

Two Nations and ESD

Analysis of the Implementation of Education for Sustainable Development (ESD) in
Ecuador and Swden for grades 1 to 10

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Abstract

The end of the Decade of Education for Sustainable Development in the present year marked a scenario to evaluate the achievement made among nations. However the success of implementation of Education for Sustainable Development (ESD) is not equal as well the information available on the subject depends on the country. The aim of the thesis is to deliver a current status and recommendations for improvement on the implementation of ESD for Basic General Education (grades 1th to 10th) in Ecuador. The approach carried out an analysis in different levels; from the national policy till school reality generating information from the whole system. In order to make recommendations for the improvement, Sweden was chosen as mentor country to be compared against. In Ecuador was found that Education for Sustainable Development was included without being directly named, through the “Good Living Concept” but remained only conceptual. Sweden in the other hand, does not possess a national action plan for the implementation of ESD, it is already found into the National Laws and Regulations which are supported by individual work carried by municipalities, organizations, teachers NGOs, and Swedish citizens through diverse programs and initiative to implement ESD in schools. Within the analysis of Ecuador, the “good living concept” presents a great opportunity to be used to introduce further ESD into the curricula. Meanwhile from the Swedish national initiatives, that could be adapted to Ecuador is the use of motivational programs as the Green Flag Award or the Sustainability School Award. Finally the level of implementation of ESD should be further monitored in order to improve the results.

Keywords: DESD, ESD, “Good Living Concept”

Executive Summary

Education for Sustainable Development is a tool that should be nurtured since early stages of childhood in order to give future citizens the opportunity to choose a different path for society towards sustainable development. Officially ESD was launched in New York in 2005 with the aim to be integrated into all levels of education. ESD's vision is that everyone has the opportunity to benefit from quality education, in order to transmit values, which would transform into behavior and lifestyles, leading to a positive social transformation. The bottom up approach allows to specialize knowledge in further education without making it a privilege of those who reach college or follow certain careers. ESD implemented since early stages will allow the development of conscious citizens that would cope with environmental and social policies needed to change unsustainable practices.

The end of the Decade of Education for Sustainable in the present year marked a scenario to evaluate the achievement made among nations. However the success of implementation of ESD is not equal as well the information available on the subject depends on the country. The aim of the thesis is to deliver a current status and recommendations for improvement on the implementation of ESD for Basic General Education (grades 1th to 10th) in Ecuador. The approach carried out an analysis in different levels; from the national policy till school reality generating information from the whole system. In order to make recommendations for the improvement of the implementation of ESD in Ecuador, a mentor country was chosen. The mentor country served to analyze and choose key experience that could be adapted for the Ecuadorian context. For this purpose Sweden was selected as it was cited before by UNESCO it is a leading nation on ESD implementation even before the decade started.

Realities among the countries are completely different, Ecuador has fortunately improved the educational system in the last nine years, almost eradicating illiteracy, and increasing enrolment rates for grades 1th to 10th, improving and equipping educational units. In the other hand Sweden has to battle to increase the academic performance of students, prioritizing that activity from the governmental perspective. Which has led the attention of both countries in other directions away from ESD, being possibly why neither of them has implemented their regional strategy.

Even though Sweden does not possess a national action plan for the implementation of ESD, already ESD is found into the National Laws and Regulations such as Educational Acts which are translated directly to Curriculums relevant for the grades 1th to 10th correspondent to primary and compulsory education in Sweden. However educational institutions are autonomous to work for their own priorities and to set how to integrate ESD in their programs. High support for the implementation of ESD was found from individual work carried by municipalities, organizations, teachers NGOs, and Swedish citizens through diverse programs and initiatives. Regrettably there is not a monitoring activity being done at national level to reveal how ESD have been implemented among the schools and within the focus of the study correspondent to primary and compulsory education

In the other side of the world, in Ecuador was found that Education for Sustainable Development can be included without being directly named, as it was established that the "Good Living Concept", reflects in the Principles of Sustainable Development and Education for Sustainable Development. The Good living concept is the base of Constitution of Ecuador and is followed through the Organic Law of Education, to the Curriculum and to School ground. However related topics to ESD were found into the curricula and proved to

being delivered in class, which starts in 4th grade until 10th, it is only conceptual, and lies mostly in teacher's expertise and knowledge.

Within the analysis of Ecuador, the "good living concept" presents a great opportunity to be used to introduce further ESD into the curricula, but taking into consideration the high diversity from cultural background, ethnicity, and environmental region of Ecuador. The policy or initiative should be flexible enough to be adapted to the the variety of local context but with sufficient guidance to secure the implementation, which can be directly the curriculum and syllabus. Additionally motivational and support system should be consider to secure the implementation.

From the Swedish national initiatives, one that could be adapted to Ecuador it the use of motivational programs as the Green Flag Award or the Sustainability School Award. This motivational programs, gives liberty and democracy to choose, allowing the integration of all the school members, and also giving direction to the educational unit to follow. ESD as was referred in the introduction in order to be integrated locally should be directed by policies that give motivation, direction and support. Additionally as it is concern of the Ecuadorian Government to increase and maintain quality of education, an award system that has the criteria of management and quality standards that includes ESD into it will fulfil the needs of the Ecuadorian system.

Finally the level of implementation as was stated from the beginning in Sweden is far more advanced than in Ecuador and realities among the countries presented a difficulty to extrapolate directly initiatives or programs. Still one final lesson learned from the results of implementation in Sweden is derived from the inexistence of monitoring actions at national level being unable to perceive the implementation of ESD in the schools. Leading to the lesson of the necessity to monitor the implementation at national level for any initiative in order to improve the system within time. Still the monitoring action should not be only based on expenditure budget as it is commonly use by the government of Ecuador, which does not cover the quality parameter among other. .

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Abbreviations (if required)

DESD	Decade of Education for Sustainable Development
DPEE	Decade Plan for Environmental Education
ESD	Education for sustainable development
PISA	Program for Internacional Student Assesment

1. Introduction

“Education is the most powerful weapon which you can use to change the world”
(Nelson Mandela)

True words that have been acknowledged widely by governments, who also have turned to education as the solution to current social problems (Van 2013). Education is a change agent, and is included to calculate the human development index, the inequality human development index, and multidimensional poverty index (UNDP 2013). It is evident that education as a whole empowers development, where each stage of education promotes considerable changes in national development as well (Loening 2005). If a nation only seeks for economic growth, externalities such as depletion of natural resources, pollution of water, air and soil, decrease of welfare, would take place resulting on unsustainable development.

Externalities from development of economic activities as agricultural practices were described more than 50 years ago by Rachel Carson in her book “Silent Spring” in 1967. The words printed in the book inspired international meetings ten years later, where unsustainable development was recognized as urgent and shared concern, which is printed on the Brundtland Report “Our common future” in 1987. No agreement was developed until UN Conference on Environment and Development in 1992, where Agenda 21 was published. In Agenda 21, education was recognized as pivot point to achieve sustainable development. Followed actions aligned with sustainable development led to the World Summit on Sustainable Development in 2002, South Africa and the “Johannesburg Declaration on Sustainable Development”, emphasizing that “education is an indispensable element for achieving sustainable development”, and declared 2005-2014 as the Decade of Education for Sustainable Development (DESD) for which UNESCO was designated as the leading agency to promote and implement the Decade.

Officially DESD was launched in New York in 2005 with the aim to be integrated into all levels of education. Education for sustainable development (ESD) is based on the three pillars of Sustainable Development where it is recognized that “human development is only achieved through simultaneous, equal and secure economic growth, social development (including cultural) and environmental protection” (UNESCO 2008). Under the context of ESD, the vision is that everyone has the opportunity to benefit from quality education, in order to transmit values, which would transform into behavior and lifestyles, leading to a positive social transformation.

Formal education provided to children from 6 to 12 years old the basic tools to become effective members of society, delivering the information to young adults who are capable to adapt, into changing circumstances (HALE 1993). Formal education is a key factor for the development of future conscious citizens, being of such importance to incorporate sustainable values and knowledge at this stage, which would be crucial to provide them with the basic tools to decrease vulnerability, build resilience and work towards solutions.

ESD embraces education in all levels, the fact that it can be included in formal education as early as possible could lead future citizens to cope with the requirements to have a sustainable society. The bottom up approach allows to specialize knowledge in further education without making it a privilege of those who reaches college or follow certain careers. Also it develops conscious citizens that would cope with environmental and social policies needed to change unsustainable practices.

Education by itself means empowerment for people, and constitutes a human right recognized worldwide (UNESCO 2008). Then education for sustainable development becomes the right for future citizens and an obligation for current generations to propagate in order to achieve real development. The inclusion of ESD into formal education is part of the right to have the necessary knowledge and skills to be an active citizen. Formal education is directly influenced by the national government, they are building up their future human capital. Which leads to the next question is what type of human capital they want to have?

The end of DESD marked only a small step made into the journey towards sustainable development. UNESCO presented the third and final report in Nagoya, Japan in 2014 which summarises the achievements made (UNESCO 2014). It is not new that developed nations have substantial accomplishment on integrating ESD and have developed further experiences such as Sweden, Japan, Germany, among others but also successful actions have been taken by developing countries such as Kenya, Costa Rica, Colombia and others (UNESCO 2012, 2014). Still integration of DESD have not been equal among regions or countries. How DESD was integrated on the formal educational system by each nation was their own responsibility, still previous priority in the case of developing nations has been given to improvement of schools infrastructure, access, and improvement of teacher's knowledge.

Ecuador since the adoption of 2008 Constitution under the Good Living concept, has invested increasingly per year from 1100 million USD Dollars from 2011 to 2800 million USD Dollars in 2012 on education (Noticias del Ecuador 2014). The Ecuadorian government gave priority to education, increasing access and quality and also worked on improvement of health and nutrition for children. However, information on how DESD has influenced the Ecuadorian educational system is minimal. Even less evidence about the implementation of ESD focused on formal basic education can be found.

1.1 Problem Definition

Acknowledging that education is a tool to achieve sustainable development (UNESCO 2014), the finalization of the DESD marks only one step on the journey towards a sustainable society (UNEP 2014). The progress of ESD integration into educational systems have been unequal around the globe. Worthy experiences have been shared as the case of Sweden, Germany, Brazil, Costa Rica, Colombia, Jamaica, Kenya Mauritius, among others (UNESCO 2014), which do not belong only to developed countries. Still there are nations where ESD have not strongly been monitored, leaving the need to reveal how far ESD has been integrated into their educational systems.

Information on how ESD has been implemented in case of developed nations is vast, as the case of Sweden. Sweden has been a leading nation for the inclusion of sustainability into education, placing them as owners of cumulative experiences even before the decade was launched (UNESCO 2008). Sweden hasn't only integrated ESD among its educational system since early stages as pre-elementary schools but also has a strong network of ESD researchers and postgraduate school on ESD. Also research have been conducted to compare developed countries educational schemes against Sweden in different levels of the educational system (UNESCO 2013). Information on the ESD field in Sweden is continuously shared through different networks such as SWEDESD (UNESCO 2013).

In the case of developing nations such as Ecuador, priority to deliver basic needs to their population took place first, which is also consistent under the umbrella of ESD. Priority for

the improvement of public health care system, delivering basic services (water, electricity and sanitation) and improving access to education for all children have been the achievements made by the Ecuadorian government since 2008. Ecuador is also acknowledged by having a green constitution since 2008, which follows the concept of “SUMAC KAWSAY” or “Good Living”. The constitution recognizes nature rights and places education as a governmental priority (Constitution of the Republic of Ecuador 2008). The Ecuadorian Government in the last five years, have invested in the improvement and creation of school’s infrastructure, also improving access and invested on teachers training. The reform that started in 2011 and still happening now is reaching the curricula (Parra 2015, El comercio 2015).

In terms of ESD into the educational system of Ecuador, it has been implemented through the National Action Plan for Environmental Education (NAPED) for 2006-2016 (UNESCO 2009). Still since NAPED was launched no report was emitted, leaving an open question on what happened later on (NAPED 2006). Information on how far Ecuador has integrated ESD into their educational system is poor and analysis of the subject should be taken in consideration now as the educational system is on a transformative path.

Furthermore the question that emerges also is what experiences could be extrapolated from the Swedish experience to the Ecuadorian context, for which first it is required to analyze how Ecuador and Sweden have implemented Education for Sustainable Development into the National Educational System.

1.2 Aim and objective

The aim of the thesis is to deliver a current status and recommendations for improvement on the implementation of ESD for Basic General Education in Ecuador. As was stated during the introduction, information about the implementation of ESD in Ecuador is limited, making it necessary to carry out an analysis in different levels; from the national policy till school reality to generate meaningful information. In order to make recommendations for the improvement of the implementation of ESD in Ecuador, a mentor country was chosen. The mentor country would provide with key experiences or implementation mechanisms that could be adapted for the Ecuadorian context. For this purpose Sweden was selected as it was cited before by UNESCO it is a leading nation on ESD implementation even before the decade started.

To conduct the study three stages were carried, as follow:

- a) First, elaboration of a suitable framework based on literature review regarding how ESD implementation have been studied, determining which focus points should be considered for the current study.
- b) Secondly, based on the generated framework reveal the actual status of the implementation of ESD in Ecuador analyzing for further improvements. Being a direct question to be answered and sub questions as well:

How has Ecuador integrated Education for Sustainable Development for Basic General Education?

- How has ESD been implemented at the policy level?
- How has ESD been established on the curriculum and syllabus?

- How ESD has been delivered by teachers in their classes?
- c) Third, find successful key factors and lessons from the Swedish experience in the implementation of ESD that could be adapted and applicable for the Ecuadorian context to improve their current status. The actions persuading this phase aims to answer the next question and sub question

What are the key mechanisms that allowed implementation of ESD into their Educational System?

- How have been integrated ESD into their Educational System
- What mechanisms have been incorporated to support the implementation

1.3 Research methodology

The analysis for Ecuador used the previous points mentioned on the second stage, in order to reveal the implementation of ESD in formal education on grades 1 to 10 through a combination of qualitative and quantitative methods.

First a suitable framework was created in base to literature review on DESD and ESD which is further explained in section 3 and 3.1. The framework was applied in Ecuador to analyse the information obtained through review of policies, regulations, Laws, governmental plans, curriculums, international reports, research papers, and newspapers. Information was confirmed through a total of 6 interviews. (Please see section 3.2 for further explanation)

Secondly concerning the actual implementation of ESD in the Ecuadorian schools, with the participation of 14 Educational Units, 282 surveys were applied to school's teachers from a Sangolqui parroquia¹. Additionally for confirmation of data, a total of 14 interviews were conducted with teachers and school rectors. (Please see section 3.2 for further explanation)

Third with regard to lessons learned from the ESD implementation in Sweden, a literature review took place. The purpose was to have a picture of the system, map the actors involved, and match it with actual governmental documents generated and researches conducted. Two interviews were conducted for additional information for a possible transferible mechanism. Additionally an email interview was conducted to confirm points of view with an independent researcher of the implementation of ESD in Sweden. (Please see section 3.3 for further explanation)

1.4 Limitations and scope

As the approach is to give a broad picture of how the DESD was implemented in Ecuador, it evidently have less depth on all the points to be analysed which could led to incomplete findings, however this approach was selected in order to generate information that is minimal

¹ Parroquia is the minimal territorial and political distribution recognized into a province of Ecuador (Base de datos Políticos de las Americas 2005).

in Ecuador and aims to take attention of the governmental parties involved in the matter of education.

Additionally to it the researcher has deeper knowledge of the context of the country and the language, which were positive factors in order to review the existing information on the subject.

Also there exist circumstances that were taken into consideration for the design of the research:

- Based on a statistical sample the study was delimited to a specific region of Ecuador called in Spanish “parroqui”. Within the Province of Pichincha, in the Municipality of Ruminahui, the parroqui of Sangolqui was selected.
- There is a lack of information analysing how Ecuador have implemented ESD into the educational system, and even less which would focus on school grades from 1 to 10. Which gives none opportunity to compare with previous studies made.

On the other hand, as Lund University is located in Sweden and it is a country with a vast experience on ESD in all levels of education, it was suitable to explore the Swedish experience and verify if their lessons could be extrapolated to the Ecuadorian context. However the language is a barrier to obtain further information which is in Swedish.

1.5 Audience

Possible audience for the thesis are Ecuadorian governmental authorities that are related with the educational system, additionally the report could aid rectors and school teachers who are concerned with Education for Sustainable Development.

2. Literature Analysis

The present chapter offers a review on the importance of education, covers what is Education for Sustainable Development and the launch of the Decade for Sustainable Development. Finalizing with key factors studied within the implementation of ESD worldwide. This chapter is the base that allowed the establishment of the methodology, defined as stage one in 1.3 Research Methodology.

2.1 Education as factor of change and importance of formal education.

Education is an essential keystone of human development and societal progress (UN 2003) and has been recognized globally as a basic human right at the Universal Declaration of Human Rights (UN 1948). World wide nations have acknowledged education as a priority and committed themselves to multiple conventions and conferences; 1989 Convention on the Rights of the Child, and the commitment on the World Conference on Education for all 1990 (UNICEF 1999), among others. Further recognition can be found on the World Education Forum at the Millennium Summit 2000, where it was explicitly stated that “education is critical, for achieving social and demographic progress, sustained economic development and gender equality” (UN 2003).

Schooling is an important contributor for individual development of skills and for a nation, it represents an increase of human capital (EFA 2005). Elementary education that comprehends six to twelve years provides the basic tools to become an effective member of society, in other words it is a foundation knowledge needed for young adults to be capable of adapt it into changing circumstances (HALE 1993). It is recognized for instance, that four to six years of education is the minimum required to increase agricultural productivity (Tilbury et al 2002). It was also found that an average of six to eight years of public education for women would influence a decline on birth rate on early adolescences while increasing infant health and children’s education (Loening 2005). According to Tilbury et al 2002, nine to twelve years of education will be required before industrial productivity increases. Loening 2005 and Tilbury *et al* 2002 also argues that direct influence of primary and secondary education is related with increase in productivity of labor force, meanwhile development and research would mostly be influenced by the tertiary level and life learning process.

