustainable environment, also Goal 6 which seeks to ensure stable, fair, and decent work. Also, regarding the subject of cooperation in strategic sectors in which the project is classified are: Sector 4. Social Development; 4.4. Gender equality; 5. Production support, industrial development, and competitiveness; 5.3 5.6 Other (technological change); 8. Environmental protection; and 8.1. Environmental Control. This means the project is within the sensitive sectors of cooperation and support guidelines to which Ecuador is governed to achieve sustainable development.

### **2.1.3 Beneficiary Sector**

The artisanal Brickmaking sector of Cuenca is the target population in the EELA project. As known, one of the major artisan economic activities in Cuenca is the production of bricks and tiles. These products are highly valued in the local market, both for the growing construction sector and the architectural heritage of the city. Brick making in Cuenca has been going on since ancient times and has continued until today because of the transfer of knowledge from generation to generation. However, while traditional brick production has a great cultural and historical significance, today it is also regarded as a highly polluting activity.

The target population of brick makers is in areas far from the city such as; Sinincay, Chiquintad, Balzay, and San Sebastián, among others. The artisanal sector is recognized as a vulnerable group, because it has poor living conditions and a subsistence economy. Also, it is characterized as an informal, rustic type production that is not really paid attention to by public and private institutions, especially when it comes to control entities, knowledge of the activity, as well as awareness of their needs and problems.

#### **2.1.4 Problems**

As mentioned at the beginning of this report, one of the most serious problems facing the world is climate change. This phenomenon, resulting from behavioral patterns, consumption, and production of mankind throughout history has led the planet to an unsustainable operating point. As is generally known, climate change is caused by the concentration of greenhouse gases (GHG) in the atmosphere of the planet; they do not allow in sunlight and trap heat, causing an increase in the average temperature of the planet. This phenomenon of climate change has palpable effects throughout the world and in the country and the region is no exception. A variety of risks due to climate change exist such as droughts, floods, melting glaciers, etc. All countries are exposed to the damage produced by this phenomenon, and thus the need for mitigation has arisen.

There are several greenhouse gases emitters (GHG) that contribute to global warming and therefore climate change. These emitters are small industry, although on a smaller scale compared to the big polluters, they are also emitting GHGs. Within these industries are the artisanal brickyards, which emit large amounts of greenhouse gases from the use of fuels with high environmental impact in low efficiency kilns. These gases affect air quality, the health of brick makers and those living near the area, and especially climate change. Indeed, this problem is what has motivated the implementation of the Regional Program EELA in Latin America and particularly the EELA-Ecuador program, with the primary objective of promoting the reduction of GHG in artisanal brickyards and thus contribute to mitigating climate change.

In addition to environmental concerns, the project seeks to improve the quality of life for the artisanal brickmaking sector, simply because most people who make up this area have low levels of development and have poor working conditions. Many brickmaking businesses even today are informal, disorganized, and out dated. There is almost no use of technology in their production processes, and despite the passage of time, the sector continues to produce bricks in the same way that it's always been done, without improvements in the type of production or working conditions. This sector has various

environmental, technological, economic, and social problems. The EELA project seeks to support and improve productivity and even improve their quality of life.

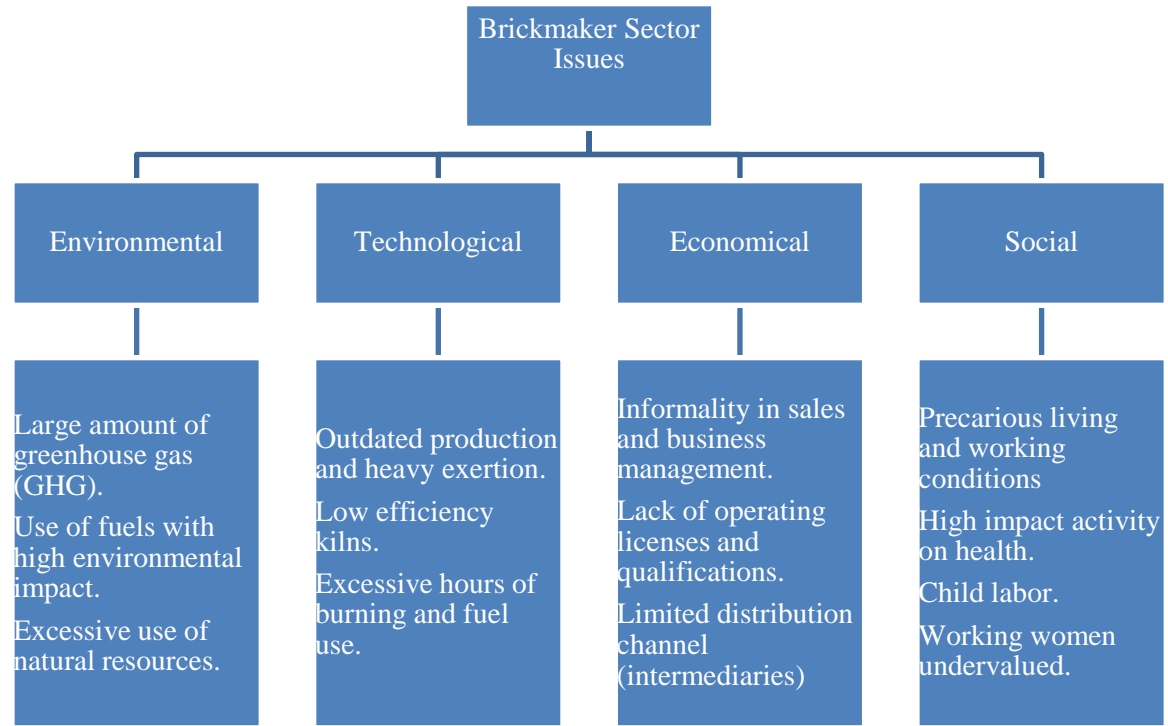
In the environmental field, as described at the beginning of the chapter, the brick makers use high environmental impact fuels to burn their products, such as wood and even plastic. As a result, there are large emissions of gases that harm the atmosphere, as well as the health of farmers and those living near the brickyards. Also, the brick burning is done in kilns of low energy efficiency, generating an excess in resource usage. This directly affects the environment, as in the case of Cuenca where wood is used as fuel and the excessive and inefficient use of this resource contributes to deforestation.

From a technological aspect, brick production is not very technical and requires great physical effort on the part of the craftsman. For example, clay is the main raw material and the craftsman uses an ancient technique of beating the mixture with the aid of animals. This activity requires a great deal of effort because it is needed to move the material to achieve an acceptable mixture for molding bricks. Furthermore, the conditions in which the batter is made are poor and as a result, the artisans are likely to get diseases or suffer from muscle and joint pains. It is worth mentioning also that the kiln used and burn techniques are very inefficient, generating an excess in time that the kilns are turned on, as well as an excess of fuel consumption that harms not only the brick maker but the economy and environment as well.

In the economic sphere, there are a number of problems identified. Most of the informal sector is rustic; there are no operating licenses and there are very few skilled craftsmen. Another aspect is the informality in sales and business management due to the absence of book keeping; this results in losses due to uncontrolled production costs. Furthermore, the distribution channel is a problem since most of their sales are made through an intermediary at low prices, since most of the brick makers do not have the capacity or knowledge to directly sell to the market.

In the social sphere, it should first be noted that brickmaking is usually a family business. In the area it can be see groups of family members that do not have medical insurance, and security measures are very poor, even in a high risk occupation like brickmaking. As for gender and childhood, the industry does not have more information on these issues, many children miss school to help their parents, this obviously affects their school performance. Furthermore, the role of women is underrated, as indeed in many instances the salaries of women are not taken into account, only for the man as the head of household. Regarding the educational level, most of the brick makers have only primary education and have no more training to manage their small businesses.

Graphic 2: Summary of the problems presented in the artisanal brickmaking sector



As can be seen, the brickmaking sector is a vulnerable. It is generally handled informally using outdated methods, as they have not had more support or opportunity to make changes to their traditional production models. This also implies that their quality of life and working conditions also have not had major changes. To help meet these needs,



EELA project has intervened with a comprehensive model that supports technological, environmental, economic and social areas.

### **2.1.5 Objectives and Proposed Goals**

The problem aims to be solved through the application of the EELA project by following these regional program guidelines and objectives.

- Development Objective
  - Contribute to mitigating climate change through reducing emissions of greenhouse gases from Ecuador and improve the quality of life of the population.
- General Objective
  - Promote the implementation of comprehensive models of cleaner production in artisanal brickyards with a proposal for access to the carbon market.
- Specific Objectives
  - Specific objective 1. Promote technology and more efficient energy processes and the use of cleaner fuels that contribute to reducing greenhouse gases.
  - Specific objective 2. Train and disseminate methodology of carbon market access for artisanal brickmaking sector.
  - Specific objective 3. Impact on the organizations responsible for effective institutionalization policy in the artisanal brickmaking sector, management models promoting comprehensive energy efficiency standards appropriate to national conditions.
  - Specific objective 4. Fostering entrepreneurial capacity strengthening for inclusion in the value chain.
  - Specific objective 5. Promote the exchange of knowledge, South-South experiences (Logical Framework Ecuador 2010-2012, Swisscontact).

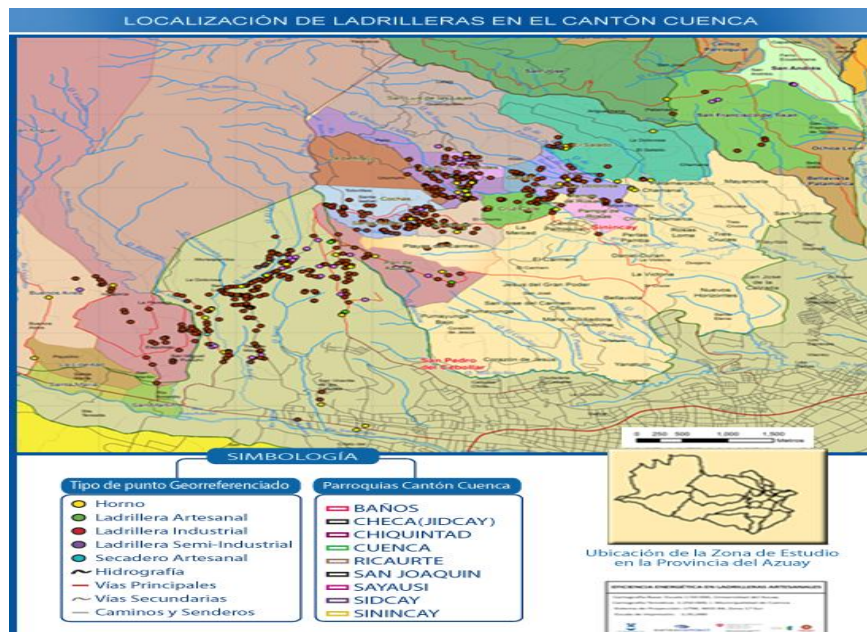
The goals set for the project EELA-Ecuador are:

- Reduced greenhouse gas emissions by 30% in Cuenca artisanal brickyards.
- Adoption of the comprehensive model of energy efficiency in brickyards.
- Approval of a program to improve artisanal ovens.
- Increase energy efficiency by 30% in brickyards.
- Using cleaner fuels in at least 300 artisanal brickyards.
- 10% of artisanal brickyards earn credits in financial institutions for technological change.
- 80% of companies know artisanal brickyard operating costs and record their income and expenses.
- Increased income of artisanal brickmaking participants by 10%.
- Adding at least one innovation in the design and production of handmade bricks considering trends and local needs.
- Inclusion of the sector in public policy.
- Preparation and approval of public policy to promote cleaner production in the artisanal brickmaking sector and the formal sector (Swisscontact Ecuador, 2012. EELA)

### **2.1.6 Actors Involved**

The Cuenca brickmaking sector is the target population of the project. In the city, the artisanal brick maker parishes are located in Bellavista, San Sebastián, Sinincay (50%), Sayausí and Chiquintad. Thanks to the cadaster developed by the project, the existence of 499 artisan brickyards, 40 semi-industrial brickyards, and 5 industrial brickyards in the city were confirmed. Thus, it was established that the area covers about 3000 people, consisting mainly of family members as workers. Also, families are composed on average of between 4-6 members, parents and children who perform this activity together (Swisscontact, 2010. Línea Base Proyecto EELA).

Graphic 3: Cadaster of Brickyards in Cuenca



Source: Swisscontact. EELA Project Baseline

Date: 2010

Prepared by: University of Azuay

The donor of the funds for project implementation is SCD. The Swiss Cooperation Agency, as presented above, is also a cooperating partner as a regional program financier, they perform the control and monitor of the project. They reserve the right to visit, monitor, and audit the project at any stage. Also, as technical secretariat, the foundation Swisscontact-Ecuador, runs EELA in Cuenca and is a central player in the development. Chapter 1 described the nature of technical NGOs and mission development support through technical assistance to small and medium businesses and environmental projects, a mission that fits the theme of EELA project. This NGO is responsible for formulating, coordinating, and implementing activities for project implementation and manages the resources for intervention and the monitoring of project progress. It is the responsible organization to implement the project, present the results, and integrate the objectives of mitigating climate change as the main problem and also generate opportunities for the brickmaking sector.

On the other hand, for the development of its work, Swisscontact relates public and private institutions, local and national, to facilitate the implementation of activities that benefit the brickmaking sector. For this, it works with the Comisión de Gestión

Ambiental (CGA) of the Municipality of Cuenca, the department responsible for managing, coordinating, and leading environmental management in the city. The CGA through the agreement signed undertook to facilitate the implementation of the project, in addition to auditing it by establishing a Monitoring Committee. Likewise, in the form of compensation, it provides facilities to locate the department Swisscontact office, from which the project is coordinated. It also works to strengthen the regulatory and institutional framework for regulation of the brickmaking sector.

These four actors; the brickmaking sector, SDC, the technical secretariat, Swisscontact, and CGA of the Municipality Cuenca are the central points of the project. However, it also works with other institutions that support the activities of the brickmaking sector. This involves the different thematic entities in the project. For example, the environmental issue involves the Ministerio del Ambiente. Production and economic issues include the Cámara de Construcción of Cuenca, and institutions such as the Servicio de Rentas Internas (SRI), the Ministerio de Industrias y Productividad (MIPRO), the public and private banks, among others, in search of opportunities to improve the business of artisanal brickmaking and productivity. The social field has sought to work with institutions that support these types of initiatives such as Instituto para la Infancia y la Familia (INFA), the Ministerio de Inclusion Económica y Social (MIES), the Ministerio de Salud, etc. All of these organizations work to combine and improve the quality of life of the sector.

There is also involvement of universities that have acted as participants of the project. This is the case of the Universidad del Azuay, who has collaborated in consulting for the baseline study of the project. The project has also received support from other NGOs and private consultants to develop alternative solutions for the brickmaking sector. During the execution of the project by Swisscontact, and in order to comply with the same goals, new actors have been included from both public and private providers that offer their services to develop the proposed activities.

## **2.2 Systematization of the Process**

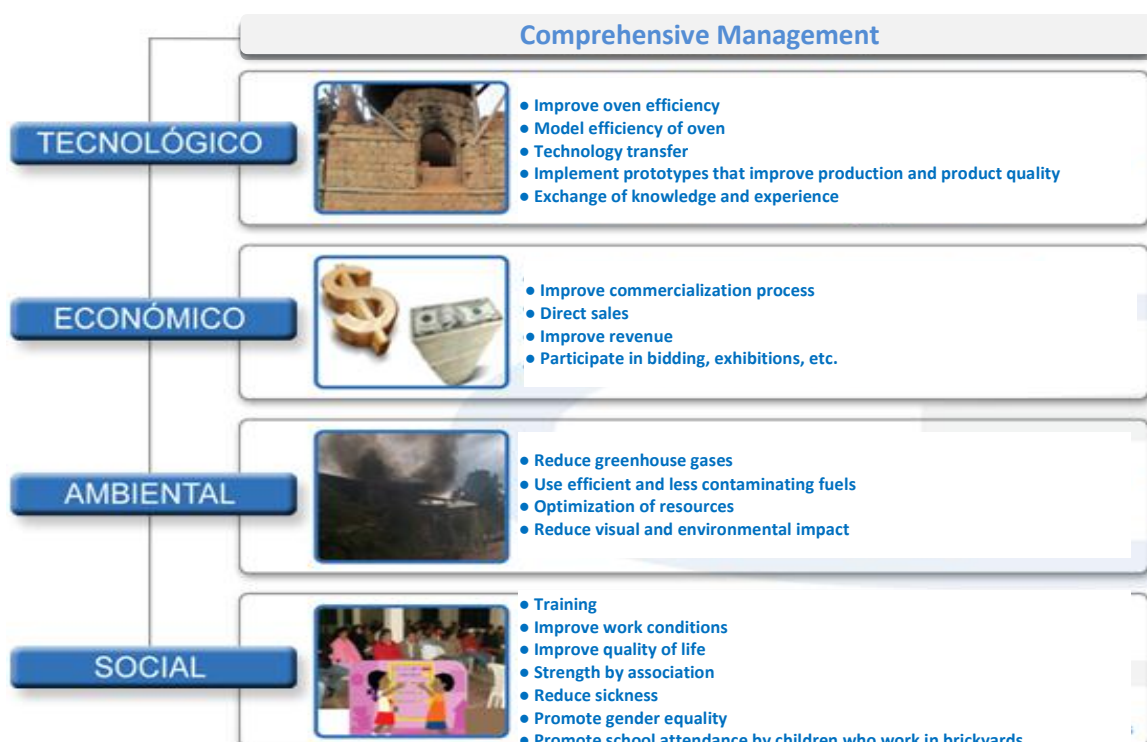
To assess the impact that the EELA project presented in the first phase, it is necessary to recount the processes and activities of Swisscontact in collaboration with different actors towards the target population, the brickmaking sector of Cuenca. First we consider the methodology used by the project, followed by the description of activities implemented to achieve the same goals. This systematization is done based on documents and reports provided by the executing secretary, Swisscontact.

### **2.2.1 Methodology**

The system the EELA project used was a logical framework, a tool to conceptualize, design, implement, and evaluate the intervention. This tool aims to help to understand the project cycle from inception to completion, as well as dealing with critical spots and preventing potential problems along the different stages of the intervention. The project uses this system to guide the process, the guidelines established by the regional program as a general reference, and prepares annual operating plans to establish the activities to be executed.

The activities developed by the project in Ecuador are established independently of the regional program, as each country chooses the means and tools to meet the goals. For EELA-Ecuador, activities are executed directly in the field by the brickmaking sector with the other actors involved. Also, to implement the project, the courses of action are divided into four areas: technological, economic, social, and environmental. The project was conceived in this way because it involves the implementation of a Comprehensive Management Model to solve the problem in the artisanal brickmaking sector.

Graphic 4: Action Line of the Project EELA-Ecuador.



Source: Swisscontact. 2012 EELA

## 2.2.2 Activities

Below is the process followed by the EELA project, the implementation process lasted over three years. The process started with a diagnosis of problems in the brickmaking sector, followed by activities implemented to achieve energy efficiency and cleaner production, which were then integrated to improve working conditions and living standards of the brick makers. Best practices, training, travel, events and industry standards for craftsmanship were implemented as well, in general, to improve the quality of life of the target population.

### 2.2.2.1 Base Line

Following the establishment of the counterpart, the development of the baseline was the first activity performed by EELA-Ecuador. This process served as a tool to diagnose,

identify, and quantify the brickmaking sector of Cuenca and was developed with the support of the University of Azuay in 2010. In this study it was performed an initial diagnosis of the sector in the areas of technology, environment, economy and society. This allowed obtaining an accurate visualization of the problems, needs and basic information of the brick making sector for establishing intervention strategies in the EELA project, as well as a course of action.