Education at early stages represent major changes in human development, but it is the age range of 6 to 12 years old where children tend to form identity and opinions most effectively (Eccles 1999). Which is also supported that children among this age range tend to gain effectively environmental knowledge, awareness and concern (Radeiski 2009). Being of such importance in the development of future conscious citizens the introduction of sustainable values and knowledge in this stage represents a clear opportunity to promote a better society for present and future generations.

2.2 Education and the launch of DESD

2.2.1 Education and Sustainable Development

Societal problems differ from region to region, still as a whole our society have become unsustainable. This has been globally acknowledged since the introduction of the concept of Sustainable Development in “Our Common Future” as the “*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*” (Brundtland Report 1987). From this perspective world wide the driving force has become the achievement of sustainable development.

Education has not only been perceived as a responsibility by governments but also as a solution for current societal problems (Van 2013). Admitting that education is a transformative agent, it was recognized as a leverage point towards the achievement of sustainable development that needed to be promoted by all nations on the compromise known as Agenda 21, product of Rio de Janeiro United Nations Conference on Environment and Development in 1992. It is specifically on chapter 36 “Promoting Education, Public awareness and training” of Agenda 21 where the call was made for all nations in order to “reorient education, towards sustainable development”². Further actions lead to the statement made in 1997 in the UNESCO report, Educating for a Sustainable Future “Education is humanity’s best hope and most effective means in the quest to achieve sustainable development (UN DESD 2008).

Nonetheless it was only until 2002 with the resolution 57/254, where the United Nations General Assembly declared 2004-2015 as the Decade of Education for Sustainable Development (DESD), and assigned UNESCO as the leading agency for the coordination of the task (UN DESD 2008). DESD was officially launched the 1 of March of 2005 by UNESCO on New York, USA (UN DESD 2008).

2.2.2 Education for Sustainable Development

Education for Sustainable Development is the educational process of achieving human development in an inclusive, equitable and secure manner (UNEP 2008). It can be also interpreted as the umbrella for diverse forms of educations that already exists and future ones that would lead a shift towards a sustainable society as it is promoted on UNESCO’s web page.

UNESCO’s definition of ESD includes formal and non-formal education. It is characterized by having a root on the principles and values of sustainable development, for which it integrates the three dimensions of sustainability, environment, society, culture and economy. ESD implies the use of multiple pedagogical techniques to promote participatory learning and higher order thinking skills. ESD promotes lifelong learning which aims the empowerment of community decision making, social tolerance, environmental stewardship, adaptable workforce and good quality of life. ESD should not be treated as isolated concept because while it should be locally relevant and culturally appropriate it also considers global issues and is interdisciplinary. Even though ESD is not equally applied among societies, it interconnects

² UN División for Sustainable Development 1992, paragraph 36

everyone, because it base focuses on local needs, their perceptions and conditions, with the acknowledge of the international effects and consequences that the fulfilling of local needs would cause, ESD promotes the adequate option to fulfill local needs, preventing or avoiding the concequences for nature, society and economy (UNESCO 2012).

This brief definition given is a starting point to review the studies that have been made in the last decade for ESD worldwide with the objective to find a guideline for the current thesis theme. One of the problems that I found repeatedly and which has been described as a barrier for the implementation of ESD is the lack of consensus of the concept of ESD (UNECE 2010; Benavot 2014 and Arlemalm *et al* 2014). However the lack of consensus is recognized by UNESCO's reports published in 2009, 2012, 2014 but not as a barrier instead it is explained that ESD is locally adaptable and is an umbrella for different pedagogical techniques being why it will not be understood in the same manner.

The review made by Benavot (2014) also explains that ESD is taught differently and depending on how it's implemented, the following classification can be given:

- 1) ESD is learned only conceptually by pupils where they basically learn about sustainable development through a conceptual taught.
- 2) ESD is taught as the need for fundamental change in order to rethink current policies practices and programs in light of sustainability criteria and,
- 3) ESD is imparted as a promoter of change, where sustainable development entails a learning process and experiences that result in the promotion of real change in the community.

Each approach can be taken as a step towards schools as agents of transformation, capable of influencing direct transformation of communities.

2.2.3 UNESCO as the leading agency

UNESCO as the leading agency of DESD reported their progresses in three periods, each report with different focus. The first report in 2009, had the objective of revealing the context and structures of work on ESD by each region and member state (UNESCO 2009). The second report in 2011, revealed the processes and learning initiatives related to ESD but it made no distinction between regions or nations (UNESCO 2011). The final report in 2014, exposed the impacts and outcomes of the DESD in each region (UNESCO 2014).

Sub launch of the decade in Latin America occurred in 2005 at the Ibero American Conference on Sustainable Development. In 2005 the regional strategy document was written and finalized in 2007 as the Building Education for Sustainable Development in Latin America and the Caribbean. The regional strategy is based on the vision for education policies to contribute to counteract environmental damage and destruction while building just and sustainable societies through inclusive participation (UNESCO LACE 2007)

UN final report remarks that ESD visibility increased mostly in national policies, where governments have integrated ESD into education to prepare their citizens to address the sustainability challenges that they soon will experience. On one hand developed countries such as Sweden, Germany and Japan have taken a leading action on ESD integrating it fully into their policies and educational systems (UNESCO 2014). In Latin America heading action

have been taken by Costa Rica, Peru, Uruguay and Brazil (UNESCO 2014). However, Ecuador where UNESCO is headquarter is located for Latin America and the Caribbean, is not mentioned even once

2.2.4 How Comparisons have been made to analysis of ESD?

Most of the documents found shared some common issues to be most critical when analyzing the implementation of ESD programs; the political background, local context, economical support, professional development and their engagement, curriculum and syllabus analysis, stakeholders participation and monitoring and control, in which the ESD program have been designed. These key elements can be also found as indicators used in accreditation programs of ESD for schools that are based on ISO 14001, such as the Green School award in Sweden, Enviro-School in New Zealand and the Green School Project China.

a) Political background

Studies generally start by reviewing the political statement that address ESD. After a brief summary on the international commitments that have been made, they study how ESD has been integrated at the national level. Henderson et al, (2004) discusses the importance of revealing not only the state of implementation on ESD from the policy perspective but also how the government perceives sustainability, as their interpretation of sustainability influence directly on how the program will run and what would be the focus of it. The type of analysis also can be interpreted in a more inspirational level (Arribas 2013). Another point made in order to analyze the policy is considering it as a leverage point (Lidgren et al 2005).

b) Local context

UNESCO defines ESD as an umbrella concept for diverse types of education with the common feature of being related with shaping sustainable development (UNESCO 2014). The local context is among the issues that should be reflected upon when deciding what ESD will pursue. It should fulfil the specific needs of the society, in which the ESD is introduced and adapted to its own reality. The general global review made by Benavot (2014), and Henderson et al (2004) stressed the heterogeneity of ESD implementation. For instance, among developed countries from West Europe, North America, and Asia the implemented ESD have taken from different perspectives compared with developing countries. For example, Australian's FEE Eco schools focuses on environmental issues such as water, energy and waste, or United Kingdom's Eco-schools program emphasizes litter, waste minimization, energy, water, and transport and school management. Meanwhile in some of the developing nations ESD pursued elements of sustainable development as health and sanitation as found in for example, Africa eco schools. Countries in Latin America and the Caribbean have highlighted poverty and to a lesser extent climate change as most important sustainability challenge (Benavot 2014).

c) Economic Support

The implementation of ESD as a governmental priority, can be spotted out on the economic support it has been unfolded, which is needed to secure the proper execution at national level (Benavot 2014). Economic support also would aid to attain international cooperation and among the public and private sector (IIS-UNESCO 2009). Developed countries have the advantage of strong economies, having less trouble allocating the finances for multiple

necessities (Benavot 2014). Economic support to implement ESD have led to the creation of new governmental bodies in charge of directly implementing ESD, for instance in USA, and EU members.

In developed nations the implementation of ESD depends mostly on the policy level, the governmental will to implement ESD shown through a policy, structural and economic support as well. However in developing countries ESD have been implemented with less success not due for lack of governmental interest but instead for low national budget to allocate on it, having to prioritize other initiatives instead. Taking as an example, the Swedish government invested 70 million SEK in 1999-2001 to increase competencies of teachers (Henderson et al 2004) in the other hand Ecuador in the last nine years have at least reached to increase its investment in education to cover 3.4 % of GDP. External financial aid can be sourced to overcome the gap but the scope of implementation would be limited (Arribas 2013). For example in India, the Barefoot College in Tilonia was initially financed by international NGOs until it could be self sustain, now it is an independent self-sustaining organization (energy and water independent) which encourages this values on their community (Arribas 2013), but the area of reach is limited to the community in Tilonia.

d) Professional development and their engagement

Teachers are direct actors of change and key performers for the implementation of ESD (Henderson et al 2004), and teacher's knowledge or their previous training itself becomes a foundation for the implementation of ESD. Teacher's training and engagement is a direct leverage point in the educational system for the implementation of ESD (Lidgren et al 2005). Additionally teachers' motivations and perceptions should be considered and should be aligned with the ESD objective pursued in order to have successful outcomes (Lidgren et al 2005; Radeiski 2009).

Lidgren *at al* (2005) also focused on teachers' essential need to be fulfilled and motivation in order to implement ESD in transversal direction on the curricula. This is conclusive in the work of Radeiski (2009), who compared the inclusion of Environmental Education (EE) in elementary schools, between Sweden and Germany. In both educational systems the implementation and importance of EE is remarkable and adapted to their context and interest but German teachers experienced more pressure to deliver their classes as in comparison with Swedish teachers due to more pupils per class. Concluding that Sweden has a highest successful teaching method that involves teacher's motivation, which led to early introduction of EE to the pupils than Germany. Lidgren *at al* (2005) and Radeiski (2009) concluded that local success in a broader spectrum is directly related with the action of teachers in the system.

e) Curriculum and syllabus Analysis

The curriculum analysis has been promoted as a key indicator to measure ESD in depth and breadth of implementation (Bagoly 2013). However, it is not always the case that subjects would appear directly on the curriculum and further analysis of background documents is needed. Sweden do not use the concept of sustainable development within the Swedish curriculum but it is comprised of supporting documents as a transversal subject (Arlemalm et al 2014). The curriculum analysis reveals the pursued objective, even if the ESD does not appears on the manes of the subjects taught, the exploration of the syllabus and content can provide a picture of related topics with ESD spread among subjects (Arlemalm et al 2014).

Integration of ESD into the curriculum is a leverage point in order to deliver the knowledge to all individuals that intervened in the system. ESD should be integrated transversely,

reaching all pupils and should not be considered as a highly specialized add-on knowledge, avoiding discrimination between high and low education status of people (Bagoly 2013).

f) Stakeholders Participation

The aim of ESD in the last step as is described by Benavot (2014) is how sustainable development entails the learning process and experiences that result in the promotion of real change in the community from which it needs the participation and integration of all members. It can be demonstrated by the whole school approach to sustainability. Henderson et al 2004, after reviewed programs established in developed and developing countries concluded that a critical component for a successful program is the integration of stakeholders into the system which would facilitate the implementation and create a real change into the system.

g) Monitoring and control

After deploying an action plan or a policy, monitoring and control should be conducted to further make corrections and secure the advances made. This step was well established on the International implementation scheme for ESD (UNESCO 2005) but yet a lack of existence and poor research on the topic have been detected.

Monitoring and reporting were considered to be of high relevance when the comparison of the implementation of ESD among the Enviro schools in New Zealand, the Green School Award in Sweden and the Green School Project China, concluded that most interest should be given to this feature (Henderson et al 2014). Also it is consistent with the report made by Benavot 2014 on the implementation of ESD in primary and secondary education, who concluded that the lack of monitoring and evaluation tools to measure ESD progress should be developed and applied further in order to secure the implementation of ESD and improve it.

3. Analytical Framework and Methodology

The current chapter is based to section 2.2.4 which refers to how comparisons have been made to analyse ESD implementation. The chapter presents the general framework and within the methodology that will be used to review the implementation of ESD in Ecuador and Sweden.

3.1 General Framework

The general framework integrates the following aspects: the political background, the local context, the economic support, the professional development and their engagement, curriculum inclusion, stakeholder's participation, monitoring and control.

3.2 Analysis of the integration of ESD in Ecuador

In order to grasp all the issues of the general framework in a national perspective a top-down approach was chosen. Compilation of information and analysis was realized starting from the national perspective till reach the school ground, in order to reflect how ESD has been integrated in the Ecuadorian Educational System for grades 1 to 10.

3.2.1 Acquisition of information

Literature review of National Policies, regulations and laws that concern to education in contrast with reviews made by scholars, NGO's and journalists set a base of information.

Further information and confirmation of previous findings in terms of how laws and regulations have been applied took place through interviews with the actors that intercede in the Educational System of Ecuador in a top-down approach (all the actors interviewed are included in references, interviews in Ecuador). This started at the Ministry of Education, followed by Municipal Authorities and finalizing at school ground with school's Rectors and Teachers. Additionally an interview was carried with a representative of VVOB. VVOB is an NGO that currently is working the Ministry of Education of Ecuador. A total number of 20 interviews were conducted from which; 14 corresponded to school teachers and rectors, 3 representatives of the Ministry of Education, 2 representatives from the Environmental Protection of the Municipality of Ruminahui and 1 from VVOB. In order to have a broader access to teachers, directors and schools itself surveys and interviews were conducted under the condition of anonymity.

In order to reflect the current status at school ground, a survey was applied for school teachers of 1 to 10 grade in a delimited geographical-political region of Ecuador, recognized as the Sangolquí parroqui (49.9 Km²), which is located in the Municipality of Ruminahui part of Pichincha Province. The statistical sample of 226 was calculated in base to the number of school teachers that work in the schools of Sangolquí province, showed in Table 1

Table 1 Schools composition and distribution in Sangolqui Parroqui. Source: Data obtain through Ruminahui Municipality 2015.

Type of School	Number	Teachers
Public Schools	25	
Private Schools	23	
Public and Private schools	1	
Total	49	1341

For the total number of the sample of 1341 teachers, with a level of confidence of 90 %, a margin of error 5% and with a response distribution unknown, the minimum recommended size for the survey was calculated to be 226. However with the collaboration of 14 Educational Units and 282 teachers, which correspond to the final number of surveys conducted.

3.2.2 Analysis of Information

ESD is based on the fundamentals of SD which are the economic, social and environmental interconnected perspectives, which was addressed in Section 2.2.2 The three keystones of SD were the basis of analysis of the information obtain for the integration of ESD in the general framework: the political background, the local context, the economic support, the professional development and their engagement, curriculum inclusion, stakeholder's participation, monitoring and control.

The carried analysis brought out the current status and focus points in which the Swedish experience could support implementation of their lessons, initiatives and programs

3.3 Analysis of the integration of ESD in Sweden:

3.3.1 Acquisition of information

Information was collected from previous analysis made for the implementation of ESD in Sweden by UNESCO, UNECE, and independent researchers, integrating their views. For further clarification of the independent researchers view, an email interview took place. Additional information of the initiatives, programs and projects was collected from their correspondent webpages. From all the initiatives that were found, one was selected to be explored further, with the aid of personal interviews with two of their representatives in Lund.

3.3.2 Analysis

The collected information was organized under the same framework as in Ecuador. From which, was extracted the initiatives, programs and relevant projects that could be adapted to the Ecuadorian context.

3.4 Converging the Swedish experience for the Ecuadorian Context

Based on to the results of the Ecuadorian analysis of implementation of ESD, carried in the first section, focus points were detected. The focus points were analyzed in comparison with the lessons of implementation of ESD that were found in Sweden, in order to make recommendations for Ecuador

4. Ecuador

A regional lunch was gathered during the Ibero-American Conference on Sustainable Development, held in Brazil in 2005, by the UNESCO and the Brazilian Business Council for Sustainable Development (UNESCO 2007). The lunch has led to the development of a regional strategy in 2007, entitled “Building Education for Sustainable Development in Latin America and the Caribbean” (UNESCO 2007). However, before going any further it is worth mentioning how ESD has been introduced in Latin America, as in many countries of this region ESD is directly linked with Environmental Education (ORELAC 2009, Van 2013).

4.1 Development of ESD in Latin America

An assessment made in 2009 to UNESCO’s actions in Latin America and the Caribbean describes conflict with the introduction of DESD and Environmental Education (EE). Environmental Education had rooted since 1975 through the International Program of Environmental Education which lasted till 1995. This program was primordial for mobilizing actors towards environmental protection and introducing the importance of environmental education. In 1995, as a product of the Convention in Latin America for the Development of National Programs for Management and Training for the Environment and Environmental Conservation, the creation of Environmental Education Net was agreed. In 1996, the Summit of the Americas took place for the adoption of the “Declaration and Action Plan for Sustainable Development for the Americas”.

The first introduction of Education for a sustainable future and promotion of ESD into Latin American context took place in 1997 during the Second Latin American Congress held in Mexico, concluding with the adoption of the Tesalonic Declaration where is stated that environmental education should be directed for a sustainable future. Contrapart of environmental education advocates held also a conference where ESD was criticized as an imposed concept by UNESCO, instead of supporting what has already achieved with Environmental Education and should not be replaced (Gonzales 1999). However others called to work for the integration of ESD into Environmental Education (Macedo 2005).

By 2002 the decision of declaring DESD in Latin America took place during the Regional Symposium for Environmental Ethic and Sustainable Development, with the participation of Ministers of Environment, approving the “Ethic for Sustainability and Life Manifest”. In this agreement a reflection over education for Sustainability appears on paragraph 22. In 2003 on the IV Congress Iberoamericano of Environmental Education held in Cuba, the debate to include ESD was still strong. However during the V Congress Iberoamericano of Environmental Education held in Joinville, Brazil in 2006, the support was given for building up ESD through EE, where “Environmental Education should be directed to support Sustainable Development” (ORELAC 2009).

Regional initiatives with the launch of DESD started with the Ibero American Conference for Sustainable Development held in Brazil in 2005. This was followed by the Latin American Meeting “Building Education for Sustainable Development in Latin America” held in Costa Rica in 2006, which aimed to promote measures to implement DESD. By 2007 the Regional Strategy entitled “Building Education for Sustainable Development in Latin America and the

Caribbean” was signed. Unfortunately the strategy was not followed by monitoring or further actions, which was found on the revision made on 2009 by ORELAC commissioned by UNESCO.