In summary, the most relevant results of the baseline are the following:

- The sector comprises some 3000 people. 499 artisan brickyards and 40 semi-industrial brickyards. They are located in the parishes of Bellavista, Chiquintad, Sayausí, San Sebastián, and Sinincay. Of the total amount of people, 53% are women and 47% men.
- Annual emissions generate 14,168 tons of CO<sub>2</sub>. With energy efficiency in kilns of 4.41 GJ / ton of ceramic.
- They have marketing problems through brokering; only 23% make direct sales and they lose revenue by not knowing their cost structure.
- 69% of brickyards do not belong to associations. They do not have credit lines to invest in technological change and improvements. 64% do not receive credit from financial institutions, 25% have consumer loans. Only 8% of brickyards have made improvements to their business. There is little investment.
- The salary of the head of household is the only income considered, excluded wives and children.
- With regard to child labor, it is estimated that of the children working in the brickyards, 30% are children aged 5-11 years old and 70% are adolescents aged 12 to 17 years.
- 87% have no health insurance and only 62% seek medical attention in an emergency. (Swisscontact, 2010. EELA Project Baseline).

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#### **2.2.2.2 Production Processes**

With the results of the baseline, and by analyzing the production process, several problems and bottlenecks were identified. In response, the project raised the need for improvements in some of the steps in the production processes of the bricks. This was done in order to achieve cleaner production and energy efficiency to reduce the impact caused by brickmaking on the environment. Furthermore, additional interventions were sought to improve productivity and the economy of the artisans. The production process of handmade brickmaking, before the EELA project was implemented, consisted of the following steps:

Graphic 5: Brick Manufacturing Process before Intervention in Cuenca





After analyzing the production process of handmade bricks, the project made the following intervention:

The first problem was found during the extraction of clay. It was found that the combination of clays that were molded, in many cases, was not the best quality, affecting the strength of the brick. Furthermore, because the mixture of the different clays is performed only based on the experience of the artisan and without a set technique, the bricks made vary quite often. There is no standardization in brickmaking. In early 2012, the project conducted a study of clay samples in various areas to determine an optimal clay mix. Based on this investigation, bricks now can rely on a standard for clay mixing, thus ensuring the quality of the bricks and facilitating the standardization of the products.



Photo 1: Variety of clay. Swisscontact, 2011



Photo 2: Variety of brick sizes

The second problem found was during the churning and mixing the clay; this requires a high amount of exertion on the part of the artisans and takes about 8 hours to perform. The heavy work is done with animals (horses or bulls); they beat the clay by treading on it. If the artisan does not own the animal himself, then one can be rented for \$10 a day. The batter is beaten until it becomes a fine mixture; this is not done entirely by the animals, the artisan must also beat the material with their feet. During this beating process, the project was able to implement an important element in the brickmaking process. EELA-Ecuador undertook the design and construction of a mixer machine, the machine replaces animals used for the mixing which produces a uniform mixture. As a result, product quality improved and the amount of physical effort in production was

decreased. Demonstration tests and loans for the machines were given to the artisans in order use it in their respective businesses. Through these activities technological changes were made in the brickmaking process.



Photo 3: Mixer from the EELA-Ecuador project



Photo 4: Use of the mixing machine. Swisscontact, 2011

The third problem encountered was observed during the molding process of the brickmaking, in which the project was able to promote a more innovative brick design. Most artisans make panelón type brick; it is a traditional brick-like mass that is very strong, so its demand is high. However, this type of brick requires a large amount of clay to make it and a lot of wood to burn it, so it requires an excess amount of resources and a longer time to cook it. Therefore, in order to reduce material usage and diversify their product line, some brick makers began to produce other types of bricks such as brick flooring. These bricks consume less clay and therefore can be sold for a greater profit. The project was able to implement this change by organizing trips to other cities, and even other countries, for the brick makers. It was during these trips that the artisans were able to exchange ideas and experience. Today, the brick makers are able to offer various types of bricks instead of the relying on just one type, panelón.



Photo 5: Molding process



Photo 6: Diversification of models. Swisscontact, 2011

The fourth problem was found during the drying and scraping process. Drying represents a bottleneck in the production process since drying time depends on the weather conditions. It can vary from 15 to 40 days. Traditionally, wooden structures, greenhouses and recycled plastic were used in the drying phase. The disadvantages of using these items were two, the wooden structures are inefficient and promote slower drying times, and secondly, the plastic greenhouses have a short shelf life and also contain toxic substances that affect the health of the workers. In response to this, the project implemented new plastic material suitable for brickmaking. To do so, the project was able to acquire support from a company called Plastilene that manufactures special plastics that can be used in brick making facilities. EELA-Ecuador has installed driers to significantly decrease the drying time.



Photo 7: Dryers



Photo 8: Drying process



During the baking process, a fifth problem was uncovered. When loading the kiln, the distribution of the bricks did not permit proper circulation of heat, resulting in unequal burning in the different parts. To solve this problem, the project provided design models showing proper brick placement and installed chimneys for optimum heating, proper distribution, and a reduced baking time.



Photo 9: Distribution of bricks

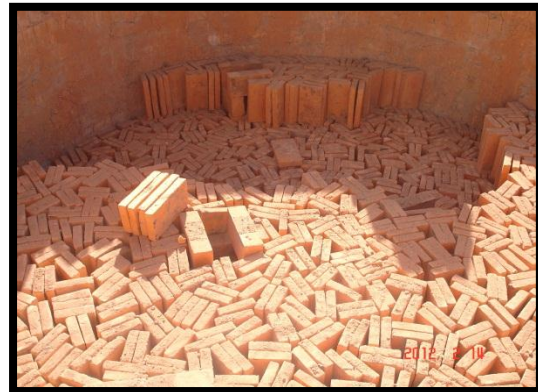


Photo 10: Installation of chimneys designed by the EELA

During the sixth process, cooking, the project has made great efforts to achieve energy efficiency and reduce kiln burning times as well as resources used as fuel. The kilns used, in many cases, are constructed by the artisans themselves. These ovens, as mentioned above, have low energy efficiency and generate high fuel consumption. Similarly, the cooking techniques that were used were outdated and inefficient. Consequently, to achieve one of the main objectives of the project, a reduction in GHG emissions, modifications were made to the ovens. Among the implementations were fans that were installed to improve the firing process. A dispenser was also installed in order to burn the sawdust created by the firewood. These implementations promote complete combustion of the material used as fuel, reducing burning times and even reducing costs due to less material consumption.



Photo 11: Use of fans in the ovens.

Swisscontact. 2011



Photo 12: Use of a dispenser to burn excess sawdust

In order to reduce of greenhouse gas emissions, two proposals were created to replace the outdated artisanal ovens. The first was the implementation of an efficient kiln, a replica model developed by the EELA-Peru. The kiln selected for replication was designed and customized to accommodate the needs and conditions of the Cuenca artisanal brick maker. The project in Ecuador has begun construction of this kiln; however, implementation is still in the process. The second proposal by the project is a more traditional style oven that includes a dome and fans to generate kiln efficiency and reduce emissions. In this proposal, a test was conducted in order to verify the operation of the oven; however, this proposal as well is still in the process of being implemented.



Photo 13:  
Traditional oven  
model.  
Swisscontact.  
2011



Photo 14: Modified oven model. Red brick makers. 2012

In terms of the cooking process, the project has worked to improve the efficiency of established artisan ovens, and also provide an option of an efficient kiln model. The project has implemented proper brick placement practices, as well as the implementation of fans and dispensers.

The final process of unloading and transport required no further intervention. However, for the sales process, the project has intervened to solve the problems in the marketing sector which is recognized as one of the bottlenecks for the artisans. Additional activities of the EELA-Ecuador project are described below.

### **2.2.2.3 Work Conditions**

The baseline study noted the need for improvements in the working conditions of the brick makers and their families. Some of the technical and economic aspects of the study are: formalization and associativity of artisans, marketing, product standardization, and access to credit for investment. The social aspects are: health, job security, and cross-cutting issues such as gender and childhood. Below is a description of each aspect of the comprehensive management model:

#### **2.2.2.3.1 Technical and Economic Aspects**

Among the problems mentioned is the informal nature of most artisanal brickyards in Cuenca. To change this situation, the EELA project has encouraged the industry, through talks and workshops, to shift towards formalization by filing with the SRI (Servicio de Rentas Internas) through the Ecuadorian Simplified Tax System (RISE), obtaining municipal licenses, as well as establishing a standard price for bricks sold.

On the issue of associativity, EELA worked hard to achieve an association of several artisanal brick makers. However, there was great resistance on the part of the artisans because most used to work individually or with close relatives. This issue hindered the development of activities and limited the ability of the project to implement some

proposals. Moreover, by not forming partnerships, it was more difficult to obtain external support to implement improvements since most programs serve the needs of associations. Therefore, the project worked individually with some brick makers as well as with some partnerships that were already in existence. Nevertheless, despite resistance, the project was able to support the creation of the association “Los Originales del Austro”, with whom agreements were signed to support implementations and improvements of the businesses.

Also, it was seen the difficulty of most brick makers to fill large product orders individually due to the lack of production capacity. Therefore, the individual artisans were forced to preclude direct sales which generated the need for intermediaries in order to sell the bricks.

As mentioned before, the project focused on promoting business partnerships, in order to fill large orders. The project conducted workshops to encourage brick makers to create

clusters of 5-10 brickworks, implement storage centers, and achieve direct sales. This option, which is still in process, allows artisans to improve profit margins by avoiding the need for an intermediary to make the sale.



Photo 15: Commercialization. Swisscontact. 2011.

Another problem relates to the standardization of the bricks. As mentioned in the description of the project, one of the industry's problems is the variety of bricks offered. This is due to the origin of the raw material. The clays used in the brick are from different sources, and also the mixture measurements used in the bricks vary. As a result the product is not homogeneous, an issue that limits the ability to sell products associatively because qualities and sizes are different. To improve this situation, the project conducted a study to determine the optimal range for the product mix, defining

strengths, and sizes of the bricks. For this activity, the Camara de la Construcción provided support in defining the parameters for the standardization of the bricks. Furthermore, legislation was established that required for sizes to be established. This was developed jointly with the Camara de la Construcción of Cuenca and the EELA project.

Credit lines were also sought after for investments involving technological change, for example production improvements and the updating of machinery. The project helped bricklayers gain access to credit lines at financial institutions considering one of the major limitations of expansion is the availability of capital. The project also works with financial institutions and ministries to seek access to low interest loans. However, one of the leading factors that limit access to funding is the lack of formal property records for their businesses.

#### **2.2.2.3.2 Social Aspects**

The above activities are the support provided by the EELA project management in the brick business. However, it also includes social issues needed to make way for the comprehensive management model. In these respects, the main activities promoted were the awareness of the brick makers and their families in health, education, children, and gender equality, among others. All this with the support of institutions related to this subject and with common goals to the project.

Regarding health, the artisans are aware that their profession is physically demanding. However, not all recognize the implications of the gases emitted by the kilns in their health, and the risks involved in this difficult task. 87% do not have any health insurance, and most resort to medical care in an emergency only. Due to this situation, the project supported the sector with workshops on health and safety, promoting membership in the social security or insurance programs.



Child labor is a major issue in brickmaking. In past years, many children working in brickyards did not attend school. Currently, most children attend school, but in many cases, in order to fill large orders, children are frequently miss school to help in the brickyards. INFA has worked with this industry to support children with a task management program in order to obtain higher performance in their areas of study. For now, the project intervention workshops were held in conjunction with INFA to encourage school attendance and gradually reduce child labor.

Similarly, gender equality has been a topic addressed by the project as work of women is much underrated. Furthermore, women generally provide support during the entire production process, in addition to the work at home, for which receives very little recognition. Compared to men, women are viewed as “helpers” and are therefore paid very little or nothing all. In the brickyard, traditional gender roles are maintained and in most cases the male makes decisions. These disadvantages intend to be modified by the project through applied training workshops. The project sought to provide tools to incorporate women in leadership and decision making, both in the brickyard and at home.



The project promoted awareness to family members on these issues to improve social and working conditions within the small businesses.

Photo 16: Gender and children. Swisscontact. 2011.

#### **2.2.2.4 Technological Transference**

EELA has sought technological options that could be implemented in the brickmaking production process. Technology is almost nonexistent in the brickyards and the technology available in the market is not suitable for brickmaking. Therefore,

technological change has been a process of adaptation to the technical and production needs of artisans. The NGO, Tecno Verde, has created a blender machine that is adapted to the artisanal brickmaking sector.

It is also important to mention that several implementations have been made through the exchange of information between the countries that are part of the regional program EELA, for example the oven model developed by EELA-Peru. Technology transfer in this case is being implemented in the brickyards of Cuenca.

Also within technology transfer is the exchange of experiences and studies done in search of cleaner fuel alternatives. It was analyzed fuels traditionally used by brick makers in the region such as: plastics, tires, firewood, rice, coffee husk, sawdust, and new alternative fuels like coal liquid hydrocarbon and natural gas. It was also examined the effects of each fuel on air pollution and the environment and as a result, EELA was able to establish which fuels were the cleanest and most efficient.

To display the results of the fuels tested during national and international exchanges, the project showed alternative fuels along with some brickmaking industry representatives. However, in Cuenca, the use of coal is impractical due to the lack of nearby mines and

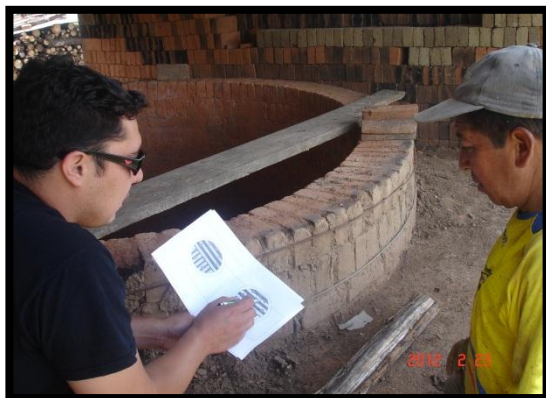


Photo 17: Workshops. Swisscontact. 2011.

the high cost involved in transporting this fuel. Also, while the use of natural gas is the most advantageous for the moment there is also no facilities near the brickyards. Therefore, no fuel changes were made. However, the project seeks to reduce the amount of material used through the implementation of modifications to the ovens as was mentioned before.

### **2.2.2.5 Identification and Implementation of Best Practices**

The best practices implemented by the EELA, respond to the need to generate cleaner production in the brickyards and achieve energy efficiency. Therefore, improved distribution techniques for brick cooking, as well as the application of fans inside the ovens were applied.



To advance these best practices and implementations, the project is in the process of designing a manual of best practices to be distributed among the brickmaking businesses.

Photo 18: Implementation of best practices

EELA's initial analysis showed that it was not right for the brickmaking sector to improve sector performance and reduce emissions, through enforcement action. This is simply due to the fact that the industry itself is not regulated. Because of this, the project chose to create a handbook for the production process, including best practices and improvements that achieve energy efficiency and that reduce emissions.

### **2.2.2.6 Training**

Training sessions and workshops have been one of the most significant activities developed by the EELA project. This is because capacity building is one of the most necessary initial requirements to create conditions for achieving technological change and improving production conditions. So far, there have been 23 training events on various topics like; cleaner production, implementation of best practices, and improvement and optimization of production processes through technology. Economical training included training courses and tax costs, formalization, business associations, and trade. Environmental training covered workshops on carbon, efficient kilns, and updated

oven models. Finally, social training discussed; childhood, gender, health, safety, and the environment.

For training, outside actors have collaborated on certain issues needed to improve sector capabilities. For example INFA contributed to training in gender and childhood issues. Also, the SRI gave classes on tax matters with a view to encourage the formal sector and the fulfillment of tax obligations. It has also received support from various ministries related to the theme of the project, such as the MIES, Ministerio del Ambiente, and the Ministerio de Salud to raise awareness of pollution issues, the environment, and health, among others. Staff employed by the project itself developed training programs and activities on issues of great importance such as business management.



Photo 19: Training in the brickmaking sector



Photo 20: Discussions with the brickmaking sector.  
Swisscontact. 2011.

#### **2.2.2.7 Exchange Visits and Events**

In order to gain acceptance of technological change and project implementations, EELA has sponsored travel and exchange tours in order to share experiences, knowledge, and technologies to improve brick manufacturing processes. Four national tours were conducted (two to Chambo, Huaquillas and Catamayo), two international tours (Brazil and Colombia) and an internship to Peru in order to observe the operation of the kiln operation and efficient model designed in Peru and encourage the efficient scale replica of the oven in Cuenca. For these tours there was a participation of 50 brick

representatives of different sectors and associations. In addition, representatives of four technicians involved with institutions and a university. This has allowed motivate technological change and implementation of best practices in the brickmaking sector.

As for events, the project organized the “First National Meeting of Brick makers” in Cuenca with the participation of several provinces of Ecuador: Pichincha, Chimborazo, Bolivar, Azuay, Loja, and Los Rios. The event was attended by 70 brickmakers from different provinces, and national and international exhibitors, and the participation of the Municipality of Cuenca, Ministerio del Ambiente and the Universidad del Azuay. Another even was the International Congress on Technology Exchange in Brazil and Colombia, with 14 people representing Cuenca from brickyards and institutions.



In 2011, the project had a stand at the Feria de la Construcción of Cuenca. This experience allowed the brick makers to have direct contact with customers and the market.

Photo 21: Participation in the Feria de la Construcción of Cuenca. Swisscontact. 2011

Thanks to the fair, they had the opportunity to see the opportunities that the market offers, but also found weaknesses facing production and trade. The fair was a positive activity as participants encouraged the need of technological change, improving joint production, and direct marketing channels.

#### **2.2.2.8 Institutional Strengthening**

At the institutional level, the activities are coordinated with the Comisión de Gestión Ambiental (CGA) of Cuenca, as a public entity and as project leader in the regulation of the brickmaking sector. To support the work of the Commission, an environmental

Guide for the brickmaking industry was developed, accompanied by a manual for implementation and enforcement, as well as public policy developed by this the city of Cuenca.

Additionally, to strengthen institutional capacities, the EELA project has developed training events for the CGA and other institutions related to the theme and objectives of the project. As part of these activities, the International Seminar on Climate Change Mitigation and mechanisms offered by the Carbon Market were developed; 120 people from public, private, university professors and students, consultants, among others were in attendance. All this is to strengthen the institutional capacities of relevant sectorial actors.

Based on the activities of the EELA project, it can be concluded that, indeed, several themes can be integrated; productive, social, economic, technological and even regulations to improve the situation of artisanal brick makers and help mitigate climate change. In the process of completing the project and establishment of pilot replica, it can be seen tangible results and intervention in different application areas.

## **2.3 Obtained Results**

### **2.3.1 Description**

From the first year of implementation in 2010 until 2012, the EELA project has presented results at different points of the comprehensive management model implemented. Below, it is presented a summary of the results achieved by the pilot EELA Project-Ecuador in its first phase, thanks to reports provided by Swisscontact:

#### **Objective 1: Production processes and energy efficiency**

- Brickmaking sector IDs
- Baseline (social, economic and environmental)

- Implementation of Best Practices in the brick cooking process, including the proper placement of the bricks and the use of fans.
- Improvements in kilns craft: this involves placing a chimney and dome over the use of fans
- Implementation of fans and metering in the process of burning brick for complete combustion of the fuel.
- Implementing a clay mixer machine (for now there are 20, these were acquired with their own resources or through credit.
- Demonstrations of new blender machines.
- Technical Manual operation of the mixer
- Innovative products: gapped panelón, cuartones and tochano for green building.
- Theoretical and practical workshops to demonstrate the results.
- Evaluation on energy efficiency in processes and traditional kilns burning alternative fuel consumption.
- Installing of plastic dryer designed specifically for the brickmaking, with the support of a company specializing in plastic.

#### **Objective 2: Carbon Offset**

- Training Workshop on Carbon Offset Market
- Proposed approach and identification of interested companies.
- Workshop on Carbon Market for technicians from the city of Cuenca, Monitoring Committee members and institutions involved in the issue, a total of 120 people

#### **Objective 3: Institutional and environmental control**

- Strengthening of control authority and creation of the Monitoring Committee of the EELA Project.
- Regulations (Guide to Good Practices) and Public Policy
- Association of 24 brick manufacturers from Sinincay -Tixán that are committed to the EELA project.