Parallel to the regional level, two actions took place in order to merge Environmental Education and Education for Sustainable Development. In 2004 the strategy to the introduction of Environmental Education to support Sustainable Development through the Latin American and Caribbean Plan of Environmental Education (PLACEA) was adopted. At subregional level the Andean-Amazonic Plan of Communication and Environmental Education (PANACEA) was developed with the participation of Bolivia, Brazil, Chile, Colombia, Ecuador, Peru and Venezuela. The first one focus in improving communication among members, and integrating private and public sectors in addition to of increasing training. Meanwhile PANACEA focus towards a national implementation through national policy and strategy, communication and training (ORELAC 2009).

4.2 Policies and Laws related to SD in Ecuador

4.2.1 Ecuador and the UNESCO

The Ecuadorian National Commission of UNESCO officially started in 1947 under the Executive Decree No. 218 and restructured in 1966 under Decree 1200. The objective is maintain and develop collaboration among Ecuador and UNESCO through coordination of the programs that UNESCO conducts (MINEDU 2014). Additionally UNESCOs commission would give advice the Ecuadorian government in educational, science, culture, communication and information issues. The structure of this commission stipulates that the Education Ministry is the president and the members are the General Assembly, the Executive board, and any extra commission that could be created to assist (MINEDU 2014).

4.2.2 Decade Action Plan for Environmental Education 2006-2016

As mentioned earlier in most of Latin American countries uses Environmental Education as the common and equivalent term instead of ESD (UNESCO 2014). In Ecuador the case is not different being one of the leading documents developed with the collaboration of UNESCO, the Decade Action Plan for Environmental Education 2006-2016.

Despite the controversy of the concept on Sustainable Development, it is widely used. In Ecuador the implementation of ESD was thought to be delivered through Environmental Education (EE) as found in the Decade Action Plan for Environmental Education 2006-2016. This plan was developed with the collaboration of the Ministries of Environment, Education, Health, Defense, Tourism, and UNESCO. After the launch of the plan no further action to monitor the implementation was conducted.

The vision stated that Education for Sustainable Development should be pursued from a global perspective and in line with the UN Millennium Development Goals. It also recognizes the urgency of society and governments to address the environmental problems through education, recognizing that education is a strategy for fostering changes in behavior of present and future generations.

This plan was elaborated based on of a diagnosis of the environmental quality of Ecuador, pointing to the following as most notable environmental problems of the nation; a) deforestation, b) biodiversity loss, c) erosion and pollution of soil, d) urban detriment of environment, e) water contamination and f) dependence and waste of energy sources.

Additionally a brief on the state of education was reported, followed by policy and strategy development for the national government to be adopted as priority, being in total seven as listed below:

- Environmental Education for Sustainable Development is a national educational priority. The government would support it by introducing it in a transversal axis on the curriculum
- Motivate research on Environmental Education
- Deliver training on environmental education for sustainable development to teachers
- Fortify institutional capacity for the development on EE in all aspects
- Fostering communication and diffusion of the plan and projects on EE for SD
- Produce, use and diffuse didactic material
- Curricular innovation will be stimulated on all levels of education

Finally the plan included the development of six projects answering to some extent to the environmental diagnosis made in cross-linked analysis with social factors. The total projected budgets was of 2 670 000 US Dollars, and should include the aid of non-governmental institutions. Regrettably the information of the development of this plan was not found in any document, through the interview conducted with members of the Ministry of Education it was confirmed that no monitoring action took place after the launch of the plan.

4.2.3 The Decade Action Plan for Education in Ecuador (DPEE) as part of ESD

Ecuador lacked consistency in its long term planning due to instability of the governmental sphere, however it has changed, and the Decade Plan for Education in Ecuador (DPEE) was first accepted nationally through consultancy and vote, officially it was launched in 2006. Since then the plan has been implemented until the present year with consistency. This plan consisted of eight policies to improve education in Ecuador as a whole, even though it does not mention ESD on it, the eight policies are a base in order to understand the Ecuadorian context and how ESD needs to be integrated. The eight policies are:

1. Universalization of pre-elementary education (1 to 5 years old).
2. Universalization of general basic education (1th to 10th grade).
3. Increase of high school enrolment which should cover at least 75% of the population with corresponding age.
4. Erradication of illiteracy and fortification of alternative education.
5. Improvement of infrastructure and equipment in educational institutions.
6. Improvement of quality and equity of education and implementation system.

7. Re-evaluation of teacher's profession, improvement of initial formation, constant training and better work conditions.
8. Annual increase of national investment in the educational sector, til it reaches 6% of GDP

4.2.4 Green Consitution and the Good Living Concept

After the election of President Rafael Correa in 2006, the plan for a new Constitution was launched under the "good living concept" and inclusion of greener parameters. After the referendum of 2008 with a approximately 63% of the Ecuadorian population agreeing with the reform, it was officially accepted and entered into force since the 20th of October in 2008.

The Ecuadorian Constitution states under Title III Article 10, that nature holds the right, which shall be recognized within the scope that the Constitution establishes. Water is considered a national heritage of the public under Article 12. The Ecuadorian government would support the acquisition of safe food, giving priority to the one that is locally produced (Article 13). Under Section II of "Healthy Environment" it is stated that every Ecuadorian citizen has the right to live in a safe environment, which should be ecologically balance and would guarantee sustainability and good living. Also in the same section the preservation of the environment, the conservation of ecosystems, the biodiversity and the genetic heritage of the nation are issues of public interest as well as the prevention of environmental damage and the recovery of natural spaces that have been degraded. On the energy sources, Article 15 states that the state would promote the use of environmental, clean and safety energy sources. Additionally it is stated that the sovereignty in the area of energy would not be achieved through the detriment of food sovereignty or the right to water.

Under the III Section on communication and information it is stated that everyone should have free access to communication in an inclusive manner. Also the state will promote diversity in communication is written on Article 17. Under Article 19 the state shall regulate the prevalence of informative, educational and cultural contents on the media program. Also it bans the emission of any kind of advertisement which contains violence, discrimination, racism, sexism, religious or political intolerance and any that attempt the human rights.

4.2.4.1 Education in the Green Constitution

Under the following section the articles extracted from the Constitution were clasified into four groups to reveal: the objective, the focus, the governmental support, and the economic support for education.

a) Governmental support for education

Education is a recognized right under Art. 26 where it is also stated as a priority area of the government for the national investment which must guarantee social equity and inclusion. It also states that education is indispensable for the "good living". Every member of the Ecuadorian society have the right and the responsibility to participate along the educational process.

Under Article 29, universal access to education is guaranteed as well as the permanence until the last year of education with out discrimination. Also states that education is obligatory from pre elementary school, until finalization of high school. Additionally, Article 36 and 39 support the right to education for children and teenagers. Furthermote Article 44 establishes that all society shall support children to realize their rights as a priority.

On Article 44 it's established that the state shall adopt among others the three priority measures to secure the right for education of children: 1) prioritisation for children younger than 6 years old in order to guarantee their education and integral care, 2) implementation of policies to eradicate child labor and 3) preferential attention for full social integration of who have disabilities.

Article 326 No.15 ban the paralization of public educational services.

Under Article 347 are established ten responsibilities of the state: 1) to fortify public education and secure constant improvement of its quality, access, infrastructure and equipment. 2) guarantee democracy and rights execution within any educational institution, 3) guarantee exiistance of formal and non formal education models, 4) guarantee that education shall integrate civil, sexual, environmental knowledge acquisition, 5) guarantee respect for psychoevolutive development of children and teenegers during the educational process, 6) eradicate all forms of violence from the system, 7) eradication of pure, functional and digital ilitracy, 8) integretion of informative and communicative technologies into the educational process 9) guarantee the use of native language for education on native communities and the use of Spanish as tool for intercultural relationship, 10) Secure the inclusion of at least one ancentral language into the curriculum in a progressive manner 11) guarantee the active participation of students, parents and teachers in the educational process 12) guarantee under equity social, territorial and regional principles that all individuals have access to public education.

Article 349 establishes constant training for teachers in the whole educational system.

b) Economic support for education

The budget established for Education from the government shall be protected even under national emergency state, which is written in Article 165. Additionally Article 286 states that education shall be persued with constant national budget under all circumstances. Furthermore the transitory disposition 18 of the National Constitution support the Decade Plan of Education to annually increase at least in 0.5 GDP for education until minimal achievement of 6 % of GDP. Also, Article 346 establishes that the government shall designate as a priority, sufficient, permanent and adequate resources for the proper operation of the educational system. Finally Article 348 establishes that lack of transference of required resources for the educational system as was stated in Article 286 shall be punished with the restitution of the authority.

c) Focus of Education

Among the articles of the Constitution the focus and objective of education can be found on Article 27, 28, and 343. The first gives the direction that education shall persue integration of the social, cultural, democratic, economical and enviornmental aspects. It starts by specifying that the focus is the Human Bieng and education shall guarantee their holistic development within human rights, sustainable environment and democracy. It also states that education will be participatory, obligatory, intercultural, democratic, inclusive, and diverse. Education of

quality shall foster gender equity, justice, solidarity, peace, also it shall stimulate critical sense, and physical education, individual initiative as well and strengthen the community, and shall develop competences and capacities to create and work.

It recognizes that education is indispensable for building knowledge, and to execute own rights, and is strategic axis for national development.

Article 28 establishes that education will respond to public interest and won't be directionated for individual or corporate interests. It also guaranties universal access, permanence and mobility to all without discrimination as well it is obligatory from pre-elementary till end of high school or its equivalent.

Article 57, in reference to native communities' rights establishes the recognition of their traditions and secures education maintaining and respecting their individual culture through the fortification of the educational system.

d) Objective of education

The objective of education can be conceived from Article 343 which states that the national educational system as final objective shall develop individual and collective capabilities that enable learning, and development of individuals to use the knowledge, techniques, art and culture. Also it states that the center of the system shall be the learner and will work in a dynamic, flexible, inclusive, efficient, and effective maner. It shall integrate the multicultural vision according to the geographical, cultural and linguistic diversity of the country.

It is important that Article 343 integrates a motivational speech base on the phrase "the Ecuadorian revolution" which is the current concept of the Government and within this article it is recognized that revolution can be only achieved throught education and for which the state shall guarantee opportunities for inclusion and quality of education.

e) Monitoring

The transitory Decree 19 of the Constitution establishes that an evualuation shall be conducted after three years to evaluate the function, objectivity and quality of the public education and shall state policies to improve it.

4.2.5 Law of Education

All the articles cited before from the Ecuadorian Contitution of 2008 are written at the beginning of the Law of Education, among others, that are relation with education for people with disabilities, sexual education, and secular education. The Law of Education develops further the Articles in 38 principles. Among the principles that education is based on, only under the memebership principle it is written that the formation received shall respond to the necessities of their natural environment from local to global perspective among the social and cultural surrounding. The rest of 27 principles comprises issues that are of more social and democratic relevance.

Under Article 3 which corresponds to the Objectives of Education stated in the Law of Education, paragraph f, states the promotion and development of a citizen and the development of a conscience of conservation, defense and improvement of the environment

in order to achieve a healthy life, and for the rational, sustainable use of natural resources. Additionally on paragraph h, it is written that the learner shall be the center of education for whom it must be guaranteed its integral development within the educational rights where the family, democracy and nature are integrated. Paragraph k, also reinforces the promotion of knowledge, respect, rescue, preservation and valoration of natural, cultural, tangible and non tangible patrimonies.

Paragraph i, makes direct reference to equity for males and females in all the educational systems for every citizen respecting their culture, promoting dignity and valorating the differences. It is reinforced by paragraph l, where ask to develop constant practice of human rights plus respect, non discrimination, justice, democracy, equity, non violence, fundamental liberty and civic values. Paragraph o, promotes education for public spirit and participation of society for the national development where the community learn, teach and participate.

Paragraph r, makes reference to education that promotes productive capacities according to the geographic and cultural diversity of the country, supporting individual and collective productive initiatives that foster an entrepreneurial culture. It is also supported by Paragraph j, which makes reference to the integration of the educational community into society as part of the transformation and shape of the Ecuatorian society.

Paragraph n, supports that education must provide knowledge for health, and prevention of diseases and drug use or any other substance that is harmful to human health.

Article 4, refers to the right to education guaranteed by the state from pre-elementary till highschool plus permanent education from formal and non formal education for every Ecuatorian citizen.

Article 5 describes responsibilities of the state related to education for all Ecuadorian citizens. Among them on paragraph m, it is written again that the state shall promote the protection and conservation of environmental and cultural patrimonies, foster research, artistic creation, practice of sports and finally directly protect and maintain the environment.

Paragraph n guarantee the active participation of students, parents, and teachers. Under this article when it is mentioned the good living it is written that the state will guarantee an integral education which includes education for sexuality, humanity and science, in this paragraph the environmental part is missing. Finally paragraph x, states that the state shall guarantee an education that will prepare citizens at the end for being included in the work force.

Article 19 refers to the objectives of the educational system, stating that the national educational system is part of the national system of inclusion and equity, which shall follow the politics under the “good living” concept. It is mentioned that it is a responsibility of the National Educational Authority to develop the curriculum, considering the multicultural environment of Ecuador. It does also mentions that it could be complemented for the peculiarities of each region. It is necessary to consider that Ecuador possesses four complete different climate zones, which are the home of a highly diverse flora and fauna plus a multicultural community for which the curriculum should be developed.

Article 21 of the Law of Education, establishes that the National Educational Authority is the Ministry of Education. Meanwhile Article 22 describes all the responsibilities of the ministry starting from the development of national policies to be applied as well the quality standards and management system for the development of the learners under the educational process. Also states that the delivering of the educational resources permanently should be a

responsibility of the Ministry of Education and simultaneously is a concern of the municipalities or local authorities.

Under title IV “the Intercultural Bilingual Education” which is an additional directive for indigenous communities of Ecuador in order to respect their right to their ancestral knowledge and own culture. Within this title, Article 79 states that the foundations of the system is the National Educational System of Ecuador but includes in a transversal manner seven foundations. It is relevant to say that the first foundation written for this system is “the respect and care of Pachamama”. Pachamama is Quechua and means Mother Earth this is one of six fundamenents of this particular system. The following Article 81, integrates the concept of the Pachamama where the educational, intercultural, bilingual system shall develop, fortify and promote education according to the cultural diversity for the preservation, conservation and harmonious coexistence with the Pachamama and for the integral development of the individual, the family and community.

4.3 The structure of the Educational System in Ecuador

The Ministry of Education is the designated authority by the government to direct all aspects related to education, through the application and monitoring execution of the Law of Education and to develop the curriculum and syllabus giving direction to the educational system of Ecuador. It is the head of the decentralized education system, which directs nine zones within the country, each zone is divided in districts. For each district exist a Director who acts in name of the Ministry of Education, and to whom the public schools should respond (MIEDU 2014).

Within the Ministry of Education exist different departments, but for the purpose of the thesis only the three were found of relevance and will be described. First the Department of Planning is responsible of the planning, execute and monitor of the current Decade Plan of Education. The department of Curriculum development is in charge of the development of the Curriculum, Syllabus, and supportive teaching material. The Inspectorate Department is in charge of monitoring the educational units but it does not integrate among its activities monitor quality of education directly (MIEDU 2014).

4.4 Curriculum

The development of the educational curricula is responsibility of the Ministry of Education (MIEDU) which established the latest reform in 2010. The development of the curricula is divided in 9 subjects: Literature and Language, Mathematics, Social and Natural Enviroment, Natural Sciences, Social Sciences, Aesthetic Education, Gym, Foreigner Language and Clubs. It can be seen in Table 2, which presents the distribution of hours per week in each subject per grade.

Table 2 Distribution of hours per week per subject per grade for Basic Unified Education (MINEDU 2014)

Subjects	Grades									
	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°
Literature and Language		12	12	9	9	9	9	6	6	6
Mathematics		8	8	7	7	7	7	6	6	6
Social and Natural Environment	25	5	5	–	–	–	–	–	–	–
Natural Sciences		–	–	5	5	5	5	4	4	4
Social Sciences		–	–	4	4	4	4	4	4	4
Aesthetic Education		2	2	2	2	2	2	2	2	2
Gym		5	5	5	5	5	5	5	5	5
Foreigner Language								5	5	5
Clubs		3	3	3	3	3	3	3	3	3

4.4.1 The Good living concept, a transversal axis into the Curricula

The Good Living concept is stated by the MIEDU to be included into the curriculum. The Good Living concept is embedded in a bidirectional manner as it acknowledges that education is needed to achieve the Good Living and education shall serve as a conductor of the transversal axis that constitute the principles of the Good Living concept. The principles that direct the “Good Living” seek to develop a society that is democratic, equitable, inclusive, diversity tolerant, and environmentally respectful.

The transversal principles should be integrated into all curricular projection with concrete actions. The inclusion of this actions should be planned by each institution since the start of the year and should include the following topics:

- Interculturality: recognition of ethnic-cultural manifestations from the local till global prespective based on a vision of respect and value of the ethnic diversity.
- Democratic community formation: development of universal human values, accomplishment of citizen obligation, awareness of rights, development of Ecuadorian identity and respect of national symbols.
- Environmental Protection: interpretation of environmental problems and what are the implication for the survival for species, the interrelationship between the human and nature and the strategies for the conservation and protection.

- Health care and recreational habits of students: importance of the biological and psychological development in accordance with the age and the socio-ecological surrounding, the food habits, hygienic and the productive use of free time
- Sexual Education: self awareness of the biological changes and respect for the integrity of the body and development of sexual identity with the biological and social consequences and the parenthood responsibilities.

4.4.2 Analysis of the curriculum for ESD

The curriculum analysis runned over only one of the subjects; Natural Sciences, which would show higher relationship with Education for Sustainable Development as was reviewed from the start the inclusion of ESD into Environmental Education which is a transversal axis on the curricula. However this approach leaves out Social Sciences which could also reveal implementation of ESD with strong focus on the social component, for which others researches could conduct further research. On the case of first, second and third grade the anlysis was conducted for Social and Natural Environmet as can bee seen on table 1, Natural Science appears as an individual subject since 4th grade. The information that follows were analyzed from the Curricula for each grade for Natural Sciences, available in the webpage of the Ministry of Education.

4.4.2.1 Natural Sciences Curriculum for Grade 1 to Grade 10

outcomes after been finalized tenth grade for Natural Sciences, is that children will be capable of; a) understand nature as an integrated and dynamic system, b) value the ecosystems and analyze the interrelationship between biotic and abiotic factors, being aware of the responsibility to maintain, preserve and protect the social and natural environment, c) develop hypothesis, reflect, analyze and synthesize knowledge in order to understand biological, chemical, physical and geological process, d) understand the environment through ideas and connected explanations, and e) learn how to learn and to transform the information into knowledge. The curriculum for Natural Sciences was classified as can be seen on Table 3 under four perspectives; social, science, environmental and economic perspective for each grade.

Table 3 Classification of natural sciences curriculum under four perspectives; social, science, environment and economy from grades 1 to 10

Grade	Social perspective	Science perspective	Environmental perspective	Economic perspective
1 and 2	Conception of the individual and the surroundings, within the social context	Identification of living organism and non-living organisms	The value of plants	Not specified
3	Interaction between the community and green spaces Self-recognition as an Ecuadorian and the culture that it involves	Relationship between life and water soil air light and heat Solid waste Malnutrition and health	Preservation of resources Classification and recycling of solid waste and impact in nature Identification of local dishes	Not specified
4	Importance of farming for the community	Identification of natural sources of energy. The relevance of fertile soil for living organisms and for agricultural Soil as a renewable source. Prevention water-borne diseases Description of life cycle of local organisms	Importance of natural resources and measures to decrease contamination Conservation and preservation of soil, water, air Activities to increase soil fertility Importance of organic farming Sustainable management of natural resources.	Humans are central and plants and animals are there to serve us and are resources to be exploited
5	Relationship of human and the environment Promote care and protection of human body	Identification of different climates zones Earth movement and recognition as a whole system Earth is a changing adaptable interactive system Importance of soil, water, air and energy for terrestrial and aquatic ecosystems Characteristics of fertile soil Differentiation of life cycles of organisms in nature	Meditation over how fragile the system is and need to be maintain Conservation of ecosystems and impact of human Sustainable agriculture Possible creation of school garden is suggested. Relevance of conservation of water but through external aid Suggestion of research how development have impacted the environment using TIC	Is not specified
6	Is not specified	Recognition of different natural regions of Ecuador Characteristics of each region referring to biotic and abiotic components Characteristics of pastureland in terms of biotic and abiotic components Relationship of soil and food	Value of soil as a renewable resource Sustainable conservation of pastureland soils Value of water for pastureland	Continue Utility of pastureland for livestock and agriculture

		chains among biomes Identification of the atmosphere and its composition		
7		Importance of biodiversity in the forest Importance of soil, and water for the forest Life cycles developed in the forest	First introduction of the word sustainability and sustainable management of a forest. Which is mentioned in the sense of managing the forest to supply the necessity of present generations without compromising future generations' needs. Preservation of biodiversity of the forests	Identification diversity of woods and which ones are of economic relevance to be exploited in a sustainable manner
8	Implication of desertification for humans	The desert as a biome and its biotic and abiotic characteristic Identification of anthropogenic factors for desertification and its environmental impact Use of solar and wind energy	Implication of desertification on the rainforest	Identification of activities to eliminate negative impact and reduce desertification of soils
9	Is not specified	Origin of the universe and life, description through theories Formation of Galapagos islands, description of biotic and abiotic characteristics Importance of sweet water and the process of desalination. Use of water to produce energy and geothermal energy	Preservation and conservation of Galapagos islands	Is not specified
10	It makes direct relevance of the activities that pollute the environment but not mention the social side of it.	Characteristics of the different natural zones of Ecuador. Identification of bio-zones in the world and comparison with Ecuador Analysis of anthropogenic impact over soils and air in different eco-zones Value of superficial and subterranean sources of water for human supply but it does not cover the rechargeable rate) Green house effect, climate change, ozone depletion, acid rain, fotochemic smog	Recognition of importance of conserve and manage in a sustainable manner the biodiversity present in Ecuador Mitigation, remediation of soils and reduction of environmental impact Inclusion of NGO's as source of information	Is not specified

4.5 Teacher's profession in Ecuador

Under the objectives for the Decade Plan of Education of Ecuador (see section 4.2.3) it is stated as a policy the re-evaluation of teacher's profession, for which the government has re-categorized teachers who work in public schools. This classification is among nine levels

which are established according to their professional degree achieved, years of experience since level (I) and participation in courses from the Ministry of Education as can be seen in Table 4. The courses given by the Ministry of Education are of pedagogical, management and quality content.

Table 4 classification of public school teachers in Ecuador, source: in base to Article 301, Chapter IV, and Title IX of the General Regulation of the Organic Law of Education

Level/ requirements	I	H	G	F	E	D	C	B	A
Professional Degree	High- school	Bachelor	Bachelor	Master	Master	PhD	PhD	PhD	PhD
Experience	0	0	2	4	8	12	16	20	24

In the last assessment made from the total of 54 387 public teachers only 18 000 were capable of ascend to a higher level, from which 63 are in level B, 949 in level C, 1651 in level D, 1928 in level E, 10512 in level F, 2012 in level G, 2168 in level H and 46 in level I. The salary of a teacher who works in public schools in level B is of 812 US Dollars actually but by 2019 the same teacher will earn a total of 1412 US Dollars under the governmental program (El Comercio 2015).

4.6 ESD in practice

4.6.1 Surveys and Interviews

Interviews were conducted for 20 people of four categories; 14 corresponded to school teachers and rectors, 3 representatives of the Ministry of Education, 2 representatives from the Environmental Protection of the Municipality of Ruminahui and 1 from VVOB, a current working NGO working with the Ministry of Education.

In order to have a broader access to teachers, directors and schools itself surveys and interviews were conducted under the condition of anonymity. A total of 14 Educational Units participated in the study with the collaboration of 282 teachers which correspond to the final number of surveys conducted. When processing the surveys 50 were annulated as they were not completed or did not correspond to the range of grades under study. Final analysis was done for 232 surveys with a confident interval 5.8 (or confidence level 95) and 18 questions each.

No information was given to the teachers prior to the survey as the survey was implemented to reveal their familiarity with the concept of ESD. The survey was constructed in a manner that by the end the person will get sense of what is ESD at least on the conceptual level.

In order to confirm information additional interviews were conducted with a total of 14 teachers and rectors from the Educational Units of Sangolqui parroqui. In the case of the interviews, anonymity was maintained but under a collective perspective, in other words what

was said will not be connected directly to a name but instead to a group of reference (see references interviews).

4.6.2 Surveys results

The first part of the survey referred to questions of personal data. Among them, **Question 2** asked the age classified in six ranges, starting with 25 until more than 51 years old as it is showed in Table 5. The majority of the group is over 41 years old with 63%. Additionally it can also be said that 13% corresponded to novel professionals under the age of 30 years old.

Table 5 Classification of teachers in base to age range during the ESD familiarity survey, 2015.

Age range	%
25-30	13
31-35	12
36-40	12
41-45	28
46-50	19
More than 51	16

In order to confirm that the survey was applied into the range of 1 to 10 grade, **Question 4** asked in which grade teachers teach. As can be seen in Table 6, the minimal number of 11 teachers from eight grade and the heights of 38 teachers from 10 grade. Additionally I must inform that the group of teachers correspondent to “Others subjects” worked on an transversal axis not having only one grade in charge but all the range from 1 to 10 and they were excused from this question as allocation was not possible.

Table 6 Distribution of teachers in base to the grade taught, from the ESD familiarity survey 2015.

Grades	Total
1	12
2	20
3	26
4	19
5	22
6	17
7	18
8	11
9	18
10	34
Total	197

Further casification of the survey started with **Question 3** which asked, what subject was taught by the teacher. The results is found in Table 7 and their percentual distribution on the

total group sample is displayed in Figure 1. It is possible to identify three groups; 1) specialist on subject corresponding to Natural Sciences, Mathematics, Literature and Grammar, Social Sciences and English, 2) multidisciplinary teachers who teach all subjects mostly from 1 to 7 grade, and 3) Others which included teachers who teach: national identity, culture, physical training, computer class, aesthetics, religion and legislation.

Table 7 Distribution of teachers in base of subject taught

Subject	Total
Natural Sciences	13
Mathematics	26
Literature and Grammar	15
Social Sciences	15
English	23
Multidisciplinary*	99
Others**	41
Total	232

*Multidisciplinary correspond to teachers that teach all subjects. **Others included teachers that teach national identity, culture, physical training, computer class, stetics, regilion and legislation.

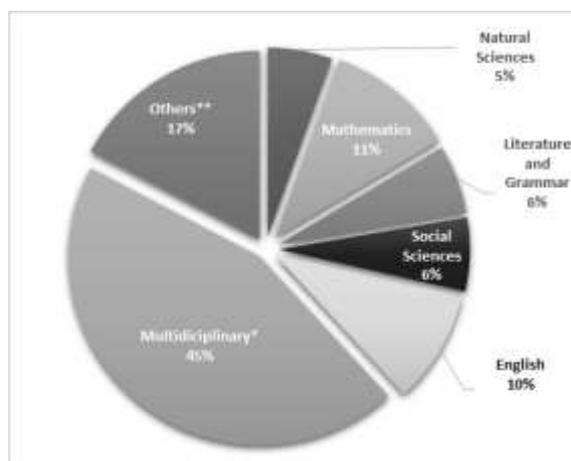


Figure 1 Percentual distribution of teachers in base of the subject taught, in reference whit the total sample number

Question 5 asked what the achieved degree was by the end of formal education, as can be seen in Table 8 the distribution of the answers shows that majority of teachers achieved a Bachelor degree.

Table 8 Percentil distribution of the group of teachers according to the degree achieved in formal education.

Degree	%
High-school	9
Bachelor	78
Master	12
PhD	0
null answer	1

Question 6 referred to information about sustainable development being previously received by the teacher from diverse sources also asked in subquestion 6. From the total sample, only 41% answered positive to have received previous information about SD. Subdividing the sample group in positive and negative answers and calculating their percentage as a subgroup as it is showed in

Table 9. Positive answers were found on Natural Sciences Teacher’s with 77 % followed by Social Sciences teachers with 47% but adding both groups it represented only 11 % (see Figure 1) of the total population being of low significance to develop further as an isolated case.

Table 9 Distribution of positive answers among groups of subjects taught by teachers

Subject	% by sub-group of positive answers
Natural Sciences	77
Mathematics	31
Literature and Grammar	29
Social Sciences	47
English	35
All	34
Others	32

Subquestion 6 revealed the origin of information about sustainable development acquired by the teachers which corresponds only to the group of positive answers of the teachers who said knew about SD, which is expressed in % in Table 10, where learning by themselves or self taught is the major mean of information acquisition for teachers. It is important to state that among the Educational Units that took this survey, 5 of them were part the Municipal Program of transference of Enviromental Education but the low incidence on governmental programs could be explained for the courses being directed for children and not for teachers.

Table 10 Origin of acquisition of ESD's information among teachers

Source	Total in %
Previous Education	14
Governmental program.	6
Information from other organizations	17
Self taught	60
Other	2

Question 10 was formulated to evaluate the knowledge on the concept of sustainable development, asking to select what are the dimensions that should be developed in order to attain sustainable development. Classification of the population was made based on previous question 6 which divided teachers who said having received information in ESD from those who did not. Results can be seen in

Table 11, the majority of teachers (74 %) independly of having or not having received information about SD respondend correctly.

Table 11 Distribution of answers for question 10, among teachers having or not having received previous information on SD.

Answers	Teachers who received information about SD	Positive answers group	Teachers who didn't received information about ESD	Negative answers group	From the total population %
a) No answered	5	72 %	5	75 %	4
b) Correct	62	22 %	114	22 %	74
c) Incorrect	19	6 %	33	3 %	22
Total	86	100	152	100	100

Additionally it was analyzed if there existed a connection among the correct answer and teachers who claimed having received previous information on SD from teachers who did not. Finding that both groups displayed the same tendency as can be seen on Table 10, under percentile distribution for each group (“In base to Positive answers group” vs “In base to Negative answers group”).

Question 9, referred to how familiar teachers were with the intergenerational concept of sustainable development using the definition of “Sustainable Development is the development that satisfy the present generation necessities without compromising the capacity of future generations to satisfy their necessities”. The only significant difference among the groups with and without previous knowledge was more concentration of answers for high familiarity. However as a whole, the distribution showed that most of the participants sense moderate familiarity with the concept as can be seen in Table 12.

Table 12 Distribution of answers for the familiarity of the intergenerational concept of SD among teachers in base to previous classification of question 6.

Answers	Teachers with previous information on SD %	Teachers without previous information in SD %	Total %
a) Highly familiar	29	9	16
b) Moderately familiar	30	45	40
c) Lightly familiar	27	20	23
d) Have never heard about it	3	17	12
d) null	10	9	9

Question 11. Allowed teachers to choose which topics they have delivered in class in relation with SD. The overall results are displayed in Table 13, based on total population of 197 teachers correspondent to all groups as showed in Table 7 with exception of “others”. As can be seen in Table 13 recycling followed by prevention of air pollution, and Gender equality and climate change are among the topics with highest number of teachers addressing in class with more than 50 %. Equal or lower than 20 % is showed for sustainable consumption, poverty reduction, and sustainable life style.

Table 13 Distribution of answers among the ESD related topics taught in class

Topic	% of teachers addressing the topic
k) Recycling	68
f) Prevention of air pollution	57
g) Gender equality	57
a) Climate change	55
d) Sustainable use of water	54
a) Biodiversity	53
o) Cultural diversity	45
e) Prevention of soil contamination	44
j) Reforestation	39
n) Waste classification and final destination	37
m) Waste reduction	30
b) Decrease of disaster risk	29
h) Health care	29
b) Poverty reduction	20
i) Sustainable life style	17
c) Sustainable consumption	16

An additional analysis was conducted based on the previous classification of having received information about sustainable development or not. The percentage of teachers treating the cited topics in class is highest for the group that have previous knowledge on sustainable development with the exception of Recycling and Gender Equality which had higher frequency on the group of teachers who said did not receive previous information related with ESD, as can be seen on Figure 2.

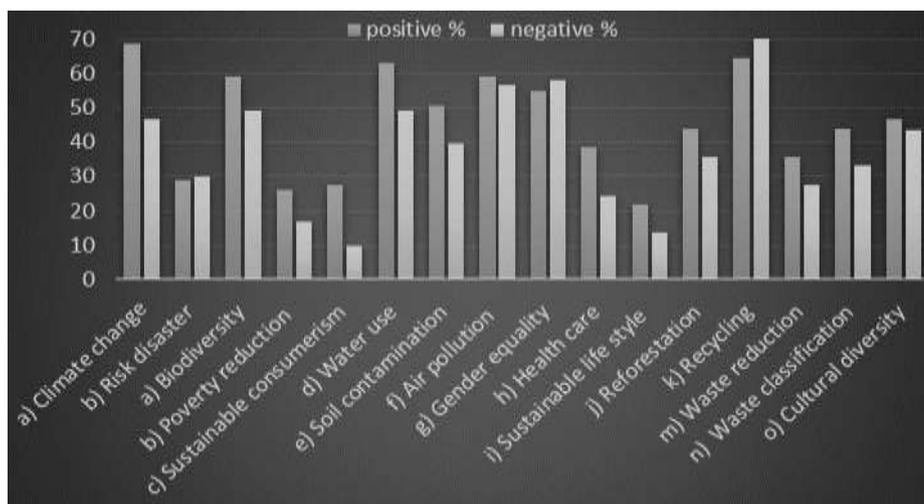


Figure 2 Distribution of teachers addressing ESD related topics among two groups: positive "teachers who said had received information about ESD" vs negative: "teachers who said didn't receive information about ESD"

Question 12, asked teachers if they perceived a relationship between the “Good Living” concept and the preceding topics asked in question 11 (see table Table 13). As can be see in Table 14 there existed a dominance with 72 % of teachers who perceived the topics been directly related with the “Good living” concept.

Table 14 distribution of answers of the perception of a relationship between ESD related topics and the "Good Living" concept

Answers	%
a) Totally related	72
b) Moderate related	21
c) Not related at all	0
e) Null	7

Question 13 asked for the perception of teachers on how the curriculum reflects local reality. The results as showed in Figure 3, reveals that a majority of teachers (71%) perceived that the curriculum reflects local reality. However, when the question was put in the one-to-one interview from the school teachers they repeatedly said that it depended on the teachers' willingness to adapt the curricula to put it in local context because the curricula itself does not.

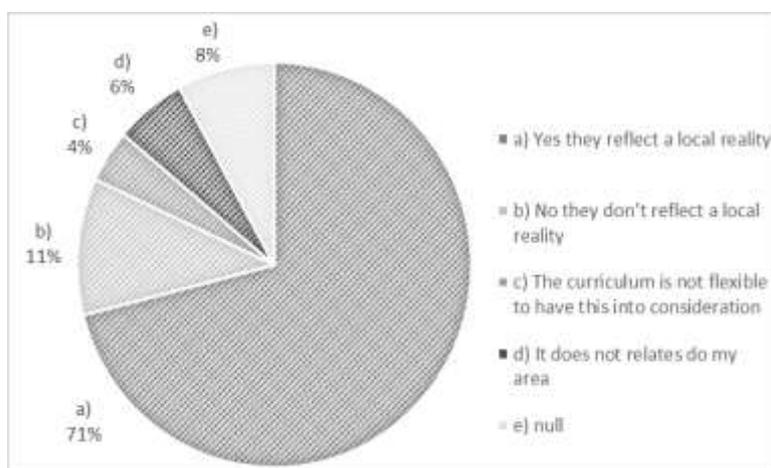


Figure 3 Percentil distribution of answers of teachers for question 13. Does the curriculum reflects local reality?

Question 14, stated if topics were reinforced with other subjects, to reveal how interconnected are classes with each other. As can be seen in Figure 4, with 55 % responding as frequently and 31 % as moderately, it could be said that teachers perceive as classes are interconnected. However, 8 of 10 teachers interviewed stated that although they planned at the beguining of the year how to integrate classes, it does not come to be realized as each of them focus on the academic performance of their own subject in which they will evaluate children at the end. Also it was a perception from 7 of 10 teachers that in order to integrate classes it would demand extended work by them and with the actual model and curriculum is not feasible, time is limited and they don't get paid for the extra hours.