- Strengthening brick maker associations.

#### **Objective 4: Business skills and marketing**

- 23 training events for the brickmaking sector.
- Participation in training, 300 brick manufacturers since 2010.
- 23 obtained the qualifications from MIPRO.
- 20 brick factories produce a variety of products for marketing
- 100 brickworks were strengthened in gender and childhood
- 150 brickworks were strengthened in formalization processes, trade association, union, and marketing strategies.
- 150 brickworks know their production costs and the benefits obtained with the technological change in the production process.
- 20 brickworks got loans for technological change
- Two banks extended credit for technological change
- Standardization process of the products made by the industry in size and quality.

#### **Objective 5: Technology transfer and exchange of knowledge and experiences**

- National Technology Transfer Seminar EELA Ecuador. Organization and participation of public and 70 brick makers.
- International Technology Transfer Seminar Regional EELA. Participation of 14 from brick makers and institutions of Cuenca.
- Fair to promote participation in artisan production of bricks
- Internship in Cusco, Peru to observe the operation of a pilot kiln.
- Contributions to the Regional Program EELA platform of experiences implemented in the participating countries.

Followed by the results achieved in the establishment of the pilot project are the tools used to evaluate EELA project progress.



### **2.3.2 Monitoring and Evaluation Mechanisms**

The processes of project monitoring and evaluation mechanisms established by the EELA were used. One of these tools are the goals proposed by the project, guiding the activities and serve as general indicators of the process. These goals, mentioned in the second chapter, were reached by the end of the first phase. Similarly, the baseline represents a tool for evaluation. After the process, this document serves to compare the initial conditions of the sector and the final terms of EELA postoperatively. Therefore, it can assess the changes and improvements in the target population.

Actors engaged in the audit and evaluation monitor the process throughout the project. On the one hand, there is the technical secretariat, Swisscontact, which through its local policy and its directors Switzerland periodic controls of the process by reviewing reports provided by project implementers. Similarly, COSUDE, the funding agency, conducts annual inspections of the process with auditors to inspect and review the activities executed in the reports provided.

## **2.4 Pilot Implemented**

### **2.4.1 Definition of Methodology**

After the development of the project, Cuenca now has the knowledge and experience to implement the EELA project on a national scale. For this purpose, the same methodology proposed in the pilot project is planned to be used, i.e. the implementation of a comprehensive management model. Similarly, it is considered the general problem and treated technological aspects, economic, environmental and social, with particular attention to the marketing of products, one aspect that after the implementation of the project proved to be a very important constraint on the sector. In short, the pilot project will be used to guide the process to be implemented.

Also, for the development of activities, public and private institutions related to the project are expected to work together. This means primary work will be performed by

municipalities, ministries, and NGOs from around the country. In addition, work with the target population will be handled similarly to the case of Cuenca, i.e. activities on-site with brick makers who are willing to work on technological change and engage in the activities proposed by the project.

### 2.4.2 Posed Activities

The pilot project is based on the following activities for replication. These activities were implemented in the pilot project and include guidance for national reproduction. However, as was the case in Cuenca, activities should be adapted to the local needs of each city and implement the necessary tools to perform the procedure.

Graphic 6: Replicated Activities



### **2.4.3 System Sustainability**

The EELA and EELA General Regional Program was planned in order to be sustainable over time and continued for actors to participate in it. One aspect that makes the project sustainable is the proposal to work with industry in the carbon market. In general, this specific objective seeks energy efficiency achieved by artisans to modify or improve their equipment and implement best practices in their processes, so gaining access to carbon credits in order to reduce greenhouse gas emissions. In the case of Cuenca, the proposal for access to the carbon market is incomplete. Peru is developing a proposal to integrate the other countries participating in the program. This proposal will allow the money received from the sale of carbon credits to be applied to the maintenance and continuous improvement of the oven, so it is a long term benefit for the brick industry to join the proposal and make improvements to achieve energy efficiency.

Another method to find sustainability the project is the implementation of public policy for the sector. The Comisión del Gestión Ambiental of Cuenca is in the development and approval process of politics and the Guide to Good Practices for regulatory control compliance for the sector. These activities ensure that processes improve and continue to be magnified given the need to meet the requirements of local oversight. Furthermore, sustainability of the project is ensured by applying best practices in the brick production process, the use of more efficient energy processes and fuels, which can optimize the production processes of bricks, providing quality products, and improved competitiveness in the market, issues that encourage replication in other brickworks, to improve their living conditions and quality of life (Swisscontact Ecuador. Energy Efficiency by Artisan Brick Manufactures. 2012).

## **2.5 Conclusion**

In short, the EELA Project represents an applied example of Swiss international cooperation in Ecuador. Thus, based on the study, it has been possible to describe EELA in each of its stages, moving from the planning and establishment of the Regional Program EELA by the Swiss Agency for Cooperation and Development, SDC, to the execution of activities by the Technical Secretariat Swisscontact, to obtaining the first results of the pilot project in Cuenca.

Furthermore, it has been shown that the project has a close relationship with the premise of sustainable development. First, the main aim to help mitigate climate change and improve the quality of life for the brickmaking sector, comprehensively managing the essence of sustainable development. This mainly meeting the needs of economic development for the sector and giving priority to the protection of the environment. Similarly, the project applies to technological change and calls for the reduction of gas emissions and consumption of resources, a basic proposal for sustainable development.

Additionally, the EELA project responds to the current dynamics of international cooperation by the elements and actors involved and the goals to be achieved. The project also manages crosscutting policies of international cooperation in the social field, such as health, gender, and childhood. In general, EELA theory applies in all current requirements established for international cooperation. Now, to test the effects obtained with the project, the next chapter perform the analysis of impacts of the project.

## **CHAPTER 3**

### **Impact Analysis of the International Cooperation Project**

This chapter conducts an impact assessment of the Energy Efficiency in Artisan Brick Factories-EELA in Cuenca in the targeted population. This is done in order to know the impact generated by international cooperation interventions and to identify their work as a complement to national efforts. The impact analysis for the EELA project is also necessary given the current trend to assess the effectiveness and efficiency of international cooperation in the countries where it is applied. To this end, the impact is measured with technical tools applied to the results obtained and the effects on the target population, and so justifies, the fact of having undertaken a project with investment of resources and efforts to address the problem in a specific sector.

The EELA project is an applied example of international cooperation by Switzerland in Ecuador. This project is currently in progress and it already present results as outcomes from the interventions implemented. It also complies with current international cooperation policies and is related to the premise of sustainable development.

The analysis measures the impact of the intervention in its objective to help mitigate climate change and improve the quality of life of the artisanal brickmaking sector of Cuenca, and value the benefits to the sector with the implementation of an international cooperation project. To develop this chapter, and with the collaboration of the Technical Secretariat-Swisscontact Ecuador, it was conducted observation activities during the project implementation stage and it is used as a qualitative source. Also, in order to obtain data on the impact generated by the project, work on site with the direct beneficiaries of Cuenca was done in order to gather information directly as a quantitative information source.

To analyze the impact of the intervention, first, the results obtained by the project thus far were reviewed. Subsequently, an assessment was made of the activities of the EELA project implementation. Next, there were presented the effects caused by the project in the brickmaking sector of Cuenca, in the technological, economic, social and environmental areas, as well as the effects not considered in project planning.

### **3.1 Analysis of Results**

#### **3.1.1 Results 2010-2012**

As mentioned in the first chapter, international cooperation and its impacts depend on the results of the target population. Furthermore, based upon those results, the benefits of the implementation and sustainability are measured. For the EELA project, the implementation has achieved significant results since 2010. Therefore, by reviewing the results of the first phase of the EELA project, which runs until 2012, it can be established the relevance of the project and its actions. To do this, it was performed a comprehensive analysis of the results obtained in the field by the technical secretariat Swisscontact-Ecuador.

##### Specific Objective 1

Noteworthy are the results achieved by the intervention on issues of energy efficiency and technological change, a keystone of the project and the first specific objective. The results obtained with the implementation of best practices in the burning of the kiln include the correct location of the bricks and the use of fans. Swisscontact estimated that the implementation has improved efficiency in kilns from 10% to 20% as well as reducing fuel consumption by 30%. Thanks to these implementations the environmental and visual impact of this activity is reduced, as well as reduced burning times, fuel consumption and thus GHG emissions.

The application of this burning technique is simple, it does not require large investment, and is therefore universally applicable. With the implementation of best practices, the

project aimed for alternative energy efficiency. Due to certain constraints (to be presented later) it was not possible to neither build an efficient kiln by association nor apply improvements to the old ovens. Therefore, these slight changes in traditional baking represent a feasibility, low investment, and high potential to be implemented by the artisans inside their factories to improve the efficiency of their kilns.

On the other hand, in the few cases where the structure of the oven was modified, i.e. the construction of a chimney, there were measurable results. The first immediate effect was the reduction of gas emissions, this mainly through the chimney that facilitated the removal of heat, directing the gases produced by burning and reducing the density. According to Swisscontact, GHGs were reduced from 20% to 30%. These modifications applied on a large scale represent a solution for the brick makers; specifically, health problems generated by emissions, environmental pollution, and complaints from neighbors due to periodic fires affecting areas surrounding the factories.

With regard to technological change in the production process, the blender machine represents an important contribution from the project. There have been positive results achieved with the use of the mixer, so far there are 20 machines operating in the sector. These mixers have been acquired through personal investment by the artisans themselves or through credit. Local demand for the mixing machines continues. Also, to facilitate the operation and maintenance of the machine, the project developed a technical guide/manual for the owners. In the end, the blender is a tool that replaces the use of cattle in the beating process, facilitating and speeding up production time.

These results have had tangible effects in the brick making sector of the city. However, there were a number of factors limiting the application, and even the reproduction of these results in a large number of brickyards. Most of these constraints were:

- Difficulty of association: the project initially aimed to achieve energy efficiency and GHG reduction through the construction of an efficient kiln tunnel, this system required the association of individual brick makers so that larger amounts

of bricks could be baked at one time. This approach did not work at all, given the refusal of the brick makers to associate and work together. Now the proposal is being modified so that the use of these types of kilns would require less investment and implement more kilns as it was documented in the implementation of this method in Peru.

- Lack of investment capital: as noted previously, the project focuses on promoting technological change and implements improvements in energy efficiency. For this purpose, the project provides workshops, knowledge and support to encourage improvements. At the end of the day though, the investors in the modifications and changes to the brickyards are the brick makers themselves. They pay for those changes either through personal investment or bank loans. Indeed, these changes have a high price tag when it comes to the construction of energy efficient ovens and the acquisition of new blender machines. This is a major investment for artisans, to say the least, due to the low availability of capital and relatively small amount of revenue gained by the brick makers. Hence, there is a rather small number of brick makers who are interested in applying those changes, regardless of the environmental and production benefits that can be achieved.
- Distrust: An additional factor is the skepticism of the brick-makers. Although the changes introduced by the project are tested, people have doubts about their effectiveness. The risk of losing their business, and hence sacrificing their livelihood through debt acquired for improvements, is too much of a gamble.
- Resistance to change: this factor is one of the most limiting to implement the improvements proposed by the project. Brickmaking is a practical activity that has been going on for many years in which knowledge is passed on from generation to generation. Therefore, the idea of a project that attempts to change traditional practices of artisans is quite complex. In many cases, it is difficult to implement changes and even persuade the brick makers to try out the technical changes proposed by the project designs.



Because of these obstacles, the project sought alternatives that would be accepted by the brick makers, and hence, achieve project's objectives. One alternative was the implementation of best practices during the baking process. This was a very affordable alternative for artisans that reduced GHG emissions and reduce fuel consumption. Furthermore, the application of best practices represented an alternative given the refusal of the brick-makers to associate. Also, in an attempt to motivate the brick makers and improve trust, the project conducted workshops and lectures to demonstrate the results and benefits from the application of technological change.

Furthermore, to support and solve the problem of the lack of capital, the project negotiated with several financial institutions to gain access to lines of credit for the brick makers to make it easier for them to invest in improvements. As a result, some brick machine mixers were purchased and some improvements were made in various factories. Although the access to credit, not all of the brick manufacturers applied for credit lines, first because of the present economic difficulties and secondly, because of lingering mistrust of investment and its risks.

In conclusion, technological change and energy efficiency were hindered due mainly to investment capital, followed by the lack of associativity, distrust, and resistance to change.

### Specific Objective 2

The second objective involved training and dissemination of the methodology for access to the carbon market. In this aspect, the project had limited participation and it is expected to be developed further in the second phase of the project. The main aspect of this objective is workshops to raise awareness of the Carbon Market, both for the brick makers and for public and private authorities in Cuenca.

### Specific Objective 3

The institutionalization of the individual brick manufacturers was the third objective of the project. This was done by maintaining a close working relationship with the

Comisión de Gestión Ambiental of Cuenca, which coordinated activities within the brickmaking sector of the city, a sector historically relegated. The commitment of this institution is to produce a Guide for Best Practices. Through this guide, it would be possible to regulate the process in which the bricks are made and promote the implementation of practices friendly to the environment. However, the guide has not been completed yet, so no effects from its implementation can be observed at this time. However, it is expected the development of public policy for the sector, which in the future may make the application of cleaner production models mandatory to the manufacturers. Although this measure is coercive, it is at least an option to change the current model of craft production and to reduce GHG emissions and pollution in general.

The biggest limitation in of this objective is the participation of the public body to commit and to accelerate the process of distributing a Guide to Best Practices, as well as implementing public policy.

#### Specific Objective 4

This objective has to do with strengthening entrepreneurial skills in order to construct a value chain for the brick making industry of Cuenca. The project worked hard on a training program with 23 training events with a participation of approximately 300 brick makers since 2010. The training focused on various topics of the comprehensive management model of the project.

To strengthen the business skills of the brick makers, there were courses offered to the artisans in: marketing strategies, leadership, customer service, trade association, production costs, and tax education. All these issues were addressed to improve the administration of the factories and generate a business concept for the owners. To promote technological change in the brickyards, workshops on the proposed project implementations, their application and results were offered to motivate change on the part of the individual owners. Courses on health, safety, gender, children, and environment, among others were given to improve the working environment of the factories. There was also discussion on sensitive topics such as child labor, work

performed by women, job security, and environmental pollution. The workshops were directed toward various participants, some belonging to already formed associations and other that were independent.

Additionally, the project supported the Group “Los Originales del Austro” for its establishment as an association by obtaining a RUC RISE and other documents. Special attention was given to this group through training to the 24 members that have committed themselves to work with the project and have been participants of most of the proposed improvements. In addition to the training, the project has implemented “consultants”. These are experienced brick manufacturers, with technical training provided by the project that helps to ensure good practices in other brickyards, whether these are known relatives or neighbors. The consultants received monetary compensation for their technical input.

With respect to the results attached to objective 4, a large number of brick makers are being trained to improve their skills, both companies and individuals. However, certain difficulties have arisen that has limited the achievement of even better results. The main limiting fact is low participation in the courses given. Whether due to lack of interest, time, or motivation the expected number of participation was below expectations, even when all courses were offered free of charge and in places close to the brickyards.

#### Specific Objective 5

Specific objective 5 involves South-South knowledge and experiences sharing. Concrete results were obtained by seminars, internships, and national and international fairs to encourage technology transfer. It is important to notice the participation of artisanal brick makers in such events, as they were useful to present the alternatives available to improve their production processes. Also, thanks to this contribution, the project could generate a space for artisans to share their experience and knowledge of production techniques, models of bricks, and other aspects, which were reflected in improvements implemented in the local brickworks. There was only one limitation to this objective which was the lack of resources for internships and seminars. Still, positive results and

experiences were shared with brickmaking industry members not directly involved in these events.

These results are a record of the contribution of the project against problems in the environment, production, working conditions, and quality of life of the brickmaking sector of Cuenca. The best results achieved were those referenced in specific objective 1, technological change and best practices that have improved the productivity of the artisans. Training and knowledge exchanges within specific objectives 4 and 5 strengthened the businesses and production capacities of the brick manufacturers. Further results are expected to be obtained in 2013 in the second phase of the project, as well as the implementation of the project on a national level using Cuenca as a test pilot.

These results were based on the information provided by the executing agency of the project, in addition to process monitoring activities. All this was done in order to know the positive results achieved, as well as the limiting factors involved.

### **3.2 Process Interpretation**

To analyze the impact of the project, in addition to its effects and results, it is important to establish the factors that have enabled or hindered the implementation of the project. As was previously displayed, the EELA project has achieved significant results by proposing a comprehensive management model in the target population. This is due to factors that have facilitated the implementation of the intervention. However, there have been difficulties and challenges in the project implementation process, factors that have delayed or even prevented its progress. The SWOT analysis tool was used in order to clearly demonstrate said factors.

#### **3.2.1 Implementation Evaluation**

To better understand the process followed, a SWOT analysis of the implementation of the EELA project was performed. This tool was chosen to graphically represent the

strengths, weaknesses, opportunities, and threats found. SWOT is used to assess and highlight areas of the project that can maximize their benefit as well as those representing certain risks for implementation. Also based on the SWOT, it can be established the reasons why the project has been limited to achieve certain goals. Below is a table with four internal and external elements that constitute the SWOT analysis.

Graphic 7: SWOT analysis of the implementation of EELA

<b><u>Strengths</u></b> (Internal)	<b><u>Weaknesses</u></b> (Internal)
<ul style="list-style-type: none"> <li>• Support of the public institution (CGA) as local counterpart.</li> <li>• Knowledge of the target population.</li> <li>• Adaptability to local conditions.</li> <li>• Versatility when establishing alternative activities.</li> <li>• Adding consultants to the sector.</li> <li>• Technical and administrative support from the regional office of EELA.</li> <li>• Technical capacity to implement activities in the target population.</li> <li>• Support from proven results in terms of improvements.</li> <li>• Support from complementary public and private institutions.</li> <li>• Commitment Aggrements for an association.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced support team</li> <li>• Low budget</li> <li>• Difficult opening communication and restricted industry leaders</li> <li>• Low technical presence in area of implementation.</li> <li>• Low financial support.</li> <li>• Low drawing power.</li> <li>• Limited commitment and involvement in the project</li> <li>• Participation only upon results.</li> <li>• Distrust and resistance to change</li> <li>• Informality</li> <li>• Limited investment capacity.</li> <li>• Subsistence economy.</li> <li>• Weak associativity based upon previous negative experiences.</li> <li>• Low environmental awareness.</li> </ul>

<b><u>Opportunities</u></b> (External)	<b><u>Threats</u></b> (External)
<ul style="list-style-type: none"> <li>• Homogeneous group</li> <li>• Great needs and solve problems in the sector.</li> <li>• Need for more training</li> <li>• People motivated to learn to improve their craft</li> <li>• Brick high demand in the market.</li> <li>• Low productivity of the brick.</li> </ul>	<ul style="list-style-type: none"> <li>• A large number of brick makers</li> <li>• Debunking misinformation and circulation of the project.</li> <li>• Limited access to credit.</li> <li>• Weak link in the value chain.</li> <li>• Dependence on intermediaries.</li> <li>• Lack of legislation and regulations for the sector.</li> <li>• Risk of eviction of factories by increasing urbanization on the outskirts of the city.</li> </ul>

This analysis offers a potential intervention strategy of leveraging the strengths such as technical expertise, industry knowledge, available resources and the support of other institutions involved. Also, particular emphasis should be placed on encouraging brick sector participation by the executing agency to potentiate the approach and relationship with the target group.

The use of these encountered opportunities is vital. This includes group homogeneity of the artisan brick makers and the need for them to improve their conditions. By taking advantage of these opportunities, they might also have universal application for other brickyards not evaluated by the project. These elements represent success factors to overcome the barrier of distrust and resistance to change, which represents one of the greatest weaknesses for achieving the before mentioned goals of the project. It is important to consider that the activity is of great value given the increasing demand of artisan bricks in the construction sector. This situation represents a great opportunity to encourage technological change and implementing improvements in the production process as it is essential for brick makers improve their processes and increase their production to meet the needs of the market.

Furthermore, considering the weaknesses of the project, many are related to the small project support team. By taking into account the large number of brick kilns in the sector, the technical team should be strengthened in order to improve work development. A more complete and motivated team may improve communication, presence, and participation with the brickmaking industry. In addition, having the support of other institutions related to the theme of the project, it is important to join these efforts in the pursuit of activities to benefit the sector, and if possible, increase the amount of help to make improvements in the brickyards. Other factor highlighted weakness is the idiosyncrasies of brick artisans such as: resistance to change, distrust, fears of risk, and association. These are sensitive points that hinder application of the project on a wide scale, thus it is needed to find a motivational strategy, project approach, and accreditation in the brick sector.

As for the threats, the project should pay special attention to these factors that are critical for the advancement of the intervention. As for the dynamics of the environment, they are very difficult to change, therefore the project should make good use of their ability to adapt to the environment and find alternatives that allow the artisans to accept and benefit from the technology change in a more gradual and positive manner.

The analysis has been developed based on observation activities on the environment and the EELA project population goal. It is hoped that this analysis will serve to provide information to help make project decisions and to be a useful tool to optimize the potentiality of the project and overcome the challenges and risks involved.

### **3.3 Project Impact Measurement**

To measure the impact of the EELA project and the benefits to the brickmaking sector of the city. There were analyzed the effects caused by the intervention, as well as those not considered. Indeed, to directly establish the benefits obtained in the brickyards, and to know the reality of the artisans participating in the project, it was the right opportunity to visualize the impacts generated by the implementations made by the Swiss international

cooperation. Moreover, this analysis is used as a tool for monitoring and evaluation to assess project performance and generate knowledge for future improvement.

### 3.3.1 Methodology

To assess the impact achieved by the EELA in the target population, a quantitative method was used to gather information in the brickyards involved in the project. This is based on surveys designed to understand the perceptions of artisans facing technical and technological improvements proposed by the project. As mentioned before, surveys were used to understand the perceptions to the actions on issues of training and activities to improve their quality of life. In addition, observation activities and field trip was a complementarily qualitative method.

To evaluate the effects of the project on the target population, there were applied surveys to collect the necessary information. First, from a total population of 50 brick kilns in which the project has intervened, or has had any involvement, it was taken a sample to be surveyed on the formula of simple random sampling for finite populations.

$$n = \frac{z^2 * N * p * q}{e^2 (N - 1) + z^2 * p * q}$$

88% Certainty

N=50

z=1,59

e=12%

p= 5%

q=5%

**n=22,9**



Although the results of 23 brickyards, there were interviewed 25 brickyards representing 50% of factories analyzed. Subsequently, in order to obtain information as to the effects caused by the EELA in each of the aspects considered in the technological change, the sample was stratified into five groups according to the degree of participation in the improvements. The surveys were conducted according to the following implementations:

1. Mixer
2. Improvements in baking (modification in laying bricks)
3. Heating improvements (using fan)
4. Full Enhancement (mixer, bricklaying modifications, and fan use)
5. No implementation

The surveys conducted (Appendix 1) consist of the following parts:

- A. General information on the brickyard
- B. List of implementations
- C. EELA Project Implementations
  - a. Technological change
    1. Production process
      - 1.1 Mixing machine
    2. Burning process
      - 2.1 Baking
      - 2.2 Heated
  - b. Training
  - c. Strengthening of Production Capacity
- D. Social effects
- E. Environmental effects
- F. Project Rating
- G. Destination of savings and time obtained from the improvements
- H. Technological and Production needs (extras)
- I. No implementation

To evaluate the information there were applied these surveys to different groups, varying only in section “C. a.,” technological change, depending on the type of implementation. However, for the general themes A. B. C. D. E. F. G. H., general surveys were conducted in order to understand the perceptions of the intervention population in these areas. Furthermore, to compare the benefits of a group that implemented all improvements to a group that has not made major changes section I was used, “no implementation.” The surveys were designed to establish the effects generated by the EELA project in the field.

After the gathering, tabulation, and analysis of the data, the following results were presented in technological, economic productivity, social, and environmental aspects.

### **3.3.2 Caused Effects**

As general information, the surveys were conducted at 25 brickyards in the parishes of Balzay, Chiquintad, San Sebastián and Sinincay. From the artisans surveyed, 80% are members of an association, most from los Originales del Austro and the rest from the association Galafaz; the remaining 20% are independent brick makers. In addition, it was discovered that the vast majority of brick makers adhere to a low education level, 80% having only completed primary education and the remaining 20% not having completed any schooling at all. On the other hand, 88% own their brickyards; the other yards are either inherited or shared. Also, 56% are dedicated purely to brickmaking and 44% perform additional jobs in order to supplement their income. Also, it was found that women are heavily involved in productive activities virtually equal to the man. Of the respondents who were owners of their brickyards, 15 were men and 10 were women. The contribution of youth and children in the brickyards could also be observed.

The following results are the perceived effects of technology.

### **3.3.2.1 Technological Effects**

Based on data and opinions collected from surveys, the following are the benefits obtained through technological change proposed by the EELA project. Concerning technological change, it was considered the improvements in the production process. First, the mixer machine, which was designed, built, and promoted by the EELA project is presented.

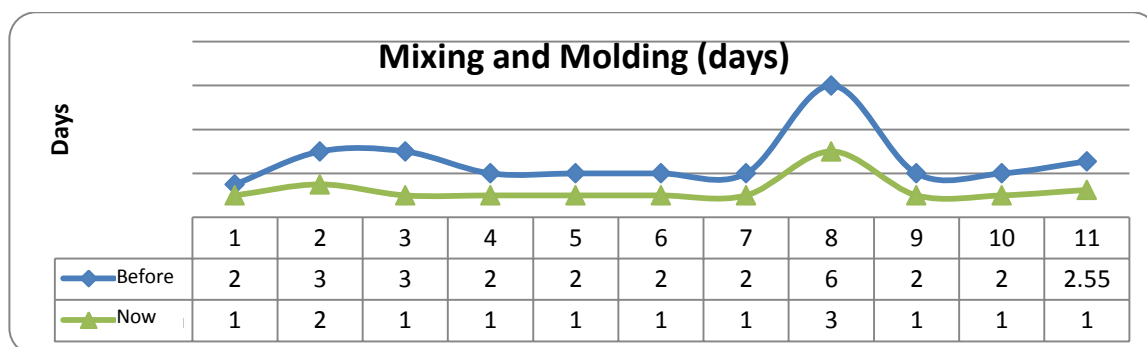
#### **Mixing Machine**

From the artisans surveyed, 50% have their own mixers. Each artisan has invested an average of \$2,740.00 U.S. dollars, of this percentage, 60% has been funded with loans and 40% with equity capital from the artisans themselves. The other 30% that does not own the machine have used the test blender provided by the project and the other 20% rent the machine to their neighbors or acquaintances.

Within the production process, it was performed a before and after comparison of the use of the mixer, the following results were obtained:

Regarding burnings performed (firings of the kiln) annually, a slight increase from 11% of fires per year with the use of a blender was obtained; the time value shows a reduction in the overall production process. The overall number of brick units obtained showed a small increase of 0.53%, showing that the use of the mixer did not change the number of units produced. This could be due to the capacity of the brick factories themselves, productive space, or staff working. Indeed, there was no increase in production amount observed. However, time spent for mixing and molding in days was reduced by 51%, in effect, half the time or an average reduction of 2.55 days to 1 day.

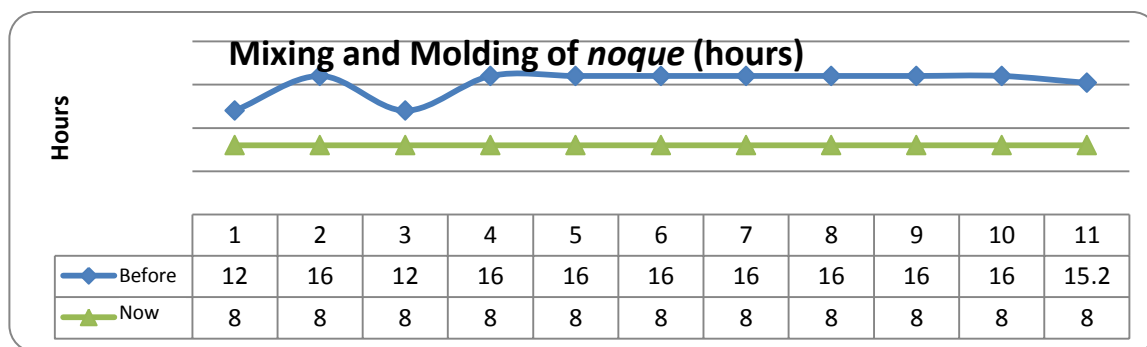
Graphic 8: Mixing and molding time in days



Tabulation survey. 1. Production Process 1.1. Blender machine. 2012

To demonstrate more clearly the change, there was an average savings of 33 hours in the total production process. There was a 47% reduction in the time used to beat the “*noque*” (mixing measure), compared to the use of animals.

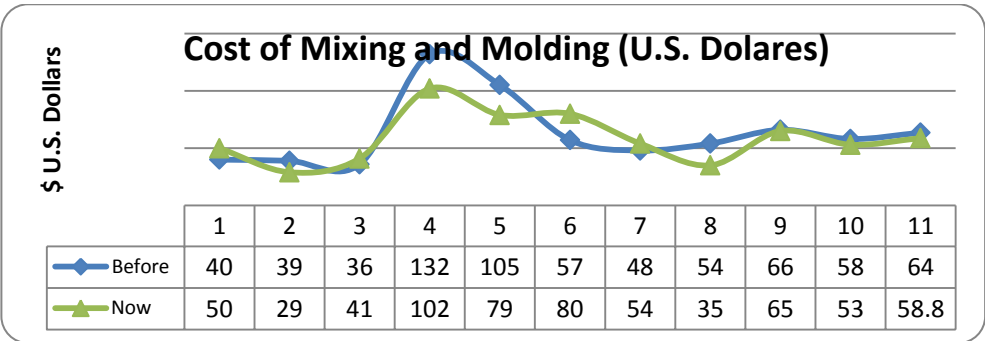
Graphic 9: Mixing and molding of *noque* in hours



Tabulación encuesta. 1. Proceso Productivo 1.1. Maquina batidora. 2012

In terms of cost reduction, there been a minimal variation compared to the previous mixing technique; there was a savings of 7% with an average of \$ 4.7 per burn.

Graphic 10: Cost of Mixing and molding

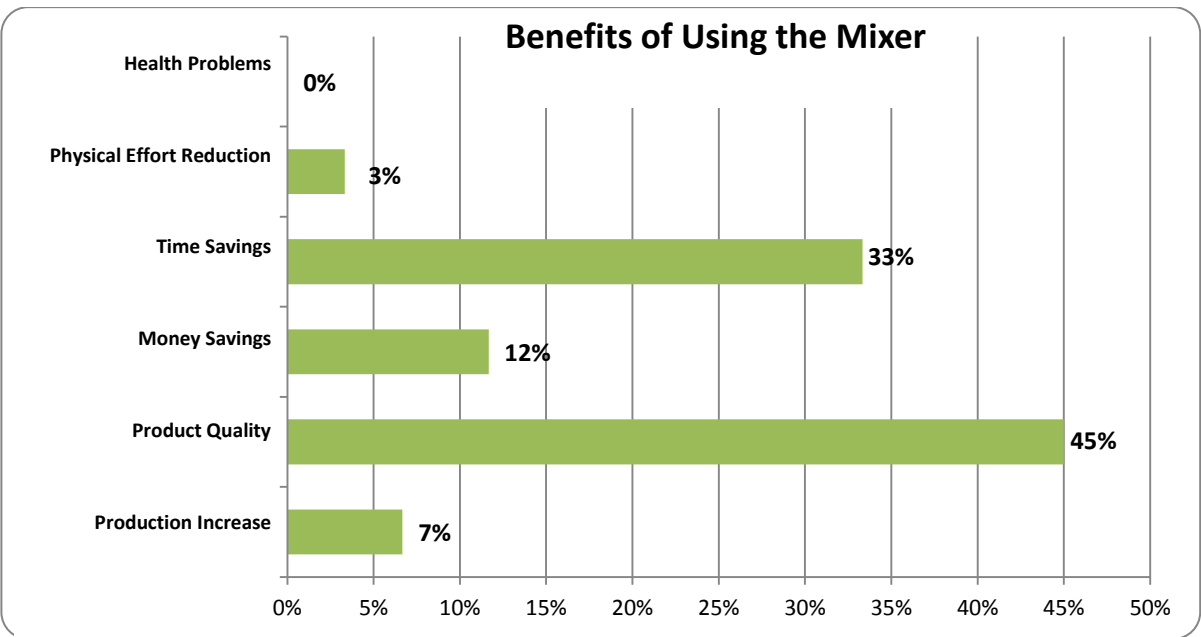


Tabulación encuesta. 1. Proceso Productivo 1.1. Maquina batidora. 2012

These are the effects of technological change in the production of brickyard activity.

Subsequently, we present the perceptions of artisans regarding various aspects of the mixer machine:

Graphic 10: Key benefits of using the mixer



Tabulation survey. 1. Production Process 1.1. Blender machine. 2012

As shown in the graph, the use of the mixer improved product quality, reduced time, and saved money to a lesser degree. It was also hoped that physical effort would be reduced

by making use of the mixing machine, compared to using animals, but it is very poorly recognized by craftsmen.

On the subject of increased production, only 7% observed a larger number of units produced, 70% of respondents felt that the production had increased slightly, and the remaining 30% saw no increase at all.

Moreover, improvements in certain parts of the production process molding showed positive views. For example, 80% of respondents considered the brick batter to be improved. And in molding, 90% believe it has improved significantly; this is due to a much finer mixture produced by the machine

Regarding the quality of the mixture from the machine, 50% considered it very good and 60% of artisans said that it was very good quality. Furthermore, 80% said that brick quality was the most significant improvement, followed by 20% saying that the most significant improvement was an increase in durability. Regarding the price of the machine, 50% answered saying that it was unaffordable and 50% as a means affordable; this is due to the reduced economic capacity of the brick makers as well as the difficulty in acquiring the machine itself.

Nevertheless, 100% of the respondents admitted that they had been motivated by the EELA project to use the machine, whether rented or purchased. Furthermore, 60% of them considered the degree of difficulty of operating the machine was easy, followed by 20% saying it had a medium difficulty level, and 20% stating it was difficult.

In conclusion, the use of a machine mixer, and its adoption in the production process, has been very useful to facilitate the batter and molded bricks; improving the quality of the mix and clearly the final product. Also, customers (mainly in direct sales) recognize the bricks quality and durability in a differentiated assessment of products produced by machine.

The opinion of bricks produced by the mixing machine is that it is a facilitating tool that saves time and produces a better quality product. Many consider that its use enables significant savings in time, but hardly any have seen a decrease in production costs. Furthermore, although the use of the mixer machine can increase the number of units produced, the main limitation is the physical space in the brickyards themselves. This is why the artisans do not perceive an increase in production.

It is worth mentioning that although some brick manufacturers have purchased the machine, many owners recognize that maintaining it is expensive. Most do not have the machine saying that the biggest constraint for implementation is the lack of capital to invest in it. They also consider it difficult to access credit and have a reluctance to invest in the machine due to a perceived inability to repay the loan, given their low incomes. In short, all of the artisans recognize the usefulness of the machine, as well as the benefits it brings, but for many the amount of investment is too high of a risk.

#### Baking and Heating Enhancements

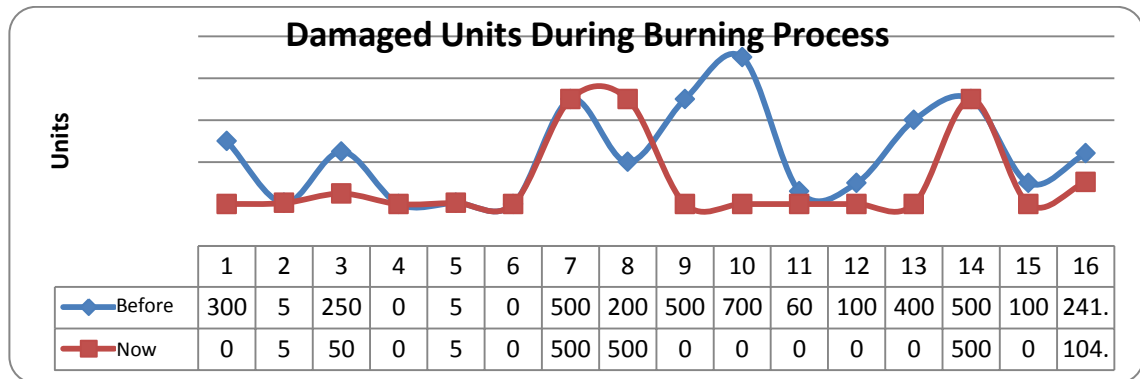
Within the technological change process, surveys were conducted on improvements in baking and heating. 100% of respondents were open to improvements in efficiency of their ovens. The greatest changes mentioned were: improvements in baking (33%), followed by improvements in heating (29%) and the use of a fan (17%). The actual structure of the oven was hardly noted by the artisans.

The improvements already implemented were: the redistribution of brick when placed in the oven and the use of a fan when heating the oven; with these improvements implemented, the following results were obtained:

There was a minimal variation in annual burnings (firings of the kiln) with an increase of only 5.3%. This was most likely due to limited space and production capacity. Also, the improvements in the kiln did not increase production. However, the important thing to

note is a 57% reduction in the number of bricks damaged or poorly heated, down from 241 to 104 damaged units; this also contributes to a reduction in production cost.

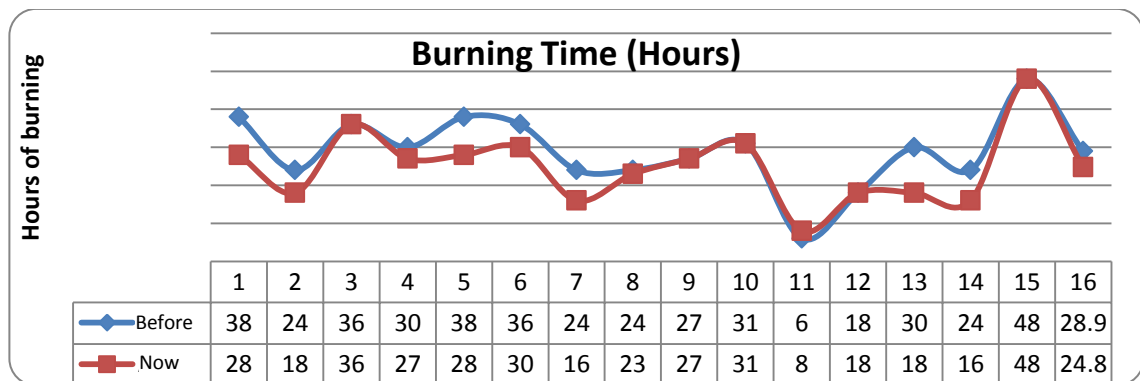
Graphic 11: Damaged Units



Tabulation survey, 2. Burning process, 2.1. Baking, 2.2. Heating. 2012

There was a decrease of 14% of time spent heating in the oven just from the techniques implemented in the oven; this equals an average savings of 4 hours.