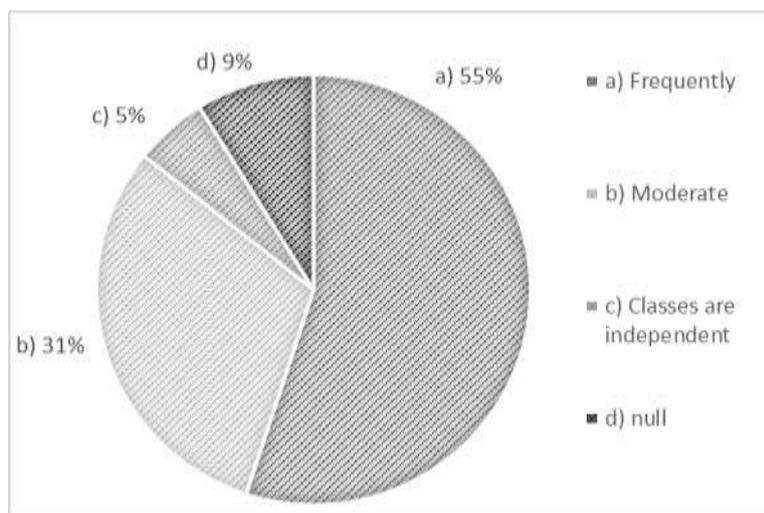


Figure 4 Percentil distribution answers to question 14: *Are topics reinforce among subjects?*

Question 15, asked if there exists a program or project that integrates the whole school. As can be seen in Figure 5, majority stated that the Educational Unit runs projects and programs that integrates the whole school. This is confirmed during the interviews with teachers and rectors but the purpose of the projects are related to science or cultural base. During the interviews with rectors from private, educational units revealed that they felt the limitation imposed by the educational authority of the district, to whom they should ask for a permit to make any program in the school and it should be previously approved for which in most cases they have put all efforts in one event and not more. In the case of public educational units it was said that they conduct with limited resources small projects that are planned by teachers individually for their subjects. Both private and public educational unit runned projects on sustainability or environmental education as a whole school activity.

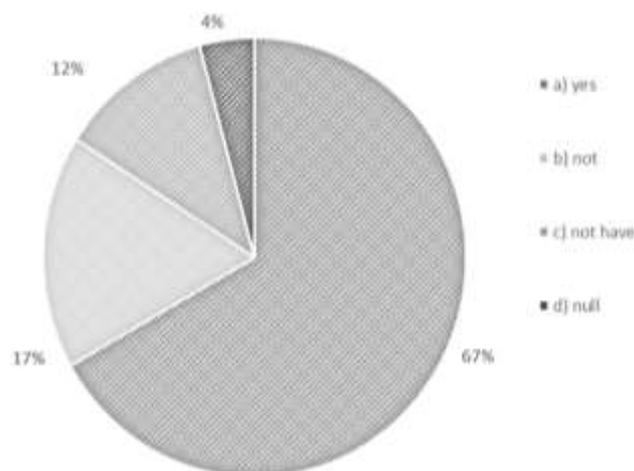


Figure 5 Percentil distribution of answers for question 15, *Does the school has a program or project that involves and integrates all the school?*

Question 17, asked which concepts would be related with education for sustainable development, for which the possible answers can be seen in Figure 6. Majority of teachers (35%) related ESD with the three keystones of sustainable development, followed by teachers that that related mostly with the environmental protection and conservation (33%).

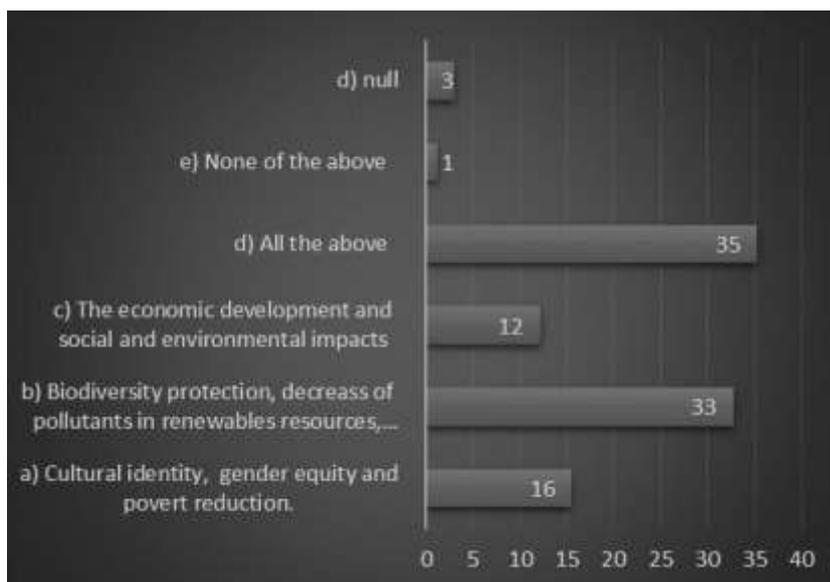


Figure 6 Percentil answers for question 17, which concepts would be related with education for sustainable development.

Question 18, asked to select the correct definition of climate change, for which the majority of 72 % answered correctly but a remaining of 26 % got it wrong answer. Those who answered wrong includes teachers of all subjects.

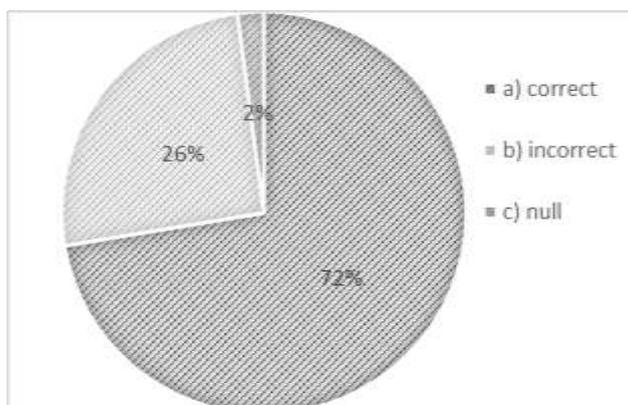


Figure 7 percentil distribution of answers for question 18 which asked to select a cause of climate change.

4.6.3 Interviews

Major points found coincident among teacher's interviews were:

- What is SD? Was the first statement made when they readed the survey.
- Teachers felt that the government have given more attention to highschools' teaches in the lasts years in a positive manner.
- Most teachers said that is difficult to integrate parents into school activities, as they only come when children are failing a subject.
- It was found as a complain the high number of pupils per class which difficults their work adding the fact that teachers also have to present daily programming ofr classes.
- Also teachers stated that is more work to have a transversal axis integrated among the subjects taught, because they would have to sit and plan with the other teachers. This work occurs at the beguining of the year but evaluations are based on the academic performance of children so we forget most of the initial work and just aim to keep the track of our own subject.

Major points found coincident among principal's interviews are the following:

- If a teacher works with more than one class it is enormous amount of paper work he or she should present to plan the daily activities. All the planning has to be united and present to the district educational authority each month. They also have it on digital but they ask for the printed version as well.
- Private schools have to find courses and train their staff by them selfs or hire profesionals with high standars.
- In the case of public schools training that have been done is only on pedagogical techniques besides the subject taught by teachers, until now by representatives of the Ministry of Education.
- The typ of projects that are develop in the school in order to integrate all students, teachers and staff are open house related with science, mostly they run once a year with the attendance of parents and every one that aims to go.
- Among the activities made by the school to recycle material, would depend on the teacher, but recycling material into a project is the most common option. The initiative of the bottle collection station is individual by one teacher who got involved with a company to collect the bottles
- The extra activities defined as clubs hours and themes, were imposed by the curriculum, there are no clubs related with the environment or sustainable development. Additionally participation in club activities are mandatory for pupils but there was poor direction on how the school should proceed to implement it. Mostly club hours are allocated for rescuing ancient or typical Ecuadorian games in the open, for sports, for musical, reading, and handcraft activities.

Principal points extracted from the interview with VVOB's representative:

- VVOB has been working in Ecuador for more than 10 years and concentrated its efforts in the north east of the country in the provinces of Azuay, Pichincha and currently in Santo Domingo. Their starting experience was in Azuay province with the center of environmental studies of Cuenca University to develop the program of “Green Schools”, with the participation of 12 schools. One of the main points they detected at the beginning was the lack of basic knowledge of teachers. Additionally teachers complained of not having teaching materials to develop their classes. Both problems were solved through the development of series of books giving step by step approach on how to teach each topic. The program focus on the teachers of 12 educational public institutions. The program was developed under 5 modules: 1) what is the environment and the air, 2) what do you know about solid waste 3) Water, 4) Biodiversity and the soil 5) Green school manual.
- The experience was successful on the schools they worked with but the latest reform has impacted in a positive and negative manner. From Elke's experience there were many gaps among knowledge and resources from one educational center to another, for which the current reform was made in order to put everyone on the same level. However the educational centers that were leading on experience had to back off and develop under the same curricula.
- Before the reform Municipal Governments were more involved with the Educational system, today if they aim to participate with the schools they should require a permit through zonal authority of the Educational Ministry. But this was also relevant on how involved the Municipal government was with the schools, they possessed a department of environmental affairs which knows the environmental peculiarities of their municipality.

Major points extracted from the interview with representatives of the Environmental Department of Ruminhau Municipality

- Part of the responsibilities of the Environmental Department is to transfer knowledge to the community for which they work with schools.
- Five Educational Institutions are currently working on monitoring the water status of two rivers from the municipality. One of the Educational Institutions was part of the current research. The project started after the NGO OIKOS realized a base line on the rivers status after that the Environmental Department took the initiative to ask the participation of the educational institutions to realize the monitoring of 5 parameters (temperature, pH, Dissolved Oxygen, Electric Current, Turbidity). Training was given to the teachers, one by school which would work with 6 to 7 pupils in each sample taken and create the report.
- The type of activities that have been done under the Environmental Education depend on the number of students and their aim to collaborate, as the budget is minimal or zero. Focusing more in courses or talks on for recycle material to create models for classes, worm farming, micro environment and how environment affects the social behavior
- Before 2014 the transversal axis was training for teachers on environmental education, but with the last reform the Ministry of Education have established that a permit and qualification is required to introduce as part of the classes. This decreased the intervention of the Municipality Department of Environment with the schools.
- The requirements were to be older than 5 years old and to have at least 25 pupils per class. One to two professionals would be designated and they include the Educational institution on the formal planning
- For 2015 a total of 14 Educational institutions will be reached the range of age is 5 to 12 and the number of pupils of each institutions that have more than 200 pupils and the second period is designated for schools with less than 200 pupils. The topics covered are: 1) solid waste and the correct disposal, 2) ecosystem and the relationship that exists with the local community and what are the problems, 3) Climate change, what are the changes on the temperature and glaciers of our nation, 4) Ecuador as Advisory Member of the Antarctic Treaty
- Before the Ministry of Education regulated the intervention of the Municipality, more activities were realized. Examples of the activities includes: a) Informal education in collaboration with the Nina Shunku theatre group the project of recycled scene was developed for the story Pollution-man Vs Recycling-man. b) Contest for the transformation, reuse and recycle of waste which was for all subjects, interdisciplinary and multidisciplinary. It depended on the teacher's participation and they notice that if it demanded extra work most of teachers would not go for it. c) Written story contest about water for children from 4th and 5th grade which involved 876 students. It was a nerve touch experience as it revealed minimal conditions on water availability in some rural areas from where children lived with their families.

Principal points from the interview with the representative of the Planning Department of the Ministry of Education

- There are not environmental clubs under the current curriculum the focus have been more in getting children active and recovering the traditional cultural games
- Increase the academic performance and continuous work under the Decade Plan of Education that will end by 2016.
- All projects, currently are monitored based on the spent budget vs the planned budget for each year.

Principal points from the interview with the representative of the Curriculum Department of the Ministry of Education

- Fails on concepts on the current curriculum it went under a revision from a specialist from Spain and revealed also that is not flexible enough to be adapted to different local realities. It also revealed that the current curricula was only conceptual. Currently a consultative agency is working on a new curricula, correcting the conceptual mistakes, integrating classes and making the curricula more didactic.
- Lack of training of teachers, but other department will work on the training before the new curricula is delivered
- The lack of effectiveness of the past curricula also was the lack of knowledge of teachers

5. Sweden

Sweden has been taken as an example of success of the national journey towards education for sustainable development by UNESCO 2013. The report reflects that Sweden has a long experience with environmental education (EE) and education for sustainable development (ESD). The history of EE in Sweden is traced back since 1919 into the curricula and reaching the integration of ESD into Swedish school system since mid-1990 by the National Agency for Education through the national curricula and the syllabi. Also ESD is implemented not only among its educational system since early stages as pre-elementary schools but as well by a strong network of ESD researchers and postgraduate school on ESD. Sweden is part of international cooperation programs related with ESD as the global school, the worldwide fund for nature, the Baltic Sea project, the globe project. As well Sweden owns national websites that provide support for ESD such as Forskning.se and the environmental Protection Agency. As well it has been reported by Radeisky (2009) how Sweden has included sustainability values into elementary schools meanwhile comparing within Germany environmental education system.

5.1 The educational system of Sweden

The Ministry of Education and Research is the direct branch of the government responsible for all education and research. The goals and the guidelines for the educational system in Sweden are set by the Swedish Riksdag (parliament) and the Ministry of Education, through Educational Acts and the Curricula for each segment of education as is described on Table 15. The segment of education that corresponds for the analysis is compulsory education that comprises 9 years of education, distributed in three stages: elementary school (lågstadiet) 1 to 3, followed by middle school (mellanstadiet) 4 to 6, and secondary school (högstadiet) 7 to 9 (SI 2013) which is comprised in the segment of compulsory education as can be seen in Table 15.

Additionally in this segment the Swedish Educational System also includes Sami schools which comprises 6 years of education, Special Schools for children with disabilities that comprises 10 years and programmes for students with intellectual disabilities (Skolverket 2015).

Table 15 Swedish Educational System. Source Skolverket 2015

Segment of Education	Nurse School	Primary education	Compulsory Education	High school	College and University
Pupils age	1 to 5 years old	6 years old	7 to 15 years old	16 to 18	NA
Years of education	5	1	9	3	2-5

Under the Ministry of Education and Research there are 15 agencies that work directly with education, the main agencies that are in charge of the implementation of the curricula, monitoring and evaluation are: The National Agency for Education and The Swishes School Inspectorate.

5.1.1 The Swedish National Agency for Education

The Swedish National Agency for Education is the administrative authority for the National School System and for publicly organized pre-school and school-age childcare activities (Ministry of Education and Research 2015). It is lead by the Director General and Advisory Council (Skolverket 2015). The agency is in charge of following up the attainment of the goals stated on the Educational Acts and Curricula (Skolverket 2015). The agency is responsible for supervising, supporting, following up and evaluating the educational units, to improve quality and outcomes. The agency targets its actions for school organizers such as: school heads, leaders and teachers in pre-school, the pre-school class, compulsory school and upper secondary schooling. Additional part of its responsibilities are the administration of public funding and grants (SI 2015).

Principal objectives of the Agency are: a) draw clear goals and knowledge requirements, b) provide support for development of schools, c) develop and disseminate new knowledge of benefit for target groups, and d) communicate to all the actors in order to improve (Skolverket 2015). The agency sets frameworks and guidelines on how education should be provided with the aid of the syllabuses and subject plans, knowledge requirement and tests. It is responsible for the national assessing knowledge test with the collaboration of universities and university colleges, and also for the development of test and assessment guides for teachers to ensure pupils receive equivalent assessment (Skolverket 2015). Furthermore part of its actions include benchmark education with other countries and finally disseminates the results and reports (Skolverket 2015).

The agency is also responsible for the National School Leadership Training Programme and the Initiative for professional and supplementary training of teachers.

5.1.2 Swedish School Inspectorate

Since 2006 the National Agency for Education was divided to form the Swedish Schools Inspectorate, which is in charge of supervising pre-schooling, school age child care, schooling and adult education. Their responsibility is to confirm that municipalities and independent schools comply with the legislation and applicable provisions to their activities. The main objective is to secure good education in a safe environment. It is also responsible for the approval of grants for independent schools. Part of the Inspectorate is the office of the Child and School Student representative (SI 2015). Inspection of municipalities and schools to comply with legislation and other provision (Skolverket 2015).

5.2 ESD in Sweden

5.2.1 Before DESD

Previous to DESD, international agreements had influenced Sweden to take actions, integrating ESD in the educational arena before the decade even started. It is reported by Aaro and Östman 2013, that Agenda 21 product of the UN Conference on Environment and Development in 1992, promoted the creation of a book delivered to headmasters and teachers

of compulsory schools and high schools in Sweden by 1994. The book explained how the Swedish Educational Act (1990), the curricula and syllabus of that time was intersected and directly influenced by four international agreements concerning human rights, children's rights, education about international understanding and environmental education (Aaro and Östman 2013).

Related with ESD at regional level in March of 2000 the Ministers of Education of the Baltic Sea region developed "Agenda 21 for Education in the Baltic Sea Region (Baltic 21E)". The Baltic 21E focusses on the development and implementation of ESD in each member country of the Baltic Region (Aaro and Östman 2013). By 2002, it was delivered to Swedish authorities in each municipality and to all schools in the educational system Aaro and Östman 2013.

In 2000 the National Action Plan for Education for all, at national level was presented. In it stated the compromise to continue with education that integrates economic, social and ecological aspects of sustainable development in all levels of the educational system (Svenska Unescorå 2000). By 2002 the National Strategy for Sustainable Development, was presented by the Swedish Government, which intergrated social, cultural, economic, and environmental perspectives. Under which lifelong skills and knowledge were targeted as means to achieve sustainable development. It also included the relevance to implement the acion plan Baltic21E (Aaro and Östman 2013).

On 2003 the Swedish Government established a committee for ESD implementation. The purpose of the committee was to analyze how to introduce ESD to all levels of the educational system, to promote development which is sustainable in all three aspects; economically, socially and environmentally. By 2004 the internal meeting took place in Gothenburg, and the final report was delivered by the end of that year (Aaro and Östman 2013).