Graphic 12: Burning Time

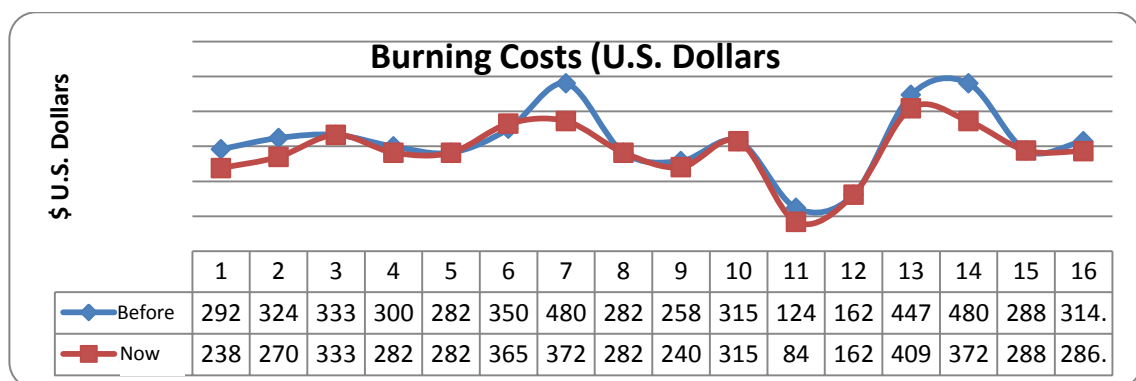


Tabulation survey, 2. Burning process, 2.1. Baking, 2.2. Heating. 2012

In burning costs, there is a saving of 9%; this is mainly due to reduced fuel usage. The average savings is \$ 28 per burning.



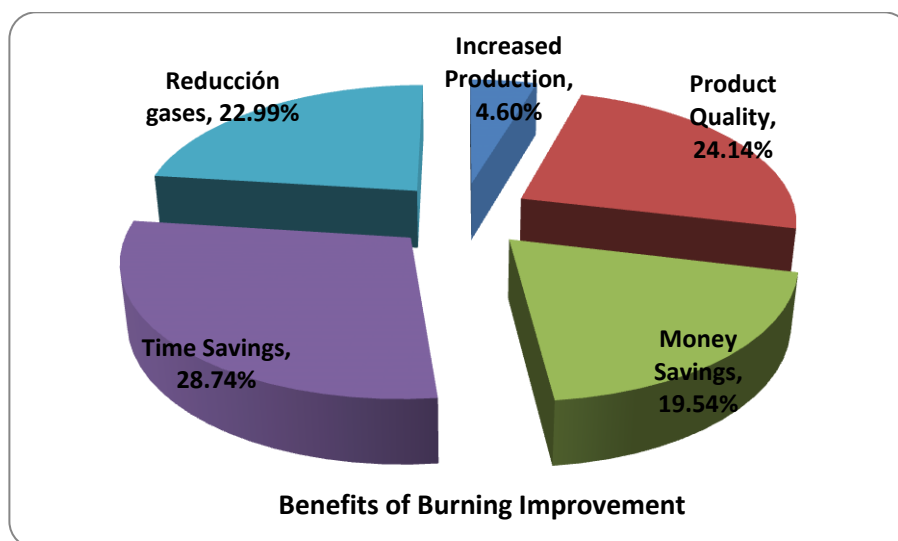
Graphic 13: Burning Costs



Tabulation survey, 2. Burning process, 2.1. Baking, 2.2. Heating. 2012

The following is a graphical representation of the perceptions of artisans regarding various aspects of improvements:

Graphic 14: Most important benefits of burning improvement



Tabulation survey, 2. Burning process, 2.1. Baking, 2.2. Heating. 2012

With technological changes made in the kilns, through the implementation of best practices, the most important benefit is time savings, followed by an improvement in product quality, and reducing gases.

As for the cost, 73% of improvements are considered affordable as they require no further investment. On the subject of increased production, 73% stated that there was no increased production. With regard to the difficulty of applying these techniques, 61% of the total considered the improved placement of the bricks for better heat distribution was easy. 90% of the total felt that fan use to optimize burning was easy to use.

On the other hand, only 86% said that the EELA project was what motivated them to implement improvements, 14% stated that it was a relative or acquaintance. This is an indicator of the need for increased training in the sector on increased communication between the various brick manufacturers.

To popularize these technical improvements that were initially provided by the project technicians, the EELA aims to strengthen the communication of baking and heating techniques between consultants and brick makers, hence promoting autonomy within the sector

It should be noted also that the cost of applying these techniques is very affordable. Also another tangible benefit is the reduction of burning times, the cost savings of reducing the use of fuel and the decrease of damaged units. With these techniques, the bricks are better quality, more durable, and the appearance is improved. Thanks to these features the brick manufacturers have acquired an advantage over the competition.

Additionally, one of the most crucial points for the project is that decreased burning times means a decrease in GHG emissions, and this is the main objective of the project. Despite having obtained a slight reduction, it still means a change to the initial situation where pollution from the long hours of burning directly impacted air quality and quality of life of those living near the factories. Similarly, saving a small portion of the fuel used for burning helps reduce deforestation, since firewood ordinarily is the fuel used by the artisans.

In general, these improvements are a feasible alternative for replication in other brickyards given its low cost, its facility of use, and immediate benefits for both the economy of artisans as well as the help to mitigate climate change.

The data shown above are the results with respect to technological change applied by artisans in brick factories. Below is a comparison between the manufacturers who have implemented all changes in the production process with those who have no changes implemented at all.

Table 1: Complete technological change vs. No technological change

Comparison Table (Averages)	
Brickyard with technological change	Brickyard without technological change
Total times of mixing and molding	
1 day	6 days
Mixing and molding times per <i>noque</i>	
8 hours	15 hours
Burning times	
27 hours	43 hours
Mixing costs	
\$59.20	\$60.20
Burning costs	
\$319.60	\$281.00

Tabulation survey. C. EELA project implementations. I. No implementation. 2012

One can clearly see the difference in time spent in different parts of the production process of the brick makers, giving advantage to those brickyards that carried out all the implementations. Regarding costs, small variations exist, with some advantage for those who implemented the changes.

Concerning the mixture, 60% those who use the machine classified their mixture as very good, while 60% who didn't use the machine considered their mixture as regular.

As previously demonstrated, saving time and improving product quality benefits result in the need to support technological change and demonstrate their utility.

For those who were consulted but did not implement major changes, they mentioned that one of the major limitations was the lack of opportunity (38%) to implement improvements in the brick, and the lack of capital (25%), information (25%), and interest (13%) to engage in the EELA project. However, 100% admit having heard of some of the activities undertaken by the project in the sector and would be interested in testing these implementations in their factories. 33% would like to use the mixer, another 33% improve efficiency in their ovens, 17% participate in training courses, and 17% install driers.

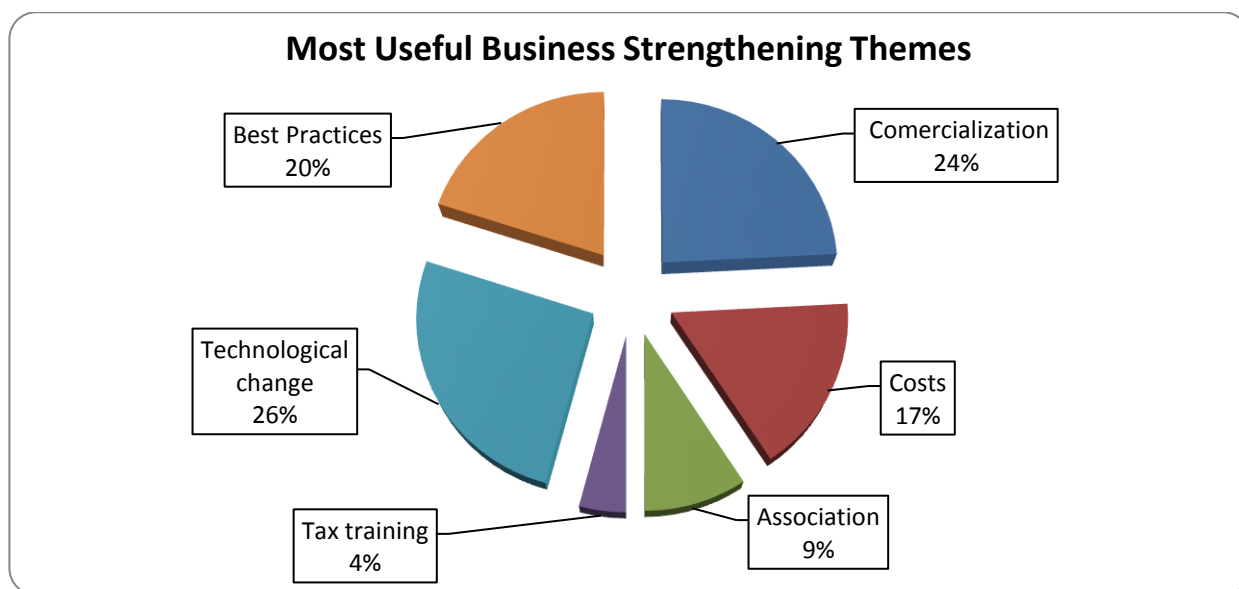
In analyzing technological change and its results, we can recognize some effects that directly impact the economy and productivity of the brick makers as they improve their times and product quality. Overall, thanks to technology implementations and expertise, changes were generated to traditional production patterns and productive technology alternatives.

### **3.3.2.2 Economy and Production**

Concerning economic and production practices, the project has supported training for personal and professional development through associativity, standardization, product innovation, marketing, formalization, and access to credit. Thanks to these contributions, the project tried to create better conditions to improve the business, and quality of life of the artisans. The effects generated in these areas, according to the insights gathered from the brick makers, are presented below:

Regarding training provided by the project, the brick makers recognized the following as “the most useful:”

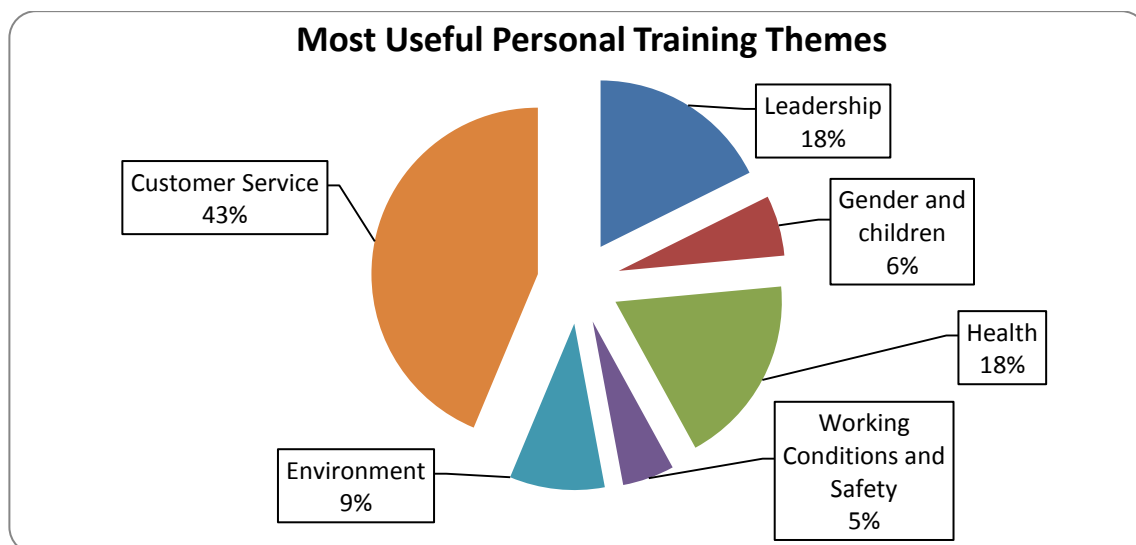
Graphic 15: Business training



Tabulation survey. b. Training. 2012

As shown, the most useful skills happen to be on technological change, marketing, and best practice. These are sensitive issues to the brick makers and are especially topics that allow them to solve the problems in production and sales both recognized as bottlenecks recognized by the majority of sector.

Graphic 16: Training in personal abilities

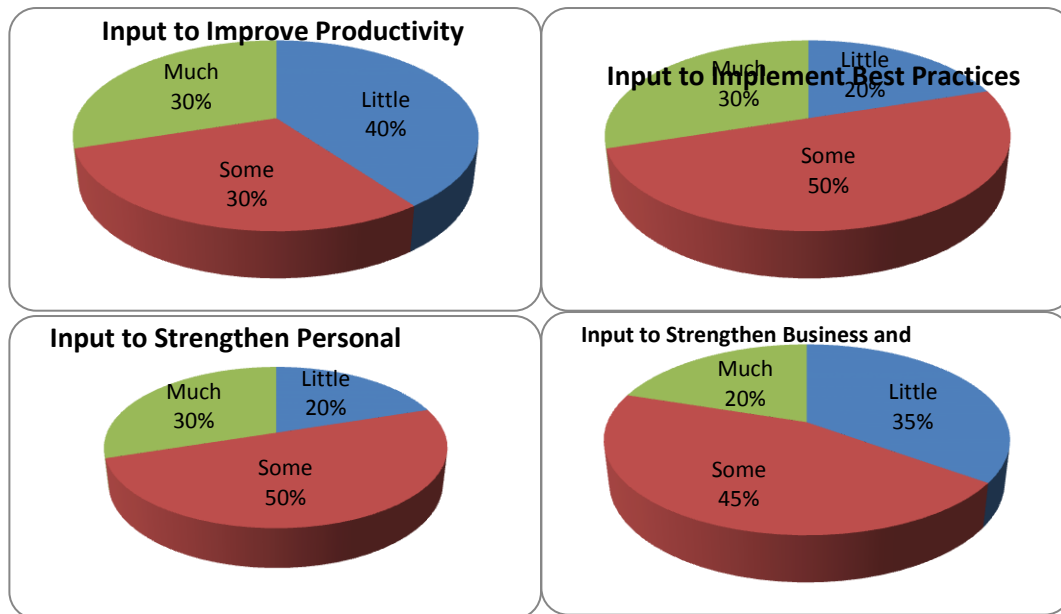


Tabulation survey. b. Training. 2012

In this type of training, there is a clear preference for customer service to improve marketing, followed by the theme of leadership and then health.

Additionally, questions were asked about the results they have had from the training in their business and everyday life, the views were:

Graphic 17: Contribution from training



Tabulation survey. b. Training. 2012

On the issue of exchange trips, 75% of respondents participated in a trip outside the province to observe alternative methods and technology for brick production. Within this percentage, 10% had the opportunity to participate in tours abroad. However, the majority (60%) feel that the training courses represent the biggest motivating factor for implementing improvements, compared to exchange trips (40%).

In addition to the above, the greatest advantage of the training for artisans is the knowledge acquired. It has allowed them to improve their negotiating skills both with suppliers and with customers. It also has allowed them to better understand and manage

their income and expenses to better manage their factories and production. Also thanks to the courses, they recognize that they have more openness to appraise and sell their products, demanding a suitable price according to quality. Those brick makers who have requested to continue with training courses recommended as subjects: sales, marketing, and best practices simply because these aspects still represent weaknesses in the sector.

Moreover, on the issue of supporting and strengthening productive capacities, the project promoted the formalization process in the sector. With this contribution, 80% of respondents obtained qualification as a business and obtained a RUC / RISE. Of this group, 67% think that the biggest advantage of formalization has been working with more freedom. Yet, despite training and counseling, 95% of the total still have no record or accounting of their expenses or income, making it difficult to control their production costs.

Also, in order for artisans to have the opportunity to apply for improvements, the project sought funding sources and institutions that provide credit to the sector. Despite this, 75% said it had not been advised to obtain credit, and only 25% did. Those who applied for financing invested in their factory's productivity, raw material purchasing, or blender machine (two cases). Also, even though there is great hesitation in acquiring debt, 90% of respondents said they would apply for a loan to improve their business if the opportunity arose.

Moreover, a sensitive point for the project is the issue of associativity. In this aspect, the project worked to achieve a trade association, despite opposition. With this type of association, 65% recognized advantages in achieving direct sales, plus increased contact with other brick producers. They are aware of the positive results and 65% of respondents would be willing to associate in marketing, with the option of implementing a storage facility. By contrast, 35% are against the idea, mainly because of unsuccessful previous experiences, lack of capital, and the lack of organization of the sector (labor individualistic trend). Those who are against associating consider the limiting factors as: unpaid association fees (42%), difference in products (32%), and distrust (26%).

Indeed, the difference in product has been an area where the project has sought to contribute. According to the brick makers, the advantages of standardization are: the same quality of product, increased orders, and a better chance of association.

On the issue of product innovation, 74% indicated that they would stay with the same product (mainly panelón and flooring) and 26% expanded with some kind of product. However, within this percentage only 21% indicated that the project had contributed to this increase, with the trips, exhibitions, and exchange of experiences.

Regarding commercialization, most keep the same distribution channel, in this case an intermediary and the same number of orders. However, according to respondents and a comparison of before and now, 29% also began to make direct sales, increasing revenue as the direct sale price represents an additional value. On average, the price is 19.6 cents for intermediaries for panelón bricks (#1 seller), while direct sales earn 24 cents per unit. In addition it was found that the income received by brick makers is essentially for subsistence. In effect, they have a minimal profit, investing it mostly in the same brickyard, in household expenses and in some cases the payment of debts. Also the presence of the project in general has no real economic benefits, despite a slight savings generated in the production process.

We can say that the project has sought to strengthen economic and productive capacities of artisan bricks through methods such as formalization, associativity, standardization, product innovation, and marketing improvements. Indeed, the brick makers are aware of the advantages and benefits that these tools represent for their business. For example, some note that by having a higher quality product through the use of a mixing machine, the customer pays the price demanded without complaint and that in some cases it is preferred over other manufacturers.

However, little has changed when it comes to marketing. The businesses maintain the same distribution channels and are not looking for ways to approach the direct sales



market, nor do they really have the means to do so. That is, the project has not generated significant influence in this area. While acknowledging the successes that the project has had, more work is needed in this area as it represents the medium in which the artisan brick could get more income to improve their living conditions, as well as represent an incentive to participate in the project.

### **3.3.2.3 Social**

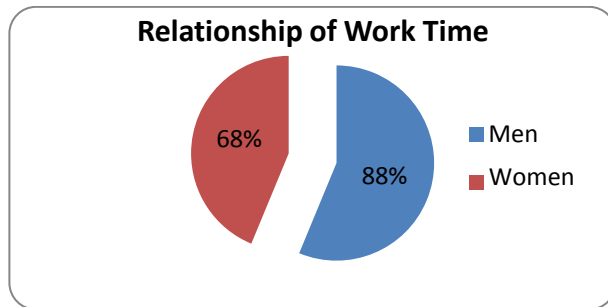
On the social side, the project has sought to generate some kind of change to poor living condition. All this is based on the improvements proposed by technological change, productivity improvements, and business development, in addition to the training and awareness talks on sensitive issues for the sector such as health, gender equality, child labor, and the environment.

For example, in the area of health, the project supported access to health insurance and health checks (as a precaution measure) to be this activity physically demanding and having long-term implications for gas extraction. As a result of the survey, it was found that only 30% of the brick makers have Medical insurance. In addition, according to the respondents, there has been no motivation of the project to acquire insurance. Similarly, only 35% have received checkups, and the amount feels that the project has not provided enough reason to acquire one. Indeed, 85% admit having some kind of pain, mainly in the joints and respiratory tract. However, 65% believe that the implementations have not reduced the damages. Generally, the artisans (85%) acknowledged that little has been contributed by the project concerning health issues.

On the issue of gender equality, the project has sought to create better opportunities for women through awareness workshops, since they bear a lot of work. Through surveys, it was discovered that men and women work in the brickyard an average of 5-7 hours per day, respectively. From the data obtained it was found that both men and women perform different activities in the production process: mixing, forming, burning, loading

and shipping. It is recognized that activities such as churning and burning are developed primarily by men, molding by women, and shipment and dispatch are developed jointly.

Graphic 18: Relationship of working time between men and women



Tabulation survey. D. Social Effects. 2012

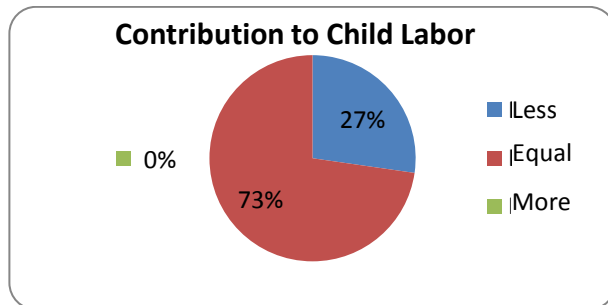
Moreover, corroborating the extra workload for women, it was found that 20% of men do an additional activity (temporary jobs, transportation, agriculture, livestock) while 80% of women are concerned with activities at home.

Also, when talking about gender equality and decision making, it was considered important to talk about money management. Results showed that there is some consensus in the administration, both at home and in the brickyard. At home there is a ratio of 49% men and 51% women in decision-making on money management, but there is an inverse relationship in the business, 51% men to 49% women. This is according to the brick makers, but the woman's salary currently remains unknown. In other words, money made in the business is primarily for family use, and both men and women administer it. In general, there is still a work overload for women, and the perception on this issue by the brick makers is that there has not been greater contribution of the project to improve these conditions.

Furthermore, the issue of child labor in the brickyards is a situation that continues, but currently to a much lesser extent compared to previous years, since the vast majority of school-age children attend school or college. The project focused on awareness by parents to encourage attendance and decrease child labor. According to the survey

results, the majority believe that child labor has stayed the same and some say it has decreased.

Graphic 19: Child labor in brickyards



Tabulation survey. D. Social Effects. 2012

Generally, child labor in the brickyards since the implementation of the project has changed very little. Most children only work a few hours a week, in activities like carrying and molding bricks. Furthermore, according to respondents, children only work according to their availability and when they are not in classes. 100% of parents say their children are not missing any school days to work, both before the project and now. Indeed, the majority believe nothing has changed and 82% believe that the project has contributed little in reducing child labor.

One can conclude that health, gender equality, and children are fundamental pillars for the social welfare of the brick makers. However, for the people of these factors it is not a priority. Therefore, the project should work harder to change the current conditions and demonstrate the relevance of a change in social conditions in the sector. As noted, most artisans did not notice any major changes in these areas and the conditions have not changed significantly according to them with the presence of the project.

#### **3.3.2.4 Environment**

The environmental issue is the priority of the project. Through a comprehensive model, energy efficiency and environmental issues are sought to decrease emissions and deforestation (wood is the main fuel used in the ovens) in the brickmaking sector of

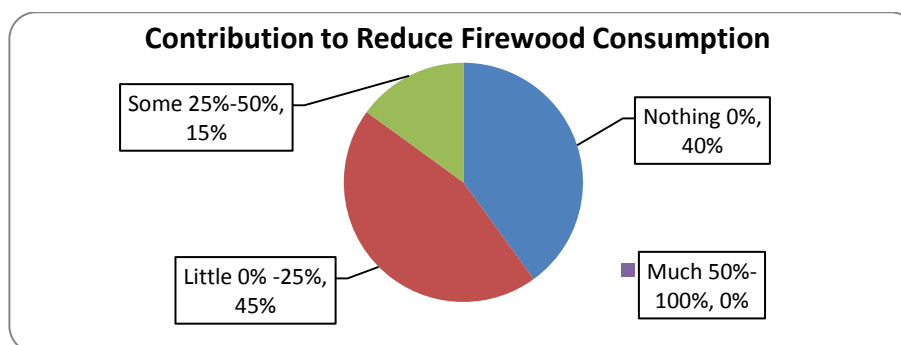
Cuenca. As a first consideration, and to assess the knowledge of the artisans, they were consulted about their perceptions on climate change and its effect. Given this, it is observed that the brick makers did not have much knowledge about this phenomenon. However, 90% think the temporal variation directly affects them. On one hand, the results of climate change causes impairment to health, and on the other hand, changes in climate which affects production. For example, in the case of extended cold periods, the product does not dry. These changes as a current problem are visible.

Subsequently, questions were asked about what they could do to help alleviate this problem and reduce pollution. Related to this, 35% believe that they may contribute to decreasing fuel consumption, 25% decreasing gas and smoke during burning, 20% decreasing burning times, and finally 25% think that they cannot contribute in any way to the environment. Thanks to the project, there are some ideas to mitigate the phenomenon somehow.

Additionally, and to confirm the existing problems, the artisans were consulted on certain sensitive issues. For example, 90% from respondents believe that artisans have no problems with the emissions. In effect only 5% say they have had complaints from neighbors and the other 5% have been controlled by the city. Instead, they recognized fuel wood scarcity and clay for production as major problems. In general, most are aware of the importance of reducing pollution, but do not consider it a priority.

Also, within the environmental effects of the project, we talk about reducing the use of resources in the brickyard business. According to respondents, the majority (45%) believes that the project's contribution reduced firewood consumption.

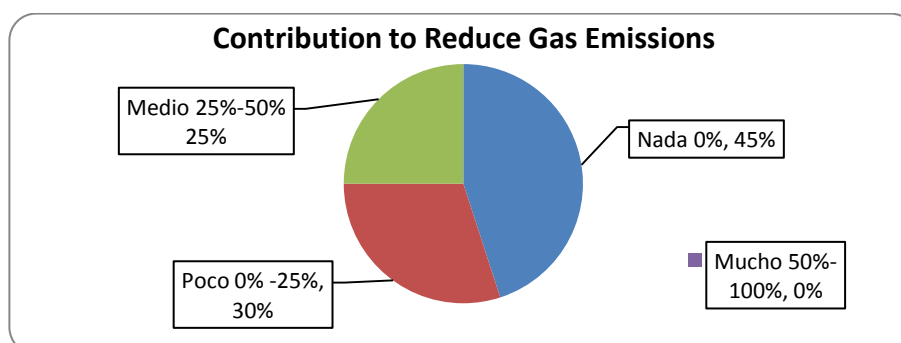
Graphic 20: Reduction of firewood consumption



Tabulation survey. E. Environmental Effects. 2012

In addition, 100% admitted not having tested or having used alternative fuels, highlighting the need to reduce the consumption of fuel as much as possible. Also, 30% of respondents recognized the contribution of the project as having slightly reduced gas emissions, 25% have seen some reduction, and 45% have seen no reduction at all.

Graphic 21: Reduction in gas emissions



Tabulation survey. E. Environmental Effects. 2012

It can be seen that despite the awareness demonstrated by workshops on climate change, the brick industry does not see pollution reduction as a priority. Indeed, they do consider emissions of gases as harmful, but their priority is to improve their production and income to meet the needs of the business, home, etc. The motivation to participate in the project is mainly to improve their income; the protection of the environment for this sector is secondary. Only people who have problems with their neighbors or direct control of public entities are more aware of the need to reduce emissions. However, the interests of other actors is primarily on reducing costs and production times to increase

the amount of money that comes into their homes, given the vulnerability and precarious living conditions of the sector.

### **3.3.3 Effects Not Considered**

Previously presented were the effects of the implementation from the EELA in artisanal brickyards. This analysis was based on the areas covered by the project; technological, economic-productive, social, and environmental. However, in the course of the study, there were presented additional effects in the target population that were not initially considered important and yet generate data for this analysis.

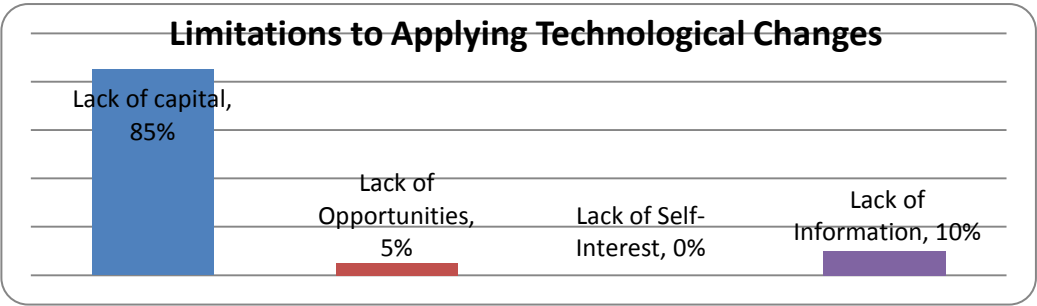
#### **3.3.3.1 Culture**

One effect refers to the cultural aspects of the target population and their perceptions facing technological change. Through the survey it was found that 55% of brick makers considered technological change useful when applied to the production processes, while 45% considered it necessary (0% considered it useless). People who experienced technological change accept its utility for the production process. In addition, people who perceive it as necessary, realize the importance of technological change to speed production and improve the final product in order to be more competitive in the market and increase their profits on bricks sell.

Additionally, 60% considered it easy to adapt to technological changes once tested, 15% considering it slightly difficulty and 25% considering it difficult. On the other hand, as to the factors that were necessary to implement the changes, 35% of the brick makers felt that it was only necessary to observe the improvements to implement them, 35% felt that it was necessary to observe and personally test them before applying them, and lastly, 30% considered it necessary to observe, test, and see results before changing anything.

On the other hand, 85% of respondents agree that lack of capital is the main constraint to implement technological changes in brickmaking; followed by 10% due to lack of information and 5% due to lack of opportunity.

Graphic 22: Limitations to technological change



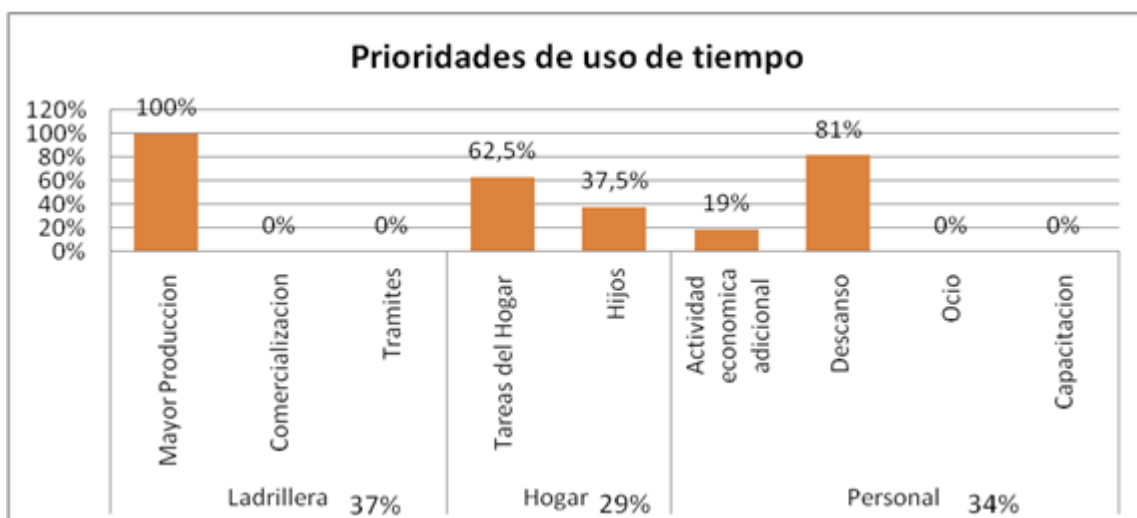
Tabulation survey. E. Social Effects. 2012

There is another important contribution to the sector by the project. By demonstrating the ability to improve the production process with alternative technologies and best practices, the project has promoted a change of attitude and perceptions in the artisans. Today, they have an alternative to the rudimentary production model used throughout the years. Indeed, they are now aware that they have additional tools and facilitators to incorporate in the traditional production. This has positive effects now that the brickmaking sector, an area previously ignored, has support to solve their problems.

3.3.3.2 Destination of Savings

A factor not considered is the fate and distribution of the money saved and time saved with the improvements implemented by the project. After analyzing the data, it showed that on average, with the improvements implemented, the time saved in the burning process was approximately 19 hours. Of those 19 hours, 37% dedicated the extra time to their business. Within that 37%, 100% was dedicated to production. The additional 34% was spent on personal matters, with the additional 81% and 19% to some additional activity. Finally, the remaining 29% of the time saved was spent at home, 37% with children and 63% to household chores.

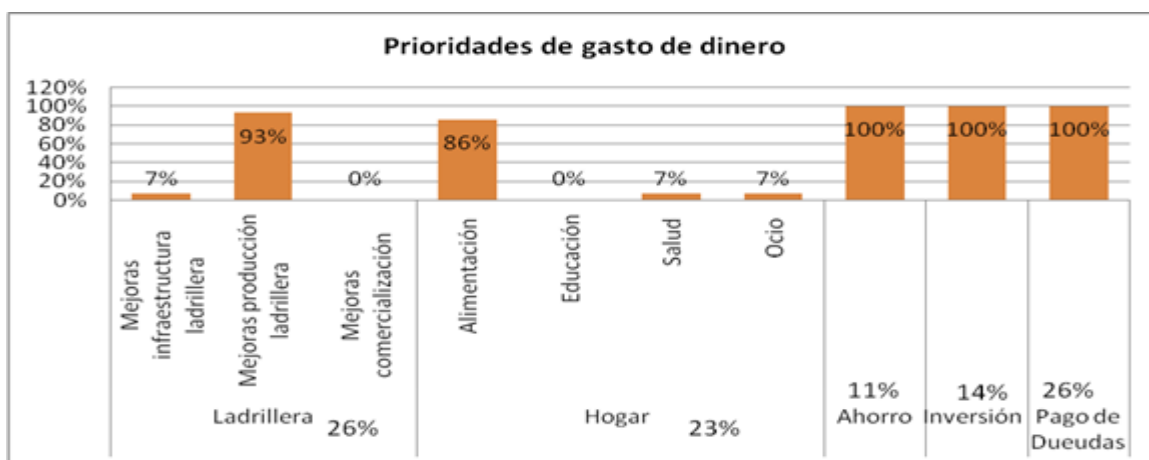
Graphic 23: Distribution and priorities for the use of time saved



Tabulation survey. G. Destination of Savings and Time. 2012

Moreover, on the issue of money saved, on average it was \$23.50 from the changes. Of these savings, priority 1 and 2 are the payment of debts by 26% and investment in the business by another 26%. As production costs, 93% invested in production improvement and the remaining 7% on infrastructure improvements. The third priority was the home to which 23% saw this as a priority with: 86% for food, 7% for leisure, and 7% on health. 14% invested their money as the fourth priority, and the last option was savings with 11% doing this.

Graphic 24: Distribution and priorities for the use of the money saved



Tabulation survey. G. Destination of Savings and Time. 2012



Through this analysis, it was possible to observe graphically the destination of savings from improvements promoted by the project. Despite being small amounts of savings, the money is useful either for the business itself or for home. Furthermore, a comparison of values of time and money savings between the businesses that implemented all proposed changes and all businesses surveyed reveals the following:

Table 2: Savings by the brick manufactures with all changes made vs. total brick manufacturers

Comparison Table (averages)	
Brick manufacturers with all changes	Total brick manufacturers
Time savings	
33 hours	19 hours
Money saved	
\$35.30 dollars	\$23.50 dollars

Tabulation survey. G. Destination of Savings and Time. 2012

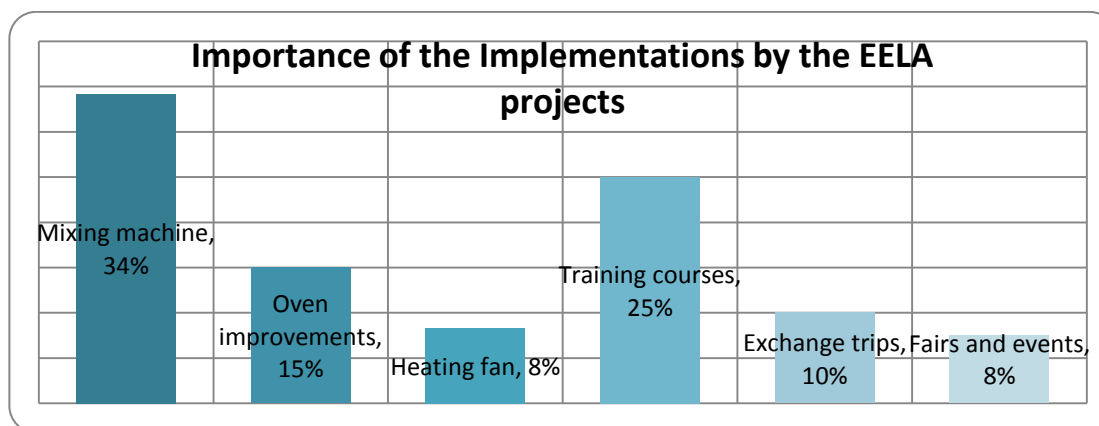
By comparing the differences, it can be observed the savings obtained by implementing all the technological changes proposed by EELA. Therefore, it is expected that with the expansion of technological change and the full adoption of the integrated management model applied by EELA, the amount of savings in production will increase and improve the lives of artisans in the industry.

### 3.3.4 Project Rating

To assess the effects and impacts of the EELA, the target population was consulted at the beginning and at the end of the survey. This was done in an effort to evaluate the project based on the perceptions of artisans against the changes. Generally, they referred to the project as a beneficial intervention that generated improvements in the sector. They were also consulted about the project's most important contribution to the sector, and artisans selected the blender machine as most relevant contribution with 34% of the

opinions, 25% mentioned the training courses as most important, and 15% said the baking improvements.

Graphic 25: Importance of the implementations by the EELA project



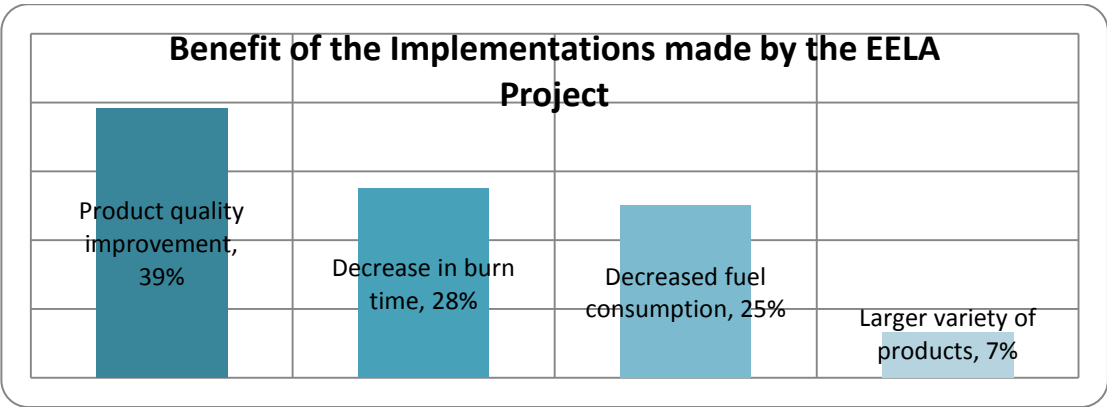
Tabulation survey. F. Project Rating. 2012

Most of the reviews were positive for the mixer machine because it provided consistent work and improved product quality. In fact, some artisans expressed that if they would be able, they would invest money in the blender machine, due to the benefits that they observed. Concerning the mixer, some mentioned that it saved some time and money, and others said they do not believe that there is any significant gain by using it except that the work is easier to perform. Indeed, the blender is considered the most significant technological change to the sector, either for those who have purchased one or those who have tested it.

Other reviews highlight the usefulness of the training, as it has been helpful to learn and exchange experiences and practices. The training has also served to sensitize the industry on important issues. They also recognize that the activities provided by the project have generated a change in the mentality of the brick makers. Now, they feel more empowered and more in control of their business and their income. Positively, 90% of respondents feel more capable thanks to the project activities.

Additionally, it was asked about the most valuable benefit generated for brick production. The first opinion was the improvement of the quality of the product with at 39%. 28% recognized the decreased burning times, 24% mentioned decreased fuel consumption, and 7% product innovation.