In 2004 the international consultation took place in Gothenburg "learning to change the world" followed by five International workshops on learning for sustainable development. A final document, The Gothenburg Recommendations was submitted to the UNESCO World Conference on ESD in Germany 2009 (Lindberg 2010).

5.2.2 Sweden as part of UNECE and DESD strategy

With the launch of DESD, the UN Economic Commission for Europe already had the strategy for ESD, which was adopted by its members on the same year 2005 (Aaro and Östman 2013). The strategy aimed to encourage its members to integrate ESD in all forms of their educational systems. It also stated the relevance of the inclusion of key ESD related issues directly: poverty alleviation, citizenship, peace, ethics, responsibility in local and global context, democracy and governance, justice, security, human rights, health, gender equity cultural diversity, rural and urban development, economy, production and consumption patterns, corporate responsibility, environmental protection, natural resource management and biological and landscape diversity. Furthermore it also enquires the participatory teaching and learning methods to motivate learners to take action for SD. The actions taken by the members should pursue six objectives as follows: 1) ensure the ESD is integrated in the policy, 2) secure the existence of regulatory and operational frameworks to support and promote ESD in formal and informal learning, 3) Equip educators with the skills to integrate SD in their teaching, 4) ensure the availability of tools and materials for ESD, 5) promote research on development of ESD, and 6) strengthen cooperation among members (UNECE 2015).

5.2.3 Policy Review

Sweden does not have a National Action Plan for the implementation of ESD (Jidesjö 2014, National Report 2014). However ESD is reflected in national policies, for example on the Strategy for Sustainable Development of 2006, where education is positioned as a central pivot to promote active participation and critical thinking to build a sustainable society. Also it is reflected in the Sweden's UNESCO Strategy 2014-2017, where it is stated that ESD is of high priority within Sweden and internationally. Also in this strategy it is recognized that education is the key to find solutions for global problems (MER 2014).

Jidesjö (2014), concludes that the implementation in Sweden has been more structural rather than operational nature. This is coincident with the ESD Sweden Report for UNECE, where it is stated, and the non existence of an official governmental body in charge of coordinating the implementation of ESD. However Sweden reports that the Swedish National Commission for UNESCO is a focal agency whose work also includes the promotion and coordination of related issues to ESD at national level (MER 2014).

Sweden has been recognized as a leading nation in ESD implementation, but the case is quite remarkable as it does not have an implementation Plan. The structural nature that Jidesjö (2014), refers is to individual work carried by organizations or in collaboration with teachers and individual institutions but not a work carried by a governmental organization who is in charge of coordinate the efforts. This agrees in some manner with Sweden ESD UNECE Report, where it is written that Sweden possess National Laws and Regulations, which includes ESD for the Educational System, but Educational Institutions are autonomous to work for their own priorities and to set how to integrate ESD in their programs. The Decentralized System of Sweden, lies on the discretion of individual public authorities and on educational institutions to implement and promote supportive policies, recognizing also the difficulty to review the achievements made at national level, how ESD supportive policies have been implemented (MER 2014).

The ESD implementation in Sweden, lies in great part in NGOs and voluntary organizations, such as Den Globala Skola, WWF, Swedish International Development Cooperation Agency (SIDA) and Global Action Plan (Jidesjö 2014). However with an agreement with the National Report, the Government also states that those institutions support the actions taken by the government on the curriculum, as ESD is addressed in a cross curriculum approach, and with the support of alternative initiatives. The national report also recognized that in Sweden, ESD Implementation is a multi stakeholder process, which includes public authorities, higher education institutions, civil society, NGOs and educational institutions (MER 2014). Examples of alternative initiatives are: a) the whole institution approach for sustainability, but it depends on the institutions to apply for it, b) Sustainable School Award, where 200 schools actually possess the award (MER 2014).

Finally, on the report under remarks, it is recognized that a lot of work has been done by NGO's and individual organizations and teachers, to include ESD in education at all levels. However existence of active support from the political level to implement and reinforce ESD is needed plus a bovermental comprmise to take further action.

5.2.4 Local Context

As was mentioned earlier NGOs and individual activities have supported ESD to be implemented in Sweden. However the government has increased its efforts to increase the academic performance of students, due to failing results in the Program for International Student Assessment (PISA) (MER 2015). Through the study made by Chung (2013), over the influence of PISA results for the implementation and application of ESD into the curricula, he concludes that the Swedish Government has turned the curricula's focus to increase the performance in PISA evaluation leaving behind ESD. PISA evaluation do not includes ESD directly or indirectly into the assessment.. Also, Chung (2013) states that fundamental values, goals, were changed to provide clear guidelines for teaching scope and grading, focusing on literacy skills and knowledge of concepts. This has affected the transition holistic approach, ethical and democrat values, and the focus on cultural aspects and pupil's attributes, were removed or shrunken. However the emphasis on literacy skills is related positively with the bases of ESD (Chung 2013).

Jidesjö (2014) implies, that Sweden is a leading nation for ESD implementation mainly for abroad efforts, and should take that into consideration as an example to improve their national implementation of ESD.

5.2.5 Economic Support

Direct budget for ESD at national level do not exist, as there are no resources intended for ESD in the national budget directly assigned and stated on the national report. Municipalities and educational intitutions have their own budget to manage (MER 2014). However Sweden invest a total of 6.3 % of GDP on Education (SI 2013). Approximately 70 % of Education and Municipal Operation as a whole, are financed by Municipal Taxes, which also support the autonomy of municipalities to invest in their own educational priorities. Furthermore Education is alone the largest item in Municipal Budget (SI 2013). Locally municipalities should allocate budget for ESD (MER 2014).

Still economic support has been spent internationally to support ESD, through the following: a) the Swedish International Development Cooperation Agency (SIDA) invested in 2004, 15 million SEK, increasing to 158 million SEK by 2013, an average per year of 42.5 million SEK, distributed among these activities: in Education (33%), Environment (29%) Agriculture Forestry (19) and Sustainable Infrastructure Services 16 %.

Finally, in the report it is stated, that the Swedish National Agency for Education and the Swedish Higher Education Authority, have limited resources for promoting ESD or to follow up how the Educational Institutions are complying with the regulations concerning ESD (MER 2014).

5.2.6 Professional Development and their Engagement

Under the Goverent Bil 2009/10:89, on the New Teacher Education Program, it is addressed and has integrated principles, values and methodologies to address SD. The policy states that values and methods for SD could be integrated in the core courses for the Educational

Programs for Teachers, but it would depend on the Educational Institution to do so. Translated to actions, it means that SD and ESD are available on optional or compulsory bases which depends on the educational program of the institution. Also that there is no monitoring action and data on the subject. Under the same policy, it is recognized the importance of teaching towards shape attitudes, increase knowledge and promote behaviors with relation to the environment and sustainability. Furthermore in an additional program, the Global school, which is part of the Educational Training Process for Teachers, works specifically with ESD Methods and Learning (MER 2014).

Since March of 2011, the Parliament introduced Teachers Certification for Pre-School Teachers in Sweden. The purpose of the certification of teachers is to rise up the teaching profession and support professional development. This is a milestone in the Swedish Education Policy (SI 2013). The Swedish National Agency for Education is responsible for the decisions to give a certification to teachers. The requirement is a Degree in Education or in Pre-School Education, in which there should be information such as: Type of school, Subject to be imparted and the years that have been qualified to teach to. The certification can be withdrawn if there is proof of bad practice. The application fee is of 1500 SEK and further actualization cost a fee of 750 SEK (Skolverket 2015).

Additional actions that support the Development of Teachers on ESD, is to be part of networks on voluntary basis, which includes: Higher Education for Sustainable Development (HU2) developed by Researchers and Administrators with University Level (KTH 2015), the Learning Network for SD integrated by 250 participants from different educational levels, Regional Centers Expertise on Education for SD (RCE) is a Global Network, which creates Regional Platforms to share information, the Global School Program integrates 15 000 educators, focusing on ESD and Global SD issues, the SWEDESD which is a Cross Sector and Cross Boundary Network for ESD, and the Baltic Sea Regional Network on ESD (MER 2014)

5.2.7 Curriculum and syllabus

As was explained at the beginning of the chapter Educational Acts, Curriculum and Syllabuses direct education in all levels. Jidesjö (2014), reports low proves of initiatives creating systematic daily practice of teacher and their students supported by institutional process. Yet ESD can be traced back to the curricula of 1994 for compulsory education, where notion of SD and ESD were introduced. It was in the curricula that was stated that ‘teaching and education should illuminate how the functioning of society and ways of living and working can support conditions for sustainable development’ (MER 2014). By 1998 pre-school was also integrated into the school system and into the curricula through the Education Act of 1990. The Higher Education Act of 2006 was changed, to promote Sustainable Development for present and future generations, for a healthy environment, within economic and social welfare and justice’ (UNESCO 2013).

The latest Education Act 2010:800 does not have explicit objectives for ESD (MER 2014). However the Knowledge Objectives of the Curricula and Syllabus contain ESD Principles (National Review 2013, Chung 2013). In the Revised Curricula and Syllabus of 2011 for Compulsory Education, there are specific and clear standards and objectives related to SD (MER 2014), which are recognized to be clearer than in the oldest version (MER 2014, Chung 2013, Jidesjö 2014).

By the end of the Compulsory School, students should have acquired knowledge and take into consideration perspectives on SD, while developed ability to act and take action on ideas in a creative way and be knowledgeable in several sciences (MER 2014). Referring directly to the goals stated on the Curricula for Compulsory Education are the following: a) obtain knowledge about the pre-requisites for a good environment and sustainable development, b) obtain knowledge about an understanding of the importance of the individual's own lifestyle and its impact on health, the environment and society (Chung 2013).

ESD can be also found on the Ordinance for Teachers, stating that the student should acquire knowledge to make judgments on SD (MER 2014). The curricula does not specify on a teaching method, and as it is stated on the National Report for UNECE it lies on teacher's professionalism.

Teaching tools and materials for ESD are not produced for national basis, but public authorities invest resources in this activity as part of their environmental and sustainability targets. Examples are projects conducted by WWF Sweden and the Global School Program for a total of 30 million SEK (from 2004 to 2014). SWEDESD, which is also funded by SIDA has covered 60 million SEK in the same period. (MER 2014)

5.2.8 Monitoring and Control

In the National Report for UNECE, no monitoring or control instruments are in place to assess implementation or outcomes of ESD in the educational system (MER 2014). However as ESD's related issues are in their curricula evaluation, they are carried under regular evaluations. Additionally the New Directive for tests for Compulsory Schools, states that issues in Sustainable Development may be included in the National Test, in non-consecutive years (National Review 2015). At the governmental level, the School Inspectorate is in charge of the evaluation of schools, however, has not yet been specifically instructed to evaluate ESD or SD issues (MER 2014).

5.2.9 Programs and Initiatives that support for ESD

As was said before, Sweden does not possess a National Plan, but ESD has been rooted in the Curriculum and Syllabus for all levels of education. Additionally Sweden possess a wide range of organizations specialized in Research of Education for Sustainable Development as: the Swedish International Center of Education for Sustainable Development (SWEDESD), Regional Center of Expertise in Skåne and West Sweden (RCE), Uppsala Center for Sustainable Development (CEMUS), among others.

Furthermore initiatives have been conducted with and without governmental economic support. In the following lines some of the initiatives are reported, which is based on the available information on internet and in the case of NaturSkola, additional information was collected from two interviews conducted in Lund.

5.2.9.1 National Award

Before DESD started in 1998 the Green School Award was established by the government, the award included all educational system: Pre-Schools, Compulsory Schools, Upper-Secondary Schools and Municipal Adult Education Centers. It was designed as an incentive to promote ESD through a whole approach, which integrates the inclusion of teaching of ESD and includes the school itself as the workplace (UNESCO 2013).

With the launch of DESD in 2005 the name of the award was replaced to Sustainable School Award and the criteria was improved, integrating with the Schools Mandatory Annual Quality Report to authorities. Until the end of 2006 the National Agency for Education was responsible for the provision of resource and supervision for the schools that applied for the award (UNESCO 2013).

The process for the application to receive the award should contain proof on the commitment to attain the two criteria shown in Table 15, which are to be continued and proved each 3 years in order to keep the award. The criteria is in line with the National Curricula and Comprehensive Development of Quality Management. Most successful municipality with awards is Umea, 90 % of its 110 Public Pre-Schools and Schools received the award.

Table 16 Sustainable School Award's criteria. Source: UNESCO 2013

Criteria	Responsible	Responsibility
		Every member of the school can actively participate in ESD
		Strategies for introduction and involvement of ESD for new staff
Educational leadership	School head	Proper in service training in ESD for the staff
		The education institution shares its expertise and cooperates with others in the field
		Requirements for ESD are evaluated, analyzed and further development are specified.
Teaching	Educators developing teaching approaches for ESD	Students and educators participate in planning implementing and evaluation of ESD
		Students have clear and active role and opportunity to influence their own learning process
		Continuous cooperation with local community
		ESD work is continuously documented and national stated requirements are evaluated and analyzed, and future development is specified.

5.2.9.2 Eco-schools, Green Flag program

This program was introduced in Sweden in 1996, coordinated by the Keep Sweden Tidy Foundation. The program actual purpose, is to raise pupils awareness of sustainable development issues. It is inspired in ISO 14001 and EMAS (eco management and audit scheme) being also an Environmental Management System. It focuses on 6 themes: consumption, climate and energy, recycling, lifestyle and health, local environment and water resources. The steps to receive the award are: 1) start an environmental committee, 2) choose one of the six themes to work with, 3) develop an action plan, 4) work with the chosen theme for 6 -18 months while applying for the green flag and 5) evaluate, review and re-plan. By the year 2012, the number of schools with green flag award was 2500.

5.2.9.3 Globe project

This is an initiative from a former US Vice-president Mr. Al Gore, which started in 1995. The aim was the creation of a community of worldwide students, teachers scientist and citizen working towards a sustain Earth's environment on local, regional and global scale. More than 24 000 schools participate on the program worldwide from which, 51 are Swedish.

5.2.9.4 Baltic SEA project

This project started with the aim to solve the acute problems of the Baltic Sea. The aim of the project is to raise awareness of the environmental problems, develop their holistic understanding the relationship among man and nature, to increase ability to study changes on the environment and encourage students to participate in developing a sustainable future. It is directed to upper secondary schools, in which there are 5 Swedish schools, actively participating in the project out of a 200 total participants.

5.2.9.5 The world wide fund for nature WWF Sweden

Under this organization, there is a program which delivers training for more than 400 Swedish teachers. The program annually focus on the following areas: sustainable consumption, reduction of ecological footprints and participation in the annual earth hour event. Additionally it develops and delivers educational material for students and teachers. Also it has been engaged in the implementation of ESD at University level in Sweden.

5.2.9.6 Forskning.se

This is a website in Swedish product of the collaboration of Swedish Public Service Television It provides information about researchs and results of SD and EE. It is an interactive educational tool as well.

5.2.9.7 NaturSkola

NaturSkola is a municipal sourced agency that supports and stimulates school development in the areas of sustainable development and kind culture. It is an educational resource for educators and students in pre-school, compulsory education and upper secondary school. All activities have a direct link with the curricula of each stage of the educational system. NaturSkola is distributed across Sweden, however the number of establishments in each municipality depends in two factors; 1) the number of schools present in the area and 2) the support of the municipality. There are total of 95 centers (NaturSkola 2015).

NaturSkola works directly with the educational institutions delivering courses and activities for teachers and students. Each agency has the liberty to proceed with the activities in their own manner, but activities should follow the following parameters:

1. Activities will contribute to build caring attitude to nature and the environment at the same time understanding human participation in the nature's cycle. Also will allow to elucidate how we can adapt the way we live to attain sustainable development. The activity must contribute to promote from a scientific knowledge, the engagement with social debate, ethical questions and positions.
2. Activities will contribute to children's development of observation and reflection, including scientific knowledge and methods, increasing their ability to make systematic observation, carry out experiments and field studies, to process and interpret results and information in a critical manner as well.
4. Activities would be shape in accordance with the Green School farms program Utemiljön will be formulated so that it gives scope for and can support the activity's pedagogical as well as recreational needs.
5. Activities to support municipality's schools and preschools to receive the award school for sustainable development, green flag or corresponding.

The first two parameters are related directly with the courses NaturSkola delivers to children or teachers. NaturSkola has a yearly plan of fixed courses for teachers with limited spaces, however more courses are also delivered under the petition of any educational institution.

Lund's NaturSkola team consists of only five people, who have to develop a strategy to amplify their actions in order to reach as much students as they can. In the case of Lund NaturSkola the principal target is for teachers as pivot points to transmit their knowledge in a wider scope "the class". One engaged teacher will transmit knowledge to at least 15 pupils per class, each course of Natur Skola is for 25 teachers and they impart 10 fixed courses a year, having reached 3750 pupils per year. In this manner they aim is to reach more students, than focusing in a class of pupils, where the teacher only observes or even if he engages on the activity, it will be on a minor scope.

In the case of the Green School farms, the school has to present a small plan for greening the yard, whit the purpose of education and how students and staff of the school are going to be integrated. NaturSkola offers an economic support for the development of green yard which corresponds to 50 % of the whole project, having the other 50% being supported by the school.

Other support offered by Naturskola is helping schools through the application of the green flag or sustainable development award.

6. Analysis

The following chapter presents the analysis of the findings in chapters 4 for Ecuador and chapter 5 for Sweden based on the framework presented on chapter 3 of Framework and Methodology.

6.1 Analysis of ESD implementation in Ecuador

The analysis of Ecuador as was explained in section 3 of Framework and Methodology, integrates the findings from the review of policies, regulations, laws, governmental plans, curriculums, international reports, research papers, and newspapers. Corroborated with the analysis of 232 teachers surveys and 20 interviews with the actors of the educational system.