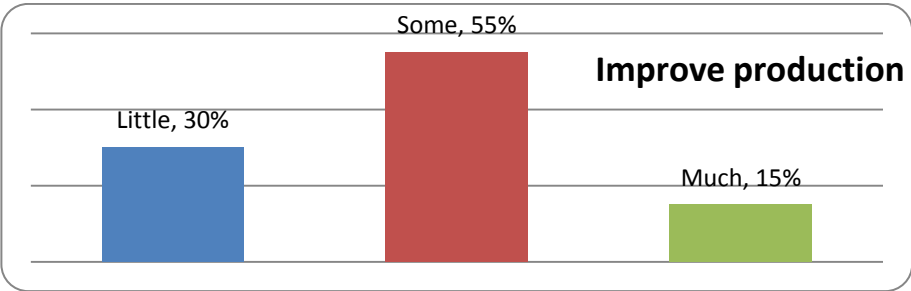
Graphic 26: Benefit of the implementations made by the EELA project



Tabulation survey. F. Project Rating. 2012

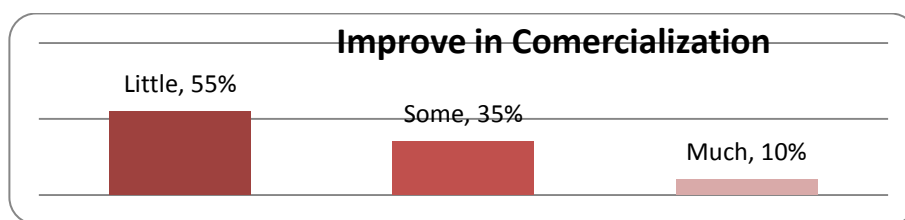
Also, in order to evaluate the intervention in general, artisans were consulted on the contribution made by the project to solve the various problems of the sector; the various responses returned the following results:

Graphic 27: EELA contribution to improve production mode



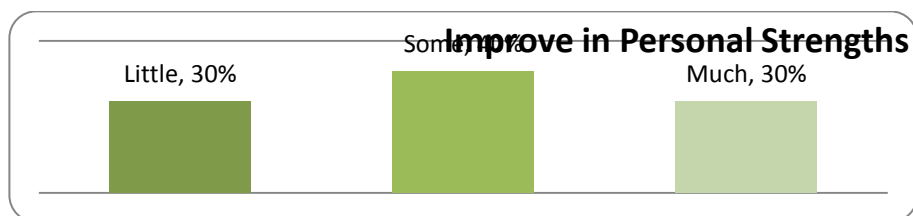
Tabulation survey. F. Project Rating. 2012

Graphic 28: EELA contribution to improve business and marketing



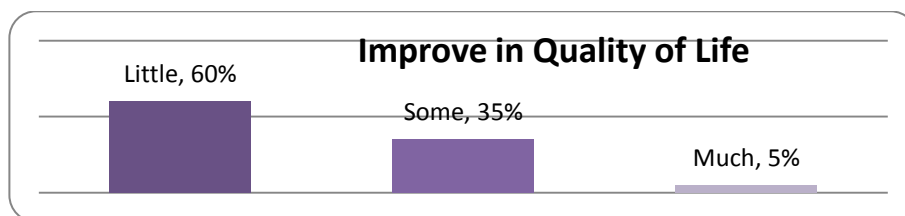
Tabulation survey. F. Project Rating. 2012

Graphic 29: EELA contribution to strengthen personal skills



Tabulation survey. F. Project Rating. 2012

Graphic 30: EELA contribution to improve the quality of life



Tabulation survey. F. Project Rating. 2012

The EELA project actually represents an opportunity to improve brick production. The artisans appreciate the improvements in their mode of production, being more skilled and observed slight change of mentality. Furthermore, it is worth noting the success of the project to make some artisans invest their own resources in improvements. It is notable that they have acquired investment and are open to applying changes and improvements in the sector.

In less encouraging terms, we present the perceptions of the artisans in terms of revenue. Only 25% believe they have improved their income and 75% believe they remain the same. Similarly, according to the chart, 55% considered the contribution of the project recently on the subject of marketing, generating certain weaknesses in the proposed model. And finally, 60% feel that little has been contributed to improve the quality of life; meaning that overall, direct changes in their way of life are not observed. The main change has been in production, but these feelings have not been reflected in their daily lives. Many brick-makers also said that the project has not come to meet initial expectations which they originally had for the EELA, demonstrating that there is work to be done, so that the effects can be felt in the future.

In general, the brick makers perceive EELA project as supportive tool, either by training or project implementations, they recognize the usefulness of it to improve production and help solve some of their problems. Also, they consider the EELA project as a positive intervention for the sector because this group was usually forgotten and vulnerable. However, brick artisans want greater engagement in the sector because of the problems that they face are still present today.

### **3.4 Sustainability**

Sustainability refers to the project's ability to transcend time, even after the executing agency has completed its work with the target population. Thus, after analyzing the results of the SWOT, and especially the effects generated in the target population, it is analyzed the sustainability measures raised by the project and estimated for future interventions.

#### **3.4.1 Sustainability Measures**

The project aims primarily at the involvement of the public entity, in the City of Cuenca through the CGA for future monitoring of the brick making sector through specific regulations. In addition, the Guide to Best Practices, as a tool of local control agency, is

expected to ensure the continuous improvement process, given the need to meet this requirement. As stated by Rosario Mena Jacome, process consultant for “Pashing Out” of SDC in Ecuador, “. . . projects that have achieved an optimum level of sustainability are especially those where strategies and proposed models have been made and institutionalized by the central or local governments, accompanied by public policies and specific regulations that ensure their permanence in time” (2009). In other words, when rules for the brick sector are implemented, technological change will more likely take place in a larger number of factories, which would then ensure the sustainability of the project.

Another aspect that would make the project sustainable is the proposal to work with the industry in the carbon market. This proposal seeks to achieve energy efficiency through modifying or improving the ovens and implementing best practices. By doing this, artisans receive financial contributions or incentives as compensation for reducing GHG emissions generated in the activity. However, current knowledge of these incentives is minimal for the brick makers, by which do not consider them as an additional advantage to implement technological change. Therefore, if this proposal is strengthened in the second phase of the project, it could emerge as a measure of successful sustainability to promote technological change and continuing improvements in the area.

With regard to the transfer of expertise and in order to continue expansion, one interesting measure of sustainability involves a traditional practice of the industry that is based on the exchange of workers in a brick factory to another yard as payment. Adapting to this custom, and with the use of consultants for the transfer of best practices, the project could replicate their actions in other brickyards. Therefore, for a measure like the one mentioned to be sustainable in the future, it is important to promote and encourage activities such as the transfer of technical knowledge, experience, and results between the individual manufacturers.

Additionally, as a measure of sustainability, the technical knowledge that the artisans have received through training should be continued. If a worker has learned and

implemented a production technique that brought good results, it will be reproduced in his/her factory. Indeed, it is expected the continuation of the proven techniques of the project, so that they are maintained over time and assumed as sustainable practices of the sector. The project helped to demonstrate that there are alternative and improved modes of production to the industry, now there are evidence that change and adaptation to the traditional model is possible.

In short, the measures of sustainability of EELA project are: the involvement of the public entity (CGA) with the regulations for the sector addressed, the proposal to work with artisans in the carbon market by selling bonds, the adoption of practices for the exchange of knowledge and best practices, and finally technical training received by the artisans. All these measures were taken to ensure the reproduction of the project and its sustainability over time.

### **3.4.2 Empowerment of the People Involved**

The EELA project and EELA General Regional Program were planned in order to be sustainable over time and continued for involved actors. However, revealing the effects generated by the project in the city, it can be noticed the lack of involvement of the beneficiaries. Throughout the analysis, little commitment from the target population for the project was shown. As mentioned previously, this is indeed one of its major limitations. From the survey, most were involved in project activities and know the objectives sought. However, there are few people who have made all the changes proposed by the project and follow the entire process. In the opinion of the brick makers, many consider the project as a support, but they do not consider themselves the main actors of the intervention, so the empowerment of the beneficiaries is quite limited.

On the other hand, regarding the empowerment of the public entity, it has provided great support to the project. However, while they have not finalized and issued regulations for the sector, they have not demonstrated full commitment of the institution to the project. In order to achieve greater empowerment of the actors EELA has promoted participatory

development activities and extensive communication, thus achieving the sector's direct involvement with the project. In order to build closer relationships and greater involvement with beneficiaries, the project should work hard to increase trust and a sense of belonging to the project.

### **3.5 Conclusions**

With the analysis performed, it was possible to measure the impact of EELA in the target population, in its objective to help mitigate climate change and improve the living conditions of the brickmaking sector; through the analysis of the results, the implementation, and the effects on the target population. In addition, it was possible to generate value criteria to analyze the benefits, so to establish the relevance of the project, as an example of international cooperation implemented by Switzerland.

As a result, it became clear that due to technological change proposed by the project, there are direct impacts on the productivity area. For example, the implementation of best practices and changes in baking reduced production times and improved product quality. These techniques are used as an alternative to achieve energy efficiency and have great potential to be implemented in factories, as they require no further investment, are simple, and are given by the transfer of knowledge between peers. This has been a successful activity of project as it sought affordable alternatives to generate the changes given the limited capacity of sector investment.

The mixing machine had important effects which generated changes to traditional production patterns and provided alternative methods of production. However, considering the price of the mixer, it is not affordable for all craftsmen. Nevertheless, the project was able to motivate the brick makers to undertake such a productive investment. The business owners become more open to the idea of technological change based on the benefits it presents.



In addition, the improvements showed a slight savings in money, resulting in an additional advantage for the precarious sector economy. It is expected that through expansion of technological change and the full adoption of the comprehensive management model applied by EELA, the amount of savings increases as well as the variation of incomes of the brick makers, to improve the lives of artisans in the industry.

Indeed, the project has had significant achievements in technology to improve productivity of the artisans. It has also succeeded in strengthening business and personal skills and achieving some recognition by the public as to the needs and problems of the sector.

However, in the social, economic and environmental aspects, the project has had little impacts. In the social area, the brick makers do not see a significant change in the sensitive points addressed by the project as health, gender equality, and child labor. These are basic considerations for the welfare of the target population. However, the brick makers do not see those points as paramount, and the project efforts to achieve significant changes in these sensitive issues are not valued for the artisans. Its main priority is to live out as they represent a vulnerable group.

On the economic front, the main need of the brick makers was to improve their incomes and achieve direct sales, but little has been achieved. While the brick makers through the project have had a change in vision, improvement of production conditions in their factories is now considered important. However, there has been no major change in the most problematic area, marketing, which is the point where artisans would be directly benefited. For now, most of the revenues are the same and the distribution channel has not changed, thus maintaining the same level of subsistence economy and the same lifestyle.

Environmentally, there has been a slight variation in the initial situation. The artisans recognize the need to reduce pollution and natural resources used in production, but this is not their priority. Indeed, the implementation of best practices and new burning

techniques has slightly reduced greenhouse gases emissions and fuel consumption. However, the mitigation of climate change for this group is a secondary need.

The project has sought to generate conditions for change to be accepted by the brick makers. However, many of the factors discussed in the SWOT have been limited for the overall achievement of the goals of the EELA project. This analysis shows that there is work to be done so that the project will generate tangible effects in each of the areas addressed by the comprehensive management model. It should be make emphasis on working to improve the income of the project participants, in order to improve their quality of life and promote environmental awareness as well.

## **CHAPTER 4**

### **Conclusions y Recommendations**

#### **4.1 Conclusions**

Although Swiss cooperation in the country has been reduced since the end of the agreement with Ecuador, the Swiss Confederation is still a relevant cooperating partner. It keeps certain activities in the country and supports regional cooperation programs on a triangular basis as is the case with the EELA project. Also, despite the fact that Ecuador is not a priority for Switzerland in its foreign policy agenda, it is observed that the cooperative relations between the two countries remain. Switzerland continues to support activities for development on the country and especially sustainable development.

As it was seen with the example applied to the EELA project, international cooperation is a complement to national efforts to solve existing problems. For EELA, cooperation focuses on technical support to help mitigate climate change and contribute to improve productivity and quality of life for the brickmaking sector. Furthermore, EELA aims to provide the necessary support to local control entity to solve the problems presented by artisanal bricks, and therefore contributing to national development plans and sensitive areas of cooperation for the country, among which environmental protection and economic and social development of vulnerable groups are goals.

The project also supports the guidelines that govern Ecuador to achieve sustainable development. Indeed, this intervention is based on the concept of sustainable development. It includes in its objectives the need to improve living conditions in the brick sector of Cuenca, both to strengthen their capabilities and generating productive opportunities with technological change. It especially includes the need to protect the environment by seeking the most appropriate mechanisms, such as the application of

tools for the efficient use of resources and reducing energy consumption, as well as to minimize the environmental impact generated by the brick factories. In effect, it aims to promote economic and social development compatible with environmental preservation and apply support to the country's sustainable development.

The EELA project complies with the concept of sustainable development, as well as macros purposes of international cooperation and the guidelines of Ecuadorian law. However, as mentioned throughout this report, international cooperation interventions need to be monitored and controlled in order to meet the objectives, targets, and especially in order to generate an impact in populations where they are implemented. This reflects the current trend of evaluating interventions funded through international cooperation. There is also the need to use scarce resources for international cooperation in an efficient, effective, and above all rational manner. It is therefore imperative to support with results a program or project, given that it has been undertaken with the investment of resources and efforts to address specific problems.

After analyzing the EELA project impact, major successes were observed, which generated positive effects on productivity and its capabilities. Technological change obtained important productive results and was absorbed by the population as important considerations before being implemented. For example, as discussed initially, so that cooperation including technology factor is accepted by the population, it must be adapted to local conditions, easy handling, and respect internal cultural practices, all this were implemented by the EELA. Technological change brought positive results in production and changing attitudes in the population. The only point to consider is the price of this technology; it should be affordable so that can be implemented on a larger scale.

The topics on which the project had reduced effects, as is the environmental area, social and economic, is expected to deepen the expected effects of the intervention for the second phase of the project. Because as previously discussed, this is a need of sustainable development, to achieve the intersection of economics, environment and

social welfare, particularly through tools that generate low-carbon, make efficient use of resources, and are socially inclusive. It is estimated that reproduction of the project is achieved by improvements and best practices proposed by EELA, palpable effects for the target population and if it makes a significant contribution in order to help mitigate climate change and improve the living conditions of the brickmaking sector.

It can be concluded that international cooperation is a proven tool for promoting development. However, it is important to follow up interventions to reach their goals and fulfill the five principles of the Paris Declaration on the effectiveness of development aid: ownership of the actors, alignment to the local needs of partner countries, harmonization of donors' actions, managing results, and finally achieve accountability between partners recipients and donor partners, both in the results, as in the transparent management of cooperation and complementarity efforts to meet development plans.

Applied to the present case, it has been possible to demonstrate the real impact of international cooperation by Switzerland in Ecuador and the role played by international organizations such as international agencies and NGOs to contribute to sustainable development. The analysis found the EELA project scope in the social, economic productivity, environmental and technological, within the target population. Checking what were the specific effects of the intervention and highlighting the challenges and difficulties that have arisen. Even if the initiative seeks to create a profound change in the target population, there were several factors that come into play in determining its course and its ultimate success. Furthermore, the analysis served as a tool to systematize the EELA project, intervention, and process developed.

Finally, the impact measurement serves as a tool for monitoring and evaluating the project of international cooperation since the opinions and perceptions in the target population were collected and a reconnaissance of facilitating and limiting factors of implementation was conducted. In addition, it would be useful to take corrective action both at critical points of the project, and to potentiate the benefits achieved by EELA. It

is hoped that this analysis will serve as a reference for possible future studies for the EELA project or applied examples of international cooperation in Ecuadorian territory.

## **4.2 Recommendations**

Following the completion of this analysis, it is important to point out some recommendations to improve the impact generated by the Swiss international cooperation in Ecuador, and more specifically the impact generated by the EELA project.

First, it should strengthen the team work of the technical secretariat of the project so that each part of the management model proposed by EELA is addressed. It should work specifically with public and private institutions that support or are interested in supporting the sector. A training or technical group must form a team committed to the goals of the project and with the artisans.

Second, it should enhance the project approach to the sector and potentiate the results, and greater involvement of EELA to achieve accreditation in the industry. It is important to continue with motivational talks and awareness process. It is even more vital for further demonstration of results achieved by technological change proposed by the project, whether it's through new demonstration workshops or training. This, knowing that the brick makers react positively and welcome change alone against proven results and visible and economic short-term benefits. To achieve greater participation in the project and reduce the resistance to change, EELA should encourage observation and testing of activities in the sector. Also, work on the approach to the sector by working on the empowerment of the actors. And indeed, empowerment is a need to ensure the sustainability of the systems operated by EELA.

Third, provide more assistance to artisans so they can access credit. The project needs to find funding sources so brick makers are able to invest in improvements and more comfortable and timely acquisition of technological tools that promotes the EELA to

improve production processes, thus facilitating wider and more efficient use of available technologies.

Fourth, more support in marketing of the product is needed. By supporting in marketing to direct sales, either through training, contact with potential customers, promotion fairs or other means, the project could generate a considerable improvement in the income of artisans, directly impacting the lives of the sector. In addition, this issue could also benefit the project for the promotion of their productivity tools and good practices in ovens because with a greater demand for product it would increase the need for the artisan to accelerate and improve their production processes.

Fifth, to solve the environmental problems of the sector it is vital for the sector to improve economic and social conditions. As previously discussed, the most basic need for artisans is to receive sufficient income to support their survival. Environmental issues for the sector are secondary. Thus, the EELA project should motivate participation in the project for economic and productive benefits that could be achieved with technological change, plus the added benefit of helping to mitigate climate change and reduce air pollution. Starting from the most basic needs and then promoting the changes of pollutants production patterns and achieve transition to more committed environmental awareness, achieving the environmental objectives of the project.

Sixth, to refer generally to the interventions of international cooperation, it is recommended when conducting pre-feasibility studies and feasibility of projects, incorporate social and cultural analysis of the target population. This should be done in order to minimize obstacles when implementing projects, because as observed in the EELA project, many of the limitations were cultural, social, and environmental. For example, resistance to change highlights the difficulty of association, distrust, among other factors that hindered the achievement of several goals.

Seventh, it is vital to rationally use the resources available for international cooperation. Therefore, it is recommended constant and continuous evaluation of programs and

projects on cooperation, so that it can assess the effectiveness, efficiency, and impact generated by this type of intervention in the territories where they occur and the populations with whom they work.

Swiss International cooperation, and international cooperation generally running in the country, is certainly a very important tool to promote local development. However, it requires continuous monitoring of this supplement in order to fulfill its mandate to support the various existing national issues. Also, the impact generated by implementations of international cooperation should be positive for the target population, both to improve living conditions, production processes, or areas where change is sought. Interventions should be designed to be sustainable over time, as well as being socially acceptable, culturally adaptable, and environmentally friendly.