6.1.1 ESD in the Ecuadorian policy

At regional level, in Latin America before the Decade of Education for Sustainable Development started, ESD stimulated division among practitioners. However the coalescing ground for most countries was the introduction of ESD through Environmental Education, such as in the case of Ecuador. Evidence of the influence of ESD in Ecuador was found in the Decade Plan for Environmental Education (DPEE) set to be from 2005-2015. Yet the information found in this document gave poor guide for ESD inclusion and focused more on the environmental side. For instance the principal environmental problems of Ecuador were identified but with no relationship to a social or economic reflection. Furthermore the Decade Plan for Environmental Education did not have actions to monitor progress of its implementation after it was published. The researcher did not find documents to confirm the implementation or that would show any monitoring action, which was confirmed by the interviews with two of the Collaborators in the development of the DPEE, and who confirmed that the implementation of the DPEE did not occur. Also the Decade Plan for Environmental Education was found not to be mentioned even once in the Constitution, in the Law of Education or in the Curriculum.

Before 2006, Ecuador suffered from political instability which led to uncompleted long term plans. However since the President Rafael Correa was elected in 2006 and re-elected twice in 2009 and 2013 the situation has changed. A proof of it, is the Decade Plan of Education, which started in 2006 and still on march and will be renewed in 2016. This is relevant for ESD first, as Ecuador is a developing nation, its budget has to be allocated to the priority set by the government which fortunately has been education in the last nine years. Also it has secured that education will continue to be a priority through the commitment with the Plan of Education that can be extracted through the Articles in the Constitution and are further specified under the paragraphs of the Law of Education.

Until the present year most of the objectives set in the Decade Plan of Education have been achieved (Segovia 2015 and Salazar *et al* 2011), however quality of education is one of the objectives that needs most of the attention. ESD as was explained on section 2.2.1 ESD of the literature review, ESD refers directly to quality of education, it is the perfect opportunity to

improve ESD inclusion under the next Educational Decade Plan. It was also said that ESD is not exclusive, and that it is an umbrella for development of specific plans directed by the necessity of each nation. The accomplishment of a policy set under the Decade Plan of Education has created the perfect ground, delivering universalization of education, improvement and equipment of educational units. However further work should be pursued to increase quality. Also increasing the economic support for the educational budget and the priority given by the government to education have set the necessary backbone to include ESD.

In the section of the political analysis of Ecuador it was stated that it would reveal the objective and focus of the nation in relationship with ESD implementation even if it is not explicitly written. In this context, it was said that Ecuador has a green Constitution which follows the “good living concept”. Under section 4.2.4 Green Constitution is reviewed the environmental, social, democratic and economic perspectives integrated among the articles which led to say that the bases of Ecuadorian Constitution are in line with the keystones of Sustainable Development. Furthermore under Articles 27 and 28 of the Constitution clearly is stated that education shall pursue integration of social, democratic, cultural, environmental and economic aspects which correlates directly with the aim of ESD. Even though there are not words directly referring to ESD, under the same article also is defined that education shall focus on the holistic development of the student with relation to human rights, democracy and sustainable environment which is directly related with the holistic view which ESD aims to develop.

Ecuador is a multi-ethnic country, being also of great impact the recognition, respect and valorization of the communities that constitute the country. From the ESD perspective under the social component the multi-ethnicity valorization also supports that the Constitutions reflects ESD components. In the local context that is base for ESD the Constitution under Article 343 reflects that education should be flexible, dynamic, and inclusive and integrate a multicultural vision according to the geographical, linguistic and cultural diversity of the country.

The direction given by the Constitution is reflected in the Law of Education but not in all aspects with the same weight, the Law of Education focuses more in social and cultural perspectives. As was written in the section 4.2.5 the Law of Education basis in 38 principles. The principles integrates among them: democracy, equity, liberty, multicultural and multiethnic respect within the local and global perspective, which reflects directly the direction given under the Good Living Concept in the Constitution. Additionally in the local context is of great relevance because Ecuador possess a diverse community and different cultural background among their four different natural regions.

The principles also made relevance to the integration of society in a participative manner into education which is also in line with ESD. The economic development is not explicit among the principles as well as the environmental side is lacked from them. To illustrate this we can take as an example the values principle, which states that education shall be based on the transference and practice of values under paragraph i, yet among all the values cited, none of them integrates the environment, instead all values are related to social, cultural and democratic perspective. The only principle that addresses the environment is in paragraph II, which refers to the relevance of education which should respond to the social, natural and cultural needs. This principle is open to interpretation of what is the environmental need ? This should be specified as it is in the Constitution under the “Good Living” concept.

However the environmental side and economic development are further integrated under the section of 1.2 in Article 3, paragraph f, where it is stated that education would promote conscience for the preservation, conservation, and improvement of the environment through a sustainable use of natural resources with the purpose of achieve a healthy life. Also the environmental side is reflected as a collective responsibility of all Ecuadorian citizens under Article 5, but for the preservation of natural and cultural heritages. This is important as under the Constitution the relevance given to the environment and nature is greater than what is written in the Law of Education. The Constitution establishes that nature and the environment are a responsibility of every Ecuadorian citizen and also that every citizen has the right to live in a safe and sustainable environment³ (see section 3.2.4). Additionally the Constitution clearly states that education will guarantee the holistic development where the environment among others aspects are considered as fundamental basis of the holistic development.

The economic development is perceived under the sustainable use of natural resources in paragraph f of Article 3. Still the economic development is further explicit under Article 5 in paragraph r, which states that education shall prepare and promote productive capacities and fostering entrepreneurial culture. Also is integrated under paragraph x, stating that education will prepare citizens for being included in the work force.

Before comparing the educational system outside of Ecuador, one of the remarks found is within the same country. The Constitution and the Law of Education as was said before respects and values the multi-ethnicity and culture of Ecuador. Being expressed in Article 57 of the Constitution the recognition of traditions and support to mantaing their transference of knowledge through education. This article is reflected on Section IV of the Law of Education (see section 3.2.4 literal b), which expresses another Educational System, which respects the right of communities for ancestral knowledge and culture. The indigenous educational section recognizes that it is based on the National educational system specified within the articles of the Law of Education but with the transversal inclusion of seven principles where nature main driver among the principles. The indigenous educational system reflects a greater inclusion of the environment, being the base in which education is built upon. Stated directly the first principle is the respect and care for Mother Earth and the following principle states the aim of the education according to the cultural diversity shall promote preservation, conservation and harmonic coexistence with the Pachamama for the integral development of the individual and the community. The difference among both systems could be defined as weak or strong sustainability. The national educational system possess weak sustainability as it focus more in social and economic development and environmental protection meanwhile the educational system for indigenous communities recognizes first the environment in which will be involved the social and economic development, as it states to live within harmony with nature explicitly under article 81.

6.1.2 Local Context

The current government works under the good living concept but also says that currently Ecuador is suffering from a citizen revolution in order to integrate all citizens and remark the changes that the government has achieved. In the constitution this concept is also reflected by recognizing that only through education the real revolution can be achieved. Motivation under

³ Section II “Healthy Environment” of the Ecuadorian Constitution.

is a powerful tool to work towards a common objective and shows the aim of being participative involving all Ecuadorians.

The good living concept, integrates the environmental perspective and is evident in the Constitution but it does not follow the same line in the Law of Education where the good living concept is further related with social, cultural and democratic aspects. For example in Article 5, paragraph n, states that education would integrate knowledge from scientific, humanistic and cultural perspectives, leaving a side the environment. Furthermore in Article 19 states that the curriculum shall reflect the diversity of culture and ethnicity however it does not considers the environment which is the origin of the social and cultural diversity in Ecuador.

6.1.3 Curriculum and teachers role in the implementation of ESD

The “Good Living concept” as is defined under the Constitution, is integrated transversally into the curriculum. The curriculum has a clear definition of what implies the good living concept (see section 3.4) in base to the aim of the development of a society that is democratic, equitable, inclusive, diversity tolerant and environmentally respectful. It is said that the transversal principles should be integrated to the curriculum into concrete actions in line with five topics (see section 3.4.1). The topics are directly related with ESD from the cultural, democratic, and environmental perspective and also reflects the local context as it focus on healthiness and recreational habits of students and sexual education. It was also found from the survey responses of teachers (see question 12 in section 4.6.2) a perception from moderate (21 %) to a high (72 %) link between the concept of " Good Living " and conceptual issues ESD.

For the curriculum analysis Natural Science was chosen to be reviewed in depth (see section 3.4.2). As was stated above the Constitution gives further specificity to the environmental side, while in the Law of education is vague, however the analysis of the subject will take place with both documents.

Under the general curriculum analysis of the Natural Sciences subject, the objectives pursued do not specify the social and economic factors. However within the curricula of each year could be identified the science and environmental perspective to become more specific and of a higher level of knowledge, meanwhile the social and economic perspective did not. The curriculum showed the existence of topics related with ESD among the grades, and was possible to classify under four perspectives which are social, science, environmental and economic. However the four perspectives aren't equally found in the curricula among grades. As it is expected the specificity of knowledge relates to higher grades, in the perspective of knowledge it is interconnected and evident from one year to another how it happened. However for the social, environmental and economic perspective there is not interconnection among grades. Comparing the topics found under the curricula and the results of question 11 which asked to select topics that were taught in class, it was found coincident among both the following topics: recycling, prevention of air, water and soil pollution, reforestation, waste classification and final destination, biodiversity, and sustainable use of water. However the curriculum did not reflect extra topics that were cited by teacher's responses which includes: waste reduction, cultural diversity, gender equality, and sustainable life style and consumption. Additionally in comparison among the group of teachers who said having received information about SD with the exception of the topic of recycling, teachers integrated the rest of the topics in class with more frequency than the group who said not having received

information about SD. The recycling topic was found to have higher frequency in the group who said not having received information about ESD which can be a direct reflection of the curriculum.

The term “sustainable” was found into the curriculum since fourth grade as “sustainable management of natural resources” in fifth grade as “sustainable agriculture” in sixth grade in “sustainable management of pasturelands” but is only in seventh grade where it is found as “sustainable management of forest” is explicitly stated the intergenerational concept in the sense that the forest should supply the necessity of present generations without compromising future generation’s needs. It is only in seventh grade when the three aspects are contemplated fully. Also is remarkable the fact that in fourth grade is stated that humans are central actors and animals and plant exist to fulfill their needs. This could be a base to say that the National Curriculum of Ecuador has integrated ESD incompletely and only from a conceptual perspective in some parts of the curriculum of natural sciences and further research should be conducted for the remaining subjects.

If the curriculum integrates ESD in a superficial manner with low specificity on the three perspectives of sustainable development, interpretation and application of the curriculum lies completely on teachers’ knowledge and expertise to deliver it the class. Teachers play a major role in the implementation of ESD, from the experience of the project Green Schools in Ecuador, the VVOB representative Elke said that the level of knowledge of teachers was low and in order to overcome this issue, besides training they delivered step-by –step books on how to deliver the class to pupils. Knowledge of teachers should be appropriate and relevant to today issues, Climate Change is a topic that is included in the curricula and should be a simple concept to be known by teachers, however the survey showed that only 77% of the population chose the correct definition of climate change.

Nowadays, Ecuador recognizes the professional development of teachers under the General Regulation of the Organic Law of Education, within a classification of nine levels. Starting with the lower level (I) for teachers who have completed high-school and have no experience, until the last level (A) for teachers with a PhD degree or equivalent and with 24 years of experience (see Section 4.5 Teacher’s Profession in Ecuador). This section revealed the diverse level of formal education that teachers have achieved, which can jeopardize in general the delivery of education for children. In the last assessment made in 2014 from the total of 54 387 public teachers only 18 000 achieved to ascend to higher level. This group was distributed among levels (I) and (B), even though only 46 teachers are in level (I) it reveals that before those teachers did not even have a high-school diploma. This diversity of levels of formal education received by teachers can also being reflected by question 5 in the survey, which asked the degree achieved by the teacher. The distribution of the group of teachers was from high-school level (9%) to Master degree (12%) where the majority of the group was found to have obtained a bachelor degree (78%). The current program of the government to improve teacher’s profession is based on motivation to achieve a higher level into the clasification which also increases their salary. Additionally educational aid programs, and regulations should be implemented to support the program of professional development of teachers.

The professional degree achieved by teachers influenced in a lower percentage the response of question 5 which asked; if teachers have received information about SD. From the total sample, less than 50 percent answered to have acquired information about SD, and the source of information in a majority was self-taught (60%) followed by information from other organizations (17%) and at least previous education (13%). This also shows teacher's concern in SD and their hability to self taught and deliver this information in class.

Question 6 of the survey addressed directly the familiarity of teachers with SD. Even though the natural science teacher's group was found as the highest on have been received information about SD it represented less than 5% of the total sample. Moreover from the whole group of teachers who said have received information of ESD (41%) only 30 percent of them were familiar with the inter-generational concept of SD (see question 9 in section 4.6.2). Nevertheless, when was asked what are the keystones of SD (see question 10 in section 4.6.2), 74% of the total sample of teachers responded that SD relates with social and economic development withing a safe environment. Overall can be said that familiarity of teachers with SD exists but is partial and needs further training to integrate the concept of Sustainable Development in class.

ESD is related to the currículum through few topics since 4th grade but unsequenced as was stated above. The whole school approach is not performed at all, and the extra activities that are part of the curriculum as Clubs do not relate with ESD from the environmental perspective but only form the cultural side. It was confirmed through the interview with Dr. Marcelo Torres, Coordinator of the Planning Department of the Ministry of Education who said that currently the focus have been more in getting children active and recovering the traditional cultural games. This was further confirmed with the interviews with directors and school teachers' who explained that clubs were conducted for rescuing typical Ecuadorian games, to foster practice of sports, and for musical, reading and handicraft activities.

Additionally in order to reveal if there were extra activities that addressed ESD in the school, answers of question 15 revealed the existence of programs or activities that integrated all the school (67 % of the population). However to confirm the nature of the activity, it was asked during the interview with rectors, what type of activities or programs are conducted to integrate all members of the school. The common answer was that schools organize mostly once a year an open house, where students present projects related to science, with the attendance of parents and every one who aims to go, but nothing related to ESD

It was observed in some schools the existence of metal containers to collect plastic bottles, however the initiative was exclusive of teachers with the involvement of a company that would collect latter the bottles. Another observation was existence of three containers for classification of waste however there is not classification system in the province of Pichincha or in the municipality of Ruminahui and all waste is buried in land, which was confirmed by the municipal authorities of the environmental Department of the Ruminahui Municipality. This could lead to say that the efforts of the schools are incomplete by the lack of municipal or government support for the collection and recycle of solid waste. As was mentioned before, waste classification and recycling are topics taught in class but is not translated to actions finally if there is not a collection system for the waste that allows this to happen. However this shows the opportunity to coordinate at least the collection of plastic bottles through the district educational authority and the private companies.

From the governmental perspective the Educational system of Ecuador is decentralized through the Zonal and District agencies which represent the Ministry of Education. However during the interviews with rectors who are directly in contact with the district authorities it was pointed out that any extra activity aimed to be included should be authorized by the Zonal or District representative but the process to get the acceptance is long because the District Authority does not have the experience or the given authority to approve it and the authorization goes to the Ministry of Education. This also happened with questions about the implementation of Clubs, as some rectors aimed to take care of a municipal garden or green space as part of their activities but they were discouraged by the process to get the approval.

6.1.4 Stakeholder's participation

The constitution reflects that all society should be integrated in the educational system to deliver education. However the Law of Education established a limit to Municipal participation with schools. This was a reflection from the interview with the representative of the Department of Environment of the Municipality of Ruminahui, who reported that prior to 2013 they worked directly with teachers and independent agencies as NGO's , artistic groups in different projects to deliver Environmental Education. Now they are limited by the Ministry of Education to work only with the children because in order to give training to teachers they should previously be qualified and authorized by the Ministry of Education. In the case of NGOs, if they work directly with the Government, they do not complied with those requirements. But in the case of independent work of an NGO, it would not happened without previous authorization of the relevant Authority of Education.

6.2 Analysis of ESD implementation in Sweden

The implementation of ESD in Sweden is a outstanding case, because it has been reported to be more successful abroad than within its own territory (see section 5.2. ESD in Sweden). Before addressing the formal case it is necessary to analyze the background. Sweden has long experience with environmental education (EE) and education for sustainable development (ESD). Before the Decade of Education for Sustainable Development started, Sweden has implemented ESD within their curriculum and syllabus from elementary level and across all the educational system, which is also revealed in the Educational Acts. However with the end of the DESD in the national report to United Nations Economic Commission for Europe (UNECE), Sweden stated not having a national action plan for implementation of ESD, or an official governmental coordinating body for the implementation, or official monitoring actions taken (see section 5.2.2 Sweden as part of UNECE and DESD strategy). Even though that in preparation for DESD in 2003, the Swedish Government established a committee to analyze how to introduce ESD to all levels of the educational system, delivering a final report by the end of 2004 (Aaro and Östman 2013) but it was not completely effective. Furthermore Sweden as a member nation of the part of the United Nations Economic Commission for Europe (UNECE) which strategy for the implementation of ESD was adopted in 2005 (Aaro and Östman 2013), there are not official documents of implementation of ESD.

One possible reason for which the Government hasn't given much attention at national level the implementation of ESD , are the results from the Program for International Student Assessment (PISA) that are related to the academic performance of the students. Focusing more in the academic performance for which yet the last report hasn't given the expected results (see section 5.2.7 Curriculum and Syllabus). Though ESD is part of national laws and regulations for the educational system, as Educational Acts, the Curriculum and Syllabus but its implementation among the Educational Institutions lies on their own priorities and to set how to integrate ESD in their programs. This is explained by the decentralized system of Sweden, which depends on the discretion of individual public authorities and educational institutions to implement and promote supportive policies (MER 2014).

It is recognized by the Swedish Government that ESD implementation has been done mostly by the work of independent NGOs, teachers and Swedish citizens who actively have integrated ESD among programs for schools activities. However it was also found governmental programs for national spectrum to integrate ESD but only through self-

motivation of the educational units to apply, as The Green Flag award or the Sustainable School Award and Naturskola.

From Gothenbourg recommendations only two of them have effectively being translated to action, the first with the creation of organizations specialized for the research of Education for sustainable development as: the Swedish International Center of Education for Sustainable Development (SWEDESD), Regional Center of Expertise in Skåne and West Sweden (RCE), Uppsala Center for Sustainable Development (CEMUS), among others. Secondly with the creation of a center for International cooperation

7. Conclusions and Recommendations

The aim of the thesis was to deliver a current status and recommendations for improvement on the implementation of ESD for Basic General Education in Ecuador. As was stated during the introduction, information about the implementation of ESD in Ecuador is limited, being why the analysis took place in different levels of the educational system; from the national policy till school reality to generate meaningful information.

Objective 1. Development of a Suitable framework based on literature review regarding how ESD implementation has been studied, determining which focus points should be considered for the current study.

The framework was formulated based on the literature review of previous national studies made for ESD implementation (see section 1.3 Methodology), derived in the focal points of the study, which were settled as follow a) political background, b) local context, c) economical support, d) professional development and their engagement, e) curriculum and syllabus, f) stakeholders participation and g) monitoring and control. Additionally in the case of the analysis of policies, laws, regulations, and curriculum the three aspects of sustainable development: economic, social, environmental, the intergenerational principle and the holistic view were taken in consideration to reveal how they were related to ESD.

Still while the collection of information and analysis took place it was found that governmental structure of the Educational Ministry, and the distribution of power over educational institutions are important for the analysis of implementation of ESD in a country, if there is not an individual official governmental coordinating body for implementation of ESD.

Objective 2. How has Ecuador implemented Education for Sustainable Development for Basic General Education?

The Education for Sustainable Development can be included without being directly named. In the case of Ecuador it was found that the “Good Living Concept” reflects the Principles of Sustainable Development and Education for Sustainable Development, concept which can be extracted from Constitution and followed through the Law of Education, to the Curriculum and latter on applied in the school ground. Even though related topics to ESD that were found into the curriculum and proved being delivered in class since 4th grade until 10th, was only in a conceptual basis and lies in teacher’s expertise and knowledge.

The journey of this conclusion is reflected upon the following conclusions:

- First the Ecuadorian Government since 2006 have worked under the Decade Plan of Education which does not refers directly to ESD, however the Ecuadorian reality of illiteracy, poor enrolment rate for basic education (1th to 10 grade), lack of infrastructure, equipment and access are part of the past. The Ecuadorian government have implemented the Decade Plan of Education within the Constitution, giving priority to education and increasing the national investment by policy in 0.5% of GDP per year. Still further actions need to be taken to increase quality of education which is the current focus of the government.

Question 1 how has ESD been implemented at Policy Level?

- At regional level, in Latin America before the Decade of Education for Sustainable Development started, ESD encouraged division among practitioners. However the binding ground was the introduction of ESD through Environmental Education, such as in the case of Ecuador. Evidence of the influence of ESD in Ecuador was found in the Decade Plan for Environmental Education (DPEE) set to be from 2005-2015. Yet the information found in this document gave poor guidelines for ESD inclusion and focused more on the environmental side. Furthermore the Decade Plan for Environmental Education did not present monitoring actions and was not found in the content of the Constitution, the Law of Education or the Curriculum.
- Within the political perspective also was pointed out that the "Good Living Concept" which is the base of the Constitution and runs over all the Policies and Regulations of the country corresponds to the local context of Ecuador for ESD. The "Good Living Concept", was found to integrate social, cultural, environmental and economic aspects, directly relates with the keystones of Sustainable Development. Within the Constitution the outcomes of education, which follows the "Good Living concept", states that "Education shall pursue integration of social, democratic, cultural, environmental and economic aspects" which correlates directly with the aim of ESD. Even though there are no words directly referring to ESD it is also defined that Education "shall focus on the holistic development of the student with relation to human rights, democracy and sustainable environment " which is a image of the holistic view that ESD aims to develop.
- Following the chain of inclusion of ESD through the "Good Living Concept ", from the Constitution to the Organic Law of Education. The principles that rule the Organic Law of Education giving greater focus to the social and cultural aspects such as: Democracy, Equity, Liberty, Multicultural and Multiethnic with respect to the local and global perspective. However the Economic and Environmental Perspectives that were not found in the Principles, were found under the objectives pursued stating that "Education would promote conscience for the preservation, conservation, and improvement of the environment through a sustainable use of natural resources with the purpose of achieving a healthy life". Meanwhile the Economic Development aspect was found in the objective that Education should promote "Sustainable use of natural resources", "prepare and promote productive capacities and fostering entrepreneurial culture" and "will prepare citizens for being included in the work force".
- The "Good Living Concept" was found in the Curriculum, with a clear definition which is a reflection of the Constitutions Articles. The integration of the "Good Living Concept", is transversal and the principles should be integrated to the curriculum in concrete actions, in line with five topics. The topics are directly related with ESD, in the cultural, democratic, and environmental perspective and also reflect the local context, as it focuses on health and recreational habits of students and sexual education.
- At school ground it was found that teachers perceived a relationship between the "good living concept" and ESD in the conceptual topics of ESD.

Question 2. How is ESD established on the curriculum and syllabus?

- The curriculum integrates ESD in a superficial manner, with low specificity on the three perspectives of sustainable development. Even though the curriculum showed the existence of topics related with ESD in Natural Science subject, within the grades fourth to tenth, the approach is only conceptual. Additionally the topics do not reflect equal interconnection with social, environmental and economic perspectives among grades 1 to 10.
- The whole school approach is not performed at all, and the extra activities that are part of the curriculum as “clubs classes” do not relate with ESD from an environmental perspective, but only from the cultural side. The aim of the current curricula for clubs is conducted for rescuing typical Ecuadorian games, to foster practice of sports, and for musical, reading and handcraft activities. Interpretation and application of the curriculum lies completely on teachers’ knowledge and expertise to deliver it into class.

Question 3. How are teachers delivering ESD in class?

- Before addressing the question on how teachers are delivering ESD into class, it is necessary to reflect that teachers play a major role in the implementation of ESD, and having a curriculum which integrates ESD in a superficial manner with low specificity on the perspectives of SD, it depends completely on the teachers' expertise to fulfil the gap or to deteriorate the situation.
- The comparison between the topics found under the curricula and the results the survey confirmed that in class was being taught: recycling, prevention of air, water and soil pollution, reforestation, waste classification and final destination, biodiversity, and sustainable use of water. However how this topics are been delivered in class depends mostly on the level of preparation of teachers. Being important to mention that the level of knowledge of school teachers of 1th to 10th grades is variable. One of the possible circumstances found for the diversity of knowledge of teachers on ESD, was the maximal formal education achieved by them, which starts from high-school level until master level, where the majority achieves a bachelor degree. Though acquisition ESD information by teachers, was found to be "self-taught". From the surveys taken, teachers showed to be capable to relate SD with social and economic development within a safe environment, but they were not familiar with the intergenerational concept of SD. Overall can be said that familiarity of teachers with SD exists, but is partial and needs further training to integrate the concept of Sustainable Development in class.

Additional remarks of Ecuador

- The constitution reflects that all society should be integrated in the educational system to deliver education. However the Law of Education established a limit to Municipal participation with schools. Now they are limited to work only with the children because in order to give training to teachers they should previously be qualified and authorized by the Ministry of Education. In the case of NGO’s, it they work directly with the Government, they do not complied with those requirements. But in the case

of independent work it cannot happen without previous authorization of the relevant Authority of Education.

- Involvement of external stakeholders within the activities of the school was limited to collection of plastic bottles and this happened because of individual involvement of a teacher in the school. In the relevant topic of classification of solid waste and classification which is given in class and within the schools exists three containers for classification of waste it is worthless because all waste is buried in land in Ecuador and further coordination could take place to at least recycle plastic bottles.
- Within the Constitution besides the “good living concept”, it was found a motivational speech of the government which is the “citizen revolution” which is used in order to integrate all citizens and remark the changes that the government has achieved. In the constitution this concept is also reflected by recognizing that only through education the real revolution can be achieved. This is a powerful tool to work towards a common objective and shows the aim of being participative involving all Ecuadorians and could be used also to integrate ESD through the system.
- Before comparing the educational system outside of Ecuador, one of the remarks was found inside the same country through an additional Educational System for indigenous communities, which respects the right of communities for ancestral knowledge and culture. This system reflects a greater inclusion of the environment, being the base in which education is built upon. If both systems were contrasted the national educational system possess weak sustainability as it focus more in social and economic development and environmental protection meanwhile the educational system for indigenous communities recognizes first the environment in which will be involved the social and economic development, as it states to live within harmony with nature.

Aim 3. Deliver key experiences successfully implement ESD into their Educational System

Question 1. How Sweden have implemented Education for Sustainable Development for Basic General Education?

Sweden does not possess a national action plan, or an official governmental coordinating body for implementing ESD. Nevertheless ESD is included in national laws and regulations such as Educational Acts which are translated directly to Curriculums relevant for the grades 1th to 10th correspondent to primary and compulsory education in Sweden, the focus of the present study. However educational institutions are autonomous to work for their own priorities and to set how to integrate ESD in their programs. High support for the implementation of ESD was found from individual work carried by municipalities, organizations, teachers, NGOs, and Swedish citizens through diverse programs and initiatives. Regrettably there is not a monitoring activity being done at national level to reveal how ESD have been implemented among the schools and within the focus of the study correspondent to primary and compulsory education.

Question 2. Which lessons from Sweden could be implement ESD for Ecuador

In the framework it was stated that the policy is a leverage point for the implementation of ESD at national level. A remark found in this study is that it can work against if the level of the individuals where is going to be applied is not equal, which was learned through the

comparison of both countries. Ecuador and Sweden were found to be coincident in not having applied fully their regional strategies for the implementation of ESD. Nevertheless Sweden has implemented ESD at national level through policies that lies in the discretion of individual public authorities and educational institutions to implement and promote the implementation of ESD through participation of municipalities, organizations, teachers, NGOs, and Swedish citizens within diverse programs and initiatives. This policy of free choice, allowed the integration of diverse stakeholders in Sweden, but this is only effective when every school and municipality are at the same level of infrastructure, quality and access to resources, which is not the case of Ecuador. The reality is different in Ecuador because before the start of the Decade Plan of Education, schools among the nation reflected great differences in structure, equipment, teacher's knowledge, access, quality and equity of education. For which the state reformulated the Law of education and set additional strict regulations for all schools to follow and with more focus on public schools. All schools shall present planned activities, follow strictly the curriculum and if they aim to incur in any type of initiative it should be pre-approved by the competent Authority of Education. In one hand this aims to equalize the education being delivered around the country, aiding schools which had poor resources in all aspects. Yet in the other hand schools that were performing well and have acceded ESD have to retreat the action and are lacked within the system.

One of the national initiatives from Sweden that could be adapted to Ecuador is the use of motivational programs as the Green Flag Award or the Sustainability School Award. This motivational programs, gives liberty and democracy to choose, allowing the integration of all the school members, and also giving direction to the educational unit to follow. ESD as was referred in the introduction, in order to be integrated locally should be directed by policies that give motivation, direction and support. Additionally as it is concern of the Ecuadorian Government to increase and maintain quality of education, an award system that has the criteria of management and quality standards that includes ESD into it will fulfil the needs of the Ecuadorian system.

NaturSkola is a municipal initiative but spread around all Sweden, each of the agencies work independently but follow five objectives, which are extracted from the curricula and also support the award system. This is a relevant organization that supports schools, focusing on students, teachers and head of schools. This is a support system which also could be developed in Ecuador, but targeting mostly teachers in order to have a higher range of reach to implement ESD in classes.

However the level of implementation as was stated from the beginning in Sweden is far more advanced than in Ecuador. Still the results of implementation in Sweden are not able to being measure because there is not a monitoring action to do so. Leading to the lesson of the necessity to monitor the implementation at national level for any initiative in order to improve the system within time.

Final Remarks

Realities among the countries are completely different, Ecuador has fortunately improved the educational system in the last nine years, almost eradicating illiteracy, and increasing enrolments rates for grades 1th to 10th, improving and equipping educational units. In the other hand Sweden has to battle to increase the academic performance of students, prioritizing that activity from the governmental perspective. Which has lead the attention of both countries in other directions from ESD.

Already in Ecuador the “good living concept” has introduced related issues of ESD through the curricula, reaching the school ground however it is only conceptual and not fully delivered by teachers. In this context the “good living concept” should be used to introduce further ESD, but taking into consideration the high diversity from cultural background, ethnicity, and environmental regions of the country. The policy or initiative should be flexible enough to be adapted to the the variety of local context but with sufficient guidance to secure the implementation, which can be directly the curriculum and syllabus. Additionally motivational and support system should be considered to secure the implementation.

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References of Intervies

Interviews in Ecuador

Names	Specification
Olwaldo Buitron (Sangolqui), Ana Molina, Maria del Carmen Sanchez, Angel Moreno, Byron Moreno (liceo Naval), (Jack Dalcrose), Fabian Quimbiulco, Susana Cahenas, Gladis de Barba (Albert Einstein), Marcia Hernández , Aida Sanchez (Giovanny Farina), Carlos (Duant), Patricia Cevallos (liceo del Valle), Maritza Zurita (salinas)	Rectors and teachers from private, public and partial public Educational Units of Sangolqui, Pichincha, Ecuador.
Gabriela López, Carlos Vacacela Alvares, Klever Parra, Marcelo Torres, Laura Maldonado and Elke Vanwildemeersch	NGO representatives and Municipal, Regional governmental authorities from the Environmental and Educational branch.
Gabriela López	Municipal Enviromental Specialist of Ruinahui Canton
Carlos Vacacela Alvares	Municipal Enviromental Specialist of Ruinahui Canton
Klever Parra	Tecnical Manager of MIEDU, collaborator of the Decade Plan for Environmetal Education.
Marcelo Torres	Coordinator of Planification Department of MIEDU
Laura Maldonado	Enviromental Specialist in Curriculum Development of MIEDU
Elke Vanwildemeersch	VVOB representative in Ecuador

Interviews in Sweden

Names	Specification	Interview type
Eva Person	Naturskola representative working in Lund	One-to-one
Lina Hällström	Naturskola representative working in Lund	One-to-one
Anders Jidesjö	Individual Resercher Author of The implementation of Education for Sustainable Development (ESD) in Sweden	Email communication

Appendix 1

Survey: Education for Sustainable Development

“The most satisfying experience that the human being have, is learning.”

As a MESPOM student at the University of Lund in Sweden, I am conducting a study regarding the "Implementation of the Education for Sustainable Development in the classroom, Basic Education level." Therefore the aim of this survey is to determine: if teachers are familiar with the subject, if implementation of ESD in their classrooms have taken place and also to know if the school is working on a project related to the topic.

The survey is anonymous for both the teacher and the educational establishment. To carry out this survey is estimated a period of approximately 15 minutes.

Date: _____

Mark your answer			
<p>1. ¿What is your age?</p> <p>a) 25-30 b) 31-35 c) 36-40 d) 41-45 e) 46-50 f) More than 51</p>	<p>2. ¿how many years of experience as a teacher do you have?</p> <p>a) 1-5 b) 6-10 c) 11-15 d) More than 16</p>	<p>3. ¿Which subject do you actually teach?</p> <p>a) Natural Sciences b) Social Sciences c) Literature/grammar d) Mathematics e) English f) Other (specify): _____</p>	<p>4. ¿In which grades do you teach?</p> <hr style="border: 1px solid black;"/>
<p>5. Your former degree belongs to:</p> <p>a) Second level: High school graduate</p> <p>b) Third level: Bachelor</p> <p>c) Fourth level: Master</p> <p>d) PhD</p>	<p>6. Have you receive information about sustainable development?</p> <p>a) No b) yes</p>	<p>6.1 If the response is positive what was the source of information:</p> <p>a) Previous Education b) Governmental program. c) Information from other organizations d) Self though e) Other (specify): _____</p>	<p>7. Are you part of a network related to sustainable development?</p> <p>a) yes b) No</p>

8. How familiar are you with the next statement

Sustainable Development is the development that satisfy the present generation necessities without compromising the capacity of future generations to satisfy their necessities. :

- a) Highly familiar
- b) Moderately familiar
- c) Lightly familiar

d) I have never hear about it before

9. In your opinion which one are the fourth dimensions that should be connected in order to have sustainable development

- e) Society, the environment, culture and the economy
- f) Law, policy, food habits and sports
- g) Consumerism, production, industrialization and development

10. Mark with an X, if you have taught in class the following topics which are related to sustainable development,: (you can mark more than one)

Topics	Mark
a) Climate change	
b) Decrease of disaster risk	
c) Biodiversity	
d) Poverty reduction	
e) Sustainable consumption	
f) Sustainable use of water	
g) Prevention of soil contamination	
h) Prevention of air pollution	
i) Gender equality	
j) Health care	
k) Sustainable life style	
l) Reforestation	
m) Recycling	
n) Sustainable use of energy	
o) Waste reduction	
p) Waste classification and final destination	
q) Cultural diversity	

11. ¿Do you consider that the Good Living Concept are related with the topics mentioned before?

- a) Totally related
- b) Moderate related
- c) Not related at all

12. ¿ Subjects treated in class are adapted to reflect a local reality?
(example: subject water; what sources are nearby, in what it is used for, what problems are caused by it wrong use, who lack of water sources in our surrounding, etc)
- a) Yes they reflect a local reality
 - b) No they don't reflect a local reality
 - c) The curriculum is not flexible to have this into consideration
 - d) It does not relates do my area
13. ¿Subjects from one class are reinforce in another class?
- a) Frequently
 - b) Moderate
 - c) Classes are independent from each other
14. ¿From the topics treated in class, have any a relationship with a Project that integrates all the institution?
- a) Yes, it relates with a Project run by all the school
 - b) No it does not relates with a project run by all the school
 - c) We do not have projects that integrates all the institution
15. Mark what do you consider is related with Education for sustainable development
- a) Cultural identity, gender equity and poverty reduction.
 - b) Biodiversity protection, decreases of pollutants in renewables resources, efficient use of energy and water.
 - c) The economic development and social and environmental impacts
 - d) All the above
 - e) None of the above
16. Climate change is related to:
- a) Environmental variation of the temperature mostly due to an increase of the release of CO₂ (carbon dioxide) into the atmosphere.
 - b) Environmental variation of the temperature mostly due to an increase of mercury concentration in ground water
 - c) Environmental variation of the temperature mostly due to an increase use of energy from renewable sources.
17. ¿In your opinion does the actual curriculum allowed the student to develop critical thinking?
- a) Frequently
 - b) Moderate
 - c) not likewise
 - d) it does not relates whit my teaching area

Thank you for the time and collaboration with this survey