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## Graphic Index

Graphic 1: Location of Projects .....	48
Graphic 2: Summary of the problems presented in the artisanal brickmaking sector .....	55
Graphic 3: Cadaster of Brickyards in Cuenca.....	58
Graphic 4: Action Line of the Project EELA-Ecuador. ....	61
Graphic 5: Brick Manufacturing Process before Intervention in Cuenca .....	63
Graphic 6: Replicated Activities .....	81
Graphic 7: SWOT analysis of the implementation of EELA.....	92
Graphic 8: Mixing and molding time in days .....	99
Graphic 9: Mixing and molding of <i>noque</i> in hours.....	99
Graphic 11: Key benefits of using the mixer .....	100
Graphic 12: Damaged Units.....	103
Graphic 13: Burning Time .....	103
Graphic 14: Burning Costs.....	104
Graphic 15: Most important benefits of burning improvement .....	104
Graphic 16: Business training .....	108
Graphic 17: Training in personal abilities.....	108
Graphic 18: Contribution from training .....	109
Graphic 19: Relationship of working time between men and women .....	113
Graphic 20: Child labor in brickyards.....	114
Graphic 21: Reduction of firewood consumption .....	116
Graphic 22: Reduction in gas emissions .....	116
Graphic 23: Limitations to technological change .....	118
Graphic 24: Distribution and priorities for the use of time saved.....	119
Graphic 25: Distribution and priorities for the use of the money saved .....	119
Graphic 26: Importance of the implementations by the EELA project .....	121
Graphic 27: Benefit of the implementations made by the EELA project .....	122
Graphic 28: EELA contribution to improve production mode .....	122
Graphic 29: EELA contribution to improve business and marketing .....	123
Graphic 30: EELA contribution to strengthen personal skills .....	123
Graphic 31: EELA contribution to improve the quality of life.....	123

## Photo Index

Photo 1: Variety of clay. Swisscontact, 2011 .....	62
Photo 2: Variety of brick sizes .....	62
Photo 3: Mixer from the EELA-Ecuador project.....	63
Photo 4: Use of the mixing machine. Swisscontact, 2011 .....	63
Photo 5: Molding process .....	63
Photo 6: Diversification of models. Swisscontact, 2011.....	63
Photo 7: Dryers .....	64
Photo 8: Drying process.....	64
Photo 9: Distribution of bricks.....	64
Photo 10: Installation of chimneys designed by the EELA .....	64
Photo 11: Use of fans in the ovens. Swisscontact. 2011 .....	65
Photo 12: Use of a dispenser to burn excess sawdust .....	65
Photo 13: Traditional oven model. Swisscontact. 2011 .....	66
Photo 14: Modified oven model. Red brick makers. 2012 .....	66
Photo 15: Commercialization. Swisscontact. 2011.....	67
Photo 16: Gender and children. Swisscontact. 2011.....	69
Photo 17: Workshops. Swisscontact. 2011. ....	70
Photo 18: Implementation of best practices.....	70
Photo 19: Training in the brickmaking sector.....	71
Photo 20: Discussions with the brickmaking sector. Swisscontact. 2011.....	71
Photo 21: Participation in the Construction Fair of Cuenca. Swisscontact. 2011.....	76

## Table Index

Table 1: Complete technological change vs. No technological change.....	106
Table 2: Savings by the brick manufactures with all changes made vs. total brick manufacturers .....	120

## ANNEXES

### Annex 1. Model of Sheets

#### **ENERGY EFFICIENCY IN ARTISANAL BRICK FACTORIES IN CUENCA**

#### Introduction

Greetings. My name is \_\_\_\_\_ and I'm a student at the University of Azuay. At the moment, I am gathering information to develop my thesis, which deals with the EELA project impacts on the brick industry, .i.e. the results obtained with the project. I need your help to conduct a survey that takes about 30 minutes. It includes the different aspects covered by the project in the brick manufacturing industry.

<b><u>A. GENERAL DATA OF THE BRICK FACTORY</u></b>										
Ref:				Classification:			Date:			
Parish				Sector						
Type of production	Brick	O	Tile	O	Association					
Name of Owner			Age		Schooling		Time worked		Business Origen	
Family members No.	Spouse		Children No.	Names		Age	Schooling			
	Age									
	Schooling									
	Years worked									
Additional activities					None					
What do you think about the project? Preliminary opinion										

<b><u>B. PROJECT LIST EELA IMPLEMENTATIONS</u></b>			Ref.		Classification	
		IMPLEMENTATION DATE	COMMENTS			
<b>a. TECHNOLOGICAL CHANGE</b>						
<b>1. Production Process</b>						
<b>1.1. Mixing machine*</b>	<input type="checkbox"/>					
<b>2. Burning Process</b>						
<b>2.1. Baking (Brick placement)*</b>	<input type="checkbox"/>					
<b>2.2. Heating (preheating, burning and Fan*)*</b>	<input type="checkbox"/>					
<b>b. TRAINING</b>						
<b>1. Courses, workshops, seminars</b>	<input type="checkbox"/>					
<b>2. Demonstration workshops (theory – practice)</b>	<input type="checkbox"/>					
<b>3. Experience Exchange trips</b>	<input type="checkbox"/>					
<b>c. STRENGTHENING IN PRODUCTION CAPABILITIES</b>						
<b>1. Associativity</b>	<input type="checkbox"/>					
<b>2. Formalization</b>	<input type="checkbox"/>					
<b>3. Standardization</b>	<input type="checkbox"/>					
<b>4. Innovation</b>	<input type="checkbox"/>					
<b>5. Comercialization</b>	<input type="checkbox"/>					
<b>6. Investment in machinary</b>						
<b>7. Credits</b>	<input type="checkbox"/>					

- Blender: used for mixing clay.
- Baked: bricklaying in the oven.
- Heated: wood burning oven (preheat, burning with wood and using fan)
- Fans: used in brick burning

**C. IMPLEMENTATIONS IN ENERGY EFFICIENCY IN ARTISANAL BRICK FACTORIES IN CUENCA**

**a. TECHNOLOGICAL CHANGE**

**1. Production Process**

Ref.

Classification

**1.1. Mixing machine**

**1.1.1. Datos batidora**

Own O	Investment		Financing		Personal Capital O	
	Place made		Date purchased		Credit O	Institution
Project O						
Rent O						

**1.1.2. Información general**

Before

Now

Number of annual burns			
Number of bricks per burning			
Number of <i>noques</i> mixed per burning		(c)	
Number of bricks per <i>noque</i>			
Duration productive process (beaten and molded) (days)			
Total duration of the production process (months)			

**1.1.3. Time Spent**

Before

Now

**Time savings per burning**

Mixing time and molded per <i>noque</i> (hours)	(a)	(b)	(a)-(b)	(d)	(d)*(c)	(e)
---	-----	-----	---------	-----	---------	-----

**1.1.4. Costs**

Before

Now

Mixing cost	Animal rental	Q	V		Gas	q	v		
	Labor per day				Labor per day				
	Other				Rent				
	Total	(a)			Total	(b)			(a)-(b)

**Time savings per burning**

## 1.2. Funcion

### 1.2.1. Technological change

a. Using a mixer, what was the biggest change for you? Choose the top 3

Most relevant change	3-1	Reason
Increase production		
Product quality		
Money saved		
Time saved		
Reduction in physical excursion		
Health problems		

### 1.2.2. Value

a. How would you classify the Price of the mixer?

Affordable	Somewhat affordable	Not affordable

### 1.2.3. Production

a. With the use of the mixer, how much did your production increase?

None 0%	Little 0% -25%	Some 25%-50%	A lot 50%-100%

b. With the use of the mixer, how did your production process improve?

Mixed		Molded	
None		None	
Little		Little	
Some		Some	
A lot		A lot	

#### 1.2.4. Quality

a. Using the mixer, how would rate the quality of the mix and the final product?

Mix quality			
Bad	Regular	Good	Very Good
Final product quality			
Bad	Regular	Good	Very Good
Most relevant product characteristics			
Toughness	Appearance	Quality	

#### 1.2.5. Operation of the mixer

a. Degree of difficulty of use

Easy	Some	Difficult

b. Maintenance

	Yes	No
Oil change		
Greased		
Change of parts		

#### 1.2.6. Who influenced you to use the mixer?

The EELA project	A family member	An acquaintance	No one

#### 1.2.7. What is your opinion of the mixer?


2. Burning Process										Ref.		Classification		
Would you like to improve the efficiency of your oven?				To improve the efficiency of your oven, what would you like to change?				Priority 3-1		Reason				
Yes		No		Baked										
How?				Heated										
				Fan use										
				Feeding mouths improved										
				Improve ashbins										
				Other										
2.1. Baked						2.2. Heated								
Modification of brick placement						Fan								
						Own						Use time		
						Project EELA						Hours per burning		
Investment		Financing				Own Captial O								
		Date of Implementation				Credit O		Institution						
2.3. Información general			Before			Now								
Total duration production process (months)														
Number of burnings per year														
Number of bricks by burning														
Number of units damaged														
2.4. Time used			Before			Now			Time saved per burning					
Baking time			(a)			(b)			(a)-(b)		(d)			
2.5. Costs			Before			Now								
Burn cost		Firewood:		Q	V		Firewood:		q	v				



	Labor (Buring time)				Labor (Buring time)				
	Other				Other				Money saved per burning
	Total per burning (a)				Total per burning (b)				(a)-(b) (d)

### 3.2. Function

#### 3.2.1. Technological change

a. With the enhancement provided, what was the biggest change for you? Choose the top 3

Most relevant change	3-1	Reason
Increased production		
Product quality		
Money savngs		
Time savings		
Reduction of gas and smoke		

#### 3.2.2. Value

a. How would you classify the improvement cost?

Affordable	Somewhat afordable	Not affordable

#### 3.2.3. Production

a. With the improvement, how much will your production increase

None 0%	Little 0% -25%	Some 25%-50%	A lot 50%-100%

#### 3.2.4. Execution of the improvement

a. Degree of difficulty of brick placement

Easy	Some	Difficult

--	--	--

### 3.2.5. Operation

#### a. Degree of difficulty of fan operation

Easy	Some	Difficult

### 3.2.6. Who influenced you to make changes?

The project EELA	Family member	Acquaintance	No one

### 3.2.7. What is your opinión?


b. <i>TRAINING</i>						Ref.		Classification	
<b>1. In order of importance, what training did you find most useful? top 3</b>						<b>4, Do you think the courses and / or visits helped to improve productivity in the factory?</b>			
Business skills 3-1		Personal skills 3-1				Little	Some	A lot	
Commetialization		Leadership				How?			
Costs		Gender and children				<b>5, Are the courses and / or visits helped to implement best practices to improve?</b>			
Associativity		Health							
Tax knowledge		Work conditions and safety				Little	Some	A lot	
Technological change (mixers and fan use, efficient kiln, dispenser)		Environment (improve burning to reduce black smoke)				How?			
Best practices		Customer service				<b>6, Do you think the courses and / or visits strengthened your personal skills?</b>			
<b>2. How many visits did you attend?</b>		0	1	2	3 or more	Little	Some	A lot	
Places:						How?			
<b>3. What motivated you to make changes in your factory?</b>						<b>7, Are the courses and / or visits helped to improve the business and marketing?</b>			
Training classes									
Exchange trips						Little	Some	A lot	
Recomendations and comments						How?			
						<b>8, What was for you the greatest advantage of the training?</b>			
Interest, future courses?									

c. PRODUCTION CAPACITY STRENGTHENING											Ref.		Classification	
										<b>1. Financiación- Créditos</b>				
What document obtained with advice from the project?				What was the biggest advantage of formalization?		Did you receive assistance from the project to obtain credit?								
RUC/RISE	<input type="checkbox"/>	Receipts				Yes					No			
Artisan qualification	<input type="checkbox"/>	Benefits of artisan sector				Amount								
Municipal permit	<input type="checkbox"/>	Freedom of work				Loan destination								
Patent	<input type="checkbox"/>	Other				Institution								
Have you started book keeping		Yes		No		Would you like to take out a loan for improvements?					Yes	No		
<b>2. Association</b>										<b>3. Standardization</b>				
What is the biggest advantage of association		What factor inhibits association?		Would you be willing to partner for marketing? Being part of a collection center			What is the biggest advantage of standardization?							
Increase in sales		Product variation			Yes				Sales association					
Direct sales		mistrust			No				Increase in sales and demand					
Greater organization		Payment agreement							Standard product quality					
Contact other producers		Other							Comply with customer demand					
Other									Other					
<b>4. Innovation</b>	Has your product line increased?	Yes	1	2	More than 2	Which:			Did you contribute to the project?		Yes			
		No								No				
<b>5. Marketing</b>														
		Before					Now							
<b>Distribution channel</b>		Directo			Intermediario		Directo			Intermediario				
<b>Price</b>														
<b>Orders</b>		Yes			No		Yes			No				

<b>Form of payment</b>	Cash	Credit		Cash	Credit	
<b>Amount of bricks per order</b>	None	Same		More	Less	
	Units					
<b>Number of bricks for sale (burning oven)</b>						
<b>Type of most requested products</b>						
<b>How much do you make per batch</b>						
<b>What do you invest in?</b>						
<b>How much do you have in the bank?</b>	Yes	No	Purpose	Savings	Loans	Other:
<b>Do you have any loans</b>	Yes How many?	No	Purpose	Investment in factory	Purchase of goods	Debt payment Other:

D. <u>SOCIAL EFFECTS</u>														Ref.		Classification			
<b>a. Salud</b>										<b>b. Genero</b>									
Do you have medical insurance?		Yes	Type		Did the Project influence you to obtain it?		Yes			man		women							
		No					No	Work in brick yard		Hours a day	Week	Hours a day	Week						
Do you get annual check-ups?		Yes	Does the project provide or motivated to get them?				Yes												
		No					No	Type of activity											
Presents some pain for work				Yes		No		Mix		<input type="checkbox"/>		<input type="checkbox"/>							
Yes, ¿de qué tipo?		¿Con las implementaciones del proyecto ha reducido alguna molestia de salud?				Yes		Mold		<input type="checkbox"/>		<input type="checkbox"/>							
						No		Burn		<input type="checkbox"/>		<input type="checkbox"/>							
Joints			Joints		Little	Some	A lot	Load/Dispatch		<input type="checkbox"/>		<input type="checkbox"/>							
Breathing			Breathing		Little	Some	A lot	Extra activity		Hours in the day		Hours a day							
Skin, eyes			Skin, eyes		Little	Some	A lot			Activity		Activity							
Stomach			Stomach		Little	Some	A lot												
Other			Otras							Money management									
In general How much do you think the Project has improved health?								Home:				% decision				% decision			
Little			Some			A lot			Factory				% decision				% decision		
<b>c. Children</b>								Has the project the project change how you handle money in the home?											
Since the beginning of the project, how have children been involved?								Yes	M	%	W	%	No						
Less			equal			More			Has the project the project change how you handle money in the factory?										
Have you had some support from the Project when it comes to children.								Yes	M	%	W	%	No						
Yes	How?						No	How muchdo you believe the project has helped omprove women conditions?											
Before					Now														
How many days a week do your children help in the factory?								Little		Some			A lot						
0	1d	2d	<3	0	1d	2d	<3	Observations											
How days do the miss school?																			

0	1d	2d	<3	0	1d	2d	<3	
In what activities?		Mixing	Molding	Burning	Hauling	Dispatch		
How much do you believe the project has helped reduce child labor?								
Little		Some		A lot				
<b>d. Cultural factors</b>								
What do you think about technological change?						What is the most limiting factor in technological change?		
Useless		Useful		Necessary		Lack of capital		
What is the difficulty in adapting to technological change?						Lack of opportunities		
Easy		Some what difficult		Difficult		Lack of interest		
What was needed to adapt to technological change?						Lack of information		
Just observation		Observation and testing		Observation, testing, and results		Other		

<u>E. ENVIRONMENTAL EFFECTS</u>						Ref.		Classification	
<b>a. Environmental problems</b>			<b>b. Problems in the area</b>						
How do you see the drastic climate changes, do the affect you?	Yes	No	Do you have problems due to gas emissions?	yes	No	Neighbors complain			
						Municipal control			
Do you think as a brick maker you can do something about climate change	Yes ¿How?	No	Do you have excess material problems?	yes	No	Waste complaint			
						Use of waste			
Decrease gas and emissions			Do you have raw clay problems?	yes	No	Clay waste			
Decrease firewood use						Complain landscape affects			
Decrease burning times			Do you have problems with the firewood?	Yes	No	Firewood waste			
Other						Deforestation complaint			
<b>c. Project perceptions</b>									
Do you believe that the project has contributed to gas reduction	None 0%	Little 0% -25%	Some 25%-50%	A lot 50%-100%					
Has the Project contributed to firewood use reduction?	None 0%	Little 0% -25%	Some 25%-50%	A lot 50%-100%					
Have you tried any fuel alternatives?		Yes	No	Which?					



<b><u>PROJECT RATING</u></b>							
<b>a. Project knowledge</b>		<b>b. Project participation</b>			Low	Medium	High
Low (Heard about activities)	<input type="checkbox"/>	<b>1.</b> Mixer					
Medium (know activities and look for them)	<input type="checkbox"/>	<b>2.</b> Interventions in the oven and burning					
High (involved in the activities)	<input type="checkbox"/>	<b>3.</b> Training					
Very High (implemented all of the activities)	<input type="checkbox"/>	<b>4.</b> Production capacity strengthening					
<b>c. Perceptions</b>							
	Little	Medium	High	What was the most important contribution by the project? 3 best 3-1			
EELA contributed to your mode of production				Mixing machine			
EELA contributed to improve sales and marketing				Baking improvements			
EELA contributed to improve of personal skills				Application of fan in heating process			
EELA contributed to improve quality of live				Training courses			
What product benefit do you consider the most important from the project? 3 best 3-1				Exchange trips			
Improvement of production quality				Fairs and events			
Decrease in burning times				What do you think about the project? Final opinion			
Saving of firewood							
Increase in product variety							
Has your income improved because of the project?	Yes	No					
Do you feel better equipped because of the project?	Yes	No					

<b><u>F. DESTINATION OF SAVED TIME AND MONEY</u></b>			Ref.		Classification	
<b>Implementations</b>						
<b>Total time saved in burning</b>			<b>Total money saved in burning</b>			
<b>What do you attribute time saved to?</b>			<b>What do you attribute money saved to?</b>			
<b>Priorities 3-1</b>	<b>Selection</b>	<b>Description</b>	<b>Priorities 5-1</b>	<b>Selection</b>	<b>Description</b>	
<b>Factory</b> <input type="checkbox"/>			<b>Factory</b> <input type="checkbox"/>			
Production increase	<input type="checkbox"/>		Improve Factory infrastructure	<input type="checkbox"/>		
marketing	<input type="checkbox"/>		Improve Factory production	<input type="checkbox"/>		
paperwork	<input type="checkbox"/>		Improve marketing	<input type="checkbox"/>		
<b>Home</b> <input type="checkbox"/>			<b>Home</b> <input type="checkbox"/>			
Housework	<input type="checkbox"/>		Food	<input type="checkbox"/>		
Children	<input type="checkbox"/>		Education	<input type="checkbox"/>		
<b>Personal</b> <input type="checkbox"/>			Health	<input type="checkbox"/>		
Extra income	<input type="checkbox"/>		leisure	<input type="checkbox"/>		
rest	<input type="checkbox"/>		<b>Savings</b> <input type="checkbox"/>			
leisure	<input type="checkbox"/>		<b>Investment</b> <input type="checkbox"/>			
training	<input type="checkbox"/>		<b>Debt payment</b> <input type="checkbox"/>			
<b>Other</b> <input type="checkbox"/>	<input type="checkbox"/>		<b>Other</b> <input type="checkbox"/>			
Observations			Observations			

<b><u>G. PRODUCTION AND TECHNOLOGICAL NEEDS (EXTRAS)</u></b>		
Need and problem	Solution	Possible help from project

<b><u>H. NO IMPLEMENTATION FROM THE PROJECT</u></b>						Ref.		Classification	
<b>1. General information</b>					<b>5. Implementations from the project EELA</b>				
Number of burnings per year					Do you know the work of the project EELA?		Yes	No	
Number of bricks per burning									
Number of mixed <i>noques</i> per burning					How come you haven't implemented any changes?				
Number of bricks per <i>noque</i>					Lack of capital				
Duration of production process (mixing y molding) (days)					Lack of opportunities				
Total duration of production process (months)					Lack of interest				
					Lack of information				
<b>2. Marketing</b>					Other				
How much do you make per batch?		Sale							
Quantity					Would you like to apply some kind of improvement in your factory?		Yes	No	
Price		Intermediary		Direct		¿What?			
Number of products sold						Mixer			
<b>3. Mixing</b>					Best practices of baking (brick placement)				
Duration of mixing and molding process (days)					Best practices of heating (use of a fan)				
Time of mixing and molding per <i>noque</i> (h)					Improve oven efficiency				
Costs					Training courses				
Cost of mixing		Rent animales	Q	v		Skill strengthening			

	Labor per day					Association	
	Other					Formalization	
	Total					Standardization	
Quality of mixture	Bad	Regular	Good			Innocvation	
Quality of product	Bad	Regular	Good			Marketing	
4. Baking and Heating						Credits	
Time spent on burning							
Costs						Observations	
Cost of burning	Firewood:	Q	v				
	labor						
	Other						
	Total for burning